EPA Region 5 Records Ctr.
230484

IV

SAUGET AREA I

DEAD CREEK FINAL REMEDY
CREEK BOTTOM SOIL
ENGINEERING EVALUATION/COST ANALYSIS

SAUGET AND CAHOKIA, ILLINOIS

VOLUME 3

ECOLOGICAL RISK ASSESSMENT

Submitted to:

USEPA Region 5, Chicago, Illinois

Submitted by:

Solutia, Inc.
St. Louis, Missouri

June 21, 2002

MENZIE • CURA & ASSOCIATES, INC.
One Courthouse Lane, Suite Two · Chelmsford, Massachusetts 01824 · Phone 978/453-4300 Fax 978/453-7260

ECOLOGICAL RISK ASSESSMENT

ON DEAD CREEK BOTTOM SOIL

Prepared for:

Solutia, Inc.
575 Maryville Centre Drive
St. Louis, MO 63141

Prepared by:

Menzie-Cura & Associates, Inc.
One Courthouse Lane, Suite 2
Chelmsford, Massachusetts 01824
(978) 453-4300

June 21, 2002

Katherine A. Fogarty, P.E.
Project Manager

Charles A. Menzie, Ph.D.
Project Reviewer

Robin Dodson
Project Scientist

TABLE OF CONTENTS

1.0 INTRODUCTION 1

1.1 PREVIOUS ECOLOGICAL RISK ASSESSMENTS FOR SAUGET AREA I 1
1.2 APPROACH TO ASSESSMENT OF ECOLOGICAL RISKS IN CREEK BOTTOM SOILS 2

2.0 DEAD CREEK HABITAT 3

3.0 DATA USED IN THE ECOLOGICAL EVALUATION OF DEAD CREEK 4

3.1 DEAD CREEK BOTTOM SOIL DATA 4
3.2 SCREENING OF CREEK BOTTOM SOIL DATA 4
3.3 DATA USED FROM THE 2001 ECOLOGICAL RISK ASSESSMENT 5
3.3.1 1999 Surface Water Data 6
3.3.2 1999 Ecological Sediment Data 6
3.3.3 1999 Forage Fish Data 6

4.0 APPROACH TO RISK ASSESSMENT/DEVELOPMENT OF REMEDIAL GOALS 8

4.1 CREEK BOTTOM SOIL REMEDIAL GOALS TO PROTECT THE SUSTAINABILITY OF WARM WATER FISH 8
4.1.1 Calculation of Site-Specific BSAFs 8
4.1.2 Evaluation of Sediment-Fish Tissue Relationships 9
4.1.2.1 Sediment-Fish Tissue Relationship for Mercury 9
4.1.3 Back-calculation of Sediment Concentrations Protective of Fish 11
4.2 CREEK BOTTOM SOIL REMEDIAL GOALS TO PROTECT THE SURVIVAL, GROWTH, AND REPRODUCTION OF LOCAL POPULATIONS OF PISCIVOROUS WILDLIFE 12
4.2.1 Evaluation of Risk to Piscivorous Wildlife due to Creek Bottom Soils 12

5.0 APPLICATIONS OF RISK ASSESSMENT/REMEDIAL GOALS TO DEAD CREEK BOTTOM SOILS 14

5.1 RISKS DUE TO CREEK BOTTOM SOILS PER CREEK SECTION 14
5.2 SELECTION AND IMPLEMENTATION OF REMEDIATION GOALS 14

6.0 EVALUATION OF POTENTIAL RISK 16

7.0 EVALUATION OF UNCERTAINTY 17

8.0 SUMMARY 20

9.0 REFERENCES 21

LIST OF TABLES

Table 3-1	Comparison of Post-Remediation Creek Bottom Soil Concentrations to Sediment Quality Guidelines
Table 3-2	Comparison of Maximum Surface Water Concentrations to Illinois Water Quality Standards
Table 3-3	List of Sample Stations, Dates, and QA/QC Samples for Fish Tissue Analysis
Table 4-1	Site-Specific BSAFs and Linear Regression Equations
Table 4-2	Whole Body Toxicity Values for Fish
Table 4-3a	Results of Food Chain Modeling - Heron
Table 4-3b	Results of Food Chain Modeling – River Otter
Table 5-1	Comparison of Creek Bottom Soil Concentrations to Cleanup Goals for Ecological Risk
Table 5-2	Implications for Additional Remediation at Dead Creek
Table 6-1	Evaluation of Potential Acute Risks
Table 7-1	Uncertainty of Evaluation of Ecological Risk Due to Creek Bottom Soils

LIST OF FIGURES

Figure 1-1	Site Locus and Sampling Locations
Figure 1-2	Monroe County Reference Areas
Figure 3-1	Creek Bottom Soil Sampling Locations

LIST OF APPENDICES

Appendix A Woodlot Alternatives, Inc. Baseline Habitat Assessment Report

Appendix B Creek Bottom Soil Data and Summary Statistics by Creek Section

- B-1 Text
- B-2 Data
- B-3 Summary Statistics

Appendix C 1999 Surface Water, Sediment, and Forage Fish Data and Summary Statistics

- C-1 Surface Water
- C-2 Sediment
- C-3 Forage Fish

Appendix D Calculation of Site-Specific BSAFs and Sediment-Fish Tissue Relationships

- D-1 Text
- D-2 Calculations
- D-3 Linear Regressions

Appendix E Food Chain Modeling

- E-1 Text
- E-2 Wildlife Toxicity Data
- E-3 Food Chain Model Results – Great Blue Heron
- E-4 Food Chain Model Results – River Otter

1.0 INTRODUCTION

This report presents an assessment of ecological risks due to residual creek bottom soils in Dead Creek Sections B through F in Sauget Area I in Sauget and Cahokia, Illinois (Figure 1-1). It follows procedures used in the Ecological Risk Assessment for Sauget Area I, Sauget, St. Clair County, Illinois (Menzie-Cura & Associates, Inc., 2001). This report focuses solely on Dead Creek Sections B through F in their current condition after the recent completion of remediation in this area. The remediation and post-remediation sampling are described in Volume 1 of this submittal (Engineering Evaluation/Cost Analysis (EE/CA)). All sediments have been removed to native soils from Dead Creek Sections B through F.

Site M is not addressed in this evaluation since it has been back-filled and is no longer an aquatic habitat.

1.1 Previous Ecological Risk Assessments for Sauget Area I

A preliminary ecological risk assessment for Dead Creek Section F (which included the Borrow Pit Lake) was conducted by Ecology and Environment, Inc. in 1997 (E and E, 1997).

In 2001, Menzie-Cura & Associates, Inc. completed a baseline Ecological Risk Assessment for Dead Creek Section F and the Borrow Pit Lake. For the ecological risk assessment, surface water, sediment, and biota (plants, fish, and invertebrates) data were collected from Dead Creek Sections B through F, the Borrow Pit Lake, Site M, and reference areas. Sauget Area 1 sampling locations are presented on Figure 1-1. Reference sampling locations are presented in Figures 1-1 and 1-2. The rationale for the selection of the reference areas was described in Section 2.0 of the Ecological Risk Assessment report.

With the agreement of the United States Environmental Protection Agency (USEPA) Remediation Project Manager (RPM) at that time, Michael McAteer, the assessment was restricted to a portion of Dead Creek Segment F and the Borrow Pit Lake. Creek Segments B through the upper portion of F were subject to a Unilateral Administrative Order (UAO) issued by the USEPA on May 31, 2000 to Monsanto Company and Solutia Inc. (Docket No. V-W-99-C-554) pursuant to section 106(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 as amended, 42 U.S.C. Section 9606(a) requiring remediation in Creek Sections B through F and Site M.

The assessment endpoints that relate specifically to the aquatic environment of Dead Creek that were evaluated in the 2001 ecological risk assessment were:

Assessment Endpoint 1: Sustainability of warm water fish;

Assessment Endpoint 2: Survival, growth, and reproduction of local populations of aquatic wildlife as represented by the, mallard duck, great blue heron, muskrat, and river otter; and

Assessment Endpoint 3: Survival, growth, and reproduction of individuals within the local bald eagle population that may overwinter near the site. No risks were identified to bald eagles

1.2 Approach to Assessment of Ecological Risks in Creek Bottom Soils

The approach taken in this assessment was to build upon the Assessment Endpoints identified in the 2001 Ecological Risk Assessment; specifically, Assessment Endpoint 1 – sustainablility of warm water fish populations; and Assessment Endpoint 2 – survival, growth and reproduction of local populations of aquatic wildlife. To this end, the sediment and forage fish data collected in 1999 prior to remediation were used to develop site-specific uptake factors for chemicals detected in Dead Creek bottom soils. These uptake factors were used to back-calculate sediment concentrations protective of fish and to calculate fish concentrations for use in food chain models for piscivorous wildlife, the great blue heron and river otter. For compounds posing risk to piscivorous wildlife, a sediment concentration protective of those wildlife could be back-calculated. The protective sediment concentrations were then compared to the UCL (or average) concentration in each creek section to identify areas and compounds that might pose an ecological risk.

Section 2.0 of this report provides a brief description of the creek habitat. Section 3.0 presents the post-remediation creek bottom soil data and the pre-remediation sediment, surface water, and biota data used in the assessment. Section 4.0 describes how the risk-based concentrations were derived, and Section 5.0 applies the derived concentrations to each creek section. It also identifies sample locations that have to be removed from the data set to result in acceptable ecological risks in Dead Creek. Section 6.0 evaluates the potential for acute risk due to Dead Creek bottom soils. Section 7.0 discusses the uncertainty associated with this assessment, and in particular, with the compounds for which risk-based concentrations could not be developed. Section 8.0 is an overall summary of the assessment.

2.0 DEAD CREEK HABITAT

Dead Creek begins immediately south of Queeny Avenue in an industrial area of Sauget, Illinois and flows slowly south through residential neighborhoods (Figure 1-1). Along most of its length, the stream is bordered by a dense, narrow band of riparian trees and shrubs. Homeowners have cleared to the creek's edge and have established lawn along several sections. Creek Section B runs from Queeny Avenue south to Judith Lane, Section C from Judith Lane to Cahokia Street, Section D from Cahokia Street to Jerome Street, and Section E from Jerome Street to the intersection of Routes 3 and 157. Section F begins at the intersection with Route 3, crosses the intersection, passes through a culvert at railroad tracks, and continues to the southwest toward the Borrow Pit Lake. West of Route 3, the creek flows south and west through the American Bottoms floodplain. This area contains active and abandoned agricultural land divided by levees and railroad right-of-ways. After Dead Creek flows under the railroad right-of-way, it is joined by a stream draining land from the north.

The Borrow Pit Lake is a borrow pond that was excavated during the construction of the local levee system. It covers approximately 530,000 square feet (approximately 200 feet by 2,650 feet). The United States Geological Survey (USGS) map of the area (Cahokia) indicates that the pond was dug to its current shape sometime after 1954. The pond is the largest non-flowing water body in the area. Its shore is surrounded with mature riparian trees. During times of high water, Dead Creek drains the pond through a pump station under a levee and flows into a ditched section of Old Prairie du Pont Creek. Storm water is allowed to accumulate in the Borrow Pit Lake until the water level reaches Elevation 10. Then the lift pumps are activated and accumulated water is pumped to Old Prairie du Pont Creek. This storm water management practice turns the Borrow Pit Lake into a storm water retention basin subject to large fluctuations in water level. Old Prairie du Pont Creek flows northwest to Arsenal Island on the Mississippi River.

A detailed habitat assessment of Dead Creek prepared by WoodLot Alternatives, Inc. is in Appendix A.

3.0 DATA USED IN THE ECOLOGICAL EVALUATION OF DEAD CREEK

3.1 Dead Creek Bottom Soil Data

The EE/CA (Volume 1) describes the sampling and analytical methodology for Dead Creek bottom soils. Sample locations are on Figures 3-1A through 3-1C.

Creek bottom soils were analyzed for herbicides and pesticides, semivolatile organic compounds (SVOCs), volatile organic compounds (VOCs), inorganics, polychlorinated biphenyl (PCB) homologs, and dioxin and furan congeners. The creek bottom soil data and summary statistics are presented in Appendix B by creek section. Appendix B also provides a description of how the summary statistics were calculated and how total concentrations were calculated for DDT, PCBs, polynuclear aromatic hydrocarbons (PAHs), and 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) toxic equivalence quotients (TEQs). Information provided in Van den Berg et al. (1998) indicates that the toxic equivalency factors (TEFs) used to calculate TEQs are slightly different for fish, birds, and mammals to account for differing wildlife sensitivities. However, for the sake of expediency, only the mammalian factors have been used in this assessment. The 2001 ecological risk assessment indicated that the summed TEQs vary only slightly overall for fish, birds, and mammals. For the sediment data used in the 2001 ecological risk assessment, the fish TEQs were 0.7 times the mammal TEQs, and the bird TEQs were 0.8 to 1.4 times the mammal TEQs.

3.2 Screening of Creek Bottom Soil Data

Table 3-1 compares the maximum concentration of each constituent analyzed in creek bottom soils with the published sediment screening benchmarks employed in the 2001 Screening Ecological Risk Assessment. These screening benchmarks are:

> Consensus-based Threshold Effect Concentrations developed and evaluated by MacDonald et al. (2000). Their Threshold Effects Concentrations (TEC) represent concentrations below which harmful effects to benthic biota are unlikely to occur. Their Probable Effects Concentrations (PEC) represent concentrations above which harmful effects to biota are likely to be observed.
>
> Florida sediment quality guidelines developed by MacDonald (1994). The Threshold Effects Level (TEL) and Probable Effects Level (PEL) are similar to the TEC and PEC described above.
>
> Ontario Sediment Quality Guidelines (Persaud et al., 1993) Lowest Effect Levels (LELs).

Note that these screening benchmarks indirectly evaluate the assessment endpoints identified in Section 1.0 of this report. These benchmarks were developed for the

protection of benthic invertebrates, which may serve as a food source to warm water fish, and possibly to wildlife receptors.

Table 3-1 indicates that the following compounds/analytes may be excluded from further consideration because they were not detected in creek bottom soils. They are the herbicides/pesticides:

> dinoseb, endrin, endrin aldehyde, MCPA, and toxaphene;
>
> the SVOCs 2,4-dinitrophenol, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-chloronaphthalene, 2-methylphenol, 2-nitroanaline, 2-nitrophenol, 3,3'-dichlorobenzidine, 3-nitroanaline, 4-bromophenylphenyl ether, 4,6-dinitro-2-methylphenol, 4-chloro-3-methylphenol, 4-chlorophenylphenyl ether, bis(2-chloroethoxy)methane, bis(2-chloroethyl)ether, 2,2'-oxybis(1-chloropropane), diethylphthalate, dimethylphthalate, di-n-octylphthalate, hexachlorobenzene, hexachlorocylcopentadiene, hexachloroethane, isophorone, and N-nitroso-di-n-propylamine; and
>
> the VOCs, 1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloropropane, bromomethane, carbon tetrachloride, chloroethane, chloromethane, cis-1,3-dichloropropene, trans-1,3-dichloropropene, and vinyl chloride.

Calcium, magnesium, potassium, and sodium were not evaluated further because they are common nutrients and soil components of low toxicity.

The following analytes are below screening benchmarks in each creek section: alpha-BHC and cobalt.

3.3 Data used from the 2001 Ecological Risk Assessment

This evaluation makes use of the Dead Creek, Borrow Pit Lake, and reference area surface water, sediment, and forage fish data that were collected in 1999 for use in the ecological risk assessment. Surface water and sediment sample locations are on Figure 1-1. Details of sample collection were presented in:

> Soil, Ground Water, Surface Water, Sediment, and Air Sampling Field Sampling Report, Sauget Area 1, Remediation Technology Group, Solutia Inc., St. Louis, MO, O'Brien & Gere Engineers, Inc., September 2000.

The data and data validation were originally presented in:

> Sauget Area 1 Site, Support Sampling Project, Data Validation Report, Solutia Inc., St. Louis, MO, O'Brien & Gere Engineers, Inc., August 2000.

3.3.1 1999 Surface Water Data

Surface water samples were collected from Dead Creek, Borrow Pit Lake, and the reference areas. Samples were co-located with surficial (0 to 2 inches) sediment samples collected for ecological risk assessment. Sample locations are on Figures 1-1 and 1-2. The surface water data and the summary statistics for those data are presented in Appendix C-1.

Table 3-2 compares the maximum detected surface water concentrations in each creek section (except Creek Section C which was dry at the time of sampling in 1999) with Illinois Water Quality Standards (Illinois, 1999) and National Recommended Water Quality Criteria (USEPA, 1999). The following compounds exceeded criteria in surface water:

> In Creek Section B, 4,4'-DDT, aldrin, dieldrin Endosulfan II, gamma-BHC, gamma-chlordane, heptachlor, heptachlor epoxide, and copper.
>
> In Creek Section D, 4,4'-DDT, endrin, Endosulfan I, Endosulfan II, gamma-BHC, gamma-chlordane, heptachlor, heptachlor epoxide, aluminum, copper, iron, and PCBs.
>
> In Creek Section E, gamma-BHC, and iron.
>
> In Creek Section F, aluminum.
>
> In Borrow Pit Lake, aluminum and iron.

A comparison of this information with creek bottom soil information presented on Table 3-1 indicates that none of the compounds previously detected in surface water were excluded from further analysis in this assessment.

3.3.2 1999 Ecological Sediment Data

Surficial sediment samples to be used for ecological risk assessment (designated "ESED" or "SED") were collected from depths of 0 to 2 inches from Dead Creek, the Borrow Pit Lake, and the reference areas. These sediment samples were co-located with surface water sampling locations. These locations are shown on Figures 1-1 and 1-2. The sediment data and summary statistics are presented in Appendix C-2.

3.3.3 1999 Forage Fish Data

Small fish, up to about 2 inches in length, were the only fish present in Dead Creek. At the time the sampling occurred in the Fall of 1999, water levels in Dead Creek were very low, and small or forage fish were not present in all creek sections. Forage fish samples were collected from Creek Sections B and D, Borrow Pit Lake, and the two reference areas. Table 3-3 provides the information on the composition of each forage fish sample.

The forage fish data and the summary statistics for those data are presented in Appendix C-3.

4.0 APPROACH TO RISK ASSESSMENT/DEVELOPMENT OF REMEDIAL GOALS

This assessment uses information on fish and higher trophic levels from the 2001 ecological risk assessment to evaluate the concentrations of chemicals currently remaining in creek bottom soils.

4.1 Creek Bottom Soil Remedial Goals to Protect the Sustainability of Warm Water Fish

This section describes how site-specific bioaccumulation factors for sediment were developed from the data collected for the 2001 ecological risk assessment. It then describes how these values will be used to back-calculate a concentration that is protective of fish using whole body toxicity reference values (TRVs) for fish tissue from the literature. In Section 5.0, these remedial goals that are protective of fish will be compared to concentrations detected in creek bottom soils.

4.1.1 Calculation of Site-Specific BSAFs

Site-specific biota to sediment accumulation factors (BSAFs) were calculated for forage fish. BSAFs were calculated as follows:

For sediment:

Nonpolar organic compounds:

$$\frac{Conc_{organism} / f_{lipid}}{Conc_{sed} / f_{oc}}$$

All other compounds (herbicides and metals):

$$\frac{Conc_{organism}}{Conc_{sed}}$$

where:

$Conc_{organism}$	=	Concentration of compound in forage fish (wet weight)
f_{lipid}	=	Fraction of lipid in forage fish (wet weight)
$Conc_{sed}$	=	Concentration of compound in sediment (dry weight)
f_{oc}	=	Fraction of organic carbon in sediment (dry weight)

BSAFs were calculated for each forage fish sample using an average sediment concentration from the area sampled (e.g., Creek Section B). These relationships were

calculated if the compound was detected in both sediment and forage fish tissue. They were also calculated for compounds that were detected in forage fish tissue but not sediment (since detection in fish tissue indicated that uptake was occurring, and therefore, the compound must be present in sediment at a concentration below the detection limit). If the compound was not detected in sediment, one half the detection limit was used to calculate the site-specific BSAF.

BSAFs calculated for each compound were averaged across samples. Sediment to biota BSAFs were then used with the average creek bottom soil concentrations in Creek Sections B through F, average lipid concentrations for forage fish, and average TOC concentrations in creek bottom soils for each creek section to model predicted concentrations of chemicals in forage fish. The calculation of BSAFs is presented in Appendix D.

4.1.2 Evaluation of Sediment-Fish Tissue Relationships

For certain compounds (aluminum, copper, mercury, zinc, PCBs, dioxin TEQs), the relationship between sediment concentrations and fish concentrations were evaluated by plotting the data and looking for trends. If a trend was apparent, the linear regression was evaluated using Statistica software; this evaluation is presented in Appendix D. For compounds with a strong linear relationship, we used the regression equation also presented in Appendix D. Of the listed compounds, mercury did not exhibit a relationship between sediment concentration and forage fish tissue concentration. Aluminum exhibited an upward trend, but the regression was not statistically significant. For the sake of completing the analysis quickly, this statistical evaluation was not performed for all the compounds detected in sediment and forage fish. For the compounds listed above, the use of the average BSAF provided a more conservative analysis than the use of the regression equation; i.e., the average BSAF predicts a higher forage fish concentration than the regression equation. The regression equation is appropriate for compounds where a linear relationship between concentrations in sediment and fish is present, and therefore, will be used for aluminum, copper, zinc, PCBs, and dioxin TEQs.

The form of mercury in sediment and other factors in the surface water body and its watershed influence uptake of mercury into fish. These factors are complex and can cause elevated fish concentrations of mercury even in pristine lakes in remote areas as discussed below. Because we do not have sufficient information to evaluate these factors in Dead Creek, this assessment will not address potential ecological risks due to mercury.

4.1.2.1 Sediment-Fish Tissue Relationship for Mercury

Mercury in the environment can exist in a variety of organic and inorganic forms and can be transformed from one form to another by a variety of processes. These include:

- The enzymatic reduction of ionic mercury to elemental mercury

- The precipitation of ionic mercury as mercury sulfide by sulfate-reducing bacteria
- The methylation of inorganic mercury to methyl mercury by sulfate-reducing and possibly other types of bacteria
- The demethylation and subsequent reduction of monomethyl mercury to elemental mercury and methane.

The production rate and final products of these processes are affected by pH, redox conditions (Eh), light, temperature, and the complexing ligands present.

In aquatic environments, methylation of mercury by microorganisms in sediment and water is an important process that affects the bioavailability of mercury. Methyl mercury readily crosses biological membranes, accumulates in exposed organisms, and can biomagnify to high concentrations in aquatic food webs (USEPA 2002a). Nearly 100% of the mercury found in fish muscle tissue is methylated (Bloom, 1992).

Much of the variability in concentrations of mercury in fish among various sites can be attributed to differences in the rate of methylation and the concentration of methylmercury in the environment. A national study of mercury contamination in aquatic ecosystems found no correlation between the concentration of total mercury in fish and in sediment. Rather, mercury concentrations in fish were more highly correlated to factors associated with the production of methylmercury (Krabbenhoft et al., 1999). These factors include environmental setting (e.g., climate, geology, land use, and land cover) water chemistry, and density of wetlands in the adjacent water basin.

There is a large degree of scientific uncertainty and variability among water bodies concerning the processes that methylate mercury (USEPA, 1997). Methylation of inorganic mercury and substantial uptake into fish can occur even in otherwise pristine lakes (Gilmour et al., 1992). Variables that can affect the net microbial production of methylmercury include physicochemical characteristics of surface waters, flooding and inundation of vegetated areas, and density of wetlands in the watershed. Human activities, such as the construction of new reservoirs, can increase levels of mercury in fish by creating environmental conditions that increase the rate of microbial methylation. For example, the introduction of sulfates into a waterbody from acid rain or runoff from soil can stimulate the activity of the microorganisms that produce methylmercury. This has been demonstrated in newly or recently flooded impoundments (Moore and Ramamoorthy, 1984; Phillips et al., 1987). In contrast, the presence of sulfide tends to inhibit methylation by producing a mercury complex that cannot be taken up by cells. In general, bacterial methylation rates appear to increase under anaerobic conditions, high temperatures, and low pH (USEPA, 1997).

The bioaccumulation of methylmercury in fish is also influenced by an array of biotic, ecological, and environmental factors and processes. Fish obtain methylmercury almost entirely through dietary uptake, which is influenced by the size of the fish, its diet, and food-web structure. Longer-lived species at the upper end of the food web typically have the highest concentrations of methylmercury in a given water body (USEPA, 1997).

Mercury uptake by aquatic life from water and sediment is influenced by pH, dissolved organic carbon (DOC), salinity, sulfides, and other parameters (e.g., temperature).

The 1999 data for Dead Creek prior to remediation indicated that forage fish concentrations in the creek (data are available for Creek Sections B and D) were below levels associated with ecological risk. In addition, mercury was not detected in the snail samples collected from Creek Sections B, C, or D, or in freshwater clams from Borrow Pit Lake. Mercury was not detected in surface water in Dead Creek or the Borrow Pit Lake in 1999.

4.1.3 Back-calculation of Sediment Concentrations Protective of Fish

Table 4-1 presents the site-specific BSAFs and linear regression equations. Site-specific BSAFs and/or sediment-forage fish regression equations could be calculated for 2,4-DB, total DDT (based on the site-specific BSAF for DDE), dicamba, dichloroprop, dieldrin, gamma-chlordane, bis(2-ethylhexyl)phthalate, dibenzo(a,h)anthracene, indeno(1,2,3-c,d)pyrene, pentachlorophenol, aluminum, chromium, copper, lead, selenium, zinc, total PCBs, and dioxin TEQs.

The BSAFs or linear regression equations were used with toxicity reference values (TRVs) for fish body burdens to back-calculate a sediment (or creek bottom soil) concentration protective of fish.

Toxicity Reference Values for aquatic life are based on critical body burdens or concentrations of compounds in animal tissues that correspond with toxicological effects. The US Army Corps of Engineers Waterways Experiment Station (WES), the research and development branch of the US Army Corps of Engineers, has developed the Environmental Residue Effects Database (ERED) (USACE, 2002). ERED compiles reports from the literature on adverse effects of compounds based on whole body concentrations in aquatic life. WES conducts a quality control review on entries and updates the database annually. US EPA has compiled a similar database (Jarvinen and Ankley, 1999). This ecological risk assessment uses both sources for development of toxicity reference values for fish.

Studies that examined effects on growth, survival or reproduction were selected for development of body burden toxicity reference values. If more than one appropriate study was available, the lowest of the lowest observed effects levels (LOAEL) and corresponding no observed effects level (NOAEL) were selected. Table 4-2 presents the test species, residue effect level, literature reference, and value selected. The selected value is used on Table 4-1. Where possible, the TRVs used in the 2001 ecological risk assessment were in the present evaluation. For compounds that were not detected previously, the same sources of information were used to select TRVs.

Table 4-1 presents the back-calculated sediment concentrations that are protective of fish using site-specific BSAFs or linear regression equations and TRVs. For compounds whose concentrations are summed within a group (i.e., DDT, polychlorinated biphenyls (PCBs), and dioxin toxic equivalents (TEQs)), the predicted concentrations of the

individual compounds in forage fish or the back-calculated concentrations in creek bottom soils were summed. Ecological risk-based sediment concentrations for the protection of fish could be calculated for total DDT (based on DDE), dieldrin, gamma-chlordane, bis(2-ethylhexyl)phthalate, aluminum, chromium, copper, lead, zinc, total PCBs, and dioxin TEQs.

4.2 Creek Bottom Soil Remedial Goals to Protect the Survival, Growth, and Reproduction of Local Populations of Piscivorous Wildlife

4.2.1 Evaluation of Risk to Piscivorous Wildlife due to Creek Bottom Soils

To evaluate which compounds present a potential risk to piscivorous wildlife due to creek bottom soils, we employed food chain models for great blue heron and river otter that were developed in the 2001 ecological risk assessment. The great blue heron was selected as a receptor to evaluate because it and other wading birds have been observed at Dead Creek and the Borrow Pit Lake. No wading bird colonies were located within the study area. However, the Illinois Natural Heritage Inventory has documented two 1000-2000 nest mixed-species colonies in East St. Louis. The closest of these two colonies is approximately one mile east of Sauget Area I near the Alton & Southern rail yards in Alorton. The second site is over two miles to the north at Audubon Avenue and 26th Street. These two colonies contain the only breeding little blue heron and snowy egret in Illinois. In addition, black-crowned night heron (Illinois – endangered), great egret (Illinois – threatened), cattle egret, great blue heron, and green-backed heron nest in the colonies. A 1988 study conducted by the U.S. Fish and Wildlife Service (USFWS; Young, 1989 – unpublished draft) found that wading birds forage over a wide area around East St. Louis. The Dead Creek/Prairie du Pont wetlands system composes a relatively small percentage of the available wetland foraging area in the region.

The river otter was selected for assessment, although river otter were not observed during wildlife or habitat surveys at the site. River otters were selected as a receptor because of the concern given to them in Illinois (the Illinois Department of Natural Resources has released river otters trapped in Louisiana as part of a recovery program), their susceptibility to bioaccumulative compounds, and the fact that the stream and wetland habitat of Dead Creek and Borrow Pit Lake could support river otter.

The details and parameters selected for the models are presented in Appendix E. The only changes or additions made to the food chain models used in the 2001 ecological risk assessment were:

The 95% UCL on the mean (where it could be calculated) for creek bottom soils was used as the sediment exposure concentration and/or to calculate a concentration in fish. The average was used if a UCL could not be calculated.

The fish concentrations were calculated using the site-specific BSAFs and linear regression equations.

The area use factor, a ratio between the site area and foraging area, was adjusted for each creek section.

Additional wildlife TRVs were added.

Tables 4-3a (heron) and 4-3b (river otter) present the results of the food chain modeling. Creek bottom soils did not present a risk to river otter and great blue heron.

5.0 APPLICATIONS OF RISK ASSESSMENT/REMEDIAL GOALS TO DEAD CREEK BOTTOM SOILS

5.1 Risks due to Creek Bottom Soils per Creek Section

Table 5-1 compares back-calculated sediment concentrations for the protection of fish to the 95% UCL on the mean (or mean) of the creek bottom soil concentrations per creek section. At Creek Sections C and D, there are too few samples to calculate an UCL, and therefore, the average is used. The resulting risks per creek section are:

Risk to fish due to aluminum at Creek Sections C, D, and E.

Risks to fish due to zinc at Creek Sections B and F; and

Risks to fish due to PCBs at Creek Section B.

For aluminum, the risk-based concentration for the protection of fish is lower than the average concentration in Illinois soil. The UCL (or average for Creek Sections C and D) concentration for aluminum in each creek section is well within the background range in Illinois soil. In Creek Section E, the aluminum UCL is less than the average Illinois background concentration, and the average in Creek Sections C and D are only slightly higher than the background average concentration. Aluminum is major component of most soils and is not generally considered highly toxic. Although aluminum concentrations in fish demonstrated a relationship to sediment concentrations, the correlation was neither strong nor statistically significant. Therefore the prediction of potential risks to fish due to aluminum in Dead Creek bottom soils is likely a result of the conservative nature of this assessment, and will not result in actual harm. The predicted potential risks due to aluminum are indistinguishable from those throughout the region and do not require further remediation.

5.2 Selection and Implementation of Remediation Goals

Table 5-2 presents the risk-based concentrations of zinc and total PCBs calculated for fish and lists sediment samples that have to be removed from the dataset to result in a UCL (or in the case of Creek Sections C and D, average) below the cleanup goals.

The risks due to zinc were to fish. These risks were identified in Creek Sections B and F. No risks to piscivorous wildlife were identified due to the existing concentrations of zinc in creek bottom soils. Therefore, the risk-based concentration for the protection of fish of 4,700 mg/kg (rounded to two significant figures) is proposed as the ecological risk-based remedial goal for zinc. To address ecological risks in a conservative manner, the 95% UCL on the mean of the zinc concentration in each creek section should be equal to or less than this value. When the zinc concentrations for samples CBS-CSB-T4-C1 and

CBS-CSB-T11-C1 are removed from the dataset, the UCL for zinc in Creek Section B is below the ecological risk-based concentration. In Creek Section F, the removal of CBS-CSF-T5 from the dataset reduces the UCL to below the ecological risk-based concentration.

The risks due to PCBs were to fish in Creek Section B. No risks to piscivorous wildlife were identified due to the existing concentrations of PCBs in creek bottom soils. Therefore, the risk-based concentration for the protection of fish of 0.58 mg/kg is proposed as the ecological risk-based remedial goal for PCBs. To address ecological risks in a conservative manner, the 95% UCL on the mean of the total PCB concentration in each creek section should be equal to or less than this value. In Creek Section B, the removal of samples CBS-CSB-T0-C1 and CBS-CSB-T3-E1 from the dataset reduces the UCL to below the ecological risk-based concentration.

The sediment concentration developed to be protective of fish, 0.58 mg/kg, is dependent on the organic carbon content of the sediment, and is based on the average total organic carbon (TOC) concentration measured for Dead Creek bottom soils of 1.5%. Similar ecological risk-based cleanup goals for sediment have been used at Superfund sites nationwide. These values have included 19 ug/g organic carbon in a wetland at Sullivan's Ledge in Massachusetts and generally have ranged from 0.1 mg/kg (Turtle Creek , Messena, New York) to 5 mg/kg (O'Connor Company in Maine) for freshwater environments. A PCB cleanup goal of 1 mg/kg for sediment has been considered protective of human health and the environment at a variety of sites including Re-Solve, Inc. in Massachusetts; Paoli Rail Yard in Pennsylvania; General Motors Central Foundry Division Site on the St. Lawrence and Raquette Rivers in Massena, New York, and the Reynolds Metal Company Site in Massena, New York (USEPA, 1993;2002b).

6.0 EVALUATION OF POTENTIAL RISK

The previous parts of this assessment evaluated chronic risk based on a measure of central tendency, either the mean or the 95% UCL. This section evaluates whether there are locations with elevated concentrations with the potential to cause acute risk even though the average or UCL concentration is below chronic ecological risk-based concentrations. Table 6-1 compares the maximum concentration of compounds detected in each creek section with the site-specific risk-based numbers calculated in this assessment. As suggested by USEPA, the Illinois Environmental Protection Agency (IEPA), and their consultants, the maximum concentration in each creek section is compared with ten times the ecological risk-based concentration. According to the agencies' suggestion, any compounded detected at a particular sample location at a concentration ten times or higher than the risk-based concentration should be considered a potential acute risk or "hotspot". Table 6-1 indicates that potential acute risks due to bis(2-ethylhexyl)phthalate and PCBs may be present in Creek Section B, but are not present in Creek Sections C through F. A comparison of ten times the risk-based concentration with the data for Creek Section B in Appendix B indicates that the following samples have concentrations ten times the risk-based concentrations:

Sample CBS-CSB-T3-E1 for bis(2-ethylhexyl)phthalate. Note that the UCL for bis(2-ethylhexyl)phtalate is below the risk-based concentration in each creek section.

Samples CBS-CSB-T0C1, CBS-CSB-T3-C1, and CBS-CSB-T3-E1 for PCBs.

Note that when these samples are removed from the dataset for Creek Section B, maximum and central tendency concentrations of other constitutes such as SVOCs are also reduced to less than 1 mg/kg.

7.0 EVALUATION OF UNCERTAINTY

As in any risk assessment, uncertainty arises because information about the system studied is never complete. In this evaluation, the greatest uncertainties are due to:

The inability to calculate a BSAF or sediment to fish tissue regression for each compound detected in creek bottom soils. For the most part, this uncertainty arises because not all compounds detected in creek bottom soils were detected in shallow (0 to 2 inch depths) sediment in Dead Creek prior to remediation or in forage fish.

The lack of fish body burden TRVs for each compound detected in creek bottom soils.

The lack of wildlife TRVs for each compound detected in creek bottom soils.

The lack of a relationship between concentrations of mercury in sediment and concentrations in fish.

To evaluate whether compounds detected in creek bottom soil for which site-specific sediment-fish relationships could not be developed have the potential to pose ecological risk, an assessment was make of their potential to bioaccumulate from sediment. Table 7-1 lists compounds detected in creek bottom soil by the amount of information available with which to evaluate ecological risk. Categories and names of compounds are:

1. Compounds for which risks to fish and piscivorous wildlife were assessed using site-specific uptake factors. The least uncertainty is associated with the evaluation of these compounds.

Total DDT, dieldrin, gamma-chlordane, bis(2-ethylhexyl)phthalate, aluminum, chromium, copper, lead, zinc, total PCBs, and total dioxin TEQs.

Of these, the compounds that resulted in risk in creek bottom soils were zinc and total PCBs.

2. Compounds for which risks to piscivorous wildlife were assessed using site-specific uptake factors.

Selenium.

There was no indication of risk from creek bottom soils due to this metal.

3. Compounds for which risks to river otter due to sediment ingestion only were assessed for which no site-specific uptake values are available, and for which 1999 data demonstrate no uptake to fish or migration to surface water.

Alpha-chlordane, benzo(a)pyrene, pyrene, arsenic, mercury, molybdenum, nickel, silver, thallium, and vanadium.

There was no indication of risk from creek bottom soil due to these compounds. Note that two of these compounds are PAHs which are unlikely to bioaccumulate in fish tissue as they are metabolized by fish.

4. Compounds for which risks to river otter could not be evaluated due to lack of toxicity values, for which no site-specific uptake values are available, and for which 1999 data demonstrate no uptake to fish or migration to surface water.

Benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, indeno(1,2,3-cd)pyrene, cobalt, and iron.

Note that five of these seven compounds are PAHs which are unlikely to bioaccumulate in fish tissue as they are metabolized by fish. Cobalt concentrations in creek bottom soils were below the screening benchmark. Iron is a common soil constituent.

5. Compounds for which site-specific uptake information is not available, but risks to river otter were evaluated due to ingestion of sediment only.

Cyanide, a toxicant unlikely to accumulate in fish tissue,

The herbicides 2,4,5-T, 2,4,5-TP, 2,4-D, 2,4-DB, dalapon, dicamba, and MCPP. These compounds have low water to fish BCFs, indicating that they are unlikely to accumulate in fish tissue.

The pesticides aldrin, alpha-BHC, beta-BHC, delta-BHC, endosulfan I, endosulfan II, endosulfan sulfate, endrin ketone, gamma-BHC, heptachlor, heptachlor epoxide, and methoxychlor. A few of these compounds (aldrin, the BHCs, heptachlor, heptachlor epoxide, and methoxychlor) have moderate water BCFs (between 100 and 3000).

The SVOCs 1,2,4-trichlorobenzene, 1,2-dichlorobenzene, 1,4-dichlorobenzene, 2,4,5-trichlorophenol, 3- and 4-methylphenol, 4-chloroanaline, di-n-butylphthalate, N-nitrosodiphenylamine, pentachlorophenol, and phenol. Of these, 1,2,4-trichlorobenzene, di-n-butylphthalate, and phenol have moderate BCFs.

The PAHs acenapthene, anthracene, fluoranthene, fluorene, and naphthalene. These compounds are metabolized in fish.

The VOCs 1,1,2-trichloroethane, 1,2-dichloroethane, bromoform, 1,1,1-trichloroethane, total 1,2-dichloroethene, 2-butanone, acetone, benzene, carbon disulfide, chlorobenzene, chloroform, ethylbenzene, methylene chloride, styrene, tetrachloroethene, toluene, trichloroethene, and total xylenes. These compounds are volatile and have low BCFs (around 1) and are therefore unlikely to accumulate in fish.

The metals antimony, barium, beryllium, cadmium, manganese, and tin. Of these, cadmium has a water BCF over 100.

The assessment of risk for a few of the compounds in this category has greater uncertainty due to the lack of site specific information, and moderate potential for bioaccumulation. Note that alpha-BHC did not exceed sediment-screening guidelines.

6. Compounds for which no site-specific uptake or toxicity information is available.

   The herbicide dichloroprop, which has a low water BCF and is therefore unlikely to accumulate in fish tissue.

   The SVOCs 1,3-dichlorobenzene, 2,4,6-trichlorophenol, 2,4-dichlorophenol, 2-chlorophenol, 4-nitroanaline, and 4-nitrophenol. butylbenzylphthalate, nitrobenzene, and hexachlorobutadiene. Of these, butylbenzylphthalate and hexachlorobutadiene have water BCFs greater than 100. The others have low BCFs and are unlikely to accumulate in fish tissue.

   The PAHs 2-methylnaphthalene, acenaphthylene, benzo(a)anthracene, carbazole, dibenzo(a,h)anthracene, dibenzofuran, and phenanthrene. These compounds are metabolized in fish.

   The VOCs 1,1,2,2-tetrachloroethane, bromodichloromethane, dibromomchloromethane, 2-hexanone, and 4-methyl-2-pentanone. These compounds are volatile, have low water BCFs, and are unlikely to accumulate in fish tissue.

8.0 SUMMARY

Menzie-Cura & Associates, Inc. evaluated ecological risks due to remaining Dead Creek bottom soils, after remediation. Sediment in Dead Creek was removed down to native soils. Sediment and forage fish data from the 2001 Ecological Risk Assessment conducted for the site were used to calculate site-specific sediment to fish uptake values for chemicals detected previously in sediment. These site-specific uptake factors were used in conjunction with body burdens in fish associated with toxic effects to back-calculate risk-based concentrations protective of fish. These site-specific uptake factors were also used in food chain models to evaluate risks to piscivorous wildlife due to creek bottom soils. No risks were predicted for piscivorous wildlife. Risk-based concentrations were calculated for total DDT, dieldrin, gamma-chlordane, bis(2-ethylhexyl)phthalate, aluminum, chromium, copper, lead, zinc, total PCBs, and dioxin TEQs. The risk-based concentrations were compared to the 95% UCL concentrations for each creek section (except at Creek Sections C and D where the average was used; not enough data were available to calculate an UCL at Creek Sections C and D). Risks due to PCBs and zinc were identified in Creek Section B, and risks due to zinc were identified in Creek Section F. Because mercury concentrations in fish could not be demonstrated to be dependent on sediment concentrations, no further analysis was performed for mercury. For PCBs and zinc in Creek Sections B and F, creek transects were identified that would, if they were are removed from the dataset, reduce the UCL to below the risk-based concentrations.

An evaluation of sample locations with potential for acute ecological risk was conducted by comparing concentrations with ten times the ecological risk-based concentrations developed in this assessment. These "hot spot" areas were identified for bis(2-ethylhexyl)phthalate and PCBs in Creek Section B, but for no other compounds or creek section.

An uncertainty evaluation was performed for the other compounds detected in creek bottom soils. With the exception of mercury, the most bioaccumulative chemicals (PCBs, DDT, dioxin) were addressed via the site-specific approach. Only a few of the chemicals for which a full assessment could not be performed have a potential to bioaccumulate (but are less likely to bioaccumulate than PCBs, DDT, or dioxin).

9.0 REFERENCES

Bloom, N.S., 1992. On the chemical form of mercury in edible fish and marine invertebrate tissue. Can. J. Fish Aquat. Sci. 49: 1010-1017.

Ecology and Environment, Inc., 1997. Preliminary Ecological Risk Assessment for Sauget Area I, Creek Segment F, Sauget, St. Clair County, Illinois; prepared for USEPA Emergency and Enforcement Response Branch, Chicago, IL.

Gilmour, C.C., E.A. Henry, and R. Mitchell. 1992. Sulfate stimulation of mercury methylation in freshwater sediments. Environ. Sci. Technol. 26:2281-2287.

Illinois, 1994. A Summary of Selected Background Conditions for Inorganics in Soil. IEPA/ENV/94-161.

Illinois, 1999. Title 35 of the Illinois Administrative Code, Subtitle C, Chapter I, Part 302 Water Quality Standards, Subpart B.

Jarvinen, A.W. and G.T. Ankley. 1999. Linkage Effects to Tissue Residues: Development of a Comprehensive Database for Aquatic Organisms Exposed to Inorganic and Organic Chemicals. Pensacola FL, Society of Environmental Toxicology and Chemistry Press, 364pp.

Krabbenhoft, D.P., J.G. Wiener, W.G. Brumbaugh, M.L. Olson, J.F. DeWild, and T.J. Sabin. 1999. A national pilot study of mercury contamination of aquatic ecosystems along multiple gradients. *In* D.W. Morganwalp and H.T. Buxton, eds. U.S. Geological Survey Toxic Substances Hydrology Program – Proceedings of the Technical Meeting, Charleston, SC. March 8-12, 1999. Vol. 2 of 3, Contamination of hydrologic systems and related ecosystems: U.S. Geological Survey Water-Resources Investigations Report 99-4018B, pp 147-160.

MacDonald, D.D. 1994. Approach to the Assessment of Sediment Quality in Florida Coastal Waters, Volume 1 – Development and Evaluation of Sediment Quality Assessment Guidelines, November 1994.

MacDonald, D.D., D.G. Ingersoll, and T.A. Berger. 2000. Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Arch. Environ. Contam. Toxicol. 39: 20-31.

Menzie-Cura & Associates, Inc. 2001. Ecological Risk Assessment for Sauget Area I, Sauget, St. Clair County, Illinois.

Moore and Ramamoorthy. 1984. Heavy Metals in Natural Waters: Applied Monitoring and Impact Assessment. Springer Verlag, New York, pp. 125-137.

Persaud, D., R. Jaagumagi, and A. Hayton. 1993. Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario. Ontario Ministry of Environment and Energy. August 1993.

Phillips, G.R., P.A. Medvick, D.R. Skaar, and D.E. Snight. 1987. Factors affecting the mobilization, transport, and bioavailability of mercury in reservoirs of the Upper Missouri River Basin. Fish and Wildlife Technical Report #10, United States Fish and Wildlife Service, 64 pp.

Regnall and Tunlid, 1991. Laboratory study of chemical speciation of mercury in lake sediment and water under aerobic and anaerobic conditions. Applied and Environmental Microbiology. 57: 789-795.

USACE. 2002. Environmental Residue Effects Database (ERED). http://www.wes.army.mil/el/ered

USEPA, 1993. BTAG Forum. Office of Emergency and Remedial Response, Hazardous Site Evaluation Division.

USEPA, 1997. Mercury Study Report to Congress. Office of Air Quality Planning & Standards and Office of Research and Development. EPA-425-97-005.

U.S. Environmental Protection Agency. USEPA. 1999. National Recommended Water Quality Criteria – Correction, Office of Water, EPA 82-2-Z-99-001 (April 1999).

USEPA, 2002a. Workshop on the Fate, Transport, and Transformation of Mercury in Aquatic and Terrestrial Environments. Proceedings and Summary Report. National Risk Management Research Laboratory. Cincinnati, OH. EPA-625-R-02-002.

USEPA, 2002b. http://www.epa.gov/superfund/sites/rodsites/index.htm.

U.S. Fish and Wildlife Service; Young, 1989 – unpublished draft.

Van den Berg, M., Birnbaum, L., Bosveld, A.T.C., Brunstrom, B., Cook, P., Feeley, M., Giesy, J.P., Hanberg, A., Hasegawa, R., Kennedy, S.W., Kubiak, T., Larsen, J.C., van Leeuwen, F.X.R., Liem, A.K.D., Nolt, C., Peterson, R.E., Poellinger, L., Safe, S., Schrenk, D., Tillitt, D., Tysklind, M., Younes, M., Waern, F, and Zacharewsk, T. 1998. Toxic Equivalency Factors (TEFs) for PCBs, PCDDs, PCDFs for humans and wildlife, Environmental Health Perspectives, Vol. 106, Number 12, pp. 775-792.

TABLES

Table 3-1
Comparison of Post-Remediation Creek Bottom Soil Concentrations to Sediment Quality Guidelines
Dead Creek
Sauget Area I

Compounds	Sediment Quality Guidelines[1] TEC	Florida SQAG[2] TEL	Ontario Guidelines[3] LEL	Post-Remediation Creek Bottom Soil Maximum Detected Concentration[4]
Cyanide, Total			0.1	4.57
Pesticides/Herbicides (ug/kg)				
2,4,5-T				610
2,4,5-TP (Silvex)				2
2,4-D				140
2,4-DB				57
4,4'-DDD	4.88	1.22	8	470
4,4'-DDE	3.16	2.07	5	35
4,4'-DDT*	4.16	1.19	8	240
Total DDT	5.28	3.89	7	470
Aldrin			2	9
alpha-BHC			6	2.9
Alpha Chlordane**	3.24	2.26	7	12
beta-BHC			5	7.7
Dalapon				50
delta-BHC				4.1
Dicamba				6.6
Dichloroprop				21
Dieldrin	1.9	0.715	2	690
Dinoseb				
Endosulfan I				0.17
Endosulfan II				10
Endosulfan sulfate				16
Endrin	2.22		3	
Endrin aldehyde				
Endrin ketone				10
gamma-BHC (Lindane)	2.37	0.32	3	2.3
Gamma Chlordane**	3.24	2.26	7	67
Heptachlor			0.3 NEL	1.2
Heptachlor epoxide	2.47		5	410
MCPA				
MCPP				6100
Methoxychlor				62
Toxaphene				
SVOCs (ug/kg)				
1,2,4-Trichlorobenzene				80000
1,2-Dichlorobenzene				53000
1,3-Dichlorobenzene				100
1,4-Dichlorobenzene				5500
2,4,5-Trichlorophenol				240
2,4,6-Trichlorophenol				4300
2,4-Dichlorophenol				6600
2,4-Dinitrophenol				
2,4-Dinitrotoluene				
2,6-Dinitrotoluene				
2-Chloronaphthalene				
2-Chlorophenol				510
2-Methylnaphthalene		20.2		7300
2-Methylphenol (o-cresol)				
2-Nitroaniline				
2-Nitrophenol				
3-Methylphenol/4-Methylphenol				1600
3,3'-Dichlorobenzidine				
3-Nitroaniline				
4-Bromophenylphenyl ether				
4,6-Dinitro-2-methylphenol				
4-Chloro-3-methylphenol				
4-Chloroaniline				11000
4-Chlorophenylphenyl ether				
4-Nitroaniline				9000
4-Nitrophenol				440
Acenaphthene		6.71		860
Acenaphthylene		5.87		240
Anthracene	57.2	46.9	220	1400
Benzo(a)anthracene	108	74.8	320	1900
Benzo(a)pyrene	150	88.8	370	1200
Benzo(b)fluoranthene				1400
Benzo(g,h,i)perylene			170	890
Benzo(k)fluoranthene			240	900
bis(2-Chloroethoxy)methane				
bis(2-Chloroethyl)ether				
2,2'-Oxybis(1-Chloropropane)				
bis(2-Ethylhexyl)phthalate		182		81000
Butylbenzylphthalate				3200
Carbazole				620
Chrysene	166	108	340	1900
Dibenzo(a,h)anthracene	33	6.22	60	340
Dibenzofuran				1600
Diethylphthalate				
Dimethylphthalate				
Di-n-butylphthalate				210
Di-n-octylphthalate				
Fluoranthene	423	113	750	4000
Fluorene	77.4	21.2	190	3500

Table 3-1
Comparison of Post-Remediation Creek Bottom Soil Concentrations to Sediment Quality Guidelines
Dead Creek
Sauget Area I

Compounds	Sediment Quality Guidelines[1] TEC	Florida SQAG[2] TEL	Ontario Guidelines[3] LEL	Post-Remediation Creek Bottom Soil Maximum Detected Concentration[4]
Hexachlorobenzene				
Hexachlorobutadiene				61
Hexachlorocyclopentadiene				
Hexachloroethane				
Indeno(1,2,3-cd)pyrene			200	830
Isophorone				
Naphthalene	176	34.6		6000
Nitrobenzene				520
N-Nitroso-di-n-propylamine				
N-Nitrosodiphenylamine				1200
Pentachlorophenol				44000
Phenanthrene	204	86.7	560	7000
Phenol				3400
Pyrene	195	153	490	4000
Total PAHs	1610	1684	4000	40560
VOCs (ug/kg)				
1,1,1-Trichloroethane				23
1,1,2,2-Tetrachloroethane				10
1,1,2-Trichloroethane				6.1
1,1-Dichloroethane				
1,1-Dichloroethene				
1,2-Dichloroethane				2.1
Cis/Trans-1,2-Dichloroethene				12
1,2-Dichloropropane				
2-Butanone (MEK)				610
2-Hexanone				77
4-Methyl-2-pentanone (MIBK)				110
Acetone				470
Benzene				180
Bromodichloromethane				1.3
Bromoform				3
Bromomethane (Methyl bromide)				
Carbon disulfide				77
Carbon tetrachloride				
Chlorobenzene				9700
Chloroform				3.1
Chloroethane				
Chloromethane				
cis-1,3-Dichloropropene				
Dibromochloromethane				2
Ethylbenzene				3200
Methylene chloride (Dichloromethane)				4.8
Styrene				2.8
Tetrachloroethene				70
Toluene				290
trans-1,3-Dichloropropene				
Trichloroethene				34
Vinyl chloride				
Xylenes, Total				29000
Inorganics (mg/kg)				
Aluminum				20000
Antimony				4.7
Arsenic	9.79	7.24	6	44
Barium				1500
Beryllium				1.3
Cadmium	0.99	0.676	0.6	57
Calcium				25000
Chromium	43.4	52.3	26	180
Cobalt			50	23
Copper	31.6	18.7	16	10000
Iron			20000	41000
Lead	35.8	30.2	31	700
Magnesium				8200
Manganese			460	890
Mercury	0.18	0.13	0.2	1.6
Molybdenum				7
Nickel	22.7	15.9	16	630
Potassium				3200
Selenium				5.9
Silver		0.733	0.5	9.8
Sodium				670
Thallium				1.3
Tin				470
Vanadium				47
Zinc	121	124	120	15000
PCBs (ug/kg)				
Monochlorobiphenyl				5.6
Dichlorobiphenyl				300
Trichlorobiphenyl				15000
Tetrachlorobiphenyl				51000
Pentachlorobiphenyl				18000
Hexachlorobiphenyl				4800
Heptachlorobiphenyl				4000
Octachlorobiphenyl				1100

Table 3-1
Comparison of Post-Remediation Creek Bottom Soil Concentrations to Sediment Quality Guidelines
Dead Creek
Sauget Area I

Compounds	Sediment Quality Guidelines[1] TEC	Florida SQAG[2] TEL	Ontario Guidelines[3] LEL	Post-Remediation Creek Bottom Soil Maximum Detected Concentration[4]
Nonachlorobiphenyl				94
Decachlorobiphenyl	59.8	21.6	70	1300
Total PCBs				84830
Dioxin TEQ (mammal) pg/g				4.5127

Except where noted, concentrations are in ug/kg for organic constituents; mg/kg for inorganic constituents

[1]Threshold Effects Concentration - MacDonald, D.D., C.G. Ingersoll, and T.A. Berger. 2000 Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems. Arch. Environ. Contam. Toxicol. 39:20-31.

[2]Sediment Quality Assessment Guidelines - MacDonald Environmental Sciences, Ltd. 1994. Approach to the Assessment of Sediment Quality in Florida Coastal Waters, Volume 1-- Development and Evaluation of Sediment Quality Assessment Guidelines Prepared for FLDEP. November, 1994.

[3]Lowest Effects Level - Persaud, D., R. Jaagumagi, and A. Hayton. 1993. Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario. Ontario Ministry of Environment and Energy. August 1993

[4]A blank in this column indicates that compound was not detected in creek bottom soil. The value presented represents the maximum detected concentration from creek segments B, C, D, E and F as measured after remediation.

* Ontario and Sediment Quality Guideline values are for 2,4'-DDT and 4,4'-DDT combined

** Florida, Ontario, and Sediment Quality Guideline values are for Chlordane

Table 3-2
Comparison of Maximum Surface Water Concentrations to Illinois Water Quality Standards
Dead Creek
Sauget Area I

Compounds	Creek Segment B			Creek Segment D		
	Acute WQ Standards (mg/L)[1]	Chronic WQ Standards (mg/L)[1]	Maximum Detected Concentration	Acute WQ Standards (mg/L)[1]	Chronic WQ Standards (mg/L)[1]	Maximum Detected Concentration
Hardness (mg/L) [3]			373			147
Cyanide, Total (mg/L)[a,b]	0.022	0.0052		0.022	0.0052	
Fluoride			0.55			0.3
Ortho-Phosphate-P			0.087			0.075
pH			8.5			8
Suspended Solids						44
Total Dissolved Solids			1200			210
Total Phosphorus			0.11			0.25
Pesticides/Herbicides (ug/L)						
2,4,5-T						
2,4,5-TP (Silvex)						
2,4-D						
2,4-DB						
4,4'-DDD			0.0052			
4,4'-DDE						
4,4'-DDT[a]	0.0011	0.000001	***0.004***	0.0011	0.000001	***0.0071***
Aldrin[a]	0.003		**0.0037**	0.003		0.0023
alpha-BHC			0.022			0.0164
Alpha Chlordane[a]	0.0024	0.0000043		0.0024	0.0000043	
beta-BHC			0.02			0.045
Dalapon						
delta-BHC			0.015			0.0126
Dicamba						
Dichloroprop						
Dieldrin[a]	0.00024	0.000056	***0.0035***	0.00024	0.000056	
Dinoseb						
Endosulfan I[a]	0.00022	0.000056		0.00022	0.000056	***0.00051***
Endosulfan II[a]	0.00022	0.000056	***0.0053***	0.00022	0.000056	***0.0063***
Endosulfan sulfate						0.017
Endrin[a]	0.000086	0.000036		0.000086	0.000036	***0.0054***
Endrin aldehyde			0.0025			
Endrin ketone						
gamma-BHC (Lindane)[a]	0.00095	0.00016	***0.04***	0.00095	0.00016	***0.0455***
Gamma Chlordane[a]	0.0024	0.0000043	***0.0054***	0.0024	0.0000043	***0.005***
Heptachlor[a]	0.00052	0.000038	***0.0048***	0.00052	0.000038	***0.012***
Heptachlor epoxide[a]	0.00052	0.000038	***0.0077***	0.00052	0.000038	***0.017***
MCPA						
MCPP						
Methoxychlor[a]		0.00003			0.00003	
Toxaphene[a]	0.00073	0.0000002		0.00073	0.0000002	
Semivolatile Organic Compounds (ug/L)						
1,2,4-Trichlorobenzene						

Table 3-2
Comparison of Maximum Surface Water Concentrations to Illinois Water Quality Standards
Dead Creek
Sauget Area I

Compounds	Creek Segment B			Creek Segment D		
	Acute WQ Standards (mg/L)[1]	Chronic WQ Standards (mg/L)[1]	Maximum Detected Concentration	Acute WQ Standards (mg/L)[1]	Chronic WQ Standards (mg/L)[1]	Maximum Detected Concentration
1,2-Dichlorobenzene						
1,3-Dichlorobenzene						
1,4-Dichlorobenzene						
2,4,5-Trichlorophenol						
2,4,6-Trichlorophenol						
2,4-Dichlorophenol						
2,4-Dinitrophenol						
2,4-Dinitrotoluene						
2,6-Dinitrotoluene						
2-Chloronaphthalene						
2-Chlorophenol						
2-Methylnaphthalene						
2-Methylphenol (o-cresol)						
2-Nitroaniline						
2-Nitrophenol						
3-Methylphenol/4-Methylphenol						
3,3'-Dichlorobenzidine						
3-Nitroaniline						
4,6-Dinitro-2-methylphenol						
4-Bromophenylphenyl ether						
4-Chlorophenylphenyl ether						
4-Chloro-3-methylphenol						
4-Chloroaniline						
4-Nitroaniline						
4-Nitrophenol						
Acenaphthene						
Acenaphthylene						
Anthracene						
Benzo(a)anthracene						
Benzo(a)pyrene						
Benzo(b)fluoranthene						
Benzo(g,h,i)perylene						
Benzo(k)fluoranthene						
bis(2-Chloroethoxy)methane						
bis(2-Chloroethyl)ether						
bis-chloroisopropyl ether						
bis(2-Ethylhexyl)phthalate						
Butylbenzylphthalate						
Carbazole						
Chrysene						
Dibenzo(a,h)anthracene						
Dibenzofuran						
Diethylphthalate						

Table 3-2
Comparison of Maximum Surface Water Concentrations to Illinois Water Quality Standards
Dead Creek
Sauget Area I

Compounds	Creek Segment B			Creek Segment D		
	Acute WQ Standards (mg/L)[1]	Chronic WQ Standards (mg/L)[1]	Maximum Detected Concentration	Acute WQ Standards (mg/L)[1]	Chronic WQ Standards (mg/L)[1]	Maximum Detected Concentration
Dimethylphthalate						
Di-n-butylphthalate						
Di-n-octylphthalate						
Fluoranthene						
Fluorene						
Hexachlorobenzene						
Hexachlorobutadiene						
Hexachlorocyclopentadiene						
Hexachloroethane						
Indeno(1,2,3-cd)pyrene						
Isophorone						
Naphthalene						
Nitrobenzene						
N-Nitroso-di-n-propylamine						
N-Nitrosodiphenylamine/Diphenylamine						
Pentachlorophenol			1			
Phenanthrene						
Phenol						
Pyrene						
Volatile Organic Compounds (ug/L)						
1,1,1-Trichloroethane						
1,1,2,2-Tetrachloroethane						
1,1,2-Trichloroethane						
1,1-Dichloroethane						
1,1-Dichloroethene						
1,2-Dichloroethane						
Cis/Trans-1,2-Dichloroethene						
1,2-Dichloropropane						
2-Butanone (MEK)						
2-Hexanone						
4-Methyl-2-pentanone (MIBK)						
Acetone			18			17
Benzene						
Bromodichloromethane						
Bromoform						
Bromomethane (Methyl bromide)						
Carbon disulfide						
Carbon tetrachloride						
Chlorobenzene			2.8			
Chloroform						
Chloroethane						
Chloromethane						
cis-1,3-Dichloropropene						

Table 3-2
Comparison of Maximum Surface Water Concentrations to Illinois Water Quality Standards
Dead Creek
Sauget Area I

Compounds	Creek Segment B Acute WQ Standards (mg/L)[1]	Creek Segment B Chronic WQ Standards (mg/L)[1]	Creek Segment B Maximum Detected Concentration	Creek Segment D Acute WQ Standards (mg/L)[1]	Creek Segment D Chronic WQ Standards (mg/L)[1]	Creek Segment D Maximum Detected Concentration
Dibromochloromethane						
Ethylbenzene						
Methylene chloride (Dichloromethane)						
Styrene						
Tetrachloroethene						
Toluene						
trans-1,3-Dichloropropene						
Trichloroethene						
Vinyl chloride						
Xylenes, Total						
Inorganics (mg/L)						
Aluminum[a]	0.75	0.087	0.066	0.75	0.087	***1.4***
Antimony			0.007			
Arsenic[a,b]	0.36	0.19	0.0064	0.36	0.19	0.005
Barium			0.3			0.175
Beryllium						
Cadmium[4,b]	0.043	0.0032	0.00091	0.015	0.0015	
Calcium			180			50
trivalent chromium	5.104	0.6084		2.381	0.2838	
Chromium[4,5,b]	0.016 / 5.1	0.011 / 0.0061		0.016 / 2.4	0.011 / 0.28	0.0057
Cobalt						
Copper[4,b]	0.061	0.036	***0.13***	0.025	0.016	***0.026***
Iron[a]		1	0.43		1	*1.8*
Lead[4,b]	0.51	0.11	0.0066	0.16	0.033	0.016
Magnesium			23			6.6
Manganese			0.034			0.082
Mercury[b]	0.0026	0.0013		0.0026	0.0013	
Molybdenum			0.032			0.0052
Nickel[a]	1.4	0.16	0.015	0.65	0.072	0.022
Potassium			7.7			6.3
Selenium[a]		0.005			0.005	0.0046
Silver[a]	0.039			0.0079		
Sodium			54			11
Thallium						
Vanadium						0.007
Zinc[a]	0.37	0.37	0.13	0.17	0.17	0.15
PCBs (ug/L)[a]						
Monochlorobiphenyl		0.000014			0.000014	
Dichlorobiphenyl		0.000014			0.000014	
Trichlorobiphenyl		0.000014			0.000014	
Tetrachlorobiphenyl		0.000014			0.000014	
Pentachlorobiphenyl		0.000014			0.000014	*0.055*
Hexachlorobiphenyl		0.000014			0.000014	

Table 3-2
Comparison of Maximum Surface Water Concentrations to Illinois Water Quality Standards
Dead Creek
Sauget Area I

Compounds	Creek Segment B			Creek Segment D		
	Acute WQ Standards (mg/L)[1]	Chronic WQ Standards (mg/L)[1]	Maximum Detected Concentration	Acute WQ Standards (mg/L)[1]	Chronic WQ Standards (mg/L)[1]	Maximum Detected Concentration
Heptachlorobiphenyl		0.000014			0.000014	
Octachlorobiphenyl		0.000014			0.000014	
Nonachlorobiphenyl		0.000014			0.000014	
Decachlorobiphenyl		0.000014			0.000014	
Dioxins (ug/L)						
1,2,3,4,6,7,8,9-OCDD			0.00558			0.00402
1,2,3,4,6,7,8-HpCDD			0.000637			0.000444
1,2,3,4,7,8-HxCDD						0.0000118
1,2,3,6,7,8-HxCDD			0.0000241			0.0000184
1,2,3,7,8,9-HxCDD			0.0000185			0.0000136
1,2,3,7,8-PeCDD						
2,3,7,8-TCDD						
Furans (ug/L)						
1,2,3,4,6,7,8,9-OCDF			0.00174			0.00125
1,2,3,4,6,7,8-HpCDF			0.0004			0.000337
1,2,3,4,7,8,9-HpCDF			0.0000248			0.0000254
1,2,3,4,7,8-HxCDF			0.0000146			0.0000077
1,2,3,6,7,8-HxCDF						0.0000153
1,2,3,7,8,9-HxCDF						
1,2,3,7,8-PeCDF						0.0000138
2,3,4,6,7,8-HxCDF						0.0000138
2,3,4,7,8-PeCDF						0.0000101
2,3,7,8-TCDF			0.0000115			0.0000053

Table 3-2
Comparison of Maximum Surface Water Concentrations to Illinois Water Quality Standards
Dead Creek
Sauget Area I

Compounds	Creek Segment E			Creek Segment F		
	Acute WQ Standards (mg/L)[1]	Chronic WQ Standards (mg/L)[1]	Maximum Detected Concentration[2]	Acute WQ Standards (mg/L)[1]	Chronic WQ Standards (mg/L)[1]	Maximum Detected Concentration
Hardness (mg/L)[3]			170			263
Cyanide, Total (mg/L)[a,b]	0.022	0.0052		0.022	0.0052	
Fluoride			0.75			0.27
Ortho-Phosphate-P			0.37			0.12
pH			7.1			8.6
Suspended Solids			7			12
Total Dissolved Solids			250			360
Total Phosphorus			0.37			0.18
Pesticides/Herbicides (ug/L)						
2,4,5-T						
2,4,5-TP (Silvex)						
2,4-D						
2,4-DB						
4,4'-DDD						
4,4'-DDE						
4,4'-DDT[a]	0.0011	0.000001		0.0011	0.000001	
Aldrin[a]	0.003			0.003		
alpha-BHC			0.0035			
Alpha Chlordane[a]	0.0024	0.0000043		0.0024	0.0000043	
beta-BHC			0.012			
Dalapon						
delta-BHC			0.028			
Dicamba						
Dichloroprop						
Dieldrin[a]	0.00024	0.000056		0.00024	0.000056	
Dinoseb						
Endosulfan I[a]	0.00022	0.000056		0.00022	0.000056	
Endosulfan II[a]	0.00022	0.000056		0.00022	0.000056	
Endosulfan sulfate						
Endrin[a]	0.000086	0.000036		0.000086	0.000036	
Endrin aldehyde						
Endrin ketone						
gamma-BHC (Lindane)[a]	0.00095	0.00016	***0.0028***	0.00095	0.00016	
Gamma Chlordane[a]	0.0024	0.0000043		0.0024	0.0000043	
Heptachlor[a]	0.00052	0.000038		0.00052	0.000038	
Heptachlor epoxide[a]	0.00052	0.000038		0.00052	0.000038	
MCPA						
MCPP						
Methoxychlor[a]		0.00003			0.00003	
Toxaphene[a]	0.00073	0.0000002		0.00073	0.0000002	
Semivolatile Organic Compounds (ug/L)						
1,2,4-Trichlorobenzene						

Table 3-2
Comparison of Maximum Surface Water Concentrations to Illinois Water Quality Standards
Dead Creek
Sauget Area I

Compounds	Creek Segment E			Creek Segment F		
	Acute WQ Standards (mg/L)[1]	Chronic WQ Standards (mg/L)[1]	Maximum Detected Concentration[2]	Acute WQ Standards (mg/L)[1]	Chronic WQ Standards (mg/L)[1]	Maximum Detected Concentration
1,2-Dichlorobenzene						
1,3-Dichlorobenzene						
1,4-Dichlorobenzene						
2,4,5-Trichlorophenol						
2,4,6-Trichlorophenol						
2,4-Dichlorophenol						
2,4-Dinitrophenol						
2,4-Dinitrotoluene						
2,6-Dinitrotoluene						
2-Chloronaphthalene						
2-Chlorophenol						
2-Methylnaphthalene						
2-Methylphenol (o-cresol)						
2-Nitroaniline						
2-Nitrophenol						
3-Methylphenol/4-Methylphenol						
3,3'-Dichlorobenzidine						
3-Nitroaniline						
4,6-Dinitro-2-methylphenol						
4-Bromophenylphenyl ether						
4-Chlorophenylphenyl ether						
4-Chloro-3-methylphenol						
4-Chloroaniline						
4-Nitroaniline						
4-Nitrophenol						
Acenaphthene						
Acenaphthylene						
Anthracene						
Benzo(a)anthracene						
Benzo(a)pyrene						
Benzo(b)fluoranthene						
Benzo(g,h,i)perylene						
Benzo(k)fluoranthene						
bis(2-Chloroethoxy)methane						
bis(2-Chloroethyl)ether						
bis-chloroisopropyl ether						
bis(2-Ethylhexyl)phthalate						
Butylbenzylphthalate						
Carbazole						
Chrysene						
Dibenzo(a,h)anthracene						
Dibenzofuran						
Diethylphthalate						

Table 3-2
Comparison of Maximum Surface Water Concentrations to Illinois Water Quality Standards
Dead Creek
Sauget Area I

Compounds	Creek Segment E Acute WQ Standards (mg/L)[1]	Creek Segment E Chronic WQ Standards (mg/L)[1]	Creek Segment E Maximum Detected Concentration[2]	Creek Segment F Acute WQ Standards (mg/L)[1]	Creek Segment F Chronic WQ Standards (mg/L)[1]	Creek Segment F Maximum Detected Concentration
Dimethylphthalate						
Di-n-butylphthalate						
Di-n-octylphthalate						
Fluoranthene			1.2			0.7
Fluorene						
Hexachlorobenzene						
Hexachlorobutadiene						
Hexachlorocyclopentadiene						
Hexachloroethane						
Indeno(1,2,3-cd)pyrene						
Isophorone						
Naphthalene						
Nitrobenzene						
N-Nitroso-di-n-propylamine						
N-Nitrosodiphenylamine/Diphenylamine						
Pentachlorophenol						
Phenanthrene			0.67			0.7
Phenol						
Pyrene			0.87			
Volatile Organic Compounds (ug/L)						
1,1,1-Trichloroethane						
1,1,2,2-Tetrachloroethane						
1,1,2-Trichloroethane						
1,1-Dichloroethane						
1,1-Dichloroethene						
1,2-Dichloroethane						
Cis/Trans-1,2-Dichloroethene						
1,2-Dichloropropane						
2-Butanone (MEK)						
2-Hexanone						
4-Methyl-2-pentanone (MIBK)						
Acetone						
Benzene						1.7
Bromodichloromethane						
Bromoform						
Bromomethane (Methyl bromide)						
Carbon disulfide						
Carbon tetrachloride						
Chlorobenzene						
Chloroform						
Chloroethane						
Chloromethane						
cis-1,3-Dichloropropene						

Table 3-2
Comparison of Maximum Surface Water Concentrations to Illinois Water Quality Standards
Dead Creek
Sauget Area I

Compounds	Creek Segment E Acute WQ Standards (mg/L)[1]	Creek Segment E Chronic WQ Standards (mg/L)[1]	Creek Segment E Maximum Detected Concentration[2]	Creek Segment F Acute WQ Standards (mg/L)[1]	Creek Segment F Chronic WQ Standards (mg/L)[1]	Creek Segment F Maximum Detected Concentration
Dibromochloromethane						
Ethylbenzene						
Methylene chloride (Dichloromethane)						
Styrene						
Tetrachloroethene						
Toluene						
trans-1,3-Dichloropropene						
Trichloroethene						
Vinyl chloride						
Xylenes, Total						
Inorganics (mg/L)						
Aluminum[a]	0.75	0.087		0.75	0.087	*0.55*
Antimony						
Arsenic[a,b]	0.36	0.19		0.36	0.19	0.0049
Barium			0.066			0.13
Beryllium						
Cadmium[4,b]	0.018	0.0017		0.029	0.0024	
Calcium			44			53
trivalent chromium	2.682	0.3196		3.834	0.4570	
Chromium[4,5,b]	0.016 / 2.7	0.011 / 0.32		0.016 / 3.8	0.011 / 0.46	
Cobalt						
Copper[4,b]	0.029	0.019	0.0092	0.044	0.027	0.012
Iron[a]		1	*1.2*		1	1
Lead[4,b]	0.19	0.039		0.33	0.069	0.0037
Magnesium			15			33
Manganese			0.14			0.14
Mercury[b]	0.0026	0.0013		0.0026	0.0013	
Molybdenum						0.0028
Nickel[a]	0.74	0.082		1.1	0.12	0.021
Potassium			4.8			6.9
Selenium[a]		0.005			0.005	
Silver[a]	0.01			0.021		
Sodium			23			22
Thallium						
Vanadium						0.003
Zinc[a]	0.19	0.19	0.073	0.27	0.27	0.075
PCBs (ug/L)[a]						
Monochlorobiphenyl		0.000014			0.000014	
Dichlorobiphenyl		0.000014			0.000014	
Trichlorobiphenyl		0.000014			0.000014	
Tetrachlorobiphenyl		0.000014			0.000014	
Pentachlorobiphenyl		0.000014			0.000014	
Hexachlorobiphenyl		0.000014			0.000014	

Table 3-2
Comparison of Maximum Surface Water Concentrations to Illinois Water Quality Standards
Dead Creek
Sauget Area I

Compounds	Creek Segment E			Creek Segment F		
	Acute WQ Standards (mg/L)[1]	Chronic WQ Standards (mg/L)[1]	Maximum Detected Concentration[2]	Acute WQ Standards (mg/L)[1]	Chronic WQ Standards (mg/L)[1]	Maximum Detected Concentration
Heptachlorobiphenyl		0.000014			0.000014	
Octachlorobiphenyl		0.000014			0.000014	
Nonachlorobiphenyl		0.000014			0.000014	
Decachlorobiphenyl		0.000014			0.000014	
Dioxins (ug/L)						
1,2,3,4,6,7,8,9-OCDD						0.000617
1,2,3,4,6,7,8-HpCDD			0.0000119			0.0000692
1,2,3,4,7,8-HxCDD						
1,2,3,6,7,8-HxCDD						
1,2,3,7,8,9-HxCDD						
1,2,3,7,8-PeCDD						
2,3,7,8-TCDD						
Furans (ug/L)						
1,2,3,4,6,7,8,9-OCDF			0.0000164			0.00026
1,2,3,4,6,7,8-HpCDF						0.0000505
1,2,3,4,7,8,9-HpCDF						0.000548
1,2,3,4,7,8-HxCDF						0.000024
1,2,3,6,7,8-HxCDF						0.0000089
1,2,3,7,8,9-HxCDF						
1,2,3,7,8-PeCDF						
2,3,4,6,7,8-HxCDF						
2,3,4,7,8-PeCDF						
2,3,7,8-TCDF						

Table 3-2
Comparison of Maximum Surface Water Concentrations to Illinois Water Quality Standards
Dead Creek
Sauget Area I

Compounds	Borrow Pit Lake Acute WQ Standards (mg/L)[1]	Borrow Pit Lake Chronic WQ Standards (mg/L)[1]	Maximum Detected Concentration
Hardness (mg/L) [3]			350
Cyanide, Total (mg/L)[a,c]	0.022	0.0052	
Fluoride			0.29
Ortho-Phosphate-P			0.83
pH			9.7
Suspended Solids			160
Total Dissolved Solids			480
Total Phosphorus			1.2
Pesticides/Herbicides (ug/L)			
2,4,5-T			
2,4,5-TP (Silvex)			
2,4-D			
2,4-DB			
4,4'-DDD			
4,4'-DDE			
4,4'-DDT[a]	0.0011	0.000001	
Aldrin[a]	0.003		
alpha-BHC			0.001
Alpha Chlordane[a]	0.0024	0.0000043	
beta-BHC			0.02
Dalapon			
delta-BHC			0.0022
Dicamba			
Dichloroprop			
Dieldrin[a]	0.00024	0.000056	0.001
Dinoseb			
Endosulfan I[a]	0.00022	0.000056	0.0024
Endosulfan II[a]	0.00022	0.000056	
Endosulfan sulfate			0.0032
Endrin[a]	0.000086	0.000036	0.00095
Endrin aldehyde			0.0032
Endrin ketone			0.0027
gamma-BHC (Lindane)[a]	0.00095	0.00016	0.0038
Gamma Chlordane[a]	0.0024	0.0000043	
Heptachlor[a]	0.00052	0.000038	0.0029
Heptachlor epoxide[a]	0.00052	0.000038	0.00096
MCPA			
MCPP			
Methoxychlor[a]		0.00003	
Toxaphene[a]	0.00073	0.0000002	
Semivolatile Organic Compounds (ug/L)			
1,2,4-Trichlorobenzene			

Table 3-2
Comparison of Maximum Surface Water Concentrations to Illinois Water Quality Standards
Dead Creek
Sauget Area I

Compounds	Borrow Pit Lake Acute WQ Standards (mg/L)[1]	Borrow Pit Lake Chronic WQ Standards (mg/L)[1]	Maximum Detected Concentration
1,2-Dichlorobenzene			
1,3-Dichlorobenzene			
1,4-Dichlorobenzene			
2,4,5-Trichlorophenol			
2,4,6-Trichlorophenol			
2,4-Dichlorophenol			
2,4-Dinitrophenol			
2,4-Dinitrotoluene			
2,6-Dinitrotoluene			
2-Chloronaphthalene			
2-Chlorophenol			
2-Methylnaphthalene			
2-Methylphenol (o-cresol)			
2-Nitroaniline			
2-Nitrophenol			
3-Methylphenol/4-Methylphenol			
3,3'-Dichlorobenzidine			
3-Nitroaniline			
4,6-Dinitro-2-methylphenol			
4-Bromophenylphenyl ether			
4-Chlorophenylphenyl ether			
4-Chloro-3-methylphenol			
4-Chloroaniline			
4-Nitroaniline			
4-Nitrophenol			
Acenaphthene			
Acenaphthylene			
Anthracene			
Benzo(a)anthracene			
Benzo(a)pyrene			
Benzo(b)fluoranthene			
Benzo(g,h,i)perylene			
Benzo(k)fluoranthene			
bis(2-Chloroethoxy)methane			
bis(2-Chloroethyl)ether			
bis-chloroisopropyl ether			
bis(2-Ethylhexyl)phthalate			
Butylbenzylphthalate			
Carbazole			
Chrysene			
Dibenzo(a,h)anthracene			
Dibenzofuran			
Diethylphthalate			

Table 3-2
Comparison of Maximum Surface Water Concentrations to Illinois Water Quality Standards
Dead Creek
Sauget Area I

Compounds	Borrow Pit Lake Acute WQ Standards (mg/L)[1]	Borrow Pit Lake Chronic WQ Standards (mg/L)[1]	Maximum Detected Concentration
Dimethylphthalate			
Di-n-butylphthalate			
Di-n-octylphthalate			
Fluoranthene			
Fluorene			
Hexachlorobenzene			
Hexachlorobutadiene			
Hexachlorocyclopentadiene			
Hexachloroethane			
Indeno(1,2,3-cd)pyrene			
Isophorone			
Naphthalene			
Nitrobenzene			
N-Nitroso-di-n-propylamine			
N-Nitrosodiphenylamine/Diphenylamine			
Pentachlorophenol			
Phenanthrene			
Phenol			
Pyrene			
Volatile Organic Compounds (ug/L)			
1,1,1-Trichloroethane			
1,1,2,2-Tetrachloroethane			
1,1,2-Trichloroethane			
1,1-Dichloroethane			
1,1-Dichloroethene			
1,2-Dichloroethane			
Cis/Trans-1,2-Dichloroethene			
1,2-Dichloropropane			
2-Butanone (MEK)			
2-Hexanone			
4-Methyl-2-pentanone (MIBK)			
Acetone			18
Benzene			
Bromodichloromethane			
Bromoform			
Bromomethane (Methyl bromide)			
Carbon disulfide			
Carbon tetrachloride			
Chlorobenzene			
Chloroform			
Chloroethane			
Chloromethane			
cis-1,3-Dichloropropene			

Table 3-2
Comparison of Maximum Surface Water Concentrations to Illinois Water Quality Standards
Dead Creek
Sauget Area I

Compounds	Borrow Pit Lake Acute WQ Standards (mg/L)[1]	Borrow Pit Lake Chronic WQ Standards (mg/L)[1]	Maximum Detected Concentration
Dibromochloromethane			
Ethylbenzene			
Methylene chloride (Dichloromethane)			
Styrene			
Tetrachloroethene			
Toluene			
trans-1,3-Dichloropropene			
Trichloroethene			
Vinyl chloride			
Xylenes, Total			
Inorganics (mg/L)			
Aluminum[a]	0.75	0.087	3.4
Antimony			
Arsenic[a,b]	0.36	0.19	0.015
Barium			0.32
Beryllium			
Cadmium[4,b]	0.040	0.0030	
Calcium			89
trivalent chromium	4.845	0.5775	
Chromium[4,5,b]	0.016 / 3.8	0.011 / 0.46	0.0041
Cobalt			0.0015
Copper[4,b]	0.058	0.034	0.0074
Iron[a]		1	8.7
Lead[4,b]	0.47	0.099	0.02
Magnesium			31
Manganese			1.7
Mercury[b]	0.0026	0.0013	
Molybdenum			0.004
Nickel[a]	1.1	0.12	0.015
Potassium			7.6
Selenium[a]		0.005	
Silver[a]	0.021		
Sodium			24
Thallium			
Vanadium			0.014
Zinc[a]	0.27	0.27	0.048
PCBs (ug/L)[a]			
Monochlorobiphenyl		0.000014	
Dichlorobiphenyl		0.000014	
Trichlorobiphenyl		0.000014	
Tetrachlorobiphenyl		0.000014	
Pentachlorobiphenyl		0.000014	
Hexachlorobiphenyl		0.000014	

Table 3-2
Comparison of Maximum Surface Water Concentrations to Illinois Water Quality Standards
Dead Creek
Sauget Area I

Compounds	Borrow Pit Lake Acute WQ Standards (mg/L)[1]	Borrow Pit Lake Chronic WQ Standards (mg/L)[1]	Maximum Detected Concentration
Heptachlorobiphenyl		0.000014	
Octachlorobiphenyl		0.000014	
Nonachlorobiphenyl		0.000014	
Decachlorobiphenyl		0.000014	
Dioxins (ug/L)			
1,2,3,4,6,7,8,9-OCDD			0.00143
1,2,3,4,6,7,8-HpCDD			0.0000569
1,2,3,4,7,8-HxCDD			
1,2,3,6,7,8-HxCDD			
1,2,3,7,8,9-HxCDD			
1,2,3,7,8-PeCDD			
2,3,7,8-TCDD			
Furans (ug/L)			
1,2,3,4,6,7,8,9-OCDF			0.000071
1,2,3,4,6,7,8-HpCDF			0.0000217
1,2,3,4,7,8,9-HpCDF			
1,2,3,4,7,8-HxCDF			
1,2,3,6,7,8-HxCDF			
1,2,3,7,8,9-HxCDF			
1,2,3,7,8-PeCDF			
2,3,4,6,7,8-HxCDF			
2,3,4,7,8-PeCDF			
2,3,7,8-TCDF			

Concentrations in **bold** exceed acute water quality standard
Concentrations in *italics* exceed chronic water quality standards
[1]Represents Illinois Water Quality Standard, if available. USEPA National Recommended WQ Criteria used if no Illinois value available.
[2]Only one surface water sample was taken from Creek Segment E. Detected concentration is presented.
[3]Average hardness for each creek segment presented.
[4]Hardness-dependent. Average measured hardness used for each creek segment.
[5]Water quality standards available for both hexavalent and trivalent chromium. The first value represents the hexavalent chromium standard and the second value represents the trivalent standard, which is hardness dependent.
[a]USEPA,1999. National Recommended Water Quallity Criteria - Correction. EPA 822-Z-99-001.
[b]Illinois. 1999. Title 35 of the Illinois Administrative Code, Subtitle C, Chapter I, Part 302 Water Quality Standards, Subpart B.

Table 3-3
List of Sample Stations, Dates, and QA/QC Samples for Fish Tissue Analysis
Dead Creek, Borrow Pit and Reference Areas
Sauget Area I

Sample Type	Sample ID	Date	Location	Species	Sample Type	Tissue Type	No. In Composite	Total Wt (g)	Notes
Forage fish whole bodies	FFCS-B COMP-01	10/5/99	CS-B	*Lepomis*	Composite	Whole Body	91	62.8	
	FFCS-D COMP-01	10/5/99	CS-D	*Lepomis*	Composite	Whole Body	225	217.2	Split with Weston
	FFBP COMP-01	10/4/99	Borrow Pit	*Lepomis*	Composite	Whole Body	14	115	
	FFBP COMP-02	10/6/99	Borrow Pit	*Lepomis*	Composite	Whole Body	151	96.1	
	FFBP COMP-03	10/8/99	Borrow Pit	*Lepomis*	Composite	Whole Body	157	92	
	FFREF1 COMP-01	10/8/99	Ref-01	*Lepomis*	Composite	Whole Body	3	120.8	
	FFREF2 COMP-01	10/8/99	Ref-02-2	*Crappie*	Composite	Whole Body	38	126.9	
	FFREF2 COMP-02	10/8/99	Ref-02-2	4 LMBass,1 minnow and 4 *Lepomis*	Composite	Whole Body	9	69.7	
	FFREF2 COMP-03	10/8/99	Ref-02-1	Minnow	Composite	Whole Body	278	78.6	

Table 4-1
Site-Specific BSAFs and Linear Regression Equations
Dead Creek
Sauget Area I

Compound	Overall Detection Frequency (%)[1]	Maximum Post Remediation Creek Bottom Soil Concentration (mg/kg)[1]	Whole Body Toxicity Values for Fish (mg/kg)[2]	Endpoint	Calculated BSAFs or sediment-fish relationship[3]	Maximum Sediment Concentration from Forage Fish BSAF Calculations - 1999 Data (mg/kg)[4]	Predicted Risk Based Sediment Concentration (mg/kg)[5]
Cyanide	5	4.57	NA			ND	
Pesticides/Herbicides							
2,4,5-T	13	0.61	3.7	NOED		ND	
2,4,5-TP (Silvex)	3	0.002	NA			ND	
2,4-D	8	0.14	1	NOED		0.012	
2,4-DB	2	0.057	NA		0.83	ND	
4,4'-DDD	6	0.47	0.6	LOED		0.15	
4,4'-DDE	12	0.035	29.2	NOED	7.12	0.02	4.1
4,4'-DDT	27	0.24	3.8	LOED		0.0014	
Total DDT	38	0.47					4.1
Aldrin	4	0.009	0.157	NOED		1.1	
alpha-BHC	10	0.0029	NA			ND	
alpha-Chlordane	5	0.012	16.6	LOED		0.026	
beta-BHC	11	0.0077	NA			ND	
Dalapon	2	0.05	NA			ND	
delta-BHC	9	0.0041	NA			0.016	
Dicamba	20	0.0066	NA		0.0922	0.013	
Dichlorprop	3	0.021	NA		0.0465	ND	
Dieldrin	44	0.69	3.7	LOED	0.777	0.0005	4.76
Endosulfan I	3	0.00017	0.195	NOED		0.0028	
Endosulfan II	2	0.01	0.195	NOED		ND	
Endosulfan sulfate	8	0.016	NA			0.13	
Endrin ketone	4	0.01	NA			0.0055	
gamma-BHC (Lindane)	10	0.0023	2.3	NOED		0.00016	
gamma-Chlordane	13	0.067	16.6	LOED	1	0.72	16.6
Heptachlor	3	0.0012	5.7	NOED		0.5	
Heptachlor epoxide	20	0.41	3.2	NOED		0.0002	
MCPP	4	6.1	NA			ND	
Methoxychlor	15	0.062	0.128	NOED		ND	
Semivolatile Organic Compounds							
1,2,4-Trichlorobenzene	6	80	NA			0.77	
1,2-Dichlorobenzene	6	53	0.7	NOED		0.37	
1,3-Dichlorobenzene	1	0.1	170	NOED/LOED		ND	
1,4-Dichlorobenzene	11	5.5	69.5	NOED		1	
2,4,5-Trichlorophenol	1	0.24	NA			ND	
2,4,6-Trichlorophenol	5	4.3	9.9			ND	
2,4-Dichlorophenol	5	6.6	NA			ND	
2-Chlorophenol	3	0.51	1.96			ND	
2-Methylnaphthalene	3	7.3	NA			ND	
3&4Methylphenol	1	1.6	NA			ND	
4-Chloroaniline	5	11	119	LOED		0.83	
4-Nitroaniline	2	9	NA			ND	
4-Nitrophenol	1	0.44	NA			ND	
Acenaphthene	2	0.86	3.5			ND	PAHs are metabolized in fish.
Acenaphthylene	1	0.24	NA			ND	
Anthracene	5	1.4	NA			ND	
Benzo(a)anthracene	11	1.9	NA			0.87	
Benzo(a)pyrene	19	1.2	0.0239	NOED		1.2	
Benzo(b)fluoranthene	16	1.4	NA			2	
Benzo(g,h,i)perylene	18	0.89	NA			1.6	
Benzo(k)fluoranthene	13	0.9	NA			1.6	
Bis(2-ethylhexyl)phthalate	10	81	0.66	NOED	1.38	3	0.478
Butylbenzylphthalate	2	3.2	6.45	NOED		ND	
Carbazole	1	0.62	NA			ND	
Chrysene	14	1.9	NA			1.8	
Dibenzo(a,h)anthracene	4	0.34	NA		0.552	ND	
Dibenzofuran	1	1.6	NA			ND	
di-n-Butylphthalate	8	0.21	NA			ND	
Fluoranthene	23	4	NA			2	

Table 4-1
Site-Specific BSAFs and Linear Regression Equations
Dead Creek
Sauget Area I

Compound	Overall Detection Frequency (%)[1]	Maximum Post Remediation Creek Bottom Soil Concentration (mg/kg)[1]	Whole Body Toxicity Values for Fish (mg/kg)[2]	Endpoint	Calculated BSAFs or sediment-fish relationship[3]	Maximum Sediment Concentration from Forage Fish BSAF Calculations - 1999 Data (mg/kg)[4]	Predicted Risk Based Sediment Concentration (mg/kg)[3]
Fluorene	2	3.5	NA			ND	
Hexachlorobutadiene	1	0.061	34.8	LOED		ND	
Indeno(1,2,3-cd)pyrene	10	0.83	NA		0.604	1.3	
Naphthalene	5	6	17	LOED		0.38	
Nitrobenzene	2	0.52	29	LOED		ND	
N-nitrosodiphenylamine	4	1.2	2	NOED		ND	
Pentachlorophenol	66	44	NA		0.00236	0.22	
Phenanthrene	18	7	NA			0.93	
Phenol	3	3.4	73.4			ND	
Pyrene	13	4	NA			2.4	
Total PAHs	31	40.56					
Volatile Organic Compounds							VOCs are not expected to bioaccumulate in fish.
1,1,1-Trichloroethane	3	0.023	0.66	NOED		ND	
1,1,2,2-Tetrachloroethane	1	0.01	0.077	NOED		ND	
1,1,2-Trichloroethane	1	0.0061	NA			ND	
1,2-Dichloroethane	1	0.0021				ND	
1,2-Dichloroethene (total)	1	0.012				ND	
2-Butanone (MEK)	48	0.61				ND	
2-Hexanone	1	0.077				0.021	
4-Methyl-2-pentanone (MIBK)	5	0.11				ND	
Acetone	61	0.47	NA			0.19	
Benzene	21	0.18	NA			ND	
Bromodichloromethane	1	0.0013				ND	
Bromoform	1	0.003				ND	
Carbon disulfide	20	0.077				ND	
Chlorobenzene	69	9.7	1.4	NOED		0.0515	
Chloroform	1	0.0031	0.66	NOED		ND	
Dibromochloromethane	1	0.002				ND	
Ethylbenzene	8	3.2				ND	
Methylene chloride	20	0.0048				ND	
Styrene	2	0.0028				ND	
Tetrachloroethene	3	0.07	0.17	NOED		ND	
Toluene	33	0.29				0.02	
Trichloroethene	3	0.034				ND	
Vinyl chloride	0	ND				ND	
Xylenes (total)	15	29				ND	
Inorganics							
Aluminum	100	20000	12.5	NOED	$\ln[Al_{fish}] = -21.2593 + 2.583 \ln[Al_{sed}]$	19000	9980
Antimony	10	4.7				8.9	
Arsenic	98	44	0.52	LOED		38	
Barium	100	1500	NA			3300	
Beryllium	84	1.3	5.3	NOED		1	
Cadmium	96	57	0.5	LOED		25	
Chromium	100	180	5.5	NOED	0.0211	78	261
Cobalt	100	23	NA			12	
Copper	100	10000	12.1	NOED/LOED	$\ln[Cu]_{fish} = -1.9295+0.4371 \ln[Cu]_{sed}$	11000	24792
Iron	100	41000				38000	
Lead	100	700	26.2	NOED/LOED	0.00833	1000	3150
Manganese	100	890				1400	
Mercury	99	1.6	0.25	NOED/LOED		1.5	
Molybdenum	34	7				7	
Nickel	100	630	NA			500	
Selenium	4	5.9			0.479	5.1	
Silver	15	9.8				15	
Thallium	4	1.3	2.72	NOED		2.1	
Tin	16	470				ND	
Vanadium	100	47	0.68	NOED		51	
Zinc	100	15000	50	NOED/LOED	$\ln[Zn]_{fish} = 2.4275 + 0.1754 \ln[Zn]_{sed}$	7900	4739

Table 4-1
Site-Specific BSAFs and Linear Regression Equations
Dead Creek
Sauget Area I

Compound	Overall Detection Frequency (%)[1]	Maximum Post Remediation Creek Bottom Soil Concentration (mg/kg)[1]	Whole Body Toxicity Values for Fish (mg/kg)[2]	Endpoint	Calculated BSAFs or sediment-fish relationship[3]	Maximum Sediment Concentration from Forage Fish BSAF Calculations - 1999 Data (mg/kg)[4]	Predicted Risk Based Sediment Concentration (mg/kg)[5]
PCBs							
Monochlorobiphenyl	5	0.0056				ND	
Dichlorobiphenyl	15	0.3				0.64	
Trichlorobiphenyl	42	15			0.84	30	
Tetrachlorobiphenyl	46	51			6.85	98	
Pentachlorobiphenyl	65	18			2.73	66	
Hexachlorobiphenyl	59	4.8			5.05	21	
Heptachlorobiphenyl	24	4			1.49	5.3	
Octachlorobiphenyl	18	1.1			0.815	1.8	
Nonachlorobiphenyl	13	0.094				ND	
Decachlorobiphenyl	39	1.3				3.4	
Total PCBs	68	84.83	0.95	NOED	$\ln[PCBf_{wet}/\%lipids] = 1.6666 + 0.6806 \ln[PCB_{sed}/\%OC]$		0.58
Dioxins							
1,2,3,4,6,7,8,9-OCDD	97	2.49			0.00636	3.42	
1,2,3,4,6,7,8-HpCDD	77	0.0584			0.019	0.397	
1,2,3,4,7,8-HxCDD	7	0.0015			0.0391	0.00231	
1,2,3,6,7,8-HxCDD	31	0.0116			0.147	0.0132	
1,2,3,7,8,9-HxCDD	21	0.0025			0.019	0.00754	
1,2,3,7,8-PeCDD	8	0.0015			0.484	0.00197	
Furans							
1,2,3,4,6,7,8,9-OCDF	87	0.517			0.0822	1.13	
1,2,3,4,6,7,8-HpCDF	72	0.0686			0.049	0.188	
1,2,3,4,7,8,9-HpCDF	15	0.0056			0.0731	0.0131	
1,2,3,4,7,8-HxCDF	18	0.0063			0.2	0.00641	
1,2,3,6,7,8-HxCDF	7	0.0029			0.0241	0.00254	
1,2,3,7,8,9-HxCDF	2	0.00038				0.000119	
1,2,3,7,8-PeCDF	7	0.0014			0.0676	0.000842	
2,3,4,6,7,8-HxCDF	4	0.00031			0.0242	0.00391	
2,3,4,7,8-PeCDF	6	0.00035			0.231	0.00128	
2,3,7,8-TCDF	14	0.00075			1.69	0.000811	
Total TEQ	97	0.0045127	0.00005	NOED	$\ln[\text{Total TEQ}_{fwt}/\%lipids] = -1.748 + 0.7556 \ln[\text{Total TEQ}_{sed}/\%OC]$*		0.00051

ND = not detected

[1]The detection frequency and maximum detected concentration for the sediment samples in Dead Creek sections B through F collected post remediation in 2002. Compounds not detected are not shown.
[2]Refer to Table 4-2.
[3]The average Biota-Sediment Accumulation Factors calculated from forage fish and sediment collected in 1999 and 2000 or the linear regression equation derived from those data where the results are linear. These data came from the Borrow Pit, Creek Segment B, Creek Segment D and two reference locations.
BAF (inorganics and polar organics) = [forage fish] / [sediment]
BSAF (nonpolar organics) = ([forage fish]/fraction lipid) / ([sediment]/fraction organic carbon)
*equation for dioxin TEQs is for concentration in ug/kg in both sediment and fish.
[4]The maximum sediment concentration from the sediment data set used in the BSAF calculations (1999 data).
[5]If toxicity information and BSAF is available, the predicted sediment concentration is the toxicity information divided by the BSAF and unnormalized or predicted by the linear regression (average fraction lipid = 0.015 and average fraction organic carbon = 0.016).

Table 4-2
Whole Body Toxicity Values for Fish
Dead Creek
Sauget Area 1

Compound	Species Common Name	Chemical Common Name	Concentration -Wet (mg/kg)	Reps	Effect	Endpoint	Exposure Route	Body Part	Start Life Stage
Herbicides									
Pentachlorophenol	Fathead minnow	PCP	22.1	1	Growth	LOED	Combined	Whole Body	Embryo
	Fathead minnow	PCP	12.6	1	Growth	NOED	Combined	Whole Body	Embryo
	Largemouth Bass	PCP	9.6	5	Growth	LOED	Absorption	Whole Body	Immature
	Trout - Rainbow	PCP	13.8	4	Mortality	ED100	Absorption	Whole Body	Adult
2,4,5-T	Mosquito fish	2,4,5-T	3.7	1	Mortality	NOED	Absorption	Whole Body	NA
2,4-D	Spiny Dogfish	2.4-D	1	4	Mortality	NOED	Injection	Whole Body	NA
Metals									
Aluminum	Trout - Brook	Aluminum	12.5	1	Growth	NOED	Absorption	Whole Body	Juvenile
Arsenic	Bluegill	Arsenic	0.52	5	Mortality	NOED	Absorption	Whole Body	Immature
Beryllium	Bluegill	Beryllium	5.13	5	Mortality	NOED	Absorption	Whole Body	Immature
Cadmium	Guppy	Cadmium	0.5	2	Growth	LOED	Ingestion	Whole Body	Immature
Chromium	Trout - Rainbow	Chromium VI	5.5	1	Mortality	NOED	Absorption	Whole Body	Immature
Copper	Common carp	Copper	12.1	1	Morphology; Mortality	LOED	Combined	Whole Body	Egg
	Common carp	Copper	12.1	1	Reproduction	NOED	Combined	Whole Body	Egg
Lead	Fathead minnow	Lead	26.2	1	Behavior	LOED	Absorption	Whole Body	Immature
	Fathead minnow	Lead	26.2	1	Behavior, Physiological	NOED	Absorption	Whole Body	Immature
Mercury	Walleye	Mercury	0.25	22	Cellular, Developmental, Physiological	LOED	Ingestion	Whole Body	Immature
	Walleye	Mercury	0.25	22	Mortality	NOED	Ingestion	Whole Body	Immature
Selenium	Bluegill	Selenium	4.6	6	Mortality	LOED	Combined	Whole Body	Adult
	Fathead minnow	Selenium	12.2	3	Growth	LOED	Ingestion	Whole Body	Larval
	Fathead minnow	Selenium	10.3	3	Growth	NOED	Ingestion	Whole Body	Larval
	Bluegill	Selenium	1.6	5	Cellular	LOED	Combined	Whole Body	Immature
	Bluegill	Selenium	4.3	3	Mortality	NOED	Absorption	Whole Body	Immature
	Largemouth Bass	Selenium	3	3	Mortality	NOED	Absorption	Whole Body	Immature
Thallium	Bluegill	Thallium	2.72	5	Mortality	NOED	Absorption	Whole Body	Immature
Vanadium	American flagfish	Vanadium	0.68	1	Growth	NOED	Absorption	Whole Body	Larval
Zinc	American flagfish	Zinc	50	1	Mortality	NOED/LOED	Combined	Whole Body	Immature

Table 4-2
Whole Body Toxicity Values for Fish
Dead Creek
Sauget Area 1

Compound	Species Common Name	Chemical Common Name	Concentration -Wet (mg/kg)	Reps	Effect	Endpoint	Exposure Route	Body Part	Start Life Stage
PCBs and Pesticides									
PCBs									
	Catfish-Channel	PCBs	14.3	3	Growth, Morphology	LOED	Ingestion	Whole Body	Immature
	Pinfish	PCBs	2.2	2	Mortality	LOED	Absorption	Whole Body	Immature
	Pinfish	PCBs	0.98	10	Mortality	NOED	Absorption	Whole Body	Immature
	Pinfish	PCBs	3.8	10	Mortality	NOED	Absorption	Whole Body	Immature
	Catfish-Channel	PCBs	10.9	3	Mortality	NOED	Ingestion	Whole Body	Immature
	Catfish-Channel	PCBs	14.3	3	Mortality	NOED	Ingestion	Whole Body	Immature
	Redbreast sunfish	PCBs	***0.95***	field study	Reproduction; Growth	NOED	Field study	Whole Body	Adult
	Redbreast sunfish	PCBs	***0.95***	field study	Reproduction; Growth	NOED	Field study	Whole Body	Adult
	Redbreast sunfish	PCBs	***0.95***	field study	Reproduction; Growth	NOED	Field study	Whole Body	Adult
DDD	Fathead minnow	4,4`-DDD	0.6	1	Reproduction	LOED	Combined	Whole Body	Adult
DDE	Mosquito fish	4,4`-DDE	29.2	1	Mortality	NOED	Combined	Whole Body	NA
DDT	Fathead minnow	4,4`-DDT	3.8	1	Reproduction	LOED	Combined	Whole Body	Adult
Aldrin	Mosquito fish	Aldrin	0.157	1	Mortality	NOED	Combined	Whole Body	NA
Dieldrin	Bluegill	Dieldrin	3.7	5	Behavior	LOED	Absorption	Whole Body	Immature
Endosulfan	Pinfish	Endosulfan	0.195	1	Mortality	NOED	Combined	Whole Body	Mature
Endrin	Golden Shiner	Endrin	***0.15***	3	Behavior	LOED	Absorption	Whole Body	NA
	Mosquito fish	Endrin	3.4	1	Mortality	LOED	Combined	Whole Body	NA
	Catfish-Channel	Endrin	0.41	1	Mortality	NOED	Absorption	Whole Body	Immature
Chlordane	Pinfish	Chlordane	16.6	2	Mortality	LOED	Combined	Whole Body	Adult
Heptachlor	Pinfish	Heptachlor	5.7	1	Mortality	NOED	Combined	Whole Body	Mature
Heptachlor epoxide	Pinfish	Heptachlor epoxide	3.2	1	Mortality	NOED	Combined	Whole Body	Mature
Methoxychlor	Mosquito fish	Methoxychlor	0.128	1	Mortality	NOED	Combined	Whole Body	NA
gamma-BHC (lindane)	Goldfish	Lindane	2.3	5	Behavior	NOED	Absorption	Whole Body	Immature
SVOCs									
Acenaphthene	Bluegill	Acenaphthene	3.5	5	Mortality	NOED	Absorption	Whole Body	Immature
Benzo(a)pyrene	Gizzard Shad	Benzo[a]pyrene	0.0283	2	Physiological	LOED	Absorption	Whole Body	Adult
	Gizzard Shad	Benzo[a]pyrene	***0.0239***	2	Physiological	NOED	Absorption	Whole Body	Adult

Table 4-2
Whole Body Toxicity Values for Fish
Dead Creek
Sauget Area 1

Compound	Species Common Name	Chemical Common Name	Concentration -Wet (mg/kg)	Reps	Effect	Endpoint	Exposure Route	Body Part	Start Life Stage
bis(2-ethylhexyl)phthalate	Bluegill	bis(2-ethylhexyl)phthalate	0.66	5	Mortality	NOED	Absorption	Whole Body	Immature
Butylbenzylphthalate	Bluegill	Butylbenzylphthalate	6.45	5	Mortality	NOED	Absorption	Whole Body	Immature
4-Chloroaniline	Trout - Rainbow	4-Chloroaniline	119	4	Mortality	LOED	Absorption	Whole Body	Adult
2-Chlorophenol	Bluegill	2-Chlorophenol	1.96	5	Mortality	NOED	Absorption	Whole Body	Immature
1,2-Dichlorobenzene	Bluegill	1,2-Dichlorobenzene	0.7	5	Mortality	NOED	Absorption	Whole Body	Immature
1,3-Dichlorobenzene	Fathead minnow	1,3-Dichlorobenzene	170	2	Mortality	NOED/LOED	Absorption	Whole Body	Egg-embryo
1,4-Dichlorobenzene	Fathead minnow	1,4-Dichlorobenzene	69.5	2	Mortality, Growth	NOED	Absorption	Whole Body	Egg-embryo
Hexachlorobutadiene	Goldfish	Hexachlorobutadiene	34.8	10	Mortality	LOED	Absorption	Whole Body	Immature
Naphthalene	Mummichog	Naphthalene	17	6	Mortality	LOED	Absorption	Whole Body	Adult
Nitrobenzene	Guppy	Nitrobenzene	29	1	Mortality	NOED	Absorption	Whole Body	Adult
N-nitrosodiphenylamine	Bluegill	N-nitrosodiphenylamine	2	5	Mortality	NOED	Absorption	Whole Body	Immature
Phenol	Trout - Rainbow	Phenol	73.4	4	Mortality	LOED	Absorption	Whole Body	Adult
2,4,6-Trichlorophenol	Salmon - Atlantic	2,4,6-Trichlorophenol	9.9	1	Mortality	NOED	Absorption	Whole Body	Immature
VOCs									
1,1,2,2-Tetrachloroethane	Bluegill	1,1,2,2-Tetrachloroethane	0.077	5	Mortality	NOED	Absorption	Whole Body	Immature
1,1,1-Trichloroethane	Bluegill	1,1,1-Trichloroethane	0.66	5	Mortality	NOED	Absorption	Whole Body	Immature
Chlorobenzene	Mosquito fish	Chlorobenzene	1.4	1	Mortality	NOED	Absorption	Whole Body	NA
Chloroform	Bluegill	Chloroform	0.66	5	Mortality	NOED	Absorption	Whole Body	Immature
Tetrachloroethene	Bluegill	PERC	0.17	5	Mortality	NOED	Absorption	Whole Body	Immature
Dioxin	Common carp	2,3,7,8-TCDD	0.0022	1	Behavior, Cellular, Morphology, mortality	LOED	Absorption	Whole Body	Adult
	Yellow perch	2,3,7,8-TCDD	0.000143	6	Growth, Morphology, Mortality	NOED	Ingestion	Whole Body	Immature
	Lake trout	2,3,7,8-TCDD	***0.00005***	NA	Mortality	NOED	Absorption	Whole Body	Based on egg concentration

If multiple values are available, selected value is bold and in italics.

Table 4-2
Whole Body Toxicity Values for Fish
Dead Creek
Sauget Area 1

Compound	Year	Author	Journal
Herbicides			
Pentachlorophenol	1985	Spehar, R.L., Nelson,H.P., Swanson, M.J., Renoos, J.W.	Environmental Toxicology and Chemistry, Vol. 4, pp 389-397, 1985
	1985	Spehar, R.L., Nelson,H.P., Swanson, M.J., Renoos, J.W.	Environmental Toxicology and Chemistry, Vol. 4, pp 389-397, 1985
	1985	Mathers, R.A., J.A. Brown and P.H. Johansen	Aquat. Toxicol. 6:157-164.
	1991	Mckim, J.M. and P.K. Schmieder	p. 161-188 in Nagel, R.et.al. Bioacc. in Aquatic Systems, Contrib. to Assmt. Proceedings
2,4,5-T	1978	Yockim, R.S., Isensee, A.R., Jones, G.E.	Chemosphere 7: 215-220
2,4-D	1979	Guarino, A.M. and S.T. Arnold	p. 233-258 in Khan, et.al. Pesticide and Xenobiotic Metabolism in Aquatic Organisms
Metals			
Aluminum	1991	Cleveland, L., D.R. Buckler, and W.G. Brumbaugh	Environmental Toxicology and Chemistry 10:243-248
Arsenic	1980	Barrows, M.E., S.R. Petrocelli, K.J. Macek and J.J. Carroll	p. 379-392 in Haque, R., ed. Dynamics, Exposure and Hazard Assessment of Toxic Chemicals
Beryllium	1980	Barrows, M.E., S.R. Petrocelli, K.J. Macek and J.J. Carroll	p. 379-392 in Haque, R., ed. Dynamics, Exposure and Hazard Assessment of Toxic Chemicals
Cadmium	1982	Hatakeyama, S. and M. Yasuno	Bull. Environ. Contam. Toxicol. 29:159-166.
Chromium	1981	Van De Putte, L., Lubbers, J., Kolar, Z.	Aquatic Toxicol. 1: 3-18
Copper	1996	Stouthart, J.H.X., Haans, J.L.M., Lock, R.A.C., Bonga, S.E.W.	Environmental Toxicology and Chemistry, Vol. 15, No. 3, pp. 376-383 (1996)
	1996	Stouthart, J.H.X., Haans, J.L.M., Lock, R.A.C., Bonga, S.E.W.	Environmental Toxicology and Chemistry, Vol. 15, No. 3, pp. 376-383 (1996)
Lead	1991	Weber, D.N., Russo, A., Seale, D.B., Spieler, R.E.	Aquatic Toxicol. 21: 71-80
	1991	Weber, D.N., Russo, A., Seale, D.B., Spieler, R.E.	Aquatic Toxicol. 21: 71-80
Mercury	1996	Friedmann, A.S., M.C. Watzin, T. Brinck-Johnsen and J.C. Leiter	Aquat. Toxicol. 35:265-278.
	1996	Friedmann, A.S., M.C. Watzin, T. Brinck-Johnsen and J.C. Leiter	Aquat. Toxicol. 35:265-278.
Selenium	1992	Hermanutz, R.O., Allen, K.N., Roush, T.H., and S.F. Hedtke	Environ. Tox. Chem. 11: 217-224
	1986	Bennett, W.N., A.S. Brooks and M.E. Boraas	Arch. Environ. Contam. Toxicol. 15:513-517.
	1986	Bennett, W.N., A.S. Brooks and M.E. Boraas	Arch. Environ. Contam. Toxicol. 15:513-517.
	1993	Lemly, A.D.	Aquat. Toxicol. 27:133-158.
	1982	Lemly, A.D.	Aquat. Toxicol. 2:235-252.
	1982	Lemly, A.D.	Aquat. Toxicol. 2:235-252.
Thallium	1980	Barrows, M.E., S.R. Petrocelli, K.J. Macek and J.J. Carroll	p. 379-392 in Haque, R., ed. Dynamics, Exposure and Hazard Assessment of Toxic Chemicals
Vanadium	1983	Holdway, D.A., J.B. Sprague and J.G. Dick	Water Res. 17:937-941.
Zinc	1978	Spehar, R.L., Leonard, E.N., Defoe, D.L.	Tans. Am. Fish. Soc., 107(2): 354-360 (1978)

Table 4-2
Whole Body Toxicity Values for Fish
Dead Creek
Sauget Area 1

Compound	Year	Author	Journal
PCBs and Pesticides			
PCBs			
	1976	Hansen, L.G., W.B. Wiekhorst and J. Simon	J. Fish. Res. Bd. Can. 33:1343-1352.
	1974	Hansen, D.J., P.R. Parrish and J. Forester	Environ. Res. 7:363-373.
	1970	Duke, T.W., J.I. Lowe and A.J. Wilson, Jr.	Bull. Environ. Contam. Toxicol. 5:171-180.
	1970	Duke, T.W., J.I. Lowe and A.J. Wilson, Jr.	Bull. Environ. Contam. Toxicol. 5:171-180.
	1976	Hansen, L.G., W.B. Wiekhorst and J. Simon	J. Fish. Res. Bd. Can. 33:1343-1352.
	1976	Hansen, L.G., W.B. Wiekhorst and J. Simon	J. Fish. Res. Bd. Can. 33:1343-1352.
	1989	Adams, S.M., K.L. Shepard, M.S. Greeley Jr., B.D. Jimenez, M.G. Ryon, L.R. Ghugart, and J.F. McCarthy;	Marine Envirnmental Research. 28: 459-464.
	1990	Adams, S.M., L.R. Shugart, G.R. Southworth and D.E. Hinton	In J.F. McCarthy and L.R. Shugart, eds., Biomarkers of Environmental Contamination. Lewis Publishers, Boca Raton, FL., pp. 333-353.
	1992	Adams, S.M., W.D. Crumby, M.S. Greeley, Jr., M.G. Ryon, and E.M Schilling	Environmental Toxicology and Chemistry. 11: 1549-1557.
DDD	1977	Jarvinen, A.W., M.J. Hoffman, and T.W. Thorslund	J. Fish. Res. Board. Can. 34:2089-2103
DDE	1974	Metcalf, R.L.	p. 17-38 in Hayes, W.J., Essays in Toxicology, Volume 5. Academic Press
DDT	1977	Jarvinen, A.W., M.J. Hoffman, and T.W. Thorslund	J. Fish. Res. Board. Can. 34:2089-2103
Aldrin	1974	Metcalf, R.L.	p. 17-38 in Hayes, W.J., Essays in Toxicology, Volume 5. Academic Press
Dieldrin	1967	Gakstatter, J.H. and C.M. Weiss	Trans. Amer. Fish. Soc. 96:301-307.
Endosulfan	1977	Schimmel, S.C., Patrick, J.M., Wilson, A.J.	Aquatic Toxicology and Hazard Evaluation, ASTM STP 634, American Society for Testing and Materials, pp. 241-252 (1977)
Endrin	1968	Ludke, J.L., D.E. Ferguson and W.D. Burke	Trans. Amer. Fish. Soc. 97:260-263.
	1973	Metcalf, R.L., I.P. Kapoor, P.Y. Lu, C.K. Schuth and P. Sherman	Environ. Health Perspect. 8:35-44.
	1973	Argyle, R.L., Williams, G.C., and H.K. Dupree	J. Fish. Res. Board Can. 30: 1743-1744
Chlordane	1976	Parrish, P.R., S.C. Schimmel, D.J. Hansen, J.M. Patrick, and J. Forester	Journal of Toxicology and Environmental Health, 1:485-494, 1976
Heptachlor	1976	Schimmel, S.C., Patrick, J.M., Forester, J.	Journal of Toxicology and Environmental Health, 1:955-965, 1976
Heptachlor epoxide	1976	Schimmel, S.C., Patrick, J.M., Forester, J.	Journal of Toxicology and Environmental Health, 1:955-965, 1976
Methoxychlor	1974	Metcalf, R.L.	p. 17-38 in Hayes, W.J., Essays in Toxicology, Volume 5. Academic Press
gamma-BHC (lindane)	1967	Gakstatter, J.H. and C.M. Weiss	Trans. Amer. Fish. Soc. 96:301-307.
SVOCs			
Acenaphthene	1980	Barrows, M.E., S.R. Petrocelli, K.J. Macek and J.J. Carroll	p. 379-392 in Haque, R., ed. Dynamics, Exposure and Hazard Assessment of Toxic Chemicals
Benzo(a)pyrene	1994	Levine, S.L., J.T. Oris and T.E. Wissing	Aquat. Toxicol. 30:61-75.
	1994	Levine, S.L., J.T. Oris and T.E. Wissing	Aquat. Toxicol. 30:61-75.

Table 4-2
Whole Body Toxicity Values for Fish
Dead Creek
Sauget Area 1

Compound	Year	Author	Journal
bis(2-ethylhexyl)phthalate	1980	Barrows, M.E., S.R. Petrocelli, K.J. Macek and J.J. Carroll	p. 379-392 in Haque, R., ed. Dynamics, Exposure and Hazard Assessment of Toxic Chemicals
Butylbenzylphthalate	1980	Barrows, M.E., S.R. Petrocelli, K.J. Macek and J.J. Carroll	p. 379-392 in Haque, R., ed. Dynamics, Exposure and Hazard Assessment of Toxic Chemicals
4-Chloroaniline	1991	Mckim, J.M. and P.K. Schmieder	p. 161-188 in Nagel, R.et.al. Bioacc. in Aquatic Systems, Contrib. to Assmt. Proceedings
2-Chlorophenol	1980	Barrows, M.E., S.R. Petrocelli, K.J. Macek and J.J. Carroll	p. 379-392 in Haque, R., ed. Dynamics, Exposure and Hazard Assessment of Toxic Chemicals
1,2-Dichlorobenzene	1980	Barrows, M.E., S.R. Petrocelli, K.J. Macek and J.J. Carroll	p. 379-392 in Haque, R., ed. Dynamics, Exposure and Hazard Assessment of Toxic Chemicals
1,3-Dichlorobenzene	1987	Carlson, A.R. and P.A. Kosian	Arch. Environ. Contam. Toxicol. 16:129-135.
1,4-Dichlorobenzene	1987	Carlson, A.R. and P.A. Kosian	Arch. Environ. Contam. Toxicol. 16:129-135.
Hexachlorobutadiene	1975	Leeuwangh, P., H. Bult, and L. Schneiders	In Koeman, J.H. and J.J.T.W.A. Strik, editors. Sublethal Effects of Toxic Chemicals on Aquatic Orgar
Naphthalene	1979	Levitan, W.N. and M.N. Taylor	J. Fish. Res. Bd. Can. 36:615-622.
Nitrobenzene	1987	Deneer, J.W., T.L. Sinnige, W. Seinen and J.L.M. Hermens	Aquat. Toxicol. 10:115-129.
N-nitrosodiphenylamine	1980	Barrows, M.E., S.R. Petrocelli, K.J. Macek and J.J. Carroll	p. 379-392 in Haque, R., ed. Dynamics, Exposure and Hazard Assessment of Toxic Chemicals
Phenol	1991	Mckim, J.M. and P.K. Schmieder	p. 161-188 in Nagel, R.et.al. Bioacc. in Aquatic Systems, Contrib. to Assmt. Proceedings
2,4,6-Trichlorophenol	1986	Carlberg, G.E., K. Martinsen, A. Kringstad, E. Gjessing, M. Grande, T. Ka	Arch. Environ. Contam. Toxicol. 15:543-548.
VOCs			
1,1,2,2-Tetrachloroethane	1980	Barrows, M.E., S.R. Petrocelli, K.J. Macek and J.J. Carroll	p. 379-392 in Haque, R., ed. Dynamics, Exposure and Hazard Assessment of Toxic Chemicals
1,1,1-Trichloroethane	1980	Barrows, M.E., S.R. Petrocelli, K.J. Macek and J.J. Carroll	p. 379-392 in Haque, R., ed. Dynamics, Exposure and Hazard Assessment of Toxic Chemicals
Chlorobenzene	1975	Lu, P.Y. and R.L. Metcalf	Environ. Health Perspect. 10:269-284.
Chloroform	1980	Barrows, M.E., S.R. Petrocelli, K.J. Macek and J.J. Carroll	p. 379-392 in Haque, R., ed. Dynamics, Exposure and Hazard Assessment of Toxic Chemicals
Tetrachloroethene	1980	Barrows, M.E., S.R. Petrocelli, K.J. Macek and J.J. Carroll	p. 379-392 in Haque, R., ed. Dynamics, Exposure and Hazard Assessment of Toxic Chemicals
Dioxin	1991	Cook, P.M., D.W. Kuehl, M.K. Walker and R.E. Peterson	p. 143-167 in Gallow, M.A., et.al. Biol. Basis for Risk Assmt. of Dioxins and Related Compounds.
	1986	Kleeman, J.M., J.R. Olson, S.M. Chen and R.E. Peterson	Toxicol. Appl. Pharmacol. 83:402-411.
	1993	USEPA	EPA/600/R-93/055

If multiple values are available, selected value is bold and in italics.

Table 4-3a
Results of Food Chain Modeling
Heron
Dead Creek
Sauget Area I

Compound	Dead Creek Segment B		Dead Creek Segment C		Dead Creek Segment D		Dead Creek Segment E		Dead Creek Segment F	
	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index
Cyanide	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Herbicides and Pesticides										
2,3,5-T	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,4,5-TP (Silvex)	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,4-D	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,4-DB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
4,4'-DDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
4,4'-DDE	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
4,4'-DDT	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total DDT	1E+00	1E-01	ND	ND	ND	ND	1E+00	1E-01	6E-01	6E-02
Aldrin	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Alpha-BHC	BSAF NA	BSAF NA	ND	ND	ND	ND	BSAF NA	BSAF NA	ND	ND
Alpha Chlordane	ND	ND	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA
beta-BHC	BSAF NA	BSAF NA	ND	ND	ND	ND	ND	ND	BSAF NA	BSAF NA
Dalapon	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
delta-BHC	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	ND	ND	ND	ND
Dicamba	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Dichloroprop	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Dieldrin	1E-02	NB	5E-03	NB	1E-01	NB	3E-02	NB	9E-03	NB
Dinoseb	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Endosulfan I	ND	NB	ND	NB	ND	NB	BSAF NA	NB	ND	NB
Endosulfan II	BSAF NA	NB	ND	NB	ND	NB	BSAF NA	NB	ND	NB
Endosulfan sulfate	BSAF NA	NB	BSAF NA	NB	BSAF NA	NB	BSAF NA	NB	BSAF NA	NB
Endrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin ketone	BSAF NA	BSAF NA	BSAF NA	BSAF NA	ND	ND	ND	ND	ND	ND
gamma-BHC (Lindane)	BSAF NA	BSAF NA	ND	ND	ND	ND	ND	ND	ND	ND
Gamma Chlordane	3E-05	5E-06	5E-05	1E-05	8E-04	2E-04	1E-04	3E-05	2E-04	4E-05
Heptachlor	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Heptachlor epoxide	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
MCPA	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
MCPP	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Methoxychlor	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Toxaphene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
SVOCs										
1,2,4-Trichlorobenzene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2-Dichlorobenzene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,3-Dichlorobenzene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,4-Dichlorobenzene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,4,5-Trichlorophenol	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,4,6-Trichlorophenol	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,4-Dichlorophenol	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,4-Dinitrophenol	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,4-Dinitrotoluene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,6-Dinitrotoluene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2-Chloronaphthalene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2-Chlorophenol	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2-Methylnaphthalene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2-Methylphenol (o-cresol)	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2-Nitroanaline	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2-Nitrophenol	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
3- & 4-Methylphenol	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
3,3'-Dichlorobenzidine	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB

Table 4-3a
Results of Food Chain Modeling
Heron
Dead Creek
Sauget Area I

Compound	Dead Creek Segment B		Dead Creek Segment C		Dead Creek Segment D		Dead Creek Segment E		Dead Creek Segment F	
	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index
3-Nitroanaline	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
4,6-Dinitro-2-methylphenol	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
4-Bromophenyl phenyl ether	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
4-Chloro-3-methylphenol	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
4-Chloroanaline	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
4-Chlorophenyl phenyl ether	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
4-Nitroanaline	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
4-Nitrophenol	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Acenapthene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Acenaphthylene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Anthracene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Benzo(a)anthracene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Benzo(a)pyrene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Benzo(b)fluoranthene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Benzo(g,h,I,)perylene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Benzo(k)fluoranthene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Bis(2-chloroethoxy)methane	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Bis(2-chloroethyl)ether	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Bis(2-chloroisopropyl)ether	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
bis(2-ethylhexyl)phthalate	5E-02	NB	ND	NB	ND	NB	1E-02	NB	3E-02	NB
Butylbenzylphthalate	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Carbazole	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Chrysene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Dibenzo(a,h)anthracene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Dibenzofuran	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Diethylphthalate	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Dimethylphthalate	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Di-n-butylphthalate	BSAF NA	BSAF NA	ND	ND	ND	ND	BSAF NA	BSAF NA	ND	ND
Di-n-octylphthalate	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Fluoranthene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Fluorene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Hexachlorobenzene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Hexachlorobutadiene	ND	NB	ND	NB	ND	NB	ND	NB	BSAF NA	NB
Hexachlorocyclopentadiene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Hexachloroethane	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Indeno(1,2,3-c,d)pyrene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Isophorone	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Naphthalene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Nitrobenzene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
N-Nitroso-di-N-propylamine	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
N-Nitrosodiphenylamine	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Pentachlorophenol	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Phenanthrene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Phenol	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Pyrene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total PAHs	5E-04	5E-05	ND	ND	2E-04	2E-05	4E-04	4E-05	4E-04	4E-05
VOCs										
1,1,1-Trichloroethane	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,1,2,2-Tetrachloroethane	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,1,2-Trichloroethane	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,1-Dichloroethane	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,1-Dichlorothene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	BSAF NA	BSAF NA

Table 4-3a
Results of Food Chain Modeling
Heron
Dead Creek
Sauget Area I

Compound	Dead Creek Segment B		Dead Creek Segment C		Dead Creek Segment D		Dead Creek Segment E		Dead Creek Segment F	
	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index
1,2-Dichloroethene(total)	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2-Dichloropropane	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2-Butanone(MEK)	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2-Hexanone	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
4-Methyl-2-pentanone (MIBK)	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Acetone	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Benzene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Bromodichloromethane	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Bromoform	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Bromomethane	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Carbon disulfide	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Carbon tetrachloride	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Chlorobenzene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Chloroform	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Chloroethane	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Chloromethane	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
cis-1,3-Dichloropropene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Dibromochloromethane	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Ethylbenzene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Methylene chloride	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Styrene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Tetrachloroethene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Toluene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
trans-1,3-Dichloropropene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Trichloroethene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Vinyl chloride	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Xylenes (total)	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Inorganics										
Aluminum, Total	1E-02	NB	2E-02	NB	2E-02	NB	2E-02	NB	1E-02	NB
Antimony	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Arsenic, Total	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA
Barium, Total	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA
Beryllium	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Cadmium, Total	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA
Calcium	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Chromium, Total	2E-01	4E-02	1E-01	2E-02	1E-01	3E-02	2E-01	4E-02	5E-02	1E-02
Cobalt	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA
Copper, Total	8E-03	6E-03	3E-03	2E-03	6E-03	4E-03	9E-03	7E-03	5E-03	3E-03
Iron	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Lead, Total	1E-01	1E-02	4E-02	4E-03	1E-01	1E-02	1E-01	1E-02	9E-02	9E-03
Magnesium	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Manganese	BSAF NA	NB	BSAF NA	NB	BSAF NA	NB	BSAF NA	NB	BSAF NA	NB
Mercury	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA
Molybdenum	BSAF NA	BSAF NA	ND	ND	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA
Nickel, Total	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA
Potassium	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Selenium	1E-01	6E-02	ND	ND	2E-01	8E-02	ND	ND	1E-01	5E-02

Table 4-3a
Results of Food Chain Modeling
Heron
Dead Creek
Sauget Area I

Compound	Dead Creek Segment B		Dead Creek Segment C		Dead Creek Segment D		Dead Creek Segment E		Dead Creek Segment F	
	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index
Silver	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Sodium	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Thallium	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Tin	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA	BSAF NA
Vanadium	BSAF NA	NB	BSAF NA	NB	BSAF NA	NB	BSAF NA	NB	BSAF NA	NB
Zinc, Total	5E-01	5E-02	4E-01	4E-02	5E-01	5E-02	4E-01	5E-02	5E-01	5E-02
PCBs										
Monochlorobiphenyl	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Dichlorobiphenyl	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Trichlorobiphenyl	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Tetrachlorobiphenyl	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Pentachlorobiphenyl	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Hexachlorobiphenyl	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Heptachlorobiphenyl	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Octachlorobiphenyl	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Nonachlorobiphenyl	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Decachlorobiphenyl	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total PCBs	1E+00	1E-01	1E-01	1E-02	6E-01	6E-02	4E-01	4E-02	3E-01	3E-02
Dioxins										
1,2,3,4,6,7,8,9-OCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,4,6,7,8-HpCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,4,7,8-HxCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,6,7,8-HxCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,7,8,9-HxCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,7,8-PeCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,3,7,8-TCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total HpCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total HxCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total PeCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total TCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Furans										
1,2,3,4,6,7,8,9-OCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,4,6,7,8-HpCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,4,7,8,9-HpCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,4,7,8-HxCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,6,7,8-HxCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,7,8,9-HxCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,7,8-PeCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,3,4,6,7,8-HxCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,3,4,7,8-PeCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,3,7,8-TCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total HpCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total HxCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total PeCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total TCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Dioxin - TEQ	2E-01	2E-02	4E-02	4E-03	1E-01	1E-02	8E-02	8E-03	2E-01	2E-02

NA=Not available/applicable
NB = Benchmark not available
ND = Not detected
BSAF NA = Biota-Sediment Accumulation Factor not available
Bolded values indicate a Hazard Index greater than 1

Table 4-3b
Results of Food Chain Modeling
River Otter
Dead Creek
Sauget Area I

Compound	Dead Creek Segment B		Dead Creek Segment C		Dead Creek Segment D		Dead Creek Segment E		Dead Creek Segment F	
	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index
Cyanide	2E-08	1E-09	ND	ND	ND	ND	ND	ND	8E-09	7E-10
Herbicides and Pesticides										
2,3,5-T	1E-08	4E-09	ND	ND	2E-09	5E-10	ND	ND	ND	ND
2,4,5-TP (Silvex)	2E-10	9E-11	ND	ND	ND	ND	ND	ND	ND	ND
2,4-D	2E-08	4E-09	ND	ND	ND	ND	3E-08	5E-09	7E-09	1E-09
2,4-DB	2E-07	7E-08	ND	ND	ND	ND	ND	ND	ND	ND
4,4'-DDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
4,4'-DDE	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
4,4'-DDT	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total DDT	2E-05	4E-06	ND	ND	8E-08	1E-08	2E-05	5E-06	2E-06	5E-07
Aldrin	5E-09	9E-10	ND	ND	2E-08	4E-09	ND	ND	7E-10	1E-10
Alpha-BHC	8E-08	1E-08	ND	ND	ND	ND	6E-08	7E-09	ND	ND
Alpha Chlordane	ND	ND	6E-10	3E-10	2E-09	1E-09	3E-09	2E-09	6E-10	3E-10
beta-BHC	1E-08	2E-09	ND	ND	ND	ND	ND	ND	2E-09	3E-10
Dalapon	1E-08	4E-09	ND	ND	5E-09	1E-09	ND	ND	ND	ND
delta-BHC	7E-08	8E-09	5E-08	7E-09	3E-08	4E-09	ND	ND	ND	ND
Dicamba	4E-07	1E-07	7E-07	2E-07	9E-08	3E-08	4E-07	1E-07	2E-07	5E-08
Dichloroprop	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Dieldrin	2E-04	2E-05	7E-05	7E-06	9E-04	9E-05	5E-04	5E-05	4E-05	4E-06
Dinoseb	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Endosulfan I	ND	NB	ND	NB	ND	NB	2E-09	NB	ND	NB
Endosulfan II	5E-08	NB	ND	NB	ND	NB	1E-08	NB	ND	NB
Endosulfan sulfate	5E-08	NB	5E-08	NB	4E-08	NB	8E-08	NB	1E-08	NB
Endrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin ketone	5E-08	5E-09	2E-07	2E-08	ND	ND	ND	ND	ND	ND
gamma-BHC (Lindane)	4E-10	4E-11	ND	ND	ND	ND	ND	ND	ND	ND
Gamma Chlordane	1E-07	5E-08	1E-07	8E-08	1E-06	6E-07	5E-07	3E-07	2E-07	1E-07
Heptachlor	2E-08	2E-09	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor epoxide	2E-07	2E-08	ND	ND	ND	ND	9E-09	9E-10	ND	ND
MCPA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MCPP	1E-06	5E-07	ND	ND	ND	ND	ND	ND	3E-07	1E-07
Methoxychlor	1E-09	6E-10	2E-09	9E-10	5E-09	3E-09	5E-10	2E-10	ND	ND
Toxaphene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
SVOCs										
1,2,4-Trichlorobenzene	8E-08	2E-08	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	1E-08	NB	ND	NB	ND	NB	ND	NB	ND	NB
1,3-Dichlorobenzene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,4-Dichlorobenzene	3E-08	3E-09	ND	ND	4E-09	4E-10	2E-08	2E-09	3E-09	3E-10
2,4,5-Trichlorophenol	3E-09	1E-09	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,4-Dichlorophenol	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,4-Dinitrophenol	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,4-Dinitrotoluene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,6-Dinitrotoluene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2-Chloronaphthalene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2-Chlorophenol	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2-Methylnaphthalene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2-Methylphenol (o-cresol)	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2-Nitroaniline	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2-Nitrophenol	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
3- & 4-Methylphenol	2E-09	9E-10	ND	ND	ND	ND	ND	ND	ND	ND

Table 4-3b
Results of Food Chain Modeling
River Otter
Dead Creek
Sauget Area I

Compound	Dead Creek Segment B		Dead Creek Segment C		Dead Creek Segment D		Dead Creek Segment E		Dead Creek Segment F	
	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index
3,3'-Dichlorobenzidine	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
3-Nitroanaline	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
4,6-Dinitro-2-methylphenol	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
4-Bromophenyl phenyl ether	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
4-Chloro-3-methylphenol	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
4-Chloroanaline	1E-07	NB	ND	NB	ND	NB	ND	NB	ND	NB
4-Chlorophenyl phenyl ether	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
4-Nitroanaline	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
4-Nitrophenol	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Acenapthene	2E-09	9E-10	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Anthracene	7E-09	NB	ND	NB	ND	NB	2E-09	NB	ND	NB
Benzo(a)anthracene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Benzo(a)pyrene	5E-07	5E-08	ND	ND	1E-07	1E-08	5E-07	5E-08	1E-07	1E-08
Benzo(b)fluoranthene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Benzo(g,h,I,)perylene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Benzo(k)fluoranthene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Bis(2-chloroethoxy)methane	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Bis(2-chloroethyl)ether	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Bis(2-chloroisopropyl)ether	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
bis(2-ethylhexyl)phthalate	3E-05	3E-06	ND	ND	ND	ND	6E-06	6E-07	3E-06	3E-07
Butylbenzylphthalate	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Carbazole	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Chrysene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Dibenzo(a,h)anthracene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Dibenzofuran	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Diethylphthalate	ND	NB	ND	NB	ND	NB	ND	NB	ND	NB
Dimethylphthalate	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Di-n-butylphthalate	1E-09	3E-10	ND	ND	ND	ND	6E-10	2E-10	ND	ND
Di-n-octylphthalate	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Fluoranthene	2E-09	NB	ND	NB	4E-10	NB	2E-09	NB	3E-10	NB
Fluorene	2E-09	NB	ND	NB	ND	NB	ND	NB	ND	NB
Hexachlorobenzene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Hexachlorobutadiene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Hexachlorocyclopentadiene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Hexachloroethane	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Indeno(1,2,3-c,d)pyrene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Isophorone	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Naphthalene	7E-08	4E-08	ND	ND	ND	ND	ND	ND	ND	ND
Nitrobenzene	NB	1E-07	NB	ND	NB	ND	NB	ND	NB	ND
N-Nitroso-dI-N-propylamine	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
N-Nitrosodiphenylamine	2E-08	2E-09	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	3E-07	9E-08	4E-09	1E-09	2E-09	7E-10	2E-08	7E-09	4E-09	1E-09
Phenanthrene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Phenol	1E-08	7E-09	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	1E-07	8E-08	ND	ND	3E-08	2E-08	1E-07	6E-08	2E-08	1E-08
Total PAHs	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
VOCs										
1,1,1-Trichloroethane	2E-11	NB	ND	NB	ND	NB	ND	NB	ND	NB
1,1,2,2-Tetrachloroethane	NB	ND	NB	ND	NB	ND	NB	ND	NB	3E-11
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	1E-09	1E-10

Table 4-3b
Results of Food Chain Modeling
River Otter
Dead Creek
Sauget Area I

Compound	Dead Creek Segment B		Dead Creek Segment C		Dead Creek Segment D		Dead Creek Segment E		Dead Creek Segment F	
	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index
1,1-Dichloroethane	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,1-Dichlorothene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	4E-11	2E-11
1,2-Dichloroethene(total)	4E-10	NB	ND	NB	ND	NB	ND	NB	ND	NB
1,2-Dichloropropane	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2-Butanone(MEK)	5E-11	2E-11	8E-12	3E-12	4E-12	2E-12	2E-11	6E-12	4E-12	1E-12
2-Hexanone	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
4-Methyl-2-pentanone (MIBK)	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Acetone	4E-08	8E-09	6E-09	1E-09	ND	ND	1E-08	2E-09	3E-09	6E-10
Benzene	1E-09	1E-10	4E-10	4E-11	ND	ND	ND	ND	ND	ND
Bromodichloromethane	NB	ND	NB	ND	NB	ND	NB	ND	NB	9E-11
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	1E-10	5E-11
Bromomethane	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Carbon disulfide	7E-09	NB	ND	NB	ND	NB	ND	NB	ND	NB
Carbon tetrachloride	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Chlorobenzene	6E-08	NB	5E-09	NB	6E-10	NB	3E-09	NB	8E-11	NB
Chloroform	5E-10	2E-10	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Chloromethane	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
cis-1,3-Dichloropropene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Dibromochloromethane	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Ethylbenzene	8E-10	3E-10	ND	ND	ND	ND	1E-10	3E-11	ND	ND
Methylene chloride	1E-09	1E-10	1E-09	1E-10	4E-10	5E-11	1E-09	1E-10	4E-10	4E-11
Styrene	1E-11	7E-12	9E-12	5E-12	ND	ND	ND	ND	ND	ND
Tetrachloroethene	2E-08	4E-09	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	2E-09	2E-10	5E-10	5E-11	2E-10	2E-11	8E-10	8E-11	3E-10	3E-11
trans-1,3-Dichloropropene	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Trichloroethene	3E-08	3E-09	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Xylenes (total)	3E-07	2E-07	6E-09	5E-09	ND	ND	ND	ND	2E-09	2E-09
Inorganics										
Aluminum, Total	3E-02	3E-03	2E-02	2E-03	1E-02	1E-03	3E-02	3E-03	7E-03	7E-04
Antimony	6E-05	6E-06	2E-05	2E-06	ND	ND	7E-05	7E-06	6E-06	6E-07
Arsenic, Total	1E-05	NB	7E-06	NB	4E-06	NB	1E-05	NB	3E-06	NB
Barium, Total	6E-05	4E-05	3E-05	2E-05	2E-05	1E-05	5E-05	4E-05	1E-05	7E-06
Beryllium	2E-06	NB	2E-06	NB	1E-06	NB	3E-06	NB	6E-07	NB
Cadmium, Total	5E-05	5E-06	2E-05	2E-06	2E-05	2E-06	6E-05	6E-06	1E-05	1E-06
Calcium	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Chromium, Total	4E-07	NB	1E-07	NB	1E-07	NB	4E-07	NB	2E-08	NB
Cobalt	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Copper, Total	3E-04	2E-04	4E-05	3E-05	5E-05	4E-05	3E-04	2E-04	3E-05	2E-05
Iron	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Lead, Total	1E-04	1E-05	3E-05	3E-06	3E-05	3E-06	1E-04	1E-05	2E-05	2E-06
Magnesium	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Manganese	6E-06	2E-06	4E-06	1E-06	1E-06	4E-07	5E-06	2E-06	3E-06	1E-06
Mercury	2E-05	3E-06	5E-06	1E-06	6E-06	1E-06	6E-05	1E-05	8E-06	2E-06
Molybdenum	2E-05	2E-06	ND	ND	1E-05	1E-06	1E-05	1E-06	3E-06	3E-07
Nickel, Total	2E-05	1E-05	1E-05	6E-06	6E-06	3E-06	2E-05	9E-06	5E-06	3E-06
Potassium	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Selenium	1E-03	9E-04	ND	ND	7E-04	4E-04	ND	ND	3E-04	2E-04
Silver	9E-08	9E-09	ND	ND	3E-08	3E-09	2E-07	2E-08	2E-08	2E-09

Table 4-3b
Results of Food Chain Modeling
River Otter
Dead Creek
Sauget Area I

Compound	Dead Creek Segment B		Dead Creek Segment C		Dead Creek Segment D		Dead Creek Segment E		Dead Creek Segment F	
	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Hazard Index	LOAEL Hazard Index
Sodium	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Thallium	3E-04	2E-05	ND	ND	ND	ND	3E-04	2E-05	ND	ND
Tin	2E-06	1E-06	5E-07	4E-07	4E-07	2E-07	1E-06	1E-06	3E-07	2E-07
Vanadium	3E-04	3E-05	3E-04	3E-05	1E-04	1E-05	4E-04	4E-05	9E-05	9E-06
Zinc, Total	3E-04	1E-04	1E-04	7E-05	9E-05	4E-05	2E-04	1E-04	7E-05	4E-05
PCBs										
Monochlorobiphenyl	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Dichlorobiphenyl	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Trichlorobiphenyl	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Tetrachlorobiphenyl	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Pentachlorobiphenyl	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Hexachlorobiphenyl	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Heptachlorobiphenyl	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Octachlorobiphenyl	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Nonachlorobiphenyl	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Decachlorobiphenyl	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total PCBs	7E-03	3E-03	5E-04	2E-04	9E-04	4E-04	2E-03	9E-04	3E-04	2E-04
Dioxins										
1,2,3,4,6,7,8,9-OCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,4,6,7,8-HpCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,4,7,8-HxCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,6,7,8-HxCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,7,8,9-HxCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,7,8-PeCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,3,7,8-TCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total HpCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total HxCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total PeCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total TCDD	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Furans										
1,2,3,4,6,7,8,9-OCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,4,6,7,8-HpCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,4,7,8,9-HpCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,4,7,8-HxCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,6,7,8-HxCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,7,8,9-HxCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
1,2,3,7,8-PeCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,3,4,6,7,8-HxCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,3,4,7,8-PeCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
2,3,7,8-TCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total HpCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total HxCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total PeCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Total TCDF	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Dioxin - TEQ	2E-02	2E-03	2E-03	2E-04	3E-03	3E-04	5E-03	5E-04	4E-03	4E-04

NA=Not available/applicable
NB = Benchmark not available
ND = Not detected
BSAF NA = Biota-Sediment Accumulation Factor not available
Bolded values indicate a Hazard Index greater than 1

Table 5-1
Comparison of Creek Bottom Soil Concentrations to Cleanup Goals for Ecological Risk
Dead Creek

Compound	Site-Specific Risk-Based Concentration For the Protection of Fish, mg/kg	Site-Specific Risk-Based Concentration For the Protection of Piscivorous Birds, mg/kg[1]	Illinois Soil Background, mg/kg[2]		Upper 95% UCL Creek Section B, mg/kg	Average Concentration Creek Section C, mg/kg	Average Concentration Creek Section D, mg/kg[3]	Upper 95% UCL Creek Section E, mg/kg	Upper 95% UCL Creek Section F, mg/kg
			Maximum	Mean					
DDT	4.1	No risk to birds due to this compound	NA	NA	0.043	ND	0.0746	0.0193	0.00695
Dieldrin	4.8	No risk to birds due to this compound	NA	NA	0.00755	0.00476	0.127	0.0226	0.00379
Gamma-chlordane	17	No risk to birds due to this compound	NA	NA	0.00044	0.0011	0.0155	0.00245	0.00199
Bis(2-ethylhexyl)phthalate	0.48	No risk to birds due to this compound	NA	NA	0.279	ND	ND	0.077	0.11
Aluminum	9960	No risk to birds due to this compound	37200	10148	9390	10800	10900	10000	8900
Chromium	261	No risk to birds due to this compound	151	21.2	71	36.1	49.3	74.2	16.9
Copper	24792	No risk to birds due to this compound	156	28.9	898	109	386	1080	230
Lead	3150	No risk to birds due to this compound	647	71.1	99.5	43.2	98.2	126	88.1
Zinc	4739	No risk to birds due to this compound	798	137.9	5340	2140	4100	3150	5650
Total PCBs	**0.58**	0.91	NA	NA	1.48	0.069	0.494	0.274	0.0838

Bold value is selected as cleanup goal
NA = not available/applicable
[1]No risks were predicted to river otter.
[2]Illinois Environmental Protection Agency. 1994. A Summary of Selected Background Conditions for Inorganics in Soil. IEPA/ENV/94-161
[3]Too few data were collected at Creek Sections C and D to calculate a UCL. Therefore, the average is used.

Table 5-2
Implications for Additional Remediation at Dead Creek
Dead Creek
Sauget Area I

Compound	Site-Specific Risk-Based Concentration For the Protection of Fish, mg/kg	Site-Specific Risk-Based Concentration For the Protection of Piscivorous Birds, mg/kg[1]	Samples to Remove to Reduce the UCL to Below the Ecological Risk-Based Concentration. Creek Section B	Creek Section C	Creek Section D	Creek Section E	Creek Section F
Zinc	**4739**	No risk to birds due to this compound	CBS-CSB-T4-C1 and CBS-CSB-T11-C1	Does not present a risk	Does not present a risk	Does not present a risk	CBS-CSF-T-5
Total PCBs	**0.58**	0.91	CBS-CSB-T0-C1 and CBS-CSB-T3-E-1	Does not present a risk	Does not present a risk	Does not present a risk	Does not present a risk

Bold value is selected as cleanup goal
[1]No risks were predicted to river otter.

Table 6-1
Evaluation of Potential Acute Risks
Dead Creek
Sauget Area I

	Site-Specific Risk-Based Concentration[1]	Ten Times the Risk-Based Concentration	Maximum Detected Concentration at Creek Segment B[2]	Maximum Detected Concentration at Creek Segment C[2]	Maximum Detected Concentration at Creek Segment D[2]	Maximum Detected Concentration at Creek Segment E[2]	Maximum Detected Concentration at Creek Segment F[2]
Total DDT (ug/kg)	4100	41000	470	ND	240	63.3	7.5
Dieldrin (ug/kg)	4800	48000	49	11	690	34	8.2
gamma-Chlordane (ug/kg)	17000	170000	0.44	1.1	67	5.5	3.8
Bis(2-ethylhexyl)phthalate (ug/kg)	0.478	4.78	**81000**	ND	ND	77	110
Aluminum (mg/kg)	9980	99800	20000	13000	14000	14000	12000
Chromium (mg/kg)	261	2610	180	110	57	170	29
Copper (mg/kg)	24792	247920	10000	250	1600	4300	505
Lead (mg/kg)	3150	31500	700	140	280	400	450
Zinc (mg/kg)	4739	47390	10450	3400	8200	5900	15000
Total PCBs (ug/kg)	580	5800	**84830**	178.2	2437.2	1251.7	356.9

Bold values indicated maximum concentration exceeds ten times the site-specific RBC

[1]Site-Specific Risk Based Concentrations as presented in Table 5-1.

[2]Maximum concentration detected in each creek segment. ND indicates not detected.

Table 7-1
Uncertainty of Evaluation of Ecological Risk Due to Creek Bottom Soils
Dead Creek

Compounds	Detected in Creek Bottom Soils - B	Detected in Creek Bottom Soils - C	Detected in Creek Bottom Soils - D	Detected in Creek Bottom Soils - E	Detected in Creek Bottom Soils - F	Risks to Fish Assessed	Risks to Great Blue Heron Assessed	Risks to River Otter Assessed	Detected at Similar Concentrations Prior to Remediation[1]	Detected in Forage Fish in 1999[2]	Detected in Surface Water in 1999[3]	Detected at Concentration greater than SW Benchmarks in 1999[4]	Bioconcentration Factor[5]
Lowest Uncertainty - Risks to fish and piscivorous birds and mammals assessed via site-specific uptake factors													
Total DDT	X		X	X	X	X	X	X					
Dieldrin	X	X	X	X	X	X	X	X			X	X	2200
gamma-Chlordane	X	X	X	X	X	X	X	X			X	X	44000
Bis(2-ethylhexyl)phthalate	X			X	X	X	X	X					24
Aluminum	X	X	X	X	X	X	X	X	X	X	X		NA
Chromium	X	X	X	X	X	X	X	X		X			0.6 for muscle
Copper	X	X	X	X	X	X	X	X	X	X	X	X	NA
Lead	X	X	X	X	X	X	X	X	X	X	X		46
Selenium	X		X		X		X	X	X				20
Zinc	X	X	X	X	X	X	X	X	X	X	X		4.4 for muscle
Total PCBs	X	X	X	X	X	X	X	X					360000
Total TEQ	X	X	X	X	X	X	X	X			X		51000
Unable to calculate a site-specific uptake factor; no evidence of fish uptake or migration to surface water from 1999 data; assessed via sediment ingestion by otter													
alpha-Chlordane		X	X	X	X			X	X				44000
Benzo(a)pyrene	X		X	X	X			X	X				<1000
Nickel	X	X	X	X	X			X	X		X		NA
Pyrene	X		X	X	X			X	X				3.4
Arsenic	X	X	X	X	X			X	X		X		4
Mercury	X	X	X	X	X			X	X				3000
Molybdenum	X		X	X	X			X			X		NA
Silver	X		X	X	X			X	X				NA
Thallium	X			X				X	X				34
Vanadium	X	X	X	X	X			X	X				NA
Unable to calculate a site-specific uptake factor; no evidence of fish uptake or migration to surface water from 1999 data; unable to assess risks to otter due to sediment ingestion due to lack of toxicity values													
Benzo(b)fluoranthene	X		X	X	X				X				<1000
Benzo(g,h,i)perylene	X	X	X	X	X				X				<1000
Benzo(k)fluoranthene	X		X	X	X				X				<1000
Chrysene	X			X	X				X				8
Indeno(1,2,3-cd)pyrene	X		X	X	X				X				190
Cobalt	X	X	X	X	X				X				NA
Iron	X	X	X	X	X				X		X		NA
Unable to calculate site specific uptake factor; unable to assess potential for uptake or migration from 1999 data; risks to due to sediment ingestion to river otter assessed													
Cyanide (mg/kg)	X				X			X					NA
2,4,5-T	X		X					X					1.0
2,4,5-TP (Silvex)	X							X					1.1
2,4-D	X			X	X			X					9
2,4-DB	X							X					1.1
Aldrin	X		X					X			X	X	2600
alpha-BHC	X			X				X			X		330
beta-BHC	X				X			X			X		330
Dalapon	X		X					X					NA
delta-BHC	X	X	X					X			X		330
Dicamba	X	X	X	X	X			X					0.74
Endosulfan I				X				X					58
Endosulfan II	X			X				X			X	X	58
Endosulfan sulfate	X	X	X	X	X			X					14
Endrin ketone	X	X						X					NA
gamma-BHC (Lindane)	X							X			X	X	330
Heptachlor	X							X			X	X	1500
Heptachlor epoxide	X			X				X			X	X	1900
MCPP	X				X			X					1.0
Methoxychlor	X	X	X	X				X					210
1,2,4-Trichlorobenzene	X							X					170
1,2-Dichlorobenzene	X							X					29
1,4-Dichlorobenzene	X		X	X	X			X					6
2,4,5-Trichlorophenol	X							X					1.1
3&4Methylphenol	X							X					0.7
4-Chloroaniline	X							X					0.6
Acenaphthene	X							X					81
Anthracene	X			X				X					45
di-n-Butylphthalate	X			X				X					330
Fluoranthene	X		X	X	X			X					19
Fluorene	X							X					18
Naphthalene	X							X					17
N-Nitrosodiphenylamine	X							X					45
Pentachlorophenol	X	X	X	X	X			X			X		41
Phenol	X							X					350
1,1,2-Trichloroethane					X			X					2.4
1,2-Dichloroethane					X			X					0.42
Bromoform					X			X					3.9

Table 7-1
Uncertainty of Evaluation of Ecological Risk Due to Creek Bottom Soils
Dead Creek

Compounds	Detected in Creek Bottom Soils - B	Detected in Creek Bottom Soils - C	Detected in Creek Bottom Soils - D	Detected in Creek Bottom Soils - E	Detected in Creek Bottom Soils - F	Risks to Fish Assessed	Risks to Great Blue Heron Assessed	Risks to River Otter Assessed	Detected at Similar Concentrations Prior to Remediation[1]	Detected in Forage Fish in 1999[2]	Detected in Surface Water in 1999[3]	Detected at Concentration greater than SW Benchmarks in 1999[4]	Bioconcentration Factor[5]
1,1,1-Trichloroethane	X							X					1.9
1,2-Dichloroethene (total)	X							X					1.4
2-Butanone (MEK)	X	X	X	X	X			X					0.1
Acetone	X	X		X	X			X			X		NA
Benzene	X	X						X					2.8
Carbon disulfide	X							X					0.7
Chlorobenzene	X	X	X	X	X			X			X		9.9
Chloroform	X							X					1.3
Ethylbenzene	X			X				X					18
Methylene chloride	X	X	X	X	X			X					0.51
Styrene	X	X						X					0.9
Tetrachloroethene	X							X					10
Toluene	X	X	X	X	X			X					310
Trichloroethene	X							X					3.5
Xylenes (total)	X	X			X			X					1.0
Antimony	X	X		X	X			X			X		"negligible"
Barium	X	X	X	X	X			X			X		NA
Beryllium	X	X	X	X	X			X					19
Cadmium	X	X	X	X	X			X			X		120
Manganese	X	X	X	X	X			X			X		NA
Tin	X	X	X	X	X			X					NA
No site-specific uptake or toxicity information available													
Dichlorprop	X	X	X										1.1
1,3-Dichlorobenzene	X												58
2,4,6-Trichlorophenol	X												7.1
2,4-Dichlorophenol	X												12
2-Chlorophenol	X												45
2-Methylnaphthalene	X												1.2
4-Nitroaniline	X												0.5
4-Nitrophenol	X												1.5
Acenaphthylene	X												38
Benzo(a)anthracene	X			X	X								8
Butylbenzylphthalate	X												140
Carbazole	X												1.1
Dibenzo(a,h)anthracene	X			X									<1000
Dibenzofuran	X												1.2
Nitrobenzene	X												0.425
Phenanthrene	X	X	X	X	X								7.1
Hexachlorobutadiene					X								510
1,1,2,2-Tetrachloroethane					X								0.8
Bromodichloromethane					X								2.4
Dibromochloromethane					X								3
2-Hexanone	X												0.5
4-Methyl-2-pentanone (MIBK)	X												0.5
Not evaluated; not detected in creek bottom soils or considered non-toxic													
Dinoseb													1.1
Endrin													1100
Endrin aldehyde											X		4
MCPA													1.0
Toxaphene													420000
2,4-Dinitrophenol													0.96
2,4-Dinitrotoluene													2
2,6-Dinitrotoluene													2.7
2-Chloronaphthalene													83
2-Methylphenol (o-Cresol)													0.7
2-Nitroaniline													0.6
2-Nitrophenol													1.4
3,3'-Dichlorobenzidine													35
3-Nitroaniline													0.5
4,6-Dinitro-2-methylphenol													5.5
4-Bromophenyl phenyl ether													720
4-Chloro-3-methylphenol													15
4-Chlorophenyl phenyl ether													230
Bis(2-chloroethoxy)methane													0.2
Bis(2-chloroethyl)ether													2.3
Bis(2-chloroisopropyl ether)													0.98
Diethyl phthalate						X				X			24
Dimethyl phthalate													12
di-n-Octylphthalate													24
Hexachlorobenzene													42000
Hexachlorocyclopentadiene													3.8
Hexachloroethane													190
Isophorone													1.5

Table 7-1
Uncertainty of Evaluation of Ecological Risk Due to Creek Bottom Soils
Dead Creek

Compounds	Detected in Creek Bottom Soils - B	Detected in Creek Bottom Soils - C	Detected in Creek Bottom Soils - D	Detected in Creek Bottom Soils - E	Detected in Creek Bottom Soils - F	Risks to Fish Assessed	Risks to Great Blue Heron Assessed	Risks to River Otter Assessed	Detected at Similar Concentrations Prior to Remediation[1]	Detected in Forage Fish in 1999[2]	Detected in Surface Water in 1999[3]	Detected at Concentration greater than SW Benchmarks in 1999[4]	Bioconcentration Factor[5]
N-Nitroso-di-N-propylamine													0.61
1,1-Dichloroethane													1.4
1,1-Dichloroethene													2.5
1,2-Dichloropropane													2
Bromomethane													0.41
Carbon tetrachloride													6.3
Chloroethane													0.72
Chloromethane													0.28
cis-1,3-Dichloropropene													0.98
trans-1,3-Dichloropropene													0.98
Vinyl chloride													0.82
Non-toxic													
Calcium	X	X	X	X	X						X		NA
Magnesium	X	X	X	X	X						X		NA
Potassium	X	X	X	X	X				X		X		NA
Sodium	X	X	X	X	X						X		NA

[1] "X" indicates that concentrations measured prior to and after remediation are within a factor of 2 of each other.
[2]Forage Fish were collected in creek segments prior to remediation.
[3]Surface water was collected in creek segments prior to remediation.
[4]Applicable surface water Benchmarks are Illinois WQ Criteria and US EPA National Ambient Water Quality Criteria.
[5]Bioconcentration Factor for surface water to fish as provided by Stephan, 1993 with highest priority given to bioconcentration factors measured in the field, followed by bioconcentration factors based on a measured BAF and then a predicted BAF based on Log Kow. If no value was presented in Stephan, 1993, a BCF is calculated with the log Kow shown based on the following equation: log BCF = 0.79(log Kow)-0.40.

FIGURES

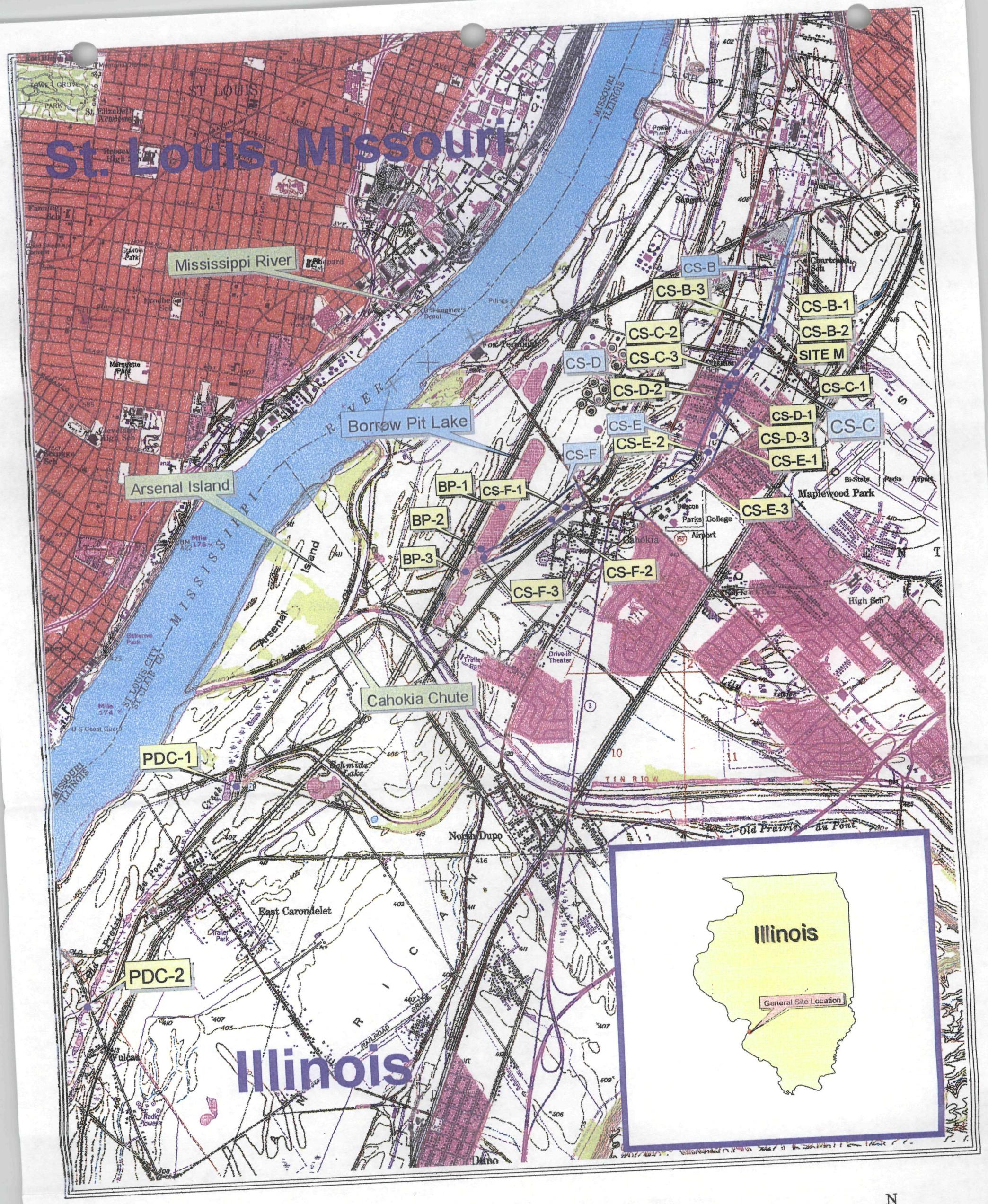
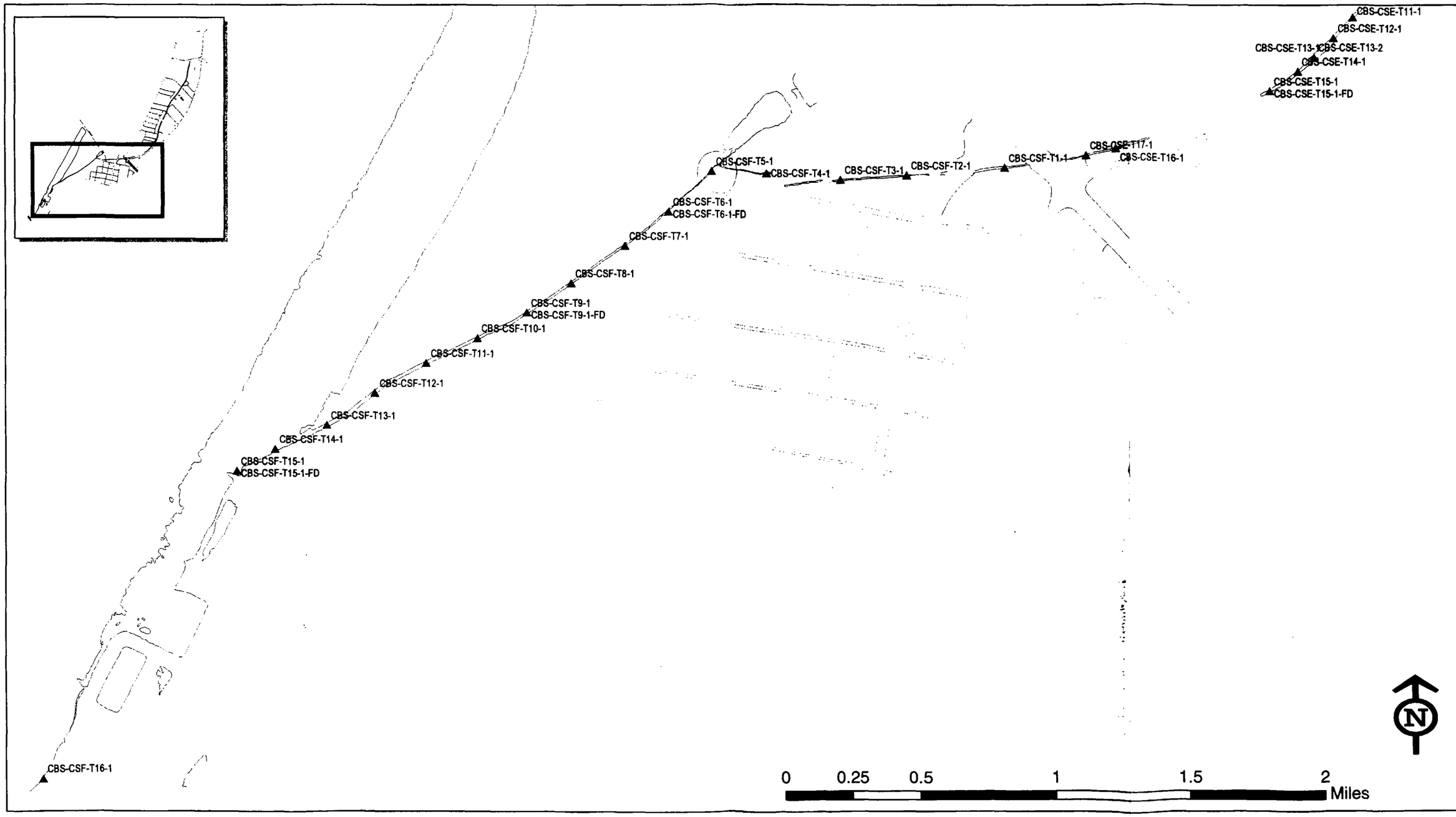


Figure 1-1: Site Locus and Sample Locations
Sauget Area 1
Sauget, Illinois

Figure 1-2: Monroe County Reference Areas
Sauget Area 1
Sauget, Illinois

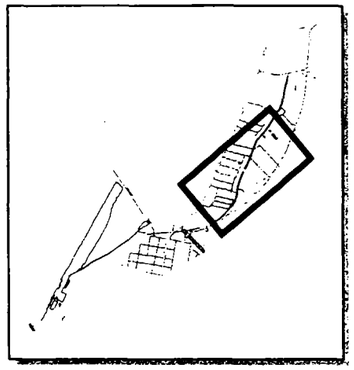


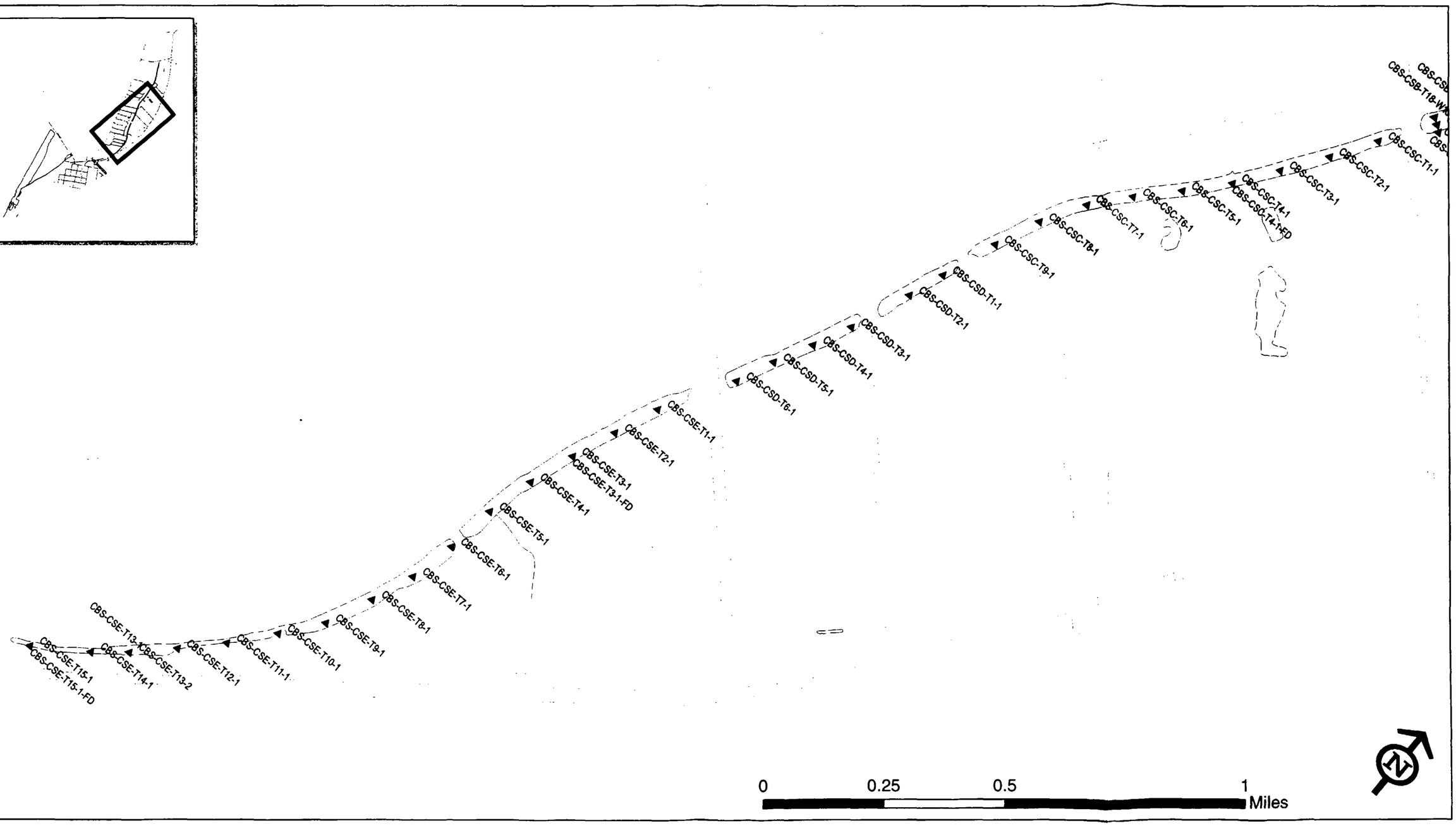
Sheet 1 of 3

Sauget SA-1 Creekbottom Soils Sample Locations

J:\Indl_Service\Project Files\Solutia-6105\SA1-SED\Maps\sa1base.mxd

Figure 3-1a
Sauget Creekbottom Soils
Sample Locations



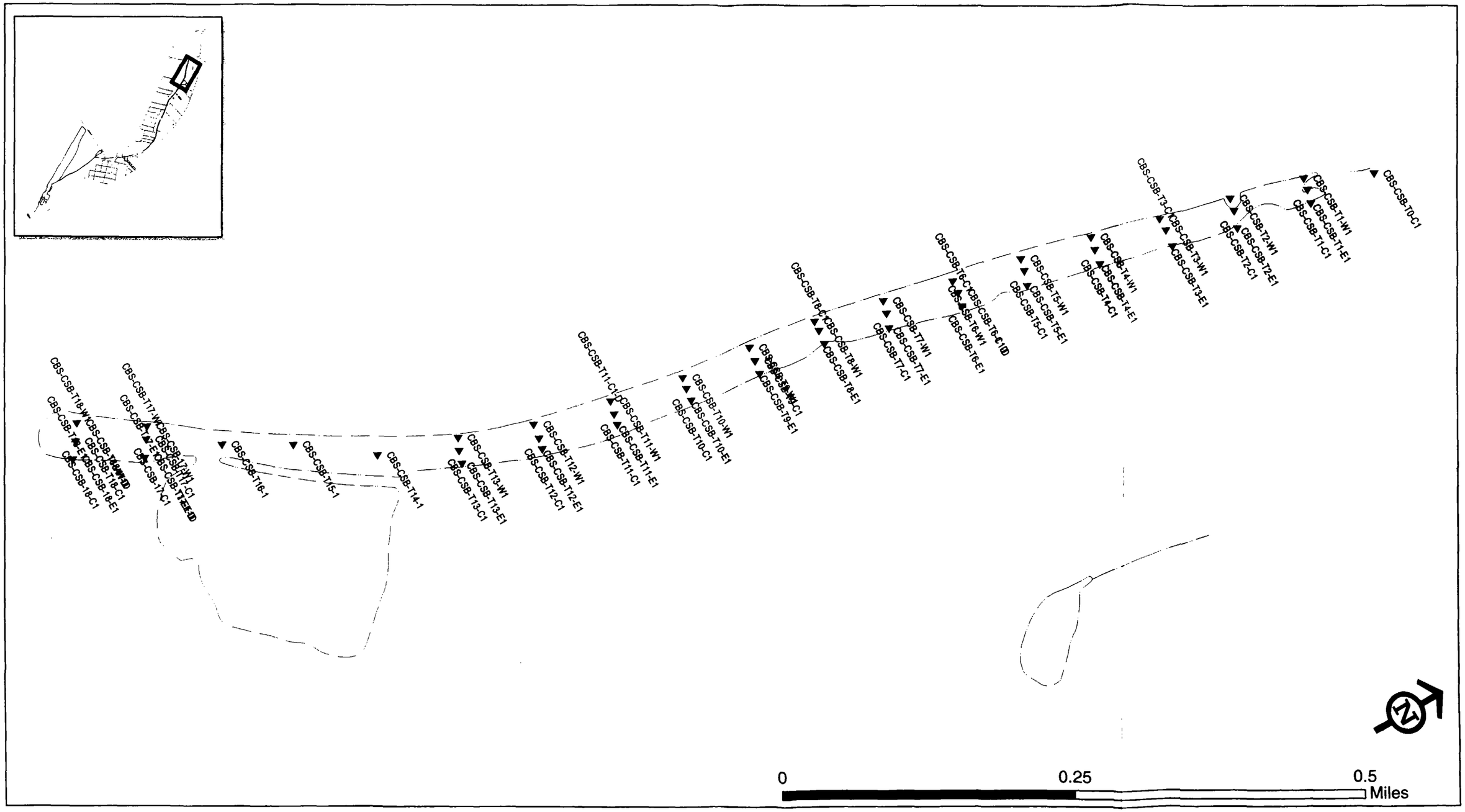


Sheet 2 of 3

Sauget SA-1 Creekbottom Soils Sample Locations

J:\Indl_Service\Project Files\Solutia-6105\SA1-SED\Maps\sa1base.mxd

Figure 3-1b
Sauget Creekbottom Soils
Sample Locations



Sheet 3 of 3

Sauget SA-1 Creekbottom Soils Sample Locations

J:\Indl_Service\Project Files\Solutia-6105\SA1-SED\Maps\sa1base.mxd

Figure 3-1c
Sauget Creekbottom Soils
Sample Locations

APPENDIX A

WOODLOT ALTERNATIVES, INC.

DEAD CREEK BASELINE HABITAT ASSESSMENT REPORT

Menzie-Cura & Associates, Inc.

Baseline Habitat Assessment
Dead Creek, Illinois

Prepared by
Woodlot Alternatives, Inc.
Topsham, Maine

January 2001

Table of Contents

1.0 INTRODUCTION 1
1.1 BACKGROUND 1
2.0 METHODS 3
2.1 VEGETATION ALLIANCE IDENTIFICATION AND MAPPING 3
2.2 VEGETATION ALLIANCE AND WETLAND CHARACTERIZATION 3
2.3 ANIMAL USE CHARACTERIZATION 4
2.4 WETLAND FUNCTION-VALUE ASSESSMENT 4
3.0 RESULTS AND DISCUSSION 5
3.1 VEGETATION ALLIANCE IDENTIFICATION AND MAPPING 5
3.2 VEGETATION ALLIANCE AND WETLAND CHARACTERIZATION 5
3.21 Vegetation Alliance Descriptions 16
3.211 Forests 16
3.212 Shrublands 17
3.213 Herbaceous Alliances 18
3.214 Open Water Communities 19
3.22 Rare Species 21
3.23 Invasive Plant Species 22
3.24 Wetland Characterization 23
3.25 Soil Survey 25
3.3 ANIMAL USE CHARACTERIZATION 25
3.4 WETLAND FUNCTION–VALUE ASSESSMENT 27
3.41 Dynamic Surface Water Storage 28
3.42 Long-Term Surface Water Storage 29
3.43 Energy Dissipation 29
3.44 Subsurface Storage of Water 30
3.45 Moderation of Groundwater Flow or Discharge 30
3.46 Nutrient Cycling 30
3.47 Removal of Imported Elements and Compounds 31
3.48 Retention of Particulates 31
3.49 Organic Carbon Export 32
3.410 Maintain Characteristic Plant Community 32
3.411 Maintain Characteristic Detrital Biomass 33
3.412 Maintain Spatial Structure of Habitat 34
3.413 Maintain Interspersion and Connectivity 34
3.414 Maintain Distribution and Abundance of Invertebrates 35
3.415 Maintain Distribution and Abundance of Vertebrates 35
4.0 LITERATURE CITED 36

1.0 INTRODUCTION

Woodlot Alternatives, Inc. was contracted to perform a baseline habitat assessment along approximately 2.4 km of Dead Creek in Sauget and Cahokia, Illinois. During this assessment, qualitative and quantitative information on plants, animals, vegetation alliances, and hydrologic regimes was collected. This report presents the results of the baseline assessment that can be used to identify organisms potentially at risk from remedial actions. These data can also be used to develop habitat restoration plans.

1.1 BACKGROUND

The project area is in Sauget and Cahokia, residential communities (population ca. 200 and 17550 people, respectively) situated south of East St. Louis in St. Clair County, Illinois (Figure 1). Dead Creek was used by various industries prior to the late 1930s as a site for waste discharge (United States Environmental Protection Agency 1996). Impoundments and borrow pits along Dead Creek have also been used for waste and wash water disposal. As a result, chlorinated solvents, chlorobenzenes, polychlorinated biphenyls, various metals, and other substances have come to be located in the sediments of Dead Creek (United States Environmental Protection Agency 1996).

The Dead Creek channel and adjacent riparian communities form a narrow, linear wetland system that passes through suburban Cahokia. Portions of Dead Creek are adjacent to residential and business lots that contain mowed lawns, buildings, driveways, and roads. To a great extent, these areas have been modified so that only relict portions of natural vegetation alliances exist. Furthermore, many areas are also influenced by non-native plant species. Sections of the creek, however, are utilized by rare species monitored by the Illinois Endangered Species Protection Board. This illustrates that Dead Creek does possess value for wildlife habitat and as a travel corridor.

Solutia, Inc. has announced it plans to begin remediation activities along Dead Creek and adjacent source sites in Cahokia and Sauget (Solutia, Inc. 2000).

> Creek Segments B through the upper portion of F are subject to a Unilateral Administrative Order issued by the USEPA on May 31, 2000, to Monsanto Company and Solutia, Inc. (Docket No. V-W-99-C-554) pursuant to section 106(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 as amended, 42 U.S.C. Section 9606(a). The Order requires the following response activities at Sauget Area 1 Creek Segments B and Site M and Creek Segments C, D, E, and F upstream of the Terminal Railroad Association embankment, which are located in Sauget and Cahokia, Illinois (Figure 1-1):
>
> - Preparation of a Time Critical Removal Action Work Plan;
>
> - Implementation of the Removal Action in accordance with the Work Plan to mitigate the threats posed by presence of contamination in Dead Creek sediments and certain adjacent soils and their potential migration via overflow and flood waters from the Site;

PREPARED BY:

WOODLOT ALTERNATIVES, INC.
122 MAIN STREET, TOPSHAM, MAINE 04086
www.woodlotalt.com

SCALE:	1"=2000'
DATE:	December 2000
PROJ. NO.	100123
DWG. NAME:	study_area.dwg

Study Area Location
Dead Creek Project Area
Baseline Habitat Assessment
Cahokia, Illinois

Source:USGS Topo Quads: Cahokia IL./French Village IL.

REV.

- Removal of materials from CS-B (creek sediments, creek bed soils and flood plain soils); CS-C, D, and E (non-native creek sediments only); and Site M (pond sediments and pond bottom soils) in Sauget Area 1, while minimizing adverse impacts to area wetlands and habitat;
- Proper handling, dewatering, treatment and placement of such materials in the on-site Containment Cell; A plan for management of Dead Creek storm water during the removal action;
- Sampling and analysis of areas where material has been removed, for the purpose of defining remaining contamination;
- Placement of membrane liner material over CS-B and in all other excavated areas where, based on post-removal sample results, such liner is determined to be necessary; and
- Design of a containment cell that will provide adequate protection to human health and the environment.

The Order requires Solutia to conduct these removal activities to abate a potential imminent and substantial endangerment to the public health, welfare or the environment that may be presented by the actual or threatened release of hazardous substances at or from the site.

2.0 METHODS

This section of the report describes the methods used to identify and map vegetation alliances (also referred to as natural communities), characterize the components of each alliance (e.g., wetlands, plants, soils), determine animal use, and describe wetland functions and values in the Dead Creek study area.

2.1 VEGETATION ALLIANCE IDENTIFICATION AND MAPPING

Vegetation alliances were identified during field surveys performed on 2 and 8–11 November 2000. Identification of alliances (or communities) was performed by examination of site hydrology, soils, and landscape location combined with determination of dominant species by strata. Classification of alliances largely followed Drake and Faber-Langendoen (1997) except for unvegetated communities (open water). Wetland communities were also classified according to Cowardin *et al.* (1979). Once identified, the boundaries of each alliance were located in the field using GPS equipment and verified using aerial and land-based photo interpretation. The extent of each community was then plotted on topographic base maps in AutoCAD Release 14. Upon completion of plotting, vegetation alliances were mapped and the areal extent of each alliance calculated.

2.2 VEGETATION ALLIANCE AND WETLAND CHARACTERIZATION

Quantitative and qualitative data regarding plant species abundance and distribution was collected for all dominant vegetation communities. Quantitative data was collected in plots that were 9 m in radius using the methods and performance standards contained in

United States Army Corps of Engineers Wetlands Delineation Manual (1987). While methods contained in this manual were developed for wetland delineation, they also provide a means for collecting quantitative data on plants, soils, and hydrology in upland and riparian habitat. Descriptive data on plant species composition and abundance were collected for trees, lianas (i.e., woody trailing, twining, or climbing plants), saplings, shrubs, seedlings, and herbs. Basal area was measured for trees using a ten-factor prism gauge. Percent areal cover per species was estimated for all other strata. Because the community surveys occurred in late season, some herbaceous plants could not be identified and dominance estimates were likely skewed. Qualitative data collected outside of plots included photographs of each community, a list of all plant species observed, and general descriptions of the ecological integrity of vegetation communities (i.e., degree of anthropogenic disturbance and estimated age of forested communities).

Descriptive data on soils were collated from available reports including the Natural Resource Conservation Service (formerly the Soil Conservation Service) medium intensity soil reports and from soil borings performed on site as part of previous investigations. No new boring or soil analyses were performed. Soil hydrology data were collected from field observations regarding inundation, saturation, and degree of organic matter buildup in the topsoil horizon.

2.3 ANIMAL USE CHARACTERIZATION

Qualitative information on animal use of the project area was collected through direct observation of species or their sign (e.g., tracks, scat, browsing), by a review of previous site investigations, and by comparing habitat available on site to habitat requirements of species known or suspected to occur in or near the project area. Information on aquatic invertebrates and fish was collected from previous site investigation reports and dip net surveys performed during site characterization. In addition, a list of fish species suspected of occurring in Dead Creek was prepared by reviewing range distributions of Illinois fish. Amphibians, reptiles, birds, and mammals seen on the site were recorded, and a list of species that could use the area was developed based on ranges and habitat availability.

2.4 WETLAND FUNCTION-VALUE ASSESSMENT

A wetland function-value assessment was performed for wetlands in the project area to document existing functions and values. The Hydrogeomorphic (HGM) Assessment to Riverine Wetlands system (Brinson *et al.* 1995) was used to the extent possible to assess wetlands and assign values for each function that the wetland provides (e.g., flood control, wildlife habitat, sediment retention). The HGM methodology could not be performed in its entirety because reference wetlands information has not been published and detailed measurements of areal net primary productivity, duration of bank overflow, soil pore space, etc. were not collected during this initial investigation. Its format, however, was followed to provide a qualitative HGM wetland function-value assessment.

3.0 RESULTS AND DISCUSSION

This section describes baseline conditions of the Dead Creek project area and includes: a map showing dominant vegetation alliances and wetland communities; a matrix table of animals known or likely to occur in the Dead Creek corridor; quantitative plant community data; representative photographs of each alliance; a wetland function-value assessment; and narrative descriptions of the site. Common names for species are used throughout the report. Scientific names can be found in Tables 3 and 4.

3.1 VEGETATION ALLIANCE IDENTIFICATION AND MAPPING

Nine vegetation alliances were identified in the Dead Creek project area based on vegetation, landscape position, and hydrological characteristics. These are: *Fraxinus americana–Ulmus americana* Temporarily Flooded Forest, *Populus deltoides* Temporarily Flooded Forest, *Salix nigra* Temporarily Flooded Forest, *Cephalanthus occidentalis* Semi-permanently Flooded Shrubland, *Persicaria*–Mixed Forb Temporarily Flooded Herbaceous, *Typha* Seasonally Flooded Herbaceous, *Potamogeton–Ceratophyllum–Elodea* Permanently Flooded Herbaceous, Temporary Open Water, and Permanent Open Water. The location and extent of each community in the project area is identified on the Wetland Characterization and Vegetative Alliance Map (Sheets 1 through 5). Table 1 presents summary statistics of each community.

3.2 VEGETATION ALLIANCE AND WETLAND CHARACTERIZATION

Both qualitative and quantitative observations of the wetland alliances found in and adjacent to Dead Creek were made during site surveys. Vegetation data was collected in sample plots located throughout the study area and the results are presented in Table 2. A preliminary flora of Dead Creek Areas B through F is presented in Table 3. Explanation of Cowardin (1979) acronyms follows:

- PFO Palustrine Forested Wetland
- PSS Palustrine Scrub-Shrub Wetland
- PEM Palustrine Emergent Wetland
- PAB Palustrine Aquatic Bed
- PUB Palustrine Unconsolidated Bottom
- POW Palustrine Open Water

Table 1. Natural Communities in Dead Creek Study Area.

Natural Communities[1]		Number of Occurrences in Study Area (Areas B - E)[2]	Total Area of Community Type (ha)	Mean Basal Area (m^2/ha)
Vegetation Alliances of Drake and Faber-Langondoen (1997)	**Cowardin *et al.* (1979)**			
Forests	**Palustrine Forested Wetland (PFO)**	**9**	**3.26**	**69.29**
Fraxinus pennsylvanica-Ulmus americana Temporarily Flooded Forest		4	2.84	60.47
Populus deltoides Temporarily Flooded Forest		4	0.34	83.15
Salix nigra Temporarily Flooded Forest		1	0.08	49.13
Total		9	3.26	
Shrublands	**Palustrine Scrub-Shrub Wetland (PSS)**	**1**	**0.04**	**7.56**
Cephalanthus occidentalis Semi-permanently flooded shrubland		1	0.04	7.56
Total		1	0.04	
Herbaceous Alliances	**Palustrine Emergent Marsh Wetland (PEM)**	**15**	**0.87**	**0.00**
	Palustrine Aquatic Bed Wetland (PAB)	**8**	**1.01**	**0.00**
Persicaria-Mixed Forb Temporarily Flooded Herbaceous		13	0.86	0.00
Potamageton-Ceratophyllun-Elodea Permanently Flooded Herbaceous		8	1.01	0.00
Typha Seasonally Flooded Herbaceous		2	0.01	0.00
Total		23	1.88	
Open Water	**Palustrine Unconsolidated Bottom Wetland (PUB)**	**3**	**0.26**	**0.00**
	Palustrine Open Water (POW)	**4**	**1.16**	**0.00**
Permanent Open Water		4	1.16	0.00
Temporary Open Water		3	0.26	0.00
Total		4	1.42	

1 = Vegetation alliance classification of Drake and Faber-Langondoen (1997) is based on dominant plant species by strata, landscape position, and hydrology. The wetland classification system of Cowardin *et al.* (1979) is based largely on the tallest dominant strata that is present for vegetated communities.

2 = occurrences separated by stream channel considered to be the same occurrence, those separated by a road are considered different occurrences

Note: Gray shading indicates community characteristics for Cowardin *et al.* classification.

Table 2. Wetland Characterization Plot Data.

Plot	Community[1]	Strata	Plant[2]	Count or Percent Cover[3]	Basal Area (m/ha)[4]	Hydrological Notes	Additional Comments
B-1	*Salix nigra* Temp. Flooded Forest	Tree	*Salix nigra*	8	60.47	scoured channel and silt stains on bank	
		Liana	*Lonicera japonica*	2		shallow rooted trees	
		Liana	*Campsis radicans*	6			
		Liana	*Rubus trivialis*	1			
		Sapling	*Salix nigra*	12			
		Sapling	*Broussonetia papyrifera*	4			
		Shrub	*Broussonetia papyrifera*	5			
		Shrub	*Salix nigra*	2			
		Herb	*Amaranthus tuberculatus*	20	60.47		
B-2	*Persicaria*-Mixed Forb Temp. Flooded	Herb	*Amaranthus tuberculatus*	63		water stained debris, silt lines over bank	
		Herb	*Potentilla norvegica*	0.5		saturated to surface	
		Herb	*Persicaria lapathifolia*	1			
B-3	*Fraxinus-Ulmus* Temp. Flooded Forest	Tree	*Morus alba*	2	15.12	area periodically flooded	area likely flooded during storm events
		Tree	*Ailanthus altissima*	10	75.59	remnant debris lines	
		Liana	*Toxicodendron radicans*	6			
		Liana	*Smilax hispida*	5			
		Liana	*Euonymus fortunei*	31			
		Sapling	*Ailanthus altissima*	14			
		Shrub	*Lonicera maackii*	47			
		Herb	*Equisetum hyemale*	1			
		Herb	*Lonicera maackii*	2			
		Herb	*Sanicula* sp.	1			
		Herb	*Geum canadense*	2	90.71		
B-4	*Fraxinus-Ulmus* Temp. Flooded Forest	Liana	*Ampelopsis cordata*	63		soils saturated at or near surface	
		Liana	*Smilax hispida*	24			
		Liana	*Euonymus fortunei*	3			
		Liana	*Campsis radicans*	6			
		Shrub	*Sambucus canadensis*	10			
		Herb	*Ampelamus albidus*	20			
		Herb	*Solanum ptychanthum*	18			
		Herb	*Eupatorium serotinum*	17			
		Herb	*Amaranthus tuberculatus*	26			
		Herb	*Carex albolutescens*	10			
		Herb	*Potentilla norvegica*	12			
		Herb	*Lycopus americanus*	6			
		Herb	*Bidens vulgata*	3	0.00		
C-1	*Typha* Seasonally Flooded Herbaceous	Sapling	*Acer saccharinum*	3		1-2 cm standing water	
		Shrub	*Acer saccharinum*	1		silt staining on vegetation	
		Herb	*Typha latifolia*	70		organic matter in soil	
		Herb	*Persicaria lapathifolia*	5			
		Herb	*Persicaria emersa*	5			
		Herb	*Lycopus americanus*	15			
		Herb	*Potentilla norvegica*	20			
		Herb	*Carex* sp.	5			
C-2	*Persicaria*-Mixed Forb Temp. Flooded	Herb	*Persicaria lapathifolia*	40		5-7 cm standing water	
		Herb	*Leersia oryzoides*	40		organic matter in soil	
		Herb	*Symphyotrichum lanceolatum*	2			
		Herb	*Lycopus americanus*	1			
		Herb	*Cyperus strigosus*	2			
C-3	*Potamogeton-Ceratophyllum-Elodea* Perm.	Herb	*Ludwigia peploides*	45		15-20 cm standing water	
		Herb	*Alisma subcordatum*	25		high organic content in soil	
		Herb	*Leersia oryzoides*	10			
		Herb	*Persicaria lapathifolia*	2			
		Herb	*Persicaria maculosa*	1			
		Herb	*Eleocharis obtusa*	12			
C-4	*Fraxinus-Ulmus* Temp. Flooded Forest	Tree	*Ulmus americana*	4	30.24	infrequent flooding	
		Tree	*Ailanthus altissima*	3	22.68	(no observable debris line)	
		Liana	*Lonicera japonica*	15			
		Liana	*Toxicodendron radicans*	36			
		Liana	*Campsis radicans*	36			
		Liana	*Smilax hispida*	10			
		Shrub	*Rubus occidentalis*	1			
		Shrub	*Cornus drummondii*	25			
		Shrub	*Ailanthus altissima*	10			
		Herb	*Allium* sp.	8			

C-7	*Fraxinus-Ulmus* Temp. Flooded Forest	Tree	*Ulmus americana*	6	45.35	soils saturated at or near surface	
		Tree	*Acer negundo*	1	7.56	evident debris line	
		Tree	*Ulmus pumila*	1	7.56		
		Liana	*Euonymus fortunei*	32			
		Liana	*Campsis radicans*	30			
		Liana	*Smilax hispida*	5			
		Liana	*Toxicodendron radicans*	6			
		Sapling	*Ulmus americana*	14			
		Shrub	*Cornus drummondii*	18			
		Shrub	*Lonicera maackii*	16			
		Shrub	*Rosa multiflora*	8	60.47		
C-8	*Persicaria*-Mixed Forb Temp. Flooded	Herb	*Symphyotrichum lanceolatum*	10		soils saturated to surface	
		Herb	*Leersia oryzoides*	25			
		Herb	*Carex albolutescens*	35			
		Herb	*Lycopus americanus*	5			
		Herb	*Persicaria maculosa*	10			
		Herb	*Potentilla norvegica*	10			
		Herb	*Amaranthus tuberculatus*	8			
		Herb	*Glechoma hederacea*	5			
		Herb	*Torilis arvensis*	1			
D-1	*Potamogeton-Ceratophyllum-Elodea* Perm.	Herb	*Ludwigia peploides*	80		20-25 cm standing water	
		Herb	*Echinodorus berteroi*	1		no discernable flow	
		Herb	*Alisma subcordatum*	1		organic matter in soils	
		Herb	*Leersia oryzoides*	1			
D-2	*Persicaria*-Mixed Forb Temp. Flooded	Liana	*Rubus trivialis*	8		soils saturated to surface	
		Herb	*Persicaria amphibia*	42			This is variety *emersa*
		Herb	*Persicaria lapathifolia*	26			
		Herb	*Lycopus americanus*	6			
		Herb	*Leersia oryzoides*	38			
		Herb	unknown Lamiaceae	5			insufficient material for identification
		Herb	*Glechoma hederacea*	1			
D-3	*Fraxinus-Ulmus* Temp. Flooded Forest	Tree	*Ulmus pumila*	5	37.80	infrequent flooding	
		Tree	*Broussonetia papyrifera*	1	7.56	(no obvious debris line)	
		Tree	*Robinia pseudoacacia*	1	7.56		
		Liana	*Euonymus fortunei*	16			
		Sapling	*Broussonetia papyrifera*	15			
		Shrub	*Sambucus canadensis*	10			
		Shrub	*Morus alba*	43			
		Shrub	*Lonicera maackii*	10			
		Shrub	*Celtis occidentalis*	6			
		Shrub	*Acer negundo*	1			
		Herb	*Allium* sp.	1			insufficient material for identification
		Herb	*Symphyotrichum lanceolatum*	3			
		Herb	*Glechoma hederacea*	1			
		Herb	*Persicaria caespitosa*	1	52.91		
D-4	*Persicaria*-Mixed Forb Temp. Flooded	Liana	*Ampelopsis cordata*	6		saturated to inundated soils	
		Shrub	*Morus alba*	2		frequently flooded	
		Shrub	*Ulmus americana*	2			
		Herb	*Lycopus americanus*	2			
		Herb	*Symphyotrichum lanceolatum*	35			
		Herb	*Leersia oryzoides*	36			
		Herb	*Sparganium* sp.	25			
		Herb	*Cyperus strigosus*	20			
		Herb	*Rumex crispus*	8			
		Herb	*Persicaria lapathifolia*	8			
		Herb	*Carex albolutescens*	5			
E-1	*Cephalanthus* Perm. Flooded Shrubland	Tree	*Acer saccharinum*	1	7.56	standing water present	
		Liana	*Vitis riparia*	8		semi-permanently flooded	
		Sapling	*Acer saccharinum*	16		organic matter in soils	
		Shrub	*Cephalanthus occidentalis*	43			
		Herb	*Persicaria lapathifolia*	10			
		Herb	*Leersia oryzoides*	3			
		Herb	*Lycopus americanus*	1	7.56		
E-2	*Potamogeton-Ceratophyllum-Elodea* Perm	Herb	*Wolffia borealis*	40		standing water in plot approx. 35 cm	
		Herb	*Lemna perpusilla*	1		*Rana* larvae, topminnow (*Fundulus*)	
		Herb	*Ludwigia peploides*	16		organic matter in soils	
		Herb	*Persicaria punctata*	18			
E-3	*Fraxinus-Ulmus* Temp. Flooded Forest	Tree	*Ulmus americana*	2	15.12	infrequent flooding	
		Tree	*Acer negundo*	1	7.56	(no obvious debris line)	
		Tree	*Juglans nigra*	2	15.12		
		Liana	*Toxicodendron radicans*	12			

		Liana	*Vitis riparia*	8			
		Sapling	*Ulmus americana*	4			
		Shrub	*Cornus drummondii*	40			
		Shrub	*Sambucus canadensis*	20			
		Shrub	*Lonicera maackii*	8			
		Herb	*Hackelia virginiana*	5			
		Herb	*Geum canadense*	7			
		Herb	*Sanicula* sp.	8			insufficient material for identification
		Herb	*Ageratina altissima*	7			
		Herb	*unknown*	5			insufficient material for identification
		Herb	*Carex* sp.	3	37.80		insufficient material for identification
E-4	*Populus deltoides* Temp. Flooded Forest	Tree	*Ulmus pumila*	5	37.80	frequently flooded	
		Tree	*Platanus occidentalis*	2	15.12	debris line present	
		Tree	*Acer negundo*	2	15.12		
		Tree	*Morus alba*	1	7.56		
		Tree	*Populus deltoides*	1	7.56		
		Liana	*Toxicodendron radicans*	14			
		Liana	*Vitis riparia*	16			
		Liana	*Campsis radicans*	1			
		Liana	*Euonymus fortunei*	1			
		Sapling	*Morus alba*	34			
		Shrub	*Celtis occidentalis*	10			
		Shrub	*Lonicera maackii*	2			
		Herb	*Ageratina altissima*	1			
		Herb	*Allium* sp.	1			insufficient material for identification
		Herb	*Sanicula* sp.	1	83.15		insufficient material for identification
E-5	*Populus deltoides* Temp. Flooded Forest	Tree	*Populus deltoides*	8	60.47	seasonally flooded	
		Tree	*Morus alba*	2	15.12	debris line present	
		Tree	*Celtis occidentalis*	1	7.56		
		Tree	*Ulmus rubra*	1	7.56		
		Liana	*Euonymus fortunei*	38			
		Sapling	*Morus alba*	25			
		Sapling	*Acer saccharinum*	10			
		Sapling	*Celtis occidentalis*	6			
		Shrub	*Celtis occidentalis*	5			
		Shrub	*Ulmus rubra*	5			
		Shrub	*Lonicera maackii*	5			
		Herb	*Ageratina altissima*	10			
		Herb	*Persicaria punctata*	2			
		Herb	*Carex* sp.	4	90.71		insufficient material for identification
E-6	*Potamogeton-Ceratophyllum-Elodea* Perm.	Herb	*Alisma subcordatum*	15		30+ cm of standing water	
		Herb	*Leersia oryzoides*	25		organic matter in soils	
		Herb	*Symphyotrichum lanceolatum*	3			
		Herb	*Persicaria punctata*	1			
		Herb	*Sagittaria montevidensis*	1			material is var. calycina
		Herb	*Bidens vulgata*	1			
		Herb	*Rumex crispus*	1			
F-1	*Populus deltoides* Temp. Flooded Forest	Tree	*Populus deltoides*	7	52.91	seasonally flooded	
		Tree	*Ulmus americana*	2	15.12	debris line present	
		Tree	*Ulmus pumila*	1	7.56		
		Liana	*Toxicodendron radicans*	8			
		Liana	*Smilax hispida*	8			
		Liana	*Euonymus fortunei*	18			
		Sapling	*Celtis occidentalis*	15			
		Sapling	*Ulmus pumila*	2			
		Sapling	*Albizzia julibrissin*	4			
		Shrub	*Celtis occidentalis*	2			
		Shrub	*Cornus drummondii*	15			
		Shrub	*Morus alba*	18			
		Shrub	*Acer negundo*	8			
		Shrub	*Ulmus pumila*	2			
		Shrub	*Lonicera maackii*	11			
		Herb	*Ageratina altissima*	4			
		Herb	*Allium* sp.	1			insuficient material for identification
		Herb	*Carex* sp.	1	75.59		insuficient material for identification

1=Community classification follows Drake and Faber-Langendoen (1997).
2=Taxonomy follows Haines and Vining (1998) where applicable and otherwise follows Flora of North America Editorial Committee (in ed.).
3=Counts provided for trees represent sampling with a 10-factor prism, otherwise counts represent areal coverage.
4=Basal area counts are provided for individual species in each plot and as well as cumulative counts located in the lowest row for the plot.

Table 3. Preliminary Flora of Dead Creek Project Area.

Plant Names		Present in the Following Natural Communities									
Species Latin Name	Species Common Name	*Salix nigra* Temporarily Flooded Forest Alliance	*Populus deltoides* Temporarily Flooded Forest Alliance	*Fraxinus pennsylvanica-Ulmus americana* Temporarily Flooded Forest Alliance	*Cephalanthus occidentalis* Semi-permanently Flooded Shrubland Alliance	*Typha* Seasonally Flooded Herbaceous Alliance	*Persicaria*-Mixed Forb Temporarily Flooded Herbaceous Alliance	*Potamogeton-Ceratophyllum-Elodea* Permanently Flooded Herbaceous Alliance	Native to Illinois	Notes
Acalypha rhomboidea	three-seeded mercury						X		*yes*	
Acer negundo	box elder		X	X					yes	
Acer rubrum	red maple			X					yes	
Acer saccharinum	silver maple		X	X	X	X			yes	
Ageratina altissima	white snakeroot		X	X					yes	
Ailanthus altissima	tree-of-heaven			X					no	dominant in portions of Area B
Albizzia julibrissin	silk-tree		X	X					no	
Alisma subcordatum	southern water-plantain							X	yes	
Allium sp.	an onion		X	X						insufficient material for identification
Amaranthus tuberculatus	rough-fruited water-hemp	X					X		yes	dominant in portions of Area B
Ampelamus albidus	sandvine			X					yes	
Ampelopsis cordata	raccoon-grape			X					yes	
Apocynum sp.	a dogbane			X						insufficient material for identification
Asclepias incarnata	swamp milkweed						X		yes	
Bidens bipinnata	Spanish needles			X					yes	
Bidens vulgata	tall beggar ticks			X					yes	
Boehmeria cylindrica	false nettle						X		yes	
Broussonetia papyrifera	paper mulberry	X		X					no	
Calystegia sepium	hedge-bindweed			X			X		yes	
Campsis radicans	trumpet-creeper	X		X					no	
Carex albolutescens	greenish-white sedge		X	X					yes	
Carex sp.	sedge					X				insufficient material for identification
Catalpa speciosa	northern catalpa		X	X					no	
Celtis occidentalis	northern hackberry		X	X					yes	frequent in sapling stratum
Cephalanthus occidentalis	buttonbush				X				yes	
Chenopodium berlandieri var. *bushianum*	pitseed goosefoot						X		yes	
Cornus drummondii	rough-leaved dogwood		X	X					yes	frequent shrub in study area
Cyperus strigosus	false nutsedge	X					X		yes	
Dactylis glomerata	orchard grass								no	
Desmodium sp.	a tick-trefoil									insufficient material for identification
Duchesnea indica	indian strawberry						X		no	
Echinochloa crus-galli	barnyard grass						X		no	
Echinodorus berteroi	tall bur-head							X	yes	
Eleocharis obtusa	blunt spikesedge						X	X	yes	
Elymus canadensis	Canada wild-rye								yes	
Elymus macregorii	early wild-rye			X					yes	a potentially rare species
Elymus virginicus	Virginia wild-rye			X					yes	
Equisetum hyemale	common scouring-rush			X					yes	
Erechtites hieraciifolia	*pilewort*	X							yes	
Euonymus fortunei	Chinese spindle-tree		X	X					no	prevalent in project area
Eupatorium serotinum	late eupatorium			X					yes	
Fallopia scandens	false buckwheat								yes	
Forsythia viridissima	greenstem forsythia			X					no	
Fraxinus americana	white ash			X					yes	
Galium asprellum	rough bedstraw			X					yes	
Geum canadense	white avens			X					yes	
Glechoma hederacea	gill-over-the-ground			X					no	
Heckelia virginiana	Virginia stickseed			X					yes	
Humulus japonicus	Japanese hops						X		no	
Juglans nigra	black walnut			X					yes	
Lactuca biennis	tall blue lettuce			X					yes	
Leersia oryzoides	rice cut-grass				X		X	X	yes	common wetland herb
Lemna perpusilla	minute duckweed							X	yes	
Lolium arundinaceum	reed fescue			X					no	
Lonicera japonica	Japanese honeysuckle	X		X					no	

Lonicera maackii	Amur honeysuckle		X	X					no	prevalent in project area
Ludwigia peploides	floating primrose-willow							X	yes	common aquatic herb
Lycopus americanus	American water-horehound				X	X	X		yes	
Menispermum canadense	moonseed			X					yes	
Morus alba	white mulberry		X	X					no	prevalent in project area
Muhlenbergia bushii	Bush's muhly			X					yes	
Oenothera parviflora	small-flowered evening-primrose		X	X					yes	
Persicaria amphibia var. *emersa*	water smartweed						X		no	
Persicaria caespitosa	a smartweed						X		no	
Persicaria lapathifolia	dock-leaved smartweed				X	X	X	X	yes	common wetland herb
Persicaria maculosa	lady's thumb						X	X	no	
Persicaria punctata	dotted smartweed		X				X		yes	
Persicaria sagittata	arrow-leaved tear-thumb			X					yes	
Philadelphus sp.	a mock-orange			X					no	
Phytolacca americana	pokeweed								yes	
Pilea pumila	clearweed			X					yes	
Platanus occidentalis	sycamore		X	X					yes	among largest trees in project area
Populus deltoides	eastern cottonwood		X						yes	among largest trees in project area
Potentilla norvegica	rough cinquefoil			X		X	X		yes	
Prunus serotina	black cherry			X					yes	
Quercus rubra	red oak			X					yes	
Rhus glabra	smooth sumac			X					yes	
Robinia pseudoacacia	black locust			X					no	
Rosa multiflora	multiflora rose			X					no	
Rubus bifrons	a blackberry			X					no	
Rubus occidentalis	black raspberry			X					yes	
Rubus trivialis	coastal-plain dewberry	X		X					yes	
Rumex crispus	curly dock						X		no	
Rumex obtusifolius	bitter dock						X		no	
Sagittaria montevidensis var. *calycina*	Mississippi arrowhead							X	yes	
Salix caroliniana	Carolina willow			X					yes	
Salix nigra	black willow	X							yes	dominant in upstream Area B
Sambucus canadensis	common elder			X					yes	
Sanicula sp.	a sanicle			X						insufficient material for identification
Scrophularia marilandica	eastern figwort			X					yes	
Setaria pumila	pigeon grass						X		no	
Smilax hispida	hispid greenbriar		X	X					yes	
Solanum ptychanthum	eastern black nightshade			X					yes	
Solidago altissima	tall goldenrod						X		yes	
Sorghum halapense	Johnson-grass			X					no	
Sparganium sp.	a bur-reed							X		insufficient material for identification
Stellaria media	common chickweed								no	
Symphyotrichum ericoides	white squarrose aster								yes	
Symphyotrichum lanceolatum	eastern lined aster						X		yes	
Symphyotrichum pilosum	awl aster								yes	
Torilis arvensis	field hedge-parsley			X			X		no	
Toxicodendron radicans	poison ivy			X					yes	
Trifolium repens	white clover		X						no	
Typha latifolia	broad-leaved cattail					X			yes	
Ulmus americana	American elm			X					yes	
Ulmus pumila	Siberian elm			X					no	prevalent in project area
Ulmus rubra	slippery elm		X	X					yes	
Urtica dioica	stinging-nettle						X			subspecies not determined
Verbascum thapsus	common mullein			X					no	
Verbena urticifolia	white vervain			X			X		yes	
Viola sp.	a violet			X						insufficient material for identification
Vitis riparia	river grape	X		X					yes	
Wolffia borealis	watermeal							X	yes	important waterfowl food
Xanthium strumarium	common cocklebur						X		no	

Table 4. Animal Species Known or Likely to Occur in Dead Creek Study Area.

Common Name	Genus	Specific Epithet	State Status	Notes	Aquatic System[2]	Terrestrial--Wetland Systems[2]
BIRDS						
Acadian flycatcher	*Empidonax*	*virescens*				B
American bittern	*Botaurus*	*lentiginosus*	Endangered			B
American black duck	*Anas*	*rubripes*			W	W
American coot	*Fulica*	*americana*			Y	
American Crow	*Corvus*	*brachyrhynchos*				Y
American goldfinch	*Carduelis*	*tristis*				Y
American Kestrel	*Falco*	*sparverius*				Y
American red-start	*Setophaga*	*ruticilla*				B
American robin	*Turdus*	*migratorius*				Y
American tree sparrow	*Spizella*	*arborea*				W
American wigeon	*Anas*	*americana*			W	W
American woodcock	*Scolopax*	*minor*				B
Baltimore oriole	*Icterus*	*galbula*				B
bank swallow	*Riparia*	*riparia*				B[1]
barn swallow	*Hirundo*	*rustica*				B
barred owl	*Strix*	*varia*				Y
bay-breasted warbler	*Dendroica*	*castanea*				W
belted kingfisher	*Ceryle*	*alcyon*			B	B
black-capped chickadee	*Poecile*	*atricapillus*				Y
black-crowned night-heron	*Nycticorax*	*Nycticorax*	Endangered		B	B
black-throated green warbler	*Dendroica*	*virens*				W
blackpoll warbler	*Dendroica*	*striata*				W
blue jay	*Cyanocitta*	*cristata*				Y
blue-gray gnatcatcher	*Polioptila*	*caerulea*				B
blue-winged teal	*Anas*	*discors*			B	B
blue-winged warbler	*Vermivora*	*pinus*				B
broad-winged hawk	*Buteo*	*platypterus*				B
brown creeper	*Certhia*	*americana*	Threatened			Y
brown thrasher	*Toxostoma*	*rufum*				B
brown-headed cowbird	*Molothrus*	*ater*				W
Canada goose	*Branta*	*canadensis*			Y	Y
Carolina chickadee	*Poecile*	*carolinensis*				Y
Carolina wren	*Thryothorus*	*ludovicianus*				Y
cattle egret	*Bubulcus*	*ibis*				B
cedar waxwing	*Bombycilla*	*cedrorum*				Y
chestnut-sided warbler	*Dendroica*	*pensylvanica*				B
chimney swift	*Chaetura*	*pelagica*				B
chipping sparrow	*Spizella*	*passerina*				B
cliff swallow	*Hirundo*	*pyrrhonota*				B[1]
common grackle	*Quiscalus*	*quiscula*				Y
common nighthawk	*Chordeiles*	*minor*				B
common snipe	*Gallinago*	*gallinago*	Watch List			B
common yellowthroat	*Geothlypis*	*trichas*				B
dark-eyed junco	*Junco*	*hyemalis*				W
dickcissel	*Spiza*	*americana*				B
downy woodpecker	*Picoides*	*pubescens*				Y
eastern bluebird	*Sialia*	*sialis*				B
eastern kingbird	*Tyrannus*	*tyrannus*				B
eastern meadowlark	*Sturnella*	*magna*				Y
eastern phoebe	*Sayornis*	*phoebe*				B
eastern towhee	*Pipilo*	*erythrophthalmus*				Y
eastern wood-pewee	*Contopus*	*virens*				B
Eurasian tree sparrow	*Passer*	*montanus*		species locally introduced in St. Louis Area		Y
European starling	*Sturnus*	*vulgaris*		introduced to North America		Y
field sparrow	*Spizella*	*pusilla*				Y
fox sparrow	*Passerella*	*iliaca*				W
gadwall	*Anas*	*strepera*			W	W
golden-crowned kinglet	*Regulus*	*satrapa*				W

grasshopper sparrow	*Ammodramus*	*savannarum*				B
gray catbird	*Dumetella*	*carolinensis*				B
great blue heron	*Ardea*	*herodias*			Y	Y
great crested flycatcher	*Myiarchus*	*crinitus*				B
great horned owl	*Bubo*	*virginianus*				Y
greater yellowlegs	*Tringa*	*melanoleuca*			W	W
green heron	*Butorides*	*virescens*			B	B
green-winged teal	*Anas*	*crecca*			Y	Y
hairy woodpecker	*Picoides*	*villosus*				Y
herring gull	*Larus*	*argentatus*			Y	
hooded merganser	*Lophodytes*	*cucullatus*			Y	Y
house finch	*Carpodacus*	*mexicanus*		introduced to North America		Y
house sparrow	*Passer*	*domesticus*		introduced to North America		Y
house wren	*Troglodytes*	*aedon*				B
indigo bunting	*Passerina*	*cyanea*				B
Kentucky warbler	*Oporornis*	*formosus*				B
killdeer	*Charadrius*	*vociferus*				Y
least flycatcher	*Empidonax*	*minimus*				B
little blue heron	*Egretta*	*caerulea*	Endangered		B	B
mallard	*Anas*	*platyrhynchos*			B	B
mourning dove	*Zenaida*	*macroura*				Y
Nashville warbler	*Vermivora*	*ruficapilla*				W
northern bobwhite	*Colinus*	*virginianus*				Y
northern cardinal	*Cardinalis*	*cardinalis*				Y
northern flicker	*Colaptes*	*auratus*				Y
northern mockingbird	*Mimus*	*polyglottos*				Y
northern parula	*Parula*	*americana*				B
northern pintail	*Anas*	*acuta*				W
northern rough-winged swallow	*Stelgidopteryx*	*serripennis*				B
northern shoveler	*Anas*	*clypeata*			W	W
northern waterthrush	*Seiurus*	*noveboracensis*				B
orange-crowned warbler	*Vermivora*	*celata*				W
orchard oriole	*Icterus*	*spurius*				B
palm warbler	*Dendroica*	*palmarum*				W
pied-billed grebe	*Podilymbus*	*podiceps*	Threatened			Y
prothonotary warbler	*Protonotaria*	*citrea*				B
purple martin	*Progne*	*subis*				B
red-bellied woodpecker	*Melanerpes*	*carolinus*				Y
red-eyed vireo	*Vireo*	*olivaceus*				B
red-headed woodpecker	*Melanerpes*	*erythrocephalus*				Y[1]
red-tailed hawk	*Buteo*	*jamaicensis*				Y
red-winged blackbird	*Agelaius*	*phoeniceus*				Y
ring-billed gull	*Larus*	*delawarensis*			Y	
rock dove	*Columba*	*livia*				Y
rose-breasted grosbeak	*Pheucticus*	*ludovicianus*				B
ruby-crowned kinglet	*Regulus*	*calendula*				W
ruby-throated hummingbird	*Archilochus*	*colubris*				B
rusty blackbird	*Euphagus*	*carolinus*				W
savannah sparrow	*Passerculus*	*sandwichensis*				W
semipalmated sandpiper	*Calidris*	*pusilla*			W	W
snowy egret	*Egretta*	*thula*	Endangered		B[1]	B[1]
solitary sandpiper	*Tringa*	*solitaria*			W	W
song sparrow	*Melospiza*	*melodia*				Y
sora	*Porzana*	*carolina*			B	B
spotted sandpiper	*Actitus*	*macularia*			B	B
Swainson's thrush	*Catharus*	*ustulatus*				B
swamp sparrow	*Melospiza*	*georgiana*				B
Tennessee warbler	*Vermivora*	*peregrina*				W
tree swallow	*Tachycineta*	*bicolor*				Y
tufted titmouse	*Baeolophus*	*bicolor*				Y
turkey vulture	*Cathartes*	*aura*				Y
vesper sparrow	*Pooecetes*	*gramineus*				W
warbling vireo	*Vireo*	*gilvus*				B
whip-poor-will	*Caprimulgus*	*vociferus*				B
white-breasted nuthatch	*Sitta*	*carolinensis*				Y
white-eyed vireo	*Vireo*	*griseus*				B

white-crowned sparrow	*Zonotrichia*	*leucophrys*				Y
white-throated sparrow	*Zonotrichia*	*albicollis*				Y
Wilson's warbler	*Wilsonia*	*pusilla*				W
wood duck	*Aix*	*sponsa*			B	B
worm-eating warbler	*Helmitheros*	*vermivorus*				B
yellow warbler	*Dendroica*	*petechia*				B
yellow-billed cuckoo	*Coccyzus*	*americanus*				B
yellow-breasted chat	*Icteria*	*virens*				B
yellow-crowned night heron	*Nyctanassa*	*violacea*	Endangered		B	B
yellow-rumped warbler	*Dendroica*	*coronata*				W
yellow-throated vireo	*Vireo*	*flavifrons*				B
MAMMALS						
beaver	*Castor*	*canadensis*		herbivory observed		Y
big brown bat	*Eptesicus*	*fuscus*				Y
common muskrat	*Ondatra*	*zibethicus*		dens observed		Y
coyote	*Canis*	*latrans*				Y
deer mouse	*Peromyscus*	*maniculatus*				Y
eastern chipmunk	*Tamias*	*striatus*				Y
eastern cottontail	*Sylvilagus*	*floridanus*				Y
eastern gray squirrel	*Sciurus*	*carolinensis*				Y
eastern mole	*Scalopus*	*aqauticus*				Y
eastern pipistrelle	*Pipistrellus*	*subflavus*				Y
gray fox	*Urocyon*	*cinereoargenteus*				Y
hoary bat	*Lasiurus*	*cinereus*				B
house mouse	*Mus*	*musculus*				Y
least shrew	*Cryptotis*	*parva*				Y
little brown myotis	*Myotis*	*lucifugus*				Y
long-tailed weasel	*Mustela*	*frenata*				Y
masked shrew	*Sorex*	*cinereus*				Y
meadow vole	*Microtus*	*pennsylvanicus*				Y
mink	*Mustela*	*vison*				Y
northern short-tailed shrew	*Blarina*	*brevicauda*				Y
Norway rat	*Rattus*	*norvegicus*				Y
raccoon	*Procyon*	*lotor*		tracks observed		Y
red bat	*Lasiurus*	*borealis*				Y
red fox	*Vulpes*	*vulpes*				Y
silver-haired bat	*Lasionycteris*	*noctivagans*				W
striped skunk	*Mephitis*	*mephitis*				Y
Virginia opossum	*Didelphis*	*virginiana*				Y
white-footed mouse	*Peromyscus*	*leucopus*				Y
white-tailed deer	*Odocoileus*	*virginianus*				Y
woodchuck	*Marmota*	*monax*				Y
HERPETILE						
American Toad	*Bufo*	*americanus*			B	B
black racer	*Coluber*	*constrictor*				B
broad-headed skink	*Eumeces*	*laticeps*				B
brown snake	*Storeria*	*dekayi*				B
bullfrog	*Rana*	*catesbeiana*			B	B
common garter snake	*Thamnophis*	*sirtalis*				B
Cope's gray treefrog	*Hyla*	*chrysoscelis*			B	B
crawfish frog	*Rana*	*areolata*			B	B
eastern box turtle	*Terrapene*	*carolina*			B	B
eastern gray treefrog	*Hyla*	*versicolor*			B	B
eastern milk snake	*Lampropeltis*	*triangulum*				B
eastern narrowmouth toad	*Gastrophryne*	*carolinensis*			B	B
eastern newt	*Notophthalmus*	*viridescens*			B	
eastern spadefoot	*Scaphiopus*	*holbrookii*			B	B
false map turtle	*Graptemys*	*pseudogeographica*			B	B
five-lined skink	*Eumeces*	*fasciatus*				B
Fowler's toad	*Bufo*	*fowleri*			B	B
fox snake	*Elaphe*	*vulpina*				B
Graham's crayfish snake	*Regina*	*grahamii*			B	B
green frog	*Rana*	*clamitans*			B	B
lesser siren	*Siren*	*intermedia*			B	
lined snake	*Tropidoclonion*	*lineatum*				B
milk snake	*Lampropeltis*	*triangulum*				B

3.21 Vegetation Alliance Descriptions

3.211 Forests

Forests are typically defined as areas with greater than 65 percent areal cover of trees. This definition was broadened in the Dead Creek study area to also include areas that had been cleared of canopy-sized trees and were in various stages of recovery or succession. This concept was used because Drake and Faber-Langendoen (1997) do not provide classification for anthropogenic habitats and these communities will ultimately recover as forests if protected from further disturbance.

SALIX NIGRA TEMPORARILY FLOODED FOREST ALLIANCE — PFO

This forested alliance occurs along riparian corridors of streams and rivers and is subject to flooding during high water events. It is identified by the dominance of black willow in the canopy. In Illinois, other tree species may also occur to a lesser extent, including eastern cottonwood, sycamore, river birch, and green ash. No other tree species occurred with black willow in the study area. The canopy was sparse and estimated to possess 40 percent areal cover. The larger trees measured 35 cm in diameter and were 45 years old. Lianas were prevalent and included Japanese honeysuckle, trumpet-creeper, and coastal-plain dewberry. Additional plants of this alliance included paper mulberry, rough-fruited water-hemp, and false nutsedge. The stream channel of this community was scoured and consisted of sand and gravel. Both water flow velocity and substrate (moderately fast and scoured, respectively) were unique to the study area. This natural community was found only near the upstream end of the study area adjacent to Queeny Avenue.

FRAXINUS PENNSYLVANICA–ULMUS AMERICANA TEMPORARILY FLOODED FOREST ALLIANCE — PFO

This forested alliance occurs along riverbanks and floodplains. It is subject to flooding during high water events. The frequency of flooding the vegetation alliance experiences is dependent on the community elevation above the river channel. For example, some occurrences of this alliance were on relatively high banks and would not be flooded as frequently as those occurring on low areas adjacent to the creek channel. This community varied in the study area relative to the amount of disturbance to the canopy and prevalence of non-native species. In some areas, such as north of Judith Lane, the tree stratum was nearly absent and dense thickets of native and non-native lianas blanketed the slope and low vegetation. Dominant species in this disturbed forest setting included raccoon-grape, hispid greenbriar, Chinese spindle-tree, and trumpet-creeper.

A second manifestation of this community was dominated by non-native tree species. Frequent canopy species in this setting included white mulberry, Siberian elm, and tree-of-heaven. The final form of this community in the study area was dominated by native tree species. Common trees included American elm, white ash, box elder, and limited stems of silver maple and black walnut. Non-native canopy species were sometimes intermixed in this last form of the community. Throughout the study area, common saplings and shrubs of this community included paper mulberry, Amur honeysuckle, common elder, and rough-leaved dogwood. The former two species are aggressive, non-native species. White snakeroot, white avens, and false nettle were common herbaceous species. Canopy height and age varied with location and species composition. In many areas the majority of trees were shorter than 15 m, had stems 10–20 cm in diameter, and were up to 15 years old. The largest trees in this community were often escaped Siberian elms (50 cm in diameter or larger).

POPULUS DELTOIDES TEMPORARILY FLOODED FOREST ALLIANCE — PFO

This forested alliance is found within riparian corridors of streams and rivers. It is inundated for short periods of time during high water events. The community is recognized by its dominance of tall, deciduous trees with eastern cottonwood as the primary canopy component. In the study area, eastern cottonwood is the most frequent species, with sycamore, box elder, and American elm often present. White mulberry and Siberian elm were frequent non-native trees. Understory woody species included northern hackberry, Chinese spindle-tree, and Amur honeysuckle. Herbaceous species were both scarce and patchy in distribution. Common species were white snakeroot and dotted smartweed. The canopy of this alliance exceeded 20 m in height, with the larger trees 80–200 cm in diameter and up to 70 years old. Substrate varies for this community throughout its range; from bare, newly formed alluvial bars to floodplain flats and terraces. Substrate also varied within the study area.

3.212 Shrublands

Shrublands are areas that lack complete tree canopies during mature stages. Though some trees are generally present, the dominant stratum in the alliance is the shrub layer.

The small, woody vegetation usually occurs in broken mats or clumps with exposed substrate (soil or water) and herbaceous plants in between.

CEPHALANTHUS OCCIDENTALIS SEMI-PERMANENTLY FLOODED SHRUBLAND — PSS

As its name indicates, this alliance is a shrub-dominated alliance with buttonbush representing the majority of cover. In the study area, this habitat was limited to a small occurrence immediately downstream of Jerome Lane. Canopy-sized trees were scarce and limited to small silver maples on the margin of the alliance. The shrub layer was almost entirely dominated by buttonbush growing in about 20 cm of water. These shrubs grew in thicket-like colonies with open water and herbs interspersed between them. Some silver maple saplings were present in this stratum as well. Dock-leaved smartweed and rice cut-grass were the dominant herbs.

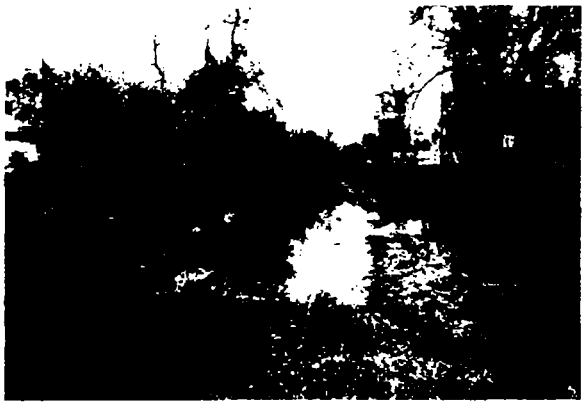
3.213 Herbaceous Alliances

Similar to shrublands, herbaceous alliances are those communities that lack complete tree canopies. In this case, however, the dominant stratum was the herb layer; these communities had very little above ground living material in the winter season, though dead persistent stems may have occurred.

TYPHA SEASONALLY FLOODED HERBACEOUS — PEM

This vegetation alliance is identified by the dominance of grass-like herbs (usually cattails) growing in seasonally flooded soils. Within the project area, this natural community was limited to two small occurrences: one immediately downstream of Judith Lane and a second occurrence near Falling Springs Road. Silver maple was the only woody species to occupy this community, and it was limited to a few saplings and seedlings. Broad-leaved cattail dominated the alliance and formed a thick stand of emergent vegetation. Other common herbs included rough cinquefoil, American water-horehound, and dock-leaved smartweed. Standing water was present during the survey to a depth of 10 cm.

PERSICARIA–MIXED FORB TEMPORARILY FLOODED HERBACEOUS — PEM



This vegetation alliance is very diverse and poorly defined. It typically occurs as exposed, saturated soil that has been uncovered as temporary pools recede during the growing season. Herbaceous species are reported to sometimes differ from year to year. In the study area, this alliance had two different forms based on substrate exposure. In the upstream portion of the study area, above Judith Lane, the community was almost entirely dominated by tall stems of rough-fruited water-hemp with tiny smartweed seedlings underneath. These plants occurred on exposed, wet mud at the edge of an open water channel. Downstream of Judith Lane, the community grew in shallow water and at the edge of the bank. The soil was nearly covered by vegetation, water, and/or leaf litter with very limited exposed mineral soil. Dock-leaved smartweed and rice cut-grass were herbaceous species that were nearly always present. Other frequent species in this form of the alliance were eastern lined-aster, water smartweed, dotted smartweed, and American water-horehound. Water depth ranged from 0 to mostly less than 15 cm deep in this community.

POTAMOGETON–CERATOPHYLLUM–ELODEA PERMANENTLY FLOODED HERBACEOUS — PAB

This vegetation alliance is another variable and poorly defined community. It is described as typically possessing standing water less than 2 m deep with less than 25 percent emergent or floating-leaved plants and often 25 percent or more submerged vegetation. In the study area, this vegetation alliance was generally dominated by floating primrose-willow and southern water-plantain. Several other species were present to lesser extent, including rice cut-grass, dotted smartweed, minute duckweed, watermeal, Mississippi arrowhead, and tall bur-head. Water depth commonly ranged from 10–50 cm in this community.

3.214 Open Water Communities

The open water community is defined as areas of standing water that lacked sufficient aquatic vegetation to be considered as one of the herbaceous alliances. In the study area,

this community occurred in several locations and, in some instances, appeared to be shade or water persistence related.

TEMPORARY OPEN WATER — PUB

This natural community was located in the upstream portion of the study area above Judith Lane (Area B). It is best described as a long channel of shallow water (usually less than 50 cm deep) that is dependent on relatively recent precipitation to maintain its level.

Portions of the shore and central channel were devoid of water and saturated substrate (firm mud) was exposed. Following a rain event during the site survey, these previously exposed areas had become inundated again. It was apparent through examination of the substrate and vegetation that this community is unlikely to maintain substantial standing water through the entire growing season. The size of this community likely varies from year to year depending on the amount of rainfall. During drought years, this community will likely be small or absent and largely replaced by *Persicaria*–Mixed Forb Temporarily Flooded Herbaceous Alliance. In heavy rainfall years, this community will be larger and impose on the herbaceous vegetation at the edge of the channel.

PERMANENT OPEN WATER — POW

This natural community was present the middle and downstream ends of the study area, below Judith Lane. It occurred both as relatively large, open pond-like areas and narrow channels located beneath the canopies of large deciduous trees (e.g., eastern cottonwood, sycamore, Siberian elm). In the study area, it is defined as somewhat shallow, open water that is both relatively permanent and relatively devoid of vegetation. The size of the community appears to be more constant than the previous open water community. No significant difference could be observed in community size following a rain event during the site visit. Only during larger storm events and spring run-off would the open water potentially overflow its bank and impinge on the forested alliances.

3.22 Rare Species

Notes on rare species occurrences were maintained during natural community and wetland mapping surveys of Dead Creek. One state threatened species of bird and one potentially rare grass was observed. Definitions of rarity and criteria for listing follow the Illinois Endangered Species Protection Board (2000).

- Illinois Endangered Species: Any species that is in danger of extinction as a breeding species in Illinois.

- Illinois Threatened Species: Any breeding species that is likely to become a state endangered species within the foreseeable future in Illinois.

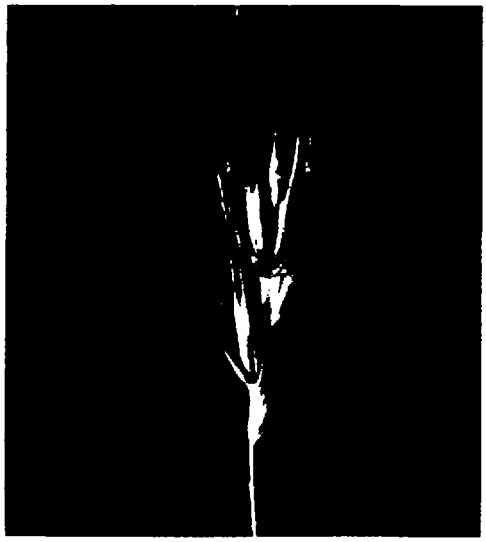
- Criteria For State Listing: A species shall be included on the official list of endangered and threatened species when one or more of the following criteria exists: (1) Species included in the Federal list of Endangered or Threatened Species, (2) Species proposed for Federal Endangered or Threatened Species which occur in Illinois, (3) Species which formerly were widespread in Illinois but have been nearly extirpated from the State due to habitat destruction, collecting, or other pressures resulting from the development of Illinois, (4) Species which exhibit very restricted geographic ranges of which Illinois is a part, (5) Species which exhibit restricted habitats or low populations in Illinois, or (6) Species which are significant disjuncts in Illinois (i.e., the Illinois population is far removed from the rest of the species' range).

Brown Creeper (*Serthia americana*)

A small, brown-streaked bird related to nuthatches, the brown creeper occurs throughout most of the United States and southern Canada. As its name implies, it forages by moving closely over the stem and main branches of trees. Its diet is comprised largely of insects, though some seeds and nuts are eaten as well (Ehrlich *et al.* 1988). This bird commonly nests in conifer, mixed conifer-hardwood, or hydric forests. Special habitat requirements include standing dead trees with loose bark for feeding and trees greater than 25 cm in diameter for nesting (Thomas *et al.* 1979). This species was heard singing on 8 November 2000 from Area B (upstream of Judith Lane). This area possessed a few, very large diameter, standing dead trees. Brown creepers were also observed by previous site investigators (information supplied by Menzie-Cura & Associates). It is likely that brown creeper use of the Dead Creek study area is minor due to limited intact forest and the young age of most trees.

Early Wild-rye (*Elymus macregorii*)

This recently described species belongs to a group of taxonomically challenging grasses. Early wild-rye possesses a single spike of congested flowers tipped by long bristles. It occurs primarily in rich forests and floodplains in eastern United States and has been documented from five counties in Illinois (e.g., Fulton, Jersey, Knox, Peoria, Union) based on review of museum specimens performed by Campbell (in ed.). Because this species occurs in floodplain forests, a community that has largely been converted to agricultural land in Illinois, this species may be extirpated from portions of the state. Though this species is not formally listed by the Illinois Endangered Species Protection Board, early wild-rye appears to be rare in the state and information on its occurrence is being supplied in the event it becomes a state-tracked species. The only occurrence of this grass in the Dead Creek study area was from a *Fraxinus pennsylvanica–Ulmus americana* Temporarily Flooded Forest in Area C. It was located on the east bank of Dead Creek, upstream of Cahokia Street within wetland characterization plot C-4. The plants were limited to a small area (2 m^2) and were senescent with dispersing fruits at the time of observation. Poison ivy, trumpet-creeper, white snakeroot, rough-leaved dogwood, and black raspberry were associated species.



3.23 Invasive Plant Species

Invasive plants are generally considered to be species that can grow to densities that exclude other plants. Invasive species can be economically important when they interfere with agricultural species or can be ecologically important when they alter the character of native plant communities. Invasive species can be further classified into two categories: those that are native to an area and those that are not. Native invasive species are plants that are historically known to occur in an area prior to extensive human occupation that, due either to changing land use practices or introduction of foreign genotypes, have subsequently become problematic. The following discussion will be restricted to non-native invasive species.

The Dead Creek study area is occupied to a significant extent by non-native species. Though exotic herbaceous species are present, it is the introduced and escaped woody species found in the forested communities that are most prevalent. In the tree stratum, white mulberry, Siberian elm, paper mulberry, and tree-of-heaven are frequent throughout the study area and, in some cases, locally dominant. These trees alter the character of native riparian forests by replacing native plants. Common non-native lianas in the study area included trumpet-creeper, Japanese honeysuckle, and Chinese spindle-tree. Not only do these species produce very different fruits as compared to the native

northern cricket frog	*Acris*	*crepitans*			B	B
northern water snake	*Nerodia*	*sipedon*			B	B
painted turtle	*Chrysemys*	*picta*			B	B
plains garter snake	*Thamnophis*	*radix*			B	B
rat snake	*Elaphe*	*obsoleta*				B
rough green snake	*Opheodrys*	*aestivus*				B
red-eared slider	*Trachemys*	*scripta*		variety *elegans*	B	B
smallmouth salamander	*Ambystoma*	*texanum*			B	B
snapping turtle	*Chelydra*	*serpentina*			B	B
southern leopard frog	*Rana*	*sphenocephala*			B	B
spiny softshell	*Apalone*	*spinifera*			B	B
spotted salamander	*Ambystoma*	*maculatum*			B	B
spring peeper	*Pseudacris*	*crucifer*			B	B
striped chorus frog	*Pseudacris*	*triseriata*			B	B
tiger salamander	*Ambystoma*	*tigrinum*			B	B
western ribbon snake	*Thamnophis*	*proximus*				B
FISH						
black bullhead	*Ameiurus*	*melas*		variety of habitats with turbid water and slow current	Y	
blackstripe topminnow	*Fundulus*	*notatus*		moderate turbidity, slow current, mud bottom	Y	
fathead minnow	*Pimephales*	*promelas*		tolerates extremes in turbidity, temperature, and oxygen	Y	
green sunfish	*Lepomis*	*cyanellus*		tolerates extremes in turbidity, temperature, and oxygen	Y	
johnny darter	*Etheostoma*	*nigrum*		slow current and mud (or sand and gravel) bottom	Y	
mosquitofish	*Gambusia*	*affinis or holbrooki*		wide variety and quality of habitats; taxonomy uncertain	Y	
red shiner	*Cyprinella*	*lutrensis*		variety of habitats, tolerates turbidity	Y	

1 = species documented to occur in project area by previous site investigators (information supplied by Menzie-Cura & Associates, Inc.)

2 = explanation of codes

Seasonal Use

Y=potential year round use of project area
B=likely present only during summer breeding season
W=likely present only during migration and/or winter season

Grey shading indicates species observed in project area

river grape (seeds within a dehiscent fruit *versus* fleshy berries, respectively) but the non-native lianas were also frequently seen growing as a dense mat over the ground or other woody species. This growth form stagnates native plant regeneration. The growth form of the Amur honeysuckle, the common non-native shrub in the study area, likewise abrogates native plants by occupying space.

Because of the abundance of non-native plant species, good opportunity exists for habitat improvement should remediation activities occur. If floodplain sediments are removed, native species can be planted and non-native species controlled in the riparian communities of Dead Creek.

3.24 Wetland Characterization

Results of surveys and community plot sampling along the approximately 2.4 km of Dead Creek indicate the site has a highly modified wetland system that, for much of the season, appears to act more as a set of shallow ponds rather than a riverine system as its name would imply. The riparian communities portray classic symptoms of residential development, including narrow and fragmented forests, young canopy trees, limited vertical diversity in terrestrial habitats, bisection by numerous roads, disturbed drainage, and a high incidence of non-native species. Dead Creek, nonetheless, plays an important role in the local storm water flow, is a wildlife travel corridor, and is utilized by rare and uncommon plant and animal species.

The Dead Creek project area is subdivided into five areas referred to as Area B, Area C, Area D, Area E, and Area F[1]. The limits of each area and a general description of vegetation alliance and condition follow.

Area B

The upstream most section of the study area occurred between Queeny Avenue and Judith Lane. This stretch possessed a poorly defined stream channel with soft mud substrate (downstream) and sand and gravel substrate (upstream). Essentially no aquatic plants occurred in the open water areas indicating the water likely did not persist without rain events to restore it. The immediate eastern shoreline was generally a broad flat of exposed, saturated substrate dominated by herbaceous species (e.g., rough-fruited water-hemp, dock-leaved smartweed). This herbaceous community was bordered on the upland side by a relatively continuous band of early successional temporarily flooded forest. Most of the native trees expected to occur in this community, such as green ash and American elm, had been replaced by non-native species (e.g., white mulberry, tree-of-heaven, paper mulberry). The western shoreline had a more abrupt bank and was largely cleared of canopy species. Regeneration there was being stagnated by a dense and continuous covering of vines and lianas over the woody vegetation. This area was extensively used by sparrows and wrens (e.g., song sparrow, field sparrow, house sparrow, Eurasian tree sparrow, Carolina wren) due to the abundance of concealing

[1] For purposes of this report, Area F is defined as the stretch of Dead Creek between IL Route 3 and Water Street.

vegetation. In general, Area B was not closely bordered by homes but instead had several large fields and open areas abutting the riparian corridor.

Area C

This section of the study area, positioned between Judith Lane and Cahokia Street, is considerably different from Area B both in terms of hydrology and vegetation. Very little exposed substrate occurred in this area; rather water, vegetation, and leaf litter concealed the creek bottom. Herbaceous communities were much more dense and frequently grew out of shallow water, rather than open wet soil. The eastern shoreline consisted of a continuous strip of floodplain forest containing a mixture of native and non-native tree species. Though of young age and frequently with abundant non-native trees and lianas, this section possessed some of the better remaining examples of *Fraxinus pennsylvanica–Ulmus americana* Temporarily Flooded Forest. This community was found to harbor early wild-rye, a recently described species that appears to be rare in Illinois. The western shoreline of Area C was very different, due to close residential development. The forest was fragmented and open lawns bordered the creek in several areas. The water appeared to be more permanent as evidenced by the sparse aquatic vegetation present.

Area D

This portion of the study area, located between Cahokia Street and Jerome Lane, can be generally described as a linear pond that is split into two sections by Kinder Street. Both sections (above and below Kinder Street) are relatively similar. The channel is shallow (less than 100 cm deep), stagnant, and vegetated by several species of aquatics including floating primrose-willow, southern water-plantain, tall bur-head, and blunt spikesedge. A somewhat continuous band of rice cut-grass with smartweeds and other herbs (*Persicaria*–Mixed Forb Temporarily Flooded Herbaceous) occurred along the edge of the creek channel and in shallow water. On the stream banks was found the *Fraxinus pennsylvanica–Ulmus americana* Temporarily Flooded Forest alliance. This community varied in terms of both age and non-native species influence, and was cleared in a few areas due to residential lots.

Area E

This long section began below Jerome Lane and ended upstream of Route 3. It was consequently a variable section. The channel was relatively deep and open in the upstream portion of this area (in the vicinity of Club Lane) and frequently over 1 m in depth. Large portions of the upper channel are sparsely vegetated with free-floating herbs (e.g., minute duckweed, watermeal) and a few rooted aquatics near the edge. Further downstream, the creek became a narrow channel frequently shaded by large tree canopies. In these shaded sections of Dead Creek, open water in the channel was essentially devoid of aquatic vegetation. The *Persicaria*–Mixed Forb Temporarily Flooded Herbaceous Alliance was nearly absent throughout Area E, represented only by small patches in the shallow water edges of the channel. The forested community was

represented by two different alliances: *Fraxinus pennsylvanica–Ulmus americana* Temporarily Flooded Forest and *Populus deltoides* Temporarily Flooded Forest. The latter community was prevalent near the downstream section of Area E in the vicinity of the intersecting parking lot. Throughout this area, the forested communities were encroached on and fragmented by streets, residential areas, and parking lots.

Area F

For purpose of this report, the description of Area F is confined to the upstream section between Route 3 and Water Street. The channel of Dead Creek in this section is well defined with vertically cut banks. No aquatic vegetation was observed in the creek. Significant portions of the adjacent riparian forest was either entirely cleared of canopy trees or fragmented with isolated large trees. Construction of a gravel parking lot on the northwest side of the channel had eliminated adjacent forests. This portion of the study area was historically vegetated by a *Populus deltoides* Temporarily Flooded Forest, as evidenced by several, large, remaining eastern cottonwood trees. Clearing, ditching, and invasive species, however, appeared to have altered the site and the regenerating community had more in common with *Fraxinus pennsylvanica–Ulmus americana* Temporarily Flooded Forest. Non-native woody species were common and even dominant in the liana, sapling, and shrub strata. Two large diameter pipes emerged from the bank and crossed Dead Creek above the water surface. Current construction was occurring for culvert improvement near Water Street.

3.25 Soil Survey

Three different soils were reported to occur in the Dead Creek project area (Illinois Watershed Management Clearinghouse 2000). In the upstream portion of Area B, immediately south of Queeny Avenue, the landscape was considered Urban Land. This area was formally derived from alluvial soils and had since been modified by various earth moving and filling activity. The majority of Area B was Haynie Silt Loam. This soil is identified by its high composition of silt particles combined with lesser amounts of sand and clay. It is further characterized by 0–2 percent slope and occasionally flooded terrain. Beginning just upstream of Judith Lane (Area B) and occurring for the remainder of the length of the project area (to Route 3) were soils referred to as Shafton–Urban Land Complex. This soil, similar to Urban Land, is found in areas with a high degree of landscape modification. This soil is also described as having 0–2 percent slope and occasionally flooded terrain.

3.3 ANIMAL USE CHARACTERIZATION

Animal use of the Dead Creek study area was generally limited to species that do not require large tracts of pristine land and can tolerate some level of habitat modification and disturbance. These animals are mostly species that can utilize residential areas for foraging and/or shelter or are smaller vertebrates that have limited space requirements. The juxtaposition of forest, shrubland, and open water did provide for some landscape diversity. Additionally, the proximity of the site to the Mississippi River and presence of

wetlands provided feeding areas for migratory waterfowl and wading birds. The early age of most of the communities (due to disturbance), however, provided limited structural diversity.

Several species of bird were observed using Dead Creek and the adjacent riparian corridor for foraging and roosting during site visits from 2 and 8–11 November 2000. Many of the birds seen were those that frequent residential areas (e.g., American robin, northern cardinal, blue jay, northern mockingbird) and could use the project area for nesting. Carolina wrens, several species of sparrows, and Eurasian tree sparrows were noted utilizing the dense shrub and liana thickets north of Judith Lane in Area B. European starlings were seen roosting in large flocks in the larger trees along Dead Creek. Limited use of the open water sections by waterfowl and wading birds does occur. These open water areas of Dead Creek are likely also used during the breeding season for feeding by swallows, phoebes, and flycatchers. On two occasions, a great horned owl was seen in or near the study area. Bird species known or likely to occur in the Dead Creek study area are presented in Table 4. This table was created by field observations of bird sightings, notes on available habitat and condition, and gathering relevant range and life history information from National Geographic (1999), Korotev (1998), and Illinois Natural History Survey (2000).

Mammals using Dead Creek habitats were primarily rodents, small omnivores, and likely bats and insectivores (i.e., shrews). Eastern chipmunks and gray squirrels were seen frequently during the surveys. Raccoon tracks were found nearly everywhere the ground surface was conducive to track formation. The only large mammal documented in the study area was white-tailed deer. Numerous tracks were observed of this species. Mammal species known or likely to occur in the Dead Creek study area are presented in Table 4. This table was created by field observations of mammal sightings, notes on available habitat and condition, and gathering relevant range and life history information from Schwartz and Schwartz (1981) and Illinois Natural History Survey (2000).

Few amphibian and reptiles (collectively called herpetiles) were observed in the study area due to the time of survey. However, the stream channel and adjacent riparian forest provide habitat for a number of species that can occur in small, somewhat disturbed, water bodies. Animals that are ubiquitous in many wetland types in the United States, such as bullfrogs, northern cricket frogs, painted turtles, red-eared sliders, and common garter snakes, were expected to utilize Dead Creek for feeding and shelter. Herpetile species known or likely to occur in the Dead Creek study area are presented in Table 4. This table was created by field observations of amphibian and reptile sightings, notes on available habitat and condition, and gathering relevant range and life history information from Phillips *et al.* (1999), Johnson (2000), Conant and Collins (1991), and Illinois Natural History Survey (2000).

Though Illinois has a rich fish fauna, it was expected that few species would be found in the project area. Due to blocked drainages and elevated culverts, much of the upper Dead Creek functioned more as a series of linear, shallow ponds rather than a flowing stream course. Therefore, during much of the year, it would be difficult for fish to move through

the watershed to escape declining water levels or other stressful conditions (e.g., high water temperature, low dissolved oxygen, avian predators). Furthermore, Dead Creek generally possessed turbid water and had a soft bottom, eliminating species that require clear water and firm substrate. Blackstripe topminnows were seen in the upstream portion of Area E in approximately 50 cm of water. Other fish that could be found in the Dead Creek study area are listed in Table 4. This table was created by field observations of fish surveys, notes on available habitat and condition, and gathering relevant range and life history information from Fuller *et al.* (1999), McClane (1978), Missouri Department of Conservation (2000), Page and Burr (1991), and Illinois Natural History Survey (2000).

Invertebrate species use Dead Creek for feeding, reproduction, and larval habitat. Odonate larvae of both suborders Anisoptera and Zygoptera (dragonflies and damselflies, respectively) were observed. This order of insects has predaceous larvae. Their presence likely indicates that a prey base of smaller arthropods occurs in Dead Creek. Other predaceous invertebrates observed in Dead Creek were giant water bugs (Order Hemiptera). This species feeds on insects and tiny vertebrates (e.g., frog and salamander larvae). A relatively large crustacean (Order Amphipoda) was also observed south of Jerome Lane. This indicates fairly permanent standing water conditions for the upstream portion of Area E.

3.4 WETLAND FUNCTION–VALUE ASSESSMENT

The Illinois Department of Natural Resources (IDNR) currently does not recognize a formal procedure for completing wetland function-value assessments. Work is being completed by the United States Army Corps of Engineer's (USACE) St. Louis District office and IDNR that will generate wetland reference data in St. Clair County for use with the USACE's Hydrogeomorphic Assessment (HGM) technique. This technique utilizes wetland hydrogeomorphic classification, comparison to reference wetlands in the region, and set functional indices to determine wetland functional value. Because the necessary data for a comprehensive HGM assessment are not available at the time of writing, we have based this narrative assessment on HGM technique definitions and criteria in an attempt to facilitate agency review. Note that the HGM technique requires quantitative sampling of many wetland elements and processes. The objective of these initial field efforts was to collect baseline ecological data for potential use during restoration planning. Functions have been discussed in general terms, and are not intended to address each specific variable included in formal HGM analyses.

The HGM technique identifies seven distinct wetland types based on factors that influence how wetlands function. These factors include: (1) geomorphic setting, (2) water source, and (3) hydrodynamics. This technique also identifies regional wetland subclasses based on site-specific wetland characteristics. Based on this method, the upper approximately 2,400 m of the Dead Creek study area would be classified as a Depression (Open, Surface Water) Wetland. This determination is based on the fact that the system occurs in a series of topographic depressions with closed elevation contours that allow for the accumulation of surface water (Smith *et al.* 1995). In depression

systems, the direction of water movement normally is from the surrounding uplands to the center of the depression. These systems may have any combination of inlets and outlets. Given that the primary sources of water in this system include precipitation, overland flow, and interflow between basins, the HGM regional subclass "Open, Surface Water" would be assigned. It is likely that downstream portions of the Dead Creek system (i.e., unculverted stretches in Area F) would be classified as true riverine systems under this assessment method.

The following sections provide a narrative discussion of existing wetland functions in the upper portion of the Dead Creek study area from Area B to Area F. Functions discussed are based on the 15 wetland functions identified in the HGM methodology. Given the nature of this project, discussion has been limited to provide a general depiction of existing site conditions.

3.41 Dynamic Surface Water Storage

The portion of the Dead Creek study area encompassed by Areas B–F is functionally similar to a series of interconnected detention basins. Urbanization of the surrounding landscape has resulted in a high percentage of impervious surface including roads, parking areas, and buildings. This factor, combined with multiple culvert crossings and storm drain outlets, has altered the natural hydrology and flow regimes of this system. Each of the basins, as separated by road crossings, responded to inputs of overland runoff somewhat independently of each other. This was primarily due to culvert restrictions and culvert elevations that were, in several areas, above the channel bed elevation. Due to these factors, overland flows were detained in the creek bed for prolonged periods and downstream channel flows through the length of the system were limited to full pond conditions when surface water elevations exceeded culvert elevations. The eight basins included in this portion of the Dead Creek study area were able to detain large amounts of overland runoff, and desynchronize or gradually release flood flows that would have otherwise emptied directly to riverine portions of Dead Creek south of Route 3.

Dynamic surface water storage capacity refers to a wetland's ability to slow and partially detain overland flows from uplands, or overbank flows during flood events, prior to flows reaching the open channel or basin associated with the subject wetland. Dynamic surface water storage capacity was not considered to be an important function of the Dead Creek wetlands in this upper portion of the system. This is because Areas B–F were channelized and contained few functional floodplain wetlands. Rather than flows passing through floodplain wetland transition zones prior to entering a water body, overland flow drained directly into the channel or impounded water. Dense herbaceous vegetation persisted in the *Persicaria*-Mixed Forb

communities, and dense woody stems occurred throughout areas mapped as *Fraxinus–Ulmus* Temporarily Flooded Forest community. This vegetation may have contributed to site roughness and slow overland flow velocities. However, long-term surface water storage was likely a more important function provided by this portion of the study area.

3.42 Long-Term Surface Water Storage

Unlike the dynamic surface water storage function that relates to a wetlands ability to slow flowing water, long-term surface water storage relates to the wetlands ability to store water once overbank flow retreats into the channel or basin, and is present for durations in excess of seven days. Long-term surface water storage was a primary function of the upper stretch of Dead Creek given the multiple restricted outlets present. To some extent, each of the interconnected basins included in Areas B–F acted as detention ponds for overland runoff from adjacent developed areas. During site investigations, surface water depths in aquatic communities varied from 30–130 cm. Although investigations were limited to a single week in the field, aquatic communities observed were well established and supported aquatic plant and animal species typical of shallow pond ecosystems in the region. Several of the basins included relatively deep organic muck substrates indicative of long-term organic settling and decay.

As discussed above, culvert elevations that limited downstream flows were the primary factor allowing long-term ponding in this system. Continuous flows from Area B to riverine portions of Area F were likely limited to periods with high runoff when the individual basins were at full holding capacity and surface water elevations reached culvert heights throughout the length of the system. All of the areas investigated for the purposes of this characterization study showed signs of being able to expand surface water detention capacity beyond the apparent limits of developed aquatic community types. This ability to expand water detention was evidenced by identifiable debris lines, silt deposits, and ice damage to woody stems.

3.43 Energy Dissipation

Energy dissipation functioning relates to the physical expression of flow velocities (i.e., deposits of woody debris, gravel deposits, and channel scours) and how these occurrences contribute to further slowing channel velocities. Energy dissipation functioning in the study area was primarily attributable to standing surface water that in effect halted flow velocity in several basins and allowed for gradual release to downstream areas. A few portions of the study area demonstrated more of the traditional indicators of energy dissipation. These indicators were limited to areas less-frequently ponded that maintain some riverine characteristics. Area B included the most pronounced signs of energy

dissipation in the study area. These signs included scoured gravel deposits and braided channels within the mapped *Salix nigra* Temporarily Flooded Forest community; buildup of coarse woody debris, including large tree trunks, throughout the upper channel; and fine woody debris along channel edges. These elements contributed to channel surface roughness that in turn contributed to energy dissipation of flow velocities.

3.44 Subsurface Storage of Water

As periodic draw down of surface water and reduction in soil saturation occurs, water storage capacity in drained soil pores becomes available. This storage capacity provides available volume for storing surface flows that would otherwise directly increase channel or basin inundation. Subsurface storage functioning is largely dependent on soil porosity and rate of water level fluctuations. Wetland soils throughout the study area consisted of poorly and very poorly drained silt loams, most of which were permanently saturated or flooded. Subsurface storage of water was unlikely to be a significant function performed by study area wetlands given the low porosity of project area silt loams, and the apparent permanence of soil saturation throughout the project area. Upland soils present within the mapped *Fraxinus pennsylvanica–Ulmus americana* Temporarily Flooded Forest community type likely offered some subsurface storage capacity within the riparian corridor.

3.45 Moderation of Groundwater Flow or Discharge

This function refers to the ability of the receiving wetland to modify groundwater flow rates entering the wetland from up-gradient sources. Similar to a wetland's capacity to alter the rate of overland runoff, modification of groundwater flows enables a wetland to buffer downstream surface bodies from the effects of cumulative hydrologic inputs. The Dead Creek study area is located on a flat terrace within the Mississippi plain. This flat topography is not conducive to groundwater discharge or seep formation. No seeps were noted during our investigations, and the ability of the upper Dead Creek wetlands to perform this function is likely limited.

3.46 Nutrient Cycling

Analysis of the nutrient cycling function is intended to measure the ability of a wetland to maintain living biomass and detrital stocks. The balance achieved in a given wetland system to convert organic matter into primary productivity and in turn release nutrients back into the cycle as detritus is indicative of a wetlands ability to perform other functions. A proper assessment of this function should limit consideration of nutrient imports from outside of the wetland. The potential for the wetland to absorb nutrients in runoff is discussed below as part of the Removal of Imported Elements and Compounds function.

Seven distinct plant community types had been mapped in the project area. Each contributed to the uptake of nutrients for primary productivity and contributed to existing detrital stocks. Perhaps the greatest contribution of seasonal detritus came from the three

deciduous forested communities types: *Populus deltoides* Temporarily Flooded Forest, *Fraxinus pennsylvanica–Ulmus americana* Temporarily Flooded Forest, and *Salix nigra* Temporarily Flooded Forest. The measured average basal area for these stands in the study area was approximately 67 m/ha. Approximately 3.26 ha of deciduous forest communities were mapped in close association with the wetland study area. Detrital stocks, including leaf litter, downed woody debris, and standing snags, were noted throughout the length of the project area. Observed vigor and density of plant communities and few signs of eutrophication, or excess nutrients, indicated that net productivity and annual detritus turnover rates were in balance. Our ability to properly assess this function was limited by the lack of reference site data and quantitative measures of litterfall and net biomass production within the study area.

3.47 Removal of Imported Elements and Compounds

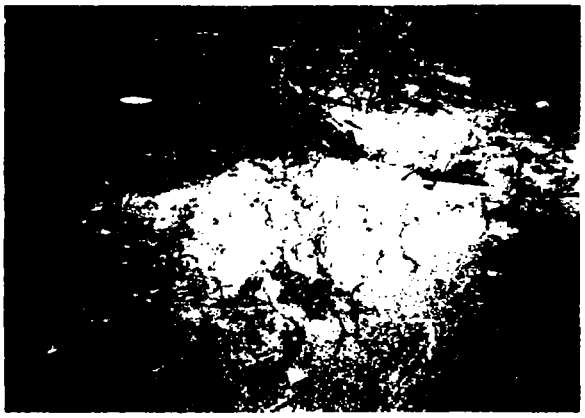
Removal of imported elements and compounds was a primary function performed by the project area wetlands. The urbanized landscape surrounding the study area, and the geographic position of the wetlands as headwaters to a riverine system enabled this portion of Dead Creek to intercept nutrients and contaminants from non-point overland runoff and point sources including storm drain outlets. The ability of the wetland basins to perform this function was further enhanced by long-term water detention capacity and the presence of both dense woody and herbaceous vegetation capable of removing elements through absorption into rhizomes and roots.

Additional variables contributing to the wetlands ability to trap nutrients included an abundance of surfaces available for microbial activity, sorptive properties of the study area soils, and deep organic sediment. Microbial activity removes or renders inactive many chemicals and compounds. Microbes are typically associated with complex surfaces such as leaf litter, humus, and plant surfaces. Aquatic vegetation in the *Potamageton–Cerataphyllum–Elodea* Permanently Flooded Herbaceous community throughout the study area provided substantial surface area for microbial activities. Fine textured soils such as the project area silts typically offer greater sorption capacities than more coarse soil types.

3.48 Retention of Particulates

Similar to the study area wetlands ability to remove dissolved substances in overland runoff, this system is able to slow and detain runoff waters and allow suspended particles to settle out of the water column. Restricted outlets in each of the basins prevent significant sediment flushing to downstream portions of Dead Creek. Over time, it is likely that the particulate matter accumulates in the lower portions of the basins and

becomes colonized by aquatic and emergent vegetation. The development of dense herbaceous communities within shallow portions of the basins likely augments retention functioning by increasing the roughness factor of the wetland and further slowing flow rates. The communities best able to support this function were the *Persicaria–* Mixed Forb Temporarily Flooded Herbaceous and *Potamageton–Cerataphyllum–Elodea* Permanently Flooded Herbaceous aquatic beds that occasionally covered the width of the basins and were therefore exposed to the largest percentage of flows. Surface runoff and storm drain outflows that emptied directly into open water portions of the study area wetlands were immediately slowed regardless of the presence of intercepting vegetation. In these situations, particulate matter was able to settle as a direct result of change in velocity.



3.49 Organic Carbon Export

Organic carbon export refers to the process through which dissolved and particulate organic carbon is exported from a wetland through leaching, flushing, and erosion. The ability of the study area wetlands to perform this function was limited to processes of leaching. It is likely that dissolved organic carbon (DOC) was leached from detritus and organic muck and transported via surface flows to downstream portions of the study area. Due to the relatively closed nature of this depression wetland system, much of the leached DOC was likely used by microbial processes within the basin.

3.410 Maintain Characteristic Plant Community

Seven vegetation alliances were mapped in the study area. Community determinations were based on Drake and Faber-Langondoen (1997). Because the portion of Dead Creek investigated for the purposes of this report was located in a residential area, the plant communities represented included some of the typical alliance characteristics, but were largely dominated by weedy and often non-native invasive species. Non-native invasive species common, and often dominant, throughout the study included:

tree-of-heaven
paper mulberry
trumpet-creeper
barnyard grass
Chinese spindle-tree
gill-over-the-ground
Japanese hops
reed fescue
Japanese honeysuckle
Amur honeysuckle
white mulberry
smartweed
lady's thumb
black locust
multiflora rose
curly dock
pigeon grass
Johnson grass
common chickweed
field hedge-parsley
Siberian elm
common mullein
common cocklebur

Determinations of plant invasiveness are based on Shackleford, Padley, and Schultes (1998) and on-site observations.

Few portions of the study area maintained community characteristics similar to the more mature bottomland hardwood stands in lower Area F. This was primarily due to the disturbance regime, dominance of non-native species, and 'edge' type community present along the Dead Creek corridor. A factor considered by the HGM method in the evaluation of this function is whether the project area community will, through succession, develop characteristics of typical reference wetland communities. The plant communities in the study area did not appear to be progressing toward a more typical bottomland community structure. Represented seedlings and saplings consisted, in part, of non-native species, including tree-of-heaven, paper mulberry, white mulberry, and Siberian elm.

The disturbed condition of plant communities throughout the study area limited the potential occurrences for rare, threatened or endangered species. Early wild-rye was documented in the *Fraxinus pennsylvanica-Ulmus americana* Temporarily Flooded Forest communities in Area C. This species is not currently listed by the Illinois Endangered Species Protection Board as rare, however, this is likely due to the recentness of this plant's description rather than its conservation biology. Information regarding this species occurrence has been included in Section 3.22.

3.411 Maintain Characteristic Detrital Biomass

This function relates to the presence of fine woody debris (wood <10cm in diameter) and coarse woody debris (wood >10cm in diameter) within the study area. Determinations are based on the production rates, accumulation, and dispersal of woody debris and other dead plant biomass as compared to reference wetland standards.

Four tree and shrub dominated community types occurred along the length of the study area. Only a few portions of the creek bank were without woody cover. Coarse woody debris, including standing snags, downed trunks, and branches, were noted within each basin other than the southernmost basin in Area E. Similarly, accumulations of fine woody debris were noted in drift lines along the wetland edge in most basins. Functions provided by woody debris varied with occurrence in each basin. Standing snags noted in Area B contained several cavities that were being utilized by Eurasian tree sparrows at the time of our investigation, and were likely used by several species during the breeding season. Downed trees and large branches in the Area B channel slowed flows and trapped additional debris carried in surface water. Silt and fine woody debris had accumulated behind several of the downed trees and branches in Area B. Elsewhere in the study area, coarse woody debris occurred in permanently flooded areas, acting as structure for aquatic habitat, while fine woody debris contributed to detritus available for nutrient recycling.

3.412 Maintain Spatial Structure of Habitat

The goal of assessing this function was to evaluate the structural and spatial complexity of the study area wetland plant community with focus on those elements that affect animal populations. The upper portion of Dead Creek assessed for the purposes of this report functioned as a riparian corridor, and in some respects a habitat island, which extended through a populated residential area. True wetland plant communities in the project area were structurally limited to herbaceous species and small patches of shrub and tree dominated communities. However, the adjacent temporarily flooded forest communities, although technically not entirely wetlands, maintained some structural diversity utilized by resident and migratory wildlife.

Dense shrub and liana growth occurred commonly along the banks of the study area, particularly in Area B. At the time of our investigations, eastern cottontail rabbits, northern bobwhite, and numerous perching birds, were utilizing these areas. Dense growth provided cover, fruit, and nesting opportunity, as evidenced by the abundance of songbird nests visible after leaf-off.

Uneven canopies (i.e., structurally diverse canopies) were present in the study area, but were sporadic and limited in size. Most of the tree stratum in the study area was too young or comprised of too few species to be very diverse. The patchiness of canopy cover contributed to the structural heterogeneity of the corridor. Species observed in areas with well-developed tree strata included roosting great horned owl, red-tailed hawk, woodpeckers, white-breasted nuthatch, and eastern gray squirrel. Trees that would be considered very mature by the HGM method were scattered along the length of the study area with greatest density occurring in the mapped *Populus deltoides* Temporarily Flooded Forest community in Area E. Similarly, several large snags were noted throughout the study area, but the occurrence of this structural feature did not represent a significant component of any community type mapped.

3.413 Maintain Interspersion and Connectivity

Proper evaluation of this function requires that potential for both aquatic and terrestrial organism movement be considered. Primary factors that dictate interspersion potential are surface water connections and the presence of continuous vegetative cover. Surface water connections that could facilitate inter-basin movements of aquatic invertebrates and vertebrates appeared limited to seasonal occurrences in some portions of the study area

and were relatively permanent in others. As discussed above, this was due to anthropogenic disturbances, primarily culvert crossings. Terrestrial connectivity was relatively continuous along the length of the study area given the dense shrub growth that lined most of the channel. This connectivity was fragmented by eight road crossings and a large parking lot. Overland access to areas outside of the Dead Creek corridor was not only limited by residential development, but also by the presence of fencing that would inhibit large mammal movements into or out of the riparian corridor.

3.414 Maintain Distribution and Abundance of Invertebrates

Due to the reconnaissance nature of these preliminary investigations, no attempts were made by Woodlot to comprehensively sample the existing invertebrate community. Proper analysis of this function as defined in the HGM method requires both terrestrial and benthic sampling to characterize invertebrate use and abundance within the project area. Potential for use can be assumed based on our site observations, macrophyte and emergent vegetation mapping efforts, and limited aquatic sampling. The HGM method identifies coarse particulate organic matter (CPOM) as a critical variable that can determine potential abundance of invertebrates in a given wetland system. The overland runoff detention capacity of basins and the presence of deciduous trees, shrubs, and lianas along most of the study area length likely added to the available CPOM required by invertebrates. Submersed macrophytes provided an important source of organic matter available to aquatic invertebrates. Floating primrose-willow was abundant in shallow, permanently flooded portions of the study area. The annual senescence of the emergent communities also contributed to available CPOM in the system.

3.415 Maintain Distribution and Abundance of Vertebrates

As discussed above, comprehensive assessments of vertebrate use in the study area has not been completed to date. Table 3 includes a list of species observed during vegetation alliance and wetland characterization work. This table also includes species likely to use the upper portion of Dead Creek (Areas A–F). Field observations for the purposes of this preliminary assessment were limited to five days in early November. During this time, 57 species of birds, and 5 species of mammals were observed without using formal sampling techniques. It appears that the riparian communities extending from Area B to Area F were well utilized by vertebrate species in the local area, and may have served as a localized travel corridor for species moving through this developed area.

Aside from the direct measures of abundance of fish, herpetiles, birds, and mammals, the HGM method also considers beaver use in the study area wetlands. Beaver herbivory was noted in several of the project area basins. No lodges, or dams were noted, but the increased downed coarse woody debris resulting from the beaver activity likely enhanced other wetland functions performed in the study area.

4.0 LITERATURE CITED

Brinson, M.M., R.D. Rheinhardt, F.R. Hauer, L.C. Lee, W.L. Nutter, R.D. Smith, and D. Whigham. 1995. A Guidebook for Application of Hydrogeomorphic Assessments to Riverine Wetlands. United States Army Corp of Engineers, Wetlands Research Program Technical Report WRP-DE-11.

Campbell, J.J.N. in ed. Notes on North American *Elymus* species (Poaceae) with paired spikelets: *E. macregorii* sp. nov., *E. glaucus* ssp. *mackenzii* comb. nov., and problems in the "*interruptus*" group.

Conant, R. and J.T. Collins. 1991. A Field Guide to Reptiles and Amphibians. Houghton Mifflin Company, Boston, MA.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Washington, D.C.

Drake and Faber-Langendoen. 1997. An Alliance Level Classification of the Vegetation of the Midwestern United States. Report to the University of Idaho Cooperative Fish and Wildlife Research Unit and GAP Analysis Program. Copyright The Nature Conservancy 1997.

Ehrlich, P.R., D.S. Dobkin, and D. Wheye. 1988. The Birder's Handbook: A Field Guide to the Natural History of North American Birds. Simon and Schuster Inc., New York, NY.

Fuller, P.L., L.G. Nico, and J.D. Williams. 1999. Nonindigenous fishes introduced into inland waters of the United States. American Fisheries Society, Special Publication 27.

Illinois Endangered Species Protection Board. 2000. Endangered and Threatened Species List. URL: http://dnr.state.il.us/espb/datelist.htm. Springfield, IL.

Illinois Natural History Survey. 2000. Birds of Illinois. URL: http://www.inhs.uiuc.edu/cbd/ilspecies/birdsplist.html. Champaign, IL.

_____. 2000. Fishes of Illinois. URL: http://www.inhs.uiuc.edu/cbd/ilspecies/fishsplist.html. Champaign, IL.

_____. 2000. The Amphibian and Reptile Species of Illinois. URL: http://www.inhs.uiuc.edu/cbd/herpdist/splist.html. Champaign, IL.

_____. 2000. Mammals of Illinois. URL: http://www.inhs.uiuc.edu/cbd/ilspecies/mammalsplist.html. Champaign, IL.

Illinois Watershed Management Clearinghouse. 2000. Map Illinois for Watersheds. URL: http://lotus.itcs.uiuc.edu/website/MIW1/viewer.htm?Title=Map%20Illinois%20for%20Watersheds. University of Illinois, Urbana-Champaign, IL.

Johnson, T.R. 2000. The Amphibians and Reptiles of Missouri, second edition. Missouri Department of Conservation, Jefferson City, MO.

Korotev, R. 1998. A Field Checklist of Birds of the St. Louis Area. Webster Groves Nature Study Society, St. Louis, MO.

McClane, A.J. 1978. Field Guide to Freshwater Fishes of North America. Holt, Rinehart, and Winston, NY.

Missouri Department of Conservation. 2000. Missouri Fish and Wildlife Information System. URL: http://www.conservation.state.mo.us/nathiso/mofwis/. St. Louis, MO.

National Geographic Society. 1999. Field Guide to the Birds of North America. National Geographic Society, Washington, D.C.

Page, L.M. and B.M. Burr. 1991. Peterson Field Guides: A Field Guide to Freshwater Fishes. Houghton Mifflin Company, Boston, MA.

Phillips, C.A., R.A. Brandon, and E.O. Moll. 1999. Field Guide to Amphibians and Reptiles of Illinois. Illinois Natural History Survey Manual 8.

Schwartz, C.W. and E.R. Schwartz. 1981. The Wild Mammals of Missouri, revised edition. University of Missouri Press and Missouri Department of Conservation, Columbia, MO.

Shackleford, I, E. Padley, and J. Schultes. 1998. Noxious Weeds and Non-native Invasive Plants: Invasive plants reported within the Eastern Region, compiled from States' information. URL: http://www.fs.fed.us/r9/weed/Sec3A.htm.

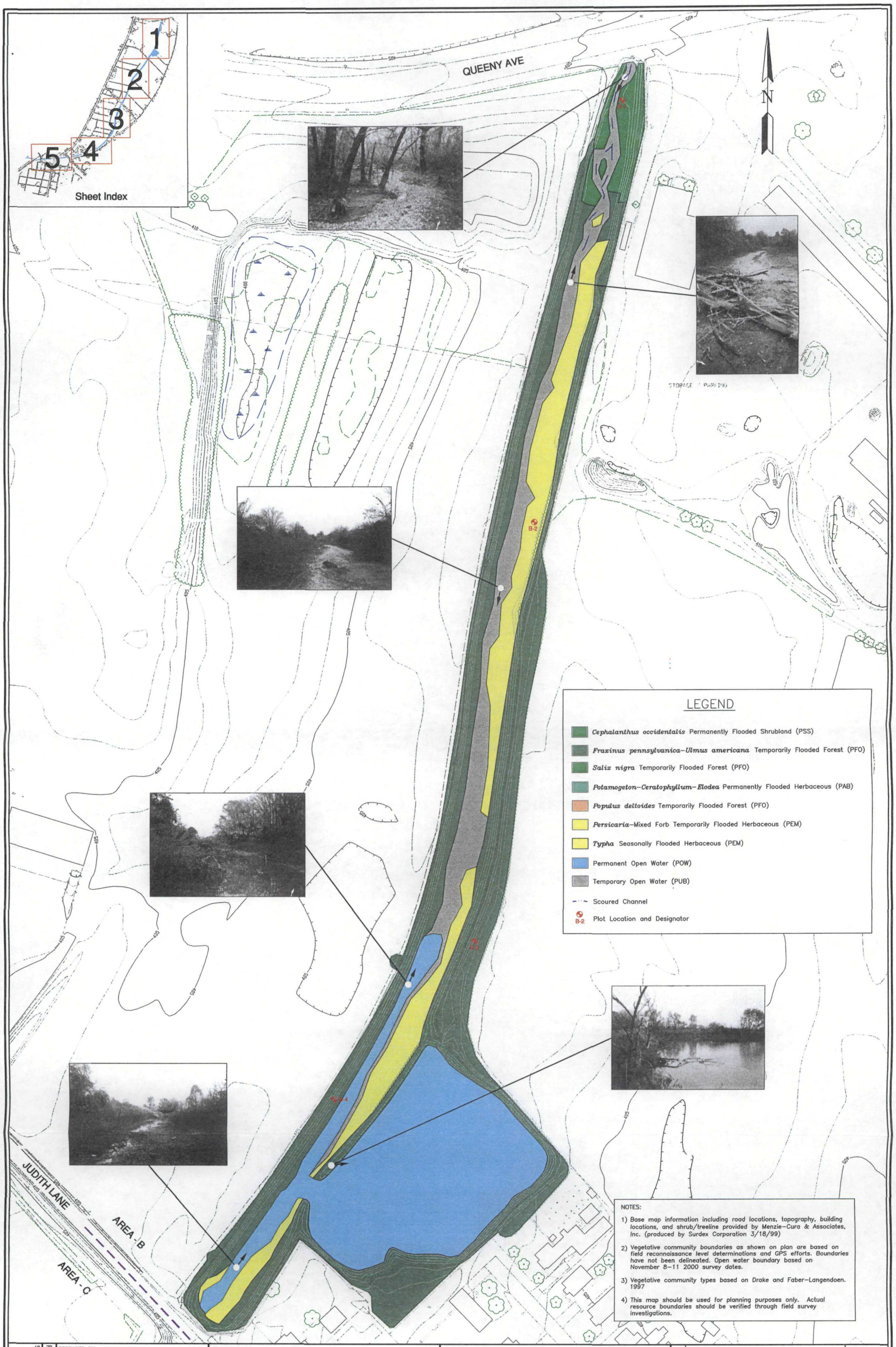
Smith, R.D., A. Ammann, C. Bartoldus, and M.M. Brinson. 1995. An Approach for Assessing Wetland Functions Using Hydrogeomorphic Classification, Reference Wetlands, and Functional Indeces. United States Corps of Engineers, Wetlands Research Program Technical Report WRP-DE-9.

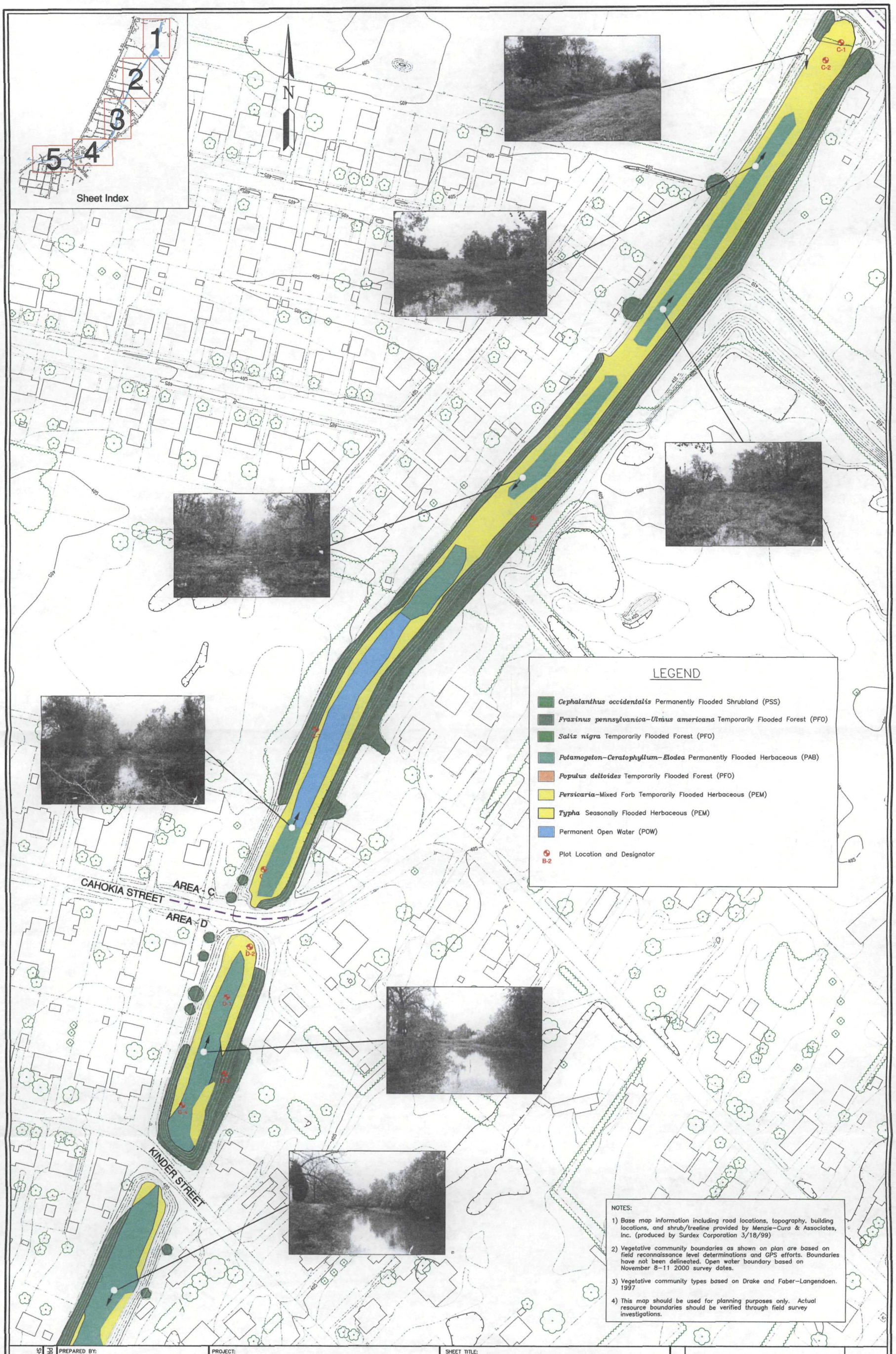
Solutia, Inc. 2000. Solutia Begins Sauget/Cahokia Removal Project in Cooperation With EPA URL: http://www.solutia.com/newsreleases/communitynews/00-06-01saugetcahokia.html.

Thomas, J.W., R. Anderson, C. Maser, and E. Bull. 1979. Snags *in* Thomas, J.W., editor, Wildlife Habitats in Managed Forests—the Blue Mountains of Oregon and Washington. Agricultural Handbook 553. United States Department of Agriculture, Washington, D.C.

United States Army Corps of Engineers. 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1. Department of the Army, Waterways Experiment Station, Vicksburg, Mississippi.

United States Environmental Protection Agency. 1996. NPL Site Narrative Listing: Sauget Area 1. URL: http://www.epa.gov/superfund/sites/npl/nar1476.htm.


Sheet Index
1
2
3
4
5
QUEENY AVE
N
B-2
JUDITH LANE
AREA - B
AREA - C
STORAGE / PARKING
LEGEND
Cephalanthus occidentalis Permanently Flooded Shrubland (PSS)
Fraxinus pennsylvanica–Ulmus americana Temporarily Flooded Forest (PFO)
Salix nigra Temporarily Flooded Forest (PFO)
Potamogeton–Ceratophyllum–Elodea Permanently Flooded Herbaceous (PAB)
Populus deltoides Temporarily Flooded Forest (PFO)
Persicaria–Mixed Forb Temporarily Flooded Herbaceous (PEM)
Typha Seasonally Flooded Herbaceous (PEM)
Permanent Open Water (POW)
Temporary Open Water (PUB)
Scoured Channel
B-2 Plot Location and Designator
NOTES:
1) Base map information including road locations, topography, building locations, and shrub/treeline provided by Menzie–Cura & Associates, Inc. (produced by Surdex Corporation 3/18/99)
2) Vegetative community boundaries as shown on plan are based on field reconnaissance level determinations and GPS efforts. Boundaries have not been delineated. Open water boundary based on November 8–11 2000 survey dates.
3) Vegetative community types based on Drake and Faber–Langendoen. 1997
4) This map should be used for planning purposes only. Actual resource boundaries should be verified through field survey investigations.
SHEET NO. 1 of 5
PROJ. NO. 100123
PREPARED BY:
WOODLOT ALTERNATIVES, INC.
122 MAIN STREET, TOPSHAM, MAINE 04086
www.woodlotalt.com
PROJECT:
Dead Creek Project Area
Baseline Habitat Assessment
ADDRESS:
Cahokia
Illinois
SHEET TITLE:
Wetland Characterization and Vegetation Alliance Map
SCALE:
1"=60'
DATE:
January 2001
NO.
REVISIONS
DATE



SHEET NO. 2 of 5

PROJ. NO. 100123

PREPARED BY:
WOODLOT ALTERNATIVES, INC.
122 MAIN STREET, TOPSHAM, MAINE 04086
www.woodlotalt.com

PROJECT:
Dead Creek Project Area
Baseline Habitat Assessment

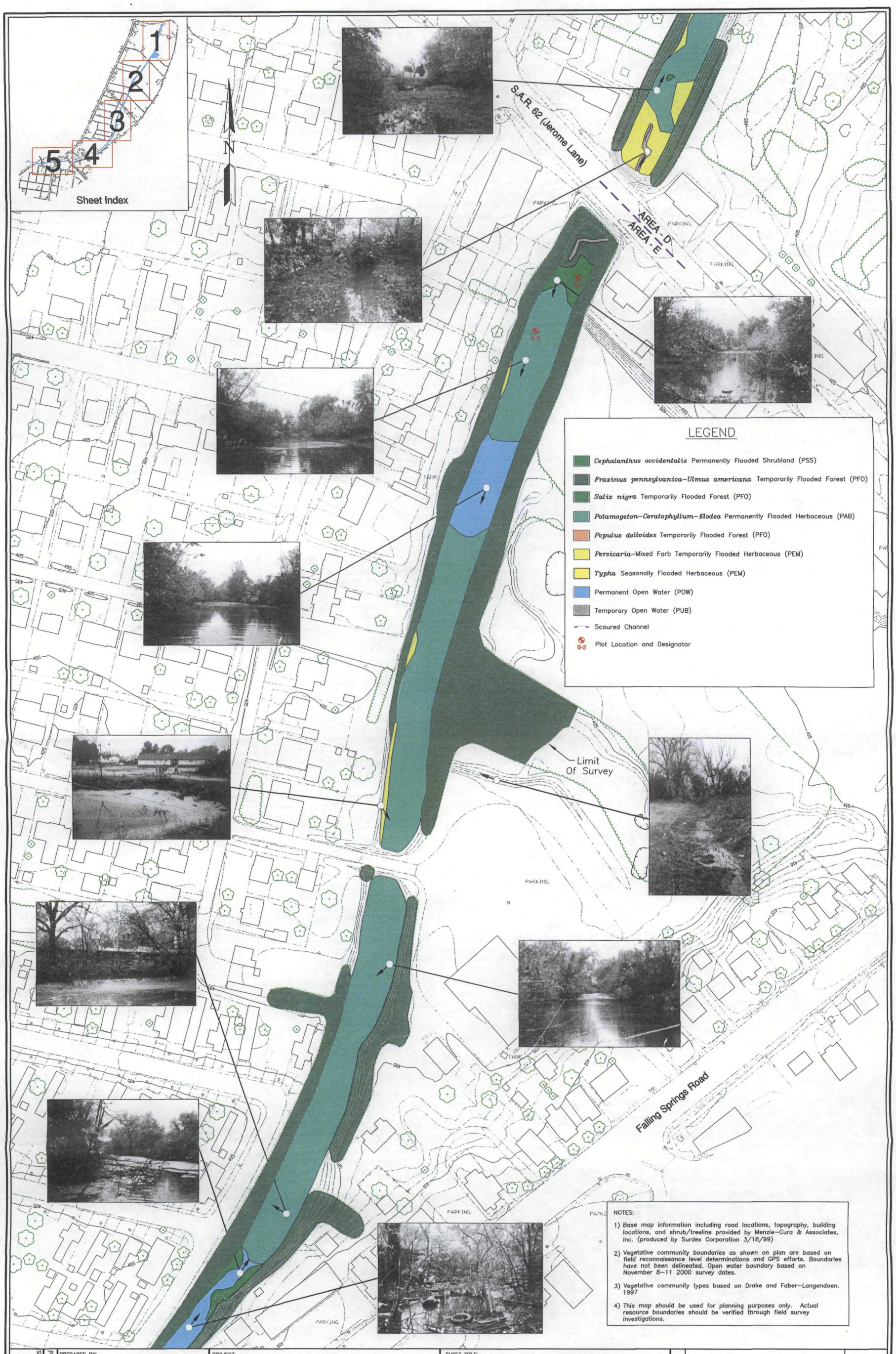
ADDRESS:
Cahokia
Illinois

SHEET TITLE:
Wetland Characterization And Vegetation Alliance Map

SCALE:
1"=60'

DATE:
January 2001

NO.	REVISIONS	DATE



SHEET NO. 3 of 5

PROJ. NO. 100123

PREPARED BY:
WOODLOT ALTERNATIVES, INC.
122 MAIN STREET, TOPSHAM, MAINE 04086
www.woodlotalt.com

PROJECT: Dead Creek Project Area Baseline Habitat Assessment

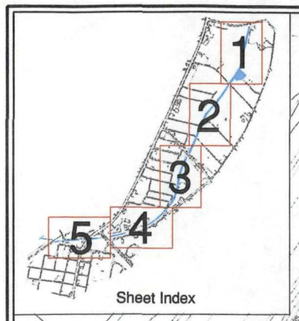
ADDRESS: Cahokia, Illinois

SHEET TITLE: Wetland Characterization And Vegetation Alliance Map

SCALE: 1"=60'

DATE: January 2001

NO.	REVISIONS	DATE



LEGEND

- *Cephalanthus occidentalis* Permanently Flooded Shrubland (PSS)
- *Fraxinus pennsylvanica–Ulmus americana* Temporarily Flooded Forest (PFO)
- *Salix nigra* Temporarily Flooded Forest (PFO)
- *Potamogeton–Ceratophyllum–Elodea* Permanently Flooded Herbaceous (PAB)
- *Populus deltoides* Temporarily Flooded Forest (PFO)
- *Persicaria*–Mixed Forb Temporarily Flooded Herbaceous (PEM)
- *Typha* Seasonally Flooded Herbaceous (PEM)
- Permanent Open Water (POW)
- B-2 Plot Location and Designator

NOTES:

1) Base map information including road locations, topography, building locations, and shrub/treeline provided by Mcnzie-Cura & Associates, Inc. (produced by Surdex Corporation 3/18/99)

2) Vegetative community boundaries as shown on plan are based on field reconnaissance level determinations and GPS efforts. Boundaries have not been delineated. Open water boundary based on November 8–11 2000 survey dates.

3) Vegetative community types based on Drake and Faber–Langendoen. 1997

4) This map should be used for planning purposes only. Actual resource boundaries should be verified through field survey investigations.

NO.	REVISIONS	DATE

SHEET TITLE: Wetland Characterization and Vegetation Alliance Map

SCALE: 1"=60'

DATE: January 2001

PROJECT: Dead Creek Project Area Baseline Habitat Assessment

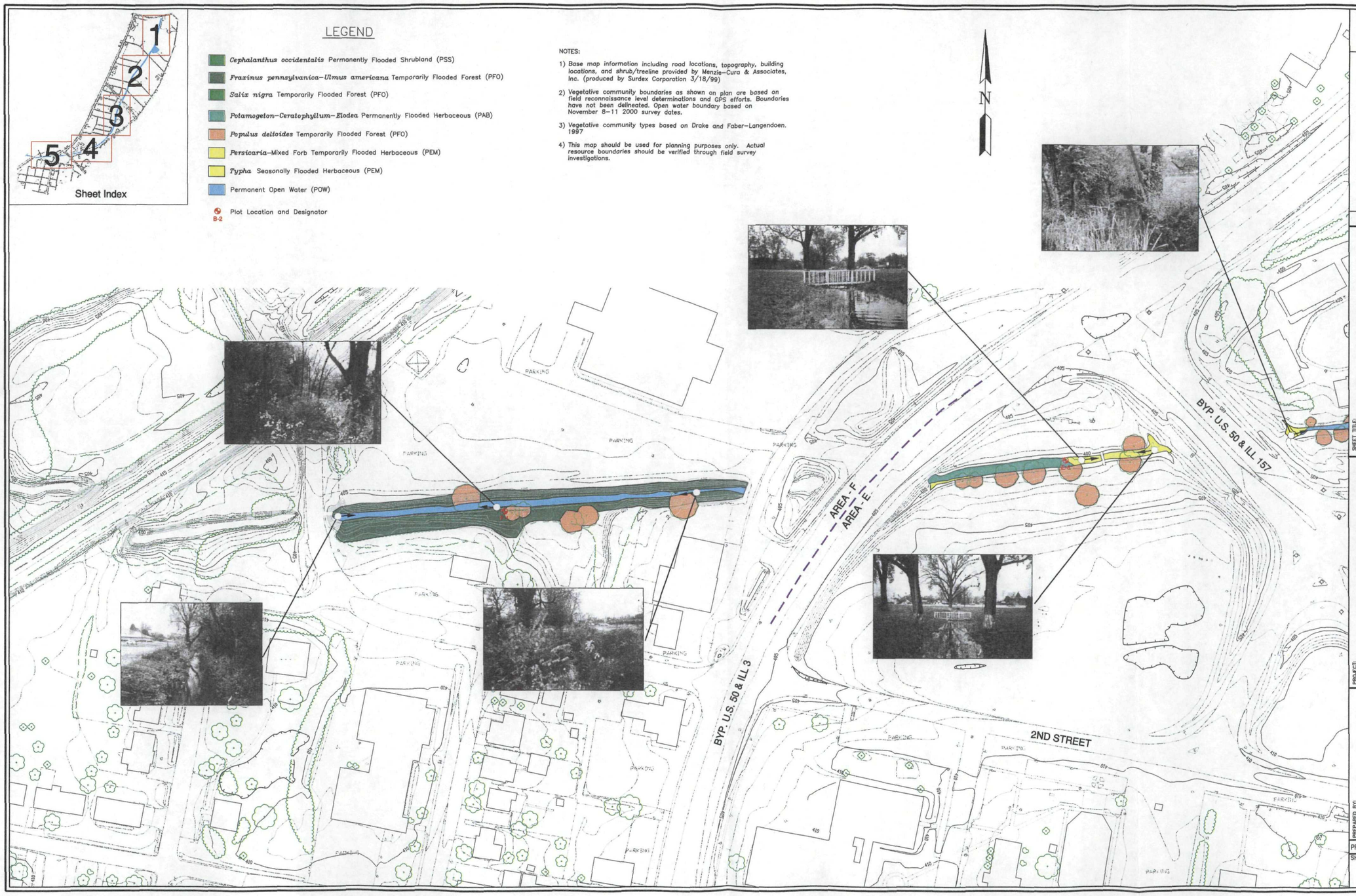
ADDRESS: Cahokia Illinois

PREPARED BY:

WOODLOT ALTERNATIVES, INC.
122 MAIN STREET, TOPSHAM, MAINE 04086
www.woodlotalt.com

PROJ. NO. 100123

SHEET NO. 4 of 5



NO.	REVISIONS	DATE

SHEET TITLE: Wetland Characterization and Vegetation Alliance Map

SCALE: 1"=60'

DATE: January 2001

PROJECT: Dead Creek Project Area Baseline Habitat Assessment

ADDRESS: Cahokia Illinois

PREPARED BY: WOODLOT ALTERNATIVES, INC. 122 MAIN STREET, TOPSHAM, MAINE 04086 www.woodlotalt.com

PROJ. NO. 100123

SHEET NO. 5 of 5

APPENDIX B

CREEK BOTTOM SOIL DATA
AND SUMMARY STATISTICS BY CREEK SECTION

Appendix B–1 Procedures for Data Analysis

This section describes how the post remediation creek bottom soil data were handled and how summary statistics and exposure point concentrations were calculated.

Data Management

Menzie-Cura & Associates, Inc. received the data from ENSR. The data were separated according to creek segment (creek segments B through F) and duplicates were averaged. Duplicates were averaged in the following manner:

If both concentrations were detected, the average concentration of the two is used;

If both concentrations were not detected, the minimum detection limit is used;

If one concentration is detected and one concentration is not detected, the detected concentration is used.

The data were then screened to eliminate unusually high detection limits by comparing each detection limit against the maximum detected concentration calculated for a particular compound (US EPA, 1989). Any detection limits where one half the detection limit exceeds the maximum detected concentration were eliminated from further analysis.

Calculation of Summary Statistics

Summary statistics were calculated for each creek segment and are presented in this Appendix. Total DDT, total PAHs, total PCBs were calculated prior to calculating summary statistics. Total TEQ was calculated by first multiplying the measured concentrations by their respective toxic equivalency factors (TEFs) for mammals (Van den Berg, M. et al., 1998) and summing the results to get a total TEQ estimate for each sample. The total TEQ concentrations were then used in the summary statistics. The average, 50th percentile, 75th percentile and 95th percentile concentrations were calculated assuming one half the detection limit for non-detects.

Calculation of Exposure Point Concentrations

Exposure point concentrations (EPCs) are calculated for each compound and are presented in this Appendix. The distribution of the data is tested for normality using the Shapiro-Wilks W test ($p=0.05$). Ninety-fifth percentile upper confidence limits (UCLs) on the mean are calculated assuming both normality and lognormality. The selected UCL represents the appropriate 95th percentile UCL on the mean depending on the results of the distribution test. If the data are found to be normally distributed, the normal UCL is used. However, if the data are not normally distributed then they are assumed to be lognormally distributed and the lognormal UCL is used. Finally, the EPC is selected in the following way:

if a compound is never detected, an EPC is not calculated;
if there were less than 10 samples used, the average was used;
if the selected UCL is greater than the maximum detected concentration, the maximum detected concentration is used;
otherwise, the selected UCL is used.

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T0-C1		CBS-CSB-T10-C1		CBS-CSB-T10-E1		CBS-CSB-T10-W1		CBS-CSB-T11-C1		CBS-CSB-T11-E1		CBS-CSB-T11-W1		CBS-CSB-T12-C1	
Cyanide	0.81		0.71	U	0.68	U	0.68	U	0.68	U	0.6	U	0.63	U	1.1	
Pesticides/Herbicides (ug/kg)																
2,4,5-T	12	U	12	U	11	U	11	U	6.5		10	U	10	U	12	J
2,4,5-TP (Silvex)	12	U	12	U	11	U	11	U	11	U	2	J	10	U	12	U
2,4-D	12	U	12	U	11	U	11	U	11	U	10	U	10	U	12	U
2,4-DB	12	U	12	U	11	U	11	U	57		10	U	10	U	36	J
4,4'-DDD	470	J	3	J	4.4	U	4.4	U	4.5	U	4	U	4.2	U	4.9	U
4,4'-DDE	120	U	4.7	U	4.4	U	4.4	U	4.5	U	4	U	4.2	U	4.9	U
4,4'-DDT	120	U	4.7	U	31	J	13		4.5	U	4	U	4.2	U	4.9	U
Aldrin	62	U	2.4	U	2.3	U	2.3	U	2.3	U	2.1	U	2.2	U	2.5	U
alpha-BHC	18	U	0.71	U	0.68	U	0.68	U	1.6	J	0.61	U	0.68	J	0.75	U
alpha-Chlordane	62	U	2.4	UJ	2.3	UJ	2.3	UJ	2.3	U	2.1	U	2.2	U	2.5	U
beta-BHC	18	U	0.71	U	0.68	U	2.6		1	J	0.61	U	2	J	0.75	U
Dalapon	96	U	93	U	88	U	88	U	89	U	79	U	82	U	97	U
delta-BHC	18	U	0.71	U	0.68	U	0.68	U	0.68	U	0.61	U	0.63	U	0.75	U
Dicamba	29	U	28	U	27	U	2.1	J	3.1	J	1.6	J	2.8	J	30	U
Dichlorprop	150	U	140	U	140	U	140	U	140	U	120	U	130	U	150	U
Dieldrin	120	U	4.7	U	4.4	U	4.4	U	4.5	U	4	U	4.2	U	4.9	U
Dinoseb	150	U	140	U	140	U	140	U	680	U	120	U	130	U	750	U
Endosulfan I	62	U	2.4	U	2.3	U	2.3	U	2.3	U	2.1	U	2.2	U	2.5	U
Endosulfan II	120	U	4.7	U	4.4	U	4.4	U	4.5	U	4	U	4.2	U	4.9	U
Endosulfan sulfate	120	U	4.7	U	4.4	U	4.4	U	4.5	U	4	U	4.2	U	4.9	U
Endrin	120	U	4.7	U	4.4	U	4.4	U	4.5	U	4	U	4.2	U	4.9	U
Endrin aldehyde	120	U	4.7	U	4.4	U	4.4	U	4.5	U	4	U	4.2	U	4.9	U
Endrin ketone	120	U	4.7	U	4.4	U	4.4	U	1.5	J	4	U	4.2	U	4.9	U
gamma-BHC (Lindane)	62	U	2.4	U	2.3	U	2.3	U	0.535		0.3	J	0.82	J	0.41	J
gamma-Chlordane	62	U	2.4	U	2.3	U	2.3	U	2.3	U	2.1	U	0.44	J	2.5	U
Heptachlor	62	U	2.4	U	0.75	J	1.2	J	2.3	U	2.1	U	2.2	U	2.5	U
Heptachlor epoxide	410	J	2.4	U	2.3	U	2.3	U	2.6	J	1.3	J	2.7	J	2.5	U
MCPA	2900	U	2800	U	2700	U	2700	U	2700	U	2400	U	2500	U	3000	U
MCPP	2900	U	2800	U	2700	U	2700	U	2700	U	2400	U	2500	U	3000	U
Methoxychlor	620	U	24	U	23	U	23	U	1.2	J	21	U	22	U	25	U
Toxaphene	6200	U	240	U	230	U	230	U	230	U	210	U	220	U	250	U
Semivolatile Organic Compounds (ug/kg)																
1,2,4-Trichlorobenzene	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	40	J
1,2-Dichlorobenzene	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
1,3-Dichlorobenzene	100	J	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
1,4-Dichlorobenzene	970		240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	240	J
2,4,5-Trichlorophenol	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
2,4,6-Trichlorophenol	100	UJ	100	UJ	94	UJ	94	UJ	96	U	85	UJ	89	UJ	100	UJ
2,4-Dichlorophenol	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
2,4-Dinitrophenol	1200	UJ	1200	UJ	1100	UJ	1100	UJ	1200	U	1000	UJ	1100	UJ	1300	UJ
2,4-Dinitrotoluene	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
2,6-Dinitrotoluene	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
2-Chloronaphthalene	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
2-Chlorophenol	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
2-Methylnaphthalene	4200		240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
2-Methylphenol (o-Cresol)	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
2-Nitroaniline	1200	UJ	1200	UJ	1100	UJ	1100	UJ	1200	U	1000	UJ	1100	UJ	1300	UJ
2-Nitrophenol	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
3&4Methylphenol	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
3,3`-Dichlorobenzidine	480	UJ	470	UJ	440	UJ	440	UJ	450	U	400	UJ	420	UJ	490	UJ
3-Nitroaniline	1200	UJ	1200	UJ	1100	UJ	1100	UJ	1200	U	1000	UJ	1100	UJ	1300	UJ
4,6-Dinitro-2-methylphenol	1200	UJ	1200	UJ	1100	UJ	1100	UJ	1200	U	1000	UJ	1100	UJ	1300	UJ

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T0-C1		CBS-CSB-T10-C1		CBS-CSB-T10-E1		CBS-CSB-T10-W1		CBS-CSB-T11-C1		CBS-CSB-T11-E1		CBS-CSB-T11-W1		CBS-CSB-T12-C1	
4-Bromophenyl phenyl ether	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
4-Chloro-3-methylphenol	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
4-Chloroaniline	450	J	470	UJ	440	UJ	440	UJ	450	U	400	UJ	420	UJ	490	UJ
4-Chlorophenyl phenyl ether	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
4-Nitroaniline	1200	UJ	1200	UJ	1100	UJ	1100	UJ	1200	U	1000	UJ	1100	UJ	1300	UJ
4-Nitrophenol	440	J	1200	UJ	1100	UJ	1100	UJ	1200	U	1000	UJ	1100	UJ	1300	UJ
Acenaphthene	860		240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	62	J
Acenaphthylene	240	J	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
Anthracene	1400		240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	190	J
Benzo(a)anthracene	1900		240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	800	
Benzo(a)pyrene	1200		130	UJ	120	UJ	120	UJ	120	U	110	UJ	110	UJ	840	
Benzo(b)fluoranthene	1400		240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	700	
Benzo(g,h,i)perylene	890		240	UJ	230	UJ	230	UJ	41	J	210	UJ	220	UJ	310	J
Benzo(k)fluoranthene	900		240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	810	
Bis(2-chloroethoxy)methane	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
Bis(2-chloroethyl)ether	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
Bis(2-chloroisopropyl ether)	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
Bis(2-ethylhexyl)phthalate	93	J	120	J	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
Butylbenzylphthalate	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
Carbazole	620		240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
Chrysene	1900		240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	770	
Dibenzo(a,h)anthracene	340	J	130	UJ	120	UJ	120	UJ	120	U	110	UJ	110	UJ	180	J
Dibenzofuran	1600		240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
Diethyl phthalate	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
Dimethyl phthalate	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
di-n-Butylphthalate	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
di-n-Octylphthalate	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
Fluoranthene	4000		240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	1600	
Fluorene	3500		240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
Hexachlorobenzene	100	UJ	100	UJ	94	UJ	94	UJ	96	U	85	UJ	89	UJ	100	UJ
Hexachlorobutadiene	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
Hexachlorocyclopentadiene	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
Hexachloroethane	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
Indeno(1,2,3-cd)pyrene	830		240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	340	
Isophorone	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
Naphthalene	6000		240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
Nitrobenzene	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
N-Nitroso-di-N-propylamine	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
N-Nitrosodiphenylamine	1200		240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
Pentachlorophenol	270		3.9	J	5.5	J	7.3	J	20.5		9	J	31		3.6	J
Phenanthrene	7000		240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	52	J
Phenol	250	UJ	240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	250	UJ
Pyrene	4000		240	UJ	230	UJ	230	UJ	230	U	210	UJ	220	UJ	1500	
Volatile Organic Compounds (ug/kg)																
1,1,1-Trichloroethane	340	U	7.6	U	9.4	U	7.7	U	6.7	U	7.1	U	6.3	U	8.9	U
1,1,2,2-Tetrachloroethane	340	U	6.1	U	9.4	U	7.7	U	6.7	U	7.1	U	6.3	U	8.9	U
1,1,2-Trichloroethane	340	U	7.6	U	9.4	U	7.7	U	6.7	U	7.1	U	6.3	U	8.9	U
1,1-Dichloroethane	340	U	7.6	U	9.4	U	7.7	U	6.7	U	7.1	U	6.3	U	8.9	U
1,1-Dichloroethene	300	U	7	U	8.6	U	7.1	U	6.2	U	6.5	U	5.8	U	8.2	U
1,2-Dichloroethane	340	U	7.6	U	9.4	U	7.7	U	6.7	U	7.1	U	6.3	U	8.9	U
1,2-Dichloroethene (total)	340	U	7.6	U	9.4	U	7.7	U	6.7	U	7.1	U	6.3	U	8.9	U
1,2-Dichloropropane	340	U	7.6	U	9.4	U	7.7	U	6.7	U	7.1	U	6.3	U	8.9	U
2-Butanone (MEK)	1700	U	19	J	47	U	38	U	21.5		35	U	32	U	73	
2-Hexanone	1700	U	38	U	47	U	38	U	34	U	35	U	32	U	44	U

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T0-C1		CBS-CSB-T10-C1		CBS-CSB-T10-E1		CBS-CSB-T10-W1		CBS-CSB-T11-C1		CBS-CSB-T11-E1		CBS-CSB-T11-W1		CBS-CSB-T12-C1	
4-Methyl-2-pentanone (MIBK)	1700	U	38	U	47	U	38	U	34	U	35	U	32	U	44	U
Acetone	1300	U	83		11	J	29	J	116.5		77		57	J	400	
Benzene	180	J	7.6	U	9.4	U	7.7	U	3.8		5.6	J	6.3	U	8.9	U
Bromodichloromethane	340	U	7.6	U	9.4	U	7.7	U	6.7	U	7.1	U	6.3	U	8.9	U
Bromoform	340	U	7.6	U	9.4	U	7.7	U	6.7	U	7.1	U	6.3	U	8.9	U
Bromomethane	680	U	15	U	19	U	15	U	13	U	14	U	13	U	18	U
Carbon disulfide	340	U	7.6	U	9.4	U	7.7	U	21.5		7.1	U	6.3	U	45	
Carbon tetrachloride	340	U	7.6	U	9.4	U	7.7	U	6.7	U	7.1	U	6.3	U	8.9	U
Chlorobenzene	9700		530		9.4	U	7.7	U	17		11		6.3	U	53	
Chloroform	340	U	7.6	U	9.4	U	7.7	U	6.7	U	7.1	U	6.3	U	8.9	U
Chloroethane	680	U	15	U	19	U	15	U	13	U	14	U	13	U	18	U
Chloromethane	680	U	15	U	19	U	15	U	13	U	14	U	13	U	18	U
cis-1,3-Dichloropropene	270	U	6.1	U	7.5	U	6.1	U	5.4	U	5.7	U	5.1	U	7.1	U
Dibromochloromethane	340	U	7.6	U	9.4	U	7.7	U	6.7	U	7.1	U	6.3	U	8.9	U
Ethylbenzene	2000		7.6	U	9.4	U	7.7	U	6.7	U	7.1	U	6.3	U	8.9	U
Methylene chloride	160	U	7.6	U	9.4	U	7.7	U	6.7	U	7.1	U	6.3	U	8.9	U
Styrene	340	U	7.6	U	9.4	U	7.7	U	6.7	U	7.1	U	6.3	U	8.9	U
Tetrachloroethene	340	U	7.6	U	9.4	U	7.7	U	6.7	U	7.1	U	6.3	U	8.9	U
Toluene	300	U	3	J	9.4	U	7.7	U	7.05		7.1	U	6.3	U	8.9	U
trans-1,3-Dichloropropene	270	U	6.1	U	7.5	U	6.1	U	5.4	U	5.7	U	5.1	U	7.1	U
Trichloroethene	340	U	7.6	U	9.4	U	7.7	U	6.7	U	7.1	U	6.3	U	8.9	U
Vinyl chloride	680	U	15	U	19	U	15	U	13	U	14	U	13	U	18	U
Xylenes (total)	7000		7.6	U	9.4	U	7.7	U	8.8		7.1	U	6.3	U	8.9	U
Inorganics (mg/kg)																
Aluminum	5800		7300		5800		9700		6850		11000		7500		6700	
Antimony	3.9	J	2.6	UJ	2.5	UJ	2.7	UJ	12	U	2.2	UJ	2.3	UJ	14	UJ
Arsenic	14		5.5		13		15		9.85		8.8		15		27	
Barium	1500		270		340		270		295		340		170		470	
Beryllium	0.5		0.46		0.26		0.65		0.56	U	0.47	U	0.49	U	0.46	U
Cadmium	11		1.1		16		8.8		54		9.5		4		42	
Calcium	21000		17000		3400		3700		8100		3600		2900		5700	
Chromium	28	J	13	J	130	J	27	J	14		89		58		140	
Cobalt	23		7.2		3		16		14.5		4.9		7.2		11	
Copper	10000	J	150		440		410		285		230		560		89	
Iron	28000	J	16000		10000		13000		11000		11000		10000		15000	
Lead	700		22	J	80	J	27	J	28		57		48		190	
Magnesium	5100	J	6500	J	1200	J	2900	J	5750		2200		2200		2700	
Manganese	250	J	280		39		170		97.5		76		81		140	
Mercury	0.82	J	0.024	J	0.16	J	0.084	J	0.4175		0.12	J	0.12	J	0.84	J
Molybdenum	1.4		1.2		0.96		0.9		1.35		0.67	U	0.49	U	1.5	
Nickel	600		28		140		280		505		190		250		630	
Potassium	1200	J	1800		1400		1700		1500		1500		1500		1700	
Selenium	1.3	UJ	0.64	UJ	1	UJ	0.8	UJ	5.9		1.1	U	1.2	U	6.8	U
Silver	9		1.3	U	1.2	U	1.4	U	0.35		1.1	U	1.2	U	0.33	
Sodium	670		200		180		170		180		150		130		170	
Thallium	1.3		0.84	U	1.2	U	0.91	U	1.2	U	0.88	U	1.2	U	1	U
Tin	54		6.5	U	6.1	U	6.8	U	6.2	U	5.5	U	5.8	U	7.4	
Vanadium	21		23		21		33		22		30		20		25	
Zinc	6800		320		1900		1700		10450		2100		1300		6600	
PCBs (ug/kg)																
Monochlorobiphenyl	24	U	4.7	U	4.4	UJ	4.4	U	4.5	U	4	UJ	4.2	UJ	4.9	UJ
Dichlorobiphenyl	300		4.7	U	4.4	UJ	4.4	U	4.65		4	UJ	4.2	UJ	7.5	J
Trichlorobiphenyl	730		4.7	U	1.4	J	3.5	J	86		4.3	J	20	J	23	J
Tetrachlorobiphenyl	5500		9.6	U	18	J	26		330		20	J	130	J	10	UJ

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T0-C1		CBS-CSB-T10-C1		CBS-CSB-T10-E1		CBS-CSB-T10-W1		CBS-CSB-T11-C1		CBS-CSB-T11-E1		CBS-CSB-T11-W1		CBS-CSB-T12-C1	
Pentachlorobiphenyl	12000		14		41	J	25		210		34	J	110	J	1.4	J
Hexachlorobiphenyl	4800		2.4	J	8.5	J	6.3	J	46		9.7	J	12	J	10	UJ
Heptachlorobiphenyl	4000		14	U	14	UJ	14	U	33		12	UJ	15	J	15	UJ
Octachlorobiphenyl	1100		14	U	14	UJ	14	U	10.9		12	UJ	3.4	J	15	UJ
Nonachlorobiphenyl	74	U	24	U	22	UJ	22	U	17.5		5.1	J	21	UJ	25	UJ
Decachlorobiphenyl	1300		24	U	4.1	J	22	U	48		8	J	8.8	J	25	UJ
Dioxins (ug/kg)																
1,2,3,4,6,7,8,9-OCDD	2490		1.1	J	23.7		13.8		73.4		7.2		15.9		0.84	J
1,2,3,4,6,7,8-HpCDD			0.1	J	2.5	J	1.5	J	8.6		0.64	J	1.6	J	0.3	J
1,2,3,4,7,8-HxCDD	1.5	J	0.01	U	0.02	U	0.02	U	0.02	U	0.03	U	0.03	U	0.04	U
1,2,3,6,7,8-HxCDD	6.5		0.01	U	0.09	J	0.06	J	0.215		0.04	U	0.06	J	0.05	U
1,2,3,7,8,9-HxCDD	2.5	J	0.01	U	0.02	U	0.04	J	0.05	J	0.03	U	0.03	U	0.15	J
1,2,3,7,8-PeCDD	1.5	J	0.02	U	0.03	U	0.03	U	0.03	U	0.04	U	0.04	U	0.09	J
2,3,7,8-TCDD	0.1	U	0.01	U	0.02	U	0.02	U	0.01	U	0.02	U	0.02	U	0.02	U
Total HpCDD	457		0.2	J	4.7		2.8	J	15.25		1.3	J	3	J	0.51	J
Total HxCDD	139	J	0.07	J	0.59	J	0.48	J	1.545		0.44	J	0.57	J	0.6	J
Total PeCDD	22.8	J	0.02	U	0.28	J	0.28	J	0.88		0.04	U	0.17	J	0.61	J
Total TCDD	53.2	J	2.7	UJ	3.1	U	2.5	UJ	3.3	U	2.4	UJ	3.2	UJ	3.6	UJ
Furans (ug/kg)																
1,2,3,4,6,7,8,9-OCDF	517		0.54	J	10.3		4.2	J	34.05		2	J	1.7	J	0.48	J
1,2,3,4,6,7,8-HpCDF	68.6		0.09	J	1.7	J	0.97	J	4.6		0.5	J	0.44	J	0.17	J
1,2,3,4,7,8,9-HpCDF	5.6		0.01	U	0.07	J	0.02	U	0.42	J	0.03	U	0.03	U	0.37	J
1,2,3,4,7,8-HxCDF	6.3		0.007	U	0.04	J	0.02	J	0.15	J	0.02	U	0.02	U	0.17	J
1,2,3,6,7,8-HxCDF	2.9	J	0.007	U	0.009	U	0.01	U	0.02	U	0.02	U	0.02	U	0.04	U
1,2,3,7,8,9-HxCDF	0.8	U	0.008	U	0.01	U	0.01	U	0.01	U	0.02	U	0.02	U	0.03	U
1,2,3,7,8-PeCDF	0.1	U	0.02	U	0.02	U	0.02	U	0.02	U	0.03	U	0.03	U	0.08	J
2,3,4,6,7,8-HxCDF	0.7	U	0.008	U	0.01	U	0.01	U	0.01	U	0.02	U	0.02	U	0.03	U
2,3,4,7,8-PeCDF	0.1	U	0.02	U	0.02	U	0.03	U	0.02	U	0.03	U	0.03	U	0.14	J
2,3,7,8-TCDF	0.09	U	0.01	U	0.01	U	0.02	U	0.06	J	0.02	U	0.02	U	0.18	J
Total HpCDF	393		0.4	J	6.4		2.9	J	21.2		1.5	J	1.6	J	0.54	J
Total HxCDF	76.1		0.04	J	1.1	J	0.8	J	3.045		0.46	J	0.72	J	1.4	J
Total PeCDF	3.6	J	0.02	U	0.12	J	0.05	J	0.16	J	0.03	U	0.03	U	0.48	J
Total TCDF	5.8		0.07	J	0.06	J	0.07	J	0.11	U	0.08	UJ	0.08	UJ	1.1	J

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T12-E1		CBS-CSB-T12-W1		CBS-CSB-T13-C1		CBS-CSB-T13-E1		CBS-CSB-T13-W1		CBS-CSB-T14-1		CBS-CSB-T15-1		CBS-CSB-T16-1	
Cyanide	0.58	U	0.64	U	0.67	U	0.59	U	0.67	U	0.76	U	0.66	U	0.72	U
Pesticides/Herbicides (ug/kg)																
2,4,5-T	9.8	U	11	U	3.9	J	9.8	U	11	U	13	U	11	U	12	U
2,4,5-TP (Silvex)	1.4	J	11	U	12	U	9.8	U	11	U	13	U	11	U	12	U
2,4-D	9.8	U	11	U	12	U	9.8	U	11	U	13	U	11	U	17	J
2,4-DB	9.8	U	11	U	12	U	9.8	U	11	U	13	U	11	U	12	U
4,4'-DDD	3.9	U	4.3	U	4.6	U	3.9	U	4.4	U	10	U	8.7	U	24	U
4,4'-DDE	3.9	U	4.3	U	4.6	U	3.9	U	4.4	U	10	U	4	J	24	U
4,4'-DDT	3.9	U	4.3	U	4.6	U	3.9	U	4.4	U	10	U	8.7	U	130	J
Aldrin	2	U	2.2	U	2.4	U	2	U	2.3	U	5.2	U	4.5	U	12	U
alpha-BHC	0.087	J	0.3	J	0.69	U	0.59	U	0.68	U	1.5	U	1.3	U	3.6	U
alpha-Chlordane	2	U	2.2	U	2.4	U	2	UJ	2.3	U	5.2	U	4.5	U	12	U
beta-BHC	0.59	U	0.66	U	0.69	U	0.59	U	0.92		1.5	U	1.3	U	3.6	U
Dalapon	76	U	86	U	90	U	41	J	88	U	100	U	86	U	94	U
delta-BHC	0.59	U	0.66	U	0.69	U	0.59	U	0.68	U	1.5	U	1.3	U	3.6	U
Dicamba	24	U	26	U	28	U	24	U	27	U	31	U	26	U	29	U
Dichlorprop	120	U	130	U	140	U	120	U	140	U	150	U	130	U	140	U
Dieldrin	3.9	U	4.3	U	4.6	U	3.9	U	4.4	U	10	U	6	J	38	J
Dinoseb	120	U	130	U	690	U	120	U	140	U	150	U	130	U	140	U
Endosulfan I	2	U	2.2	U	2.4	U	2	U	2.3	U	5.2	U	4.5	U	12	U
Endosulfan II	3.9	U	4.3	U	4.6	U	3.9	U	4.4	U	10	U	8.7	U	24	U
Endosulfan sulfate	3.9	U	4.3	U	4.6	U	3.9	U	4.4	U	10	U	8.7	U	12	J
Endrin	3.9	U	4.3	U	4.6	U	3.9	U	4.4	U	10	U	8.7	U	24	U
Endrin aldehyde	3.9	U	4.3	U	4.6	U	3.9	U	4.4	U	10	U	8.7	U	24	U
Endrin ketone	3.9	U	0.64	J	0.73	J	3.9	U	4.4	U	10	U	8.7	U	24	U
gamma-BHC (Lindane)	0.47	J	0.84	J	2.4	U	2	U	0.4	J	5.2	U	4.5	U	12	U
gamma-Chlordane	0.34	J	2.2	U	2.4	U	2	U	2.3	U	5.2	U	4.5	U	12	U
Heptachlor	2	U	2.2	U	2.4	U	2	UJ	2.3	U	5.2	U	4.5	U	12	U
Heptachlor epoxide	1.6	J	1.7	J	2.4	U	2	U	2.3	U	5.2	U	4.5	U	12	U
MCPA	2400	U	2600	U	2800	U	2400	U	2700	U	3100	U	2600	U	2900	U
MCPP	2400	U	2600	U	2800	U	2400	U	2700	U	3100	U	2600	U	2900	U
Methoxychlor	20	U	6.6	J	24	U	0.55	J	23	U	52	U	45	U	120	U
Toxaphene	200	U	220	U	240	U	200	U	230	U	520	U	450	U	1200	U
Semivolatile Organic Compounds (ug/kg)																
1,2,4-Trichlorobenzene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
1,2-Dichlorobenzene	200	UJ	220	UJ	240	UJ	200	U	230	UJ	260	UJ	220	UJ	250	UJ
1,3-Dichlorobenzene	200	UJ	220	UJ	240	UJ	200	U	230	UJ	260	UJ	220	UJ	250	UJ
1,4-Dichlorobenzene	200	UJ	220	UJ	240	UJ	200	U	230	UJ	260	UJ	220	UJ	250	UJ
2,4,5-Trichlorophenol	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
2,4,6-Trichlorophenol	82	UJ	92	UJ	97	UJ	82	UJ	94	UJ	110	UJ	92	UJ	100	UJ
2,4-Dichlorophenol	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
2,4-Dinitrophenol	1000	UJ	1100	UJ	1200	UJ	1000	UJ	1100	UJ	1300	UJ	1100	UJ	1200	UJ
2,4-Dinitrotoluene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
2,6-Dinitrotoluene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
2-Chloronaphthalene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
2-Chlorophenol	200	UJ	220	UJ	240	UJ	200	U	230	UJ	260	UJ	220	UJ	250	UJ
2-Methylnaphthalene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
2-Methylphenol (o-Cresol)	200	UJ	220	UJ	240	UJ	200	U	230	UJ	260	UJ	220	UJ	250	UJ
2-Nitroaniline	1000	UJ	1100	UJ	1200	UJ	1000	UJ	1100	UJ	1300	UJ	1100	UJ	1200	UJ
2-Nitrophenol	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
3&4Methylphenol	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
3,3'-Dichlorobenzidine	390	UJ	430	UJ	460	UJ	390	UJ	440	UJ	510	UJ	430	UJ	480	UJ
3-Nitroaniline	1000	UJ	1100	UJ	1200	UJ	1000	UJ	1100	UJ	1300	UJ	1100	UJ	1200	UJ
4,6-Dinitro-2-methylphenol	1000	UJ	1100	UJ	1200	UJ	1000	UJ	1100	UJ	1300	UJ	1100	UJ	1200	UJ

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T12-E1		CBS-CSB-T12-W1		CBS-CSB-T13-C1		CBS-CSB-T13-E1		CBS-CSB-T13-W1		CBS-CSB-T14-1		CBS-CSB-T15-1		CBS-CSB-T16-1	
4-Bromophenyl phenyl ether	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
4-Chloro-3-methylphenol	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
4-Chloroaniline	390	UJ	430	UJ	460	UJ	390	UJ	440	UJ	510	UJ	430	UJ	480	UJ
4-Chlorophenyl phenyl ether	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
4-Nitroaniline	1000	UJ	1100	UJ	1200	UJ	1000	UJ	1100	UJ	1300	UJ	1100	UJ	1200	UJ
4-Nitrophenol	1000	UJ	1100	UJ	1200	UJ	1000	UJ	1100	UJ	1300	UJ	1100	UJ	1200	UJ
Acenaphthene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
Acenaphthylene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
Anthracene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	42	J
Benzo(a)anthracene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	260	J
Benzo(a)pyrene	100	UJ	120	UJ	77	J	100	UJ	120	UJ	140	UJ	120	UJ	290	J
Benzo(b)fluoranthene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	230	J
Benzo(g,h,i)perylene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	160	J
Benzo(k)fluoranthene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	J
Bis(2-chloroethoxy)methane	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
Bis(2-chloroethyl)ether	200	UJ	220	UJ	240	UJ	200	U	230	UJ	260	UJ	220	UJ	250	UJ
Bis(2-chloroisopropyl ether)	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
Bis(2-ethylhexyl)phthalate	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
Butylbenzylphthalate	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
Carbazole	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
Chrysene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	270	J
Dibenzo(a,h)anthracene	100	UJ	120	UJ	120	UJ	100	UJ	120	UJ	140	UJ	120	UJ	130	UJ
Dibenzofuran	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
Diethyl phthalate	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
Dimethyl phthalate	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
di-n-Butylphthalate	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
di-n-Octylphthalate	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
Fluoranthene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	580	
Fluorene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
Hexachlorobenzene	82	UJ	92	UJ	97	UJ	82	UJ	94	UJ	110	UJ	92	UJ	100	UJ
Hexachlorobutadiene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
Hexachlorocyclopentadiene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
Hexachloroethane	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
Indeno(1,2,3-cd)pyrene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	150	J
Isophorone	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
Naphthalene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
Nitrobenzene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
N-Nitroso-di-N-propylamine	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
N-Nitrosodiphenylamine	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	250	UJ
Pentachlorophenol	7	J	21	J	24	U	10	J	3.7	J	2.5	J	5.6	J	12	J
Phenanthrene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	71	J
Phenol	200	UJ	220	UJ	240	UJ	200	U	230	UJ	260	UJ	220	UJ	250	UJ
Pyrene	200	UJ	220	UJ	240	UJ	200	UJ	230	UJ	260	UJ	220	UJ	630	
Volatile Organic Compounds (ug/kg)																
1,1,1-Trichloroethane	7	U	7.3	U	7.1	U	7	U	7.7	U	7	U	4.8	U	6.3	J
1,1,2,2-Tetrachloroethane	7	U	7.3	U	7.1	U	7	U	7.7	U	7	U	4.8	U	7.2	U
1,1,2-Trichloroethane	7	U	7.3	U	7.1	U	7	U	7.7	U	7	U	4.8	U	7.2	U
1,1-Dichloroethane	7	U	7.3	U	7.1	U	7	U	7.7	U	7	U	4.8	U	7.2	U
1,1-Dichloroethene	6.4	U	6.7	U	6.5	U	6.4	U	7.1	U	6.4	U	4.4	U	6.7	U
1,2-Dichloroethane	7	U	7.3	U	7.1	U	7	U	7.7	U	7	U	4.8	U	7.2	U
1,2-Dichloroethene (total)	7	U	7.3	U	7.1	U	7	U	7.7	U	7	U	4.8	U	7.2	U
1,2-Dichloropropane	7	U	7.3	U	7.1	U	7	U	7.7	U	7	U	4.8	U	7.2	U
2-Butanone (MEK)	35	U	36	U	35	U	35	U	38	U	9	J	24	U	5.2	J
2-Hexanone	35	U	36	U	35	U	35	U	38	U	35	U	24	U	36	U

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T12-E1		CBS-CSB-T12-W1		CBS-CSB-T13-C1		CBS-CSB-T13-E1		CBS-CSB-T13-W1		CBS-CSB-T14-1		CBS-CSB-T15-1		CBS-CSB-T16-1	
4-Methyl-2-pentanone (MIBK)	35	U	36	U	35	U	35	U	38	U	35	U	24	U	36	U
Acetone	70	U	72	J	91		70	U	230		67	J	14	J	72	U
Benzene	3.5	J	7.3	U	3.5	J	4.1	J	7.7	U	7	U	4.8	U	7.2	U
Bromodichloromethane	7	U	7.3	U	7.1	U	7	U	7.7	U	7	U	4.8	U	7.2	U
Bromoform	7	U	7.3	U	7.1	U	7	U	7.7	U	7	U	4.8	U	7.2	U
Bromomethane	14	U	15	U	14	U	14	U	15	U	14	U	9.7	U	14	U
Carbon disulfide	7	U	7.3	U	4.2	J	7	U	7.7	U	7	U	4.8	U	6.1	J
Carbon tetrachloride	7	U	7.3	U	7.1	U	7	U	7.7	U	7	U	4.8	U	7.2	U
Chlorobenzene	4.4	J	7.3	U	74		8.9		7.7	U	8.2		4.8	U	31	
Chloroform	7	U	7.3	U	7.1	U	7	U	7.7	U	7	U	4.8	U	3.1	J
Chloroethane	14	U	15	U	14	U	14	U	15	U	14	U	9.7	U	14	U
Chloromethane	14	U	15	U	14	U	14	U	15	U	14	U	9.7	U	14	U
cis-1,3-Dichloropropene	5.6	U	5.8	U	5.7	U	5.6	U	6.1	U	5.6	U	3.9	U	5.8	U
Dibromochloromethane	7	U	7.3	U	7.1	U	7	U	7.7	U	7	U	4.8	U	7.2	U
Ethylbenzene	7	U	7.3	U	7.1	U	7	U	7.7	U	7	U	4.8	U	11	
Methylene chloride	7	U	7.3	U	7.1	U	7	U	7.7	U	2.3	J	1.8	J	2.9	J
Styrene	7	U	7.3	U	7.1	U	7	U	7.7	U	7	U	4.8	U	2.8	J
Tetrachloroethene	7	U	7.3	U	7.1	U	7	U	7.7	U	7	U	4.8	U	7.2	U
Toluene	7	U	7.3	U	3.8	J	7	U	7.7	U	14	J	2	J	58	
trans-1,3-Dichloropropene	5.6	U	5.8	U	5.7	U	5.6	U	6.1	U	5.6	U	3.9	U	5.8	U
Trichloroethene	7	U	7.3	U	7.1	U	7	U	7.7	U	7	U	4.8	U	6.8	J
Vinyl chloride	14	U	15	U	14	U	14	U	15	U	14	U	9.7	U	14	U
Xylenes (total)	7	U	7.3	U	7.1	U	7	U	7.7	U	7	U	4.8	U	22	
Inorganics (mg/kg)																
Aluminum	8000		11000		8200		8600		7900		10000		6300		7400	
Antimony	0.9	UJ	2.2	UJ	2.5	UJ	2.1	UJ	2.7	UJ	2.8	U	2.2	U	0.71	
Arsenic	4.4		6.8		6.4		7.4		8.7		5.3		7.4		11	
Barium	360		220		230		200		270		230		260		350	
Beryllium	0.37	U	0.81		0.65	U	0.58	U	0.58	U	0.77		0.51		0.52	
Cadmium	3.3		4.4		2.8		4.6		3.9		2.8		5.2		2.8	
Calcium	2600		3800		14000		3100		3500		8200		5600		6600	
Chromium	48		80		13		21		74		17		43		27	
Cobalt	4.9		7.9		9.7		6.4		8.1		11		5.6		9.3	
Copper	280		620		30		170		240		33		370		1500	
Iron	9000		15000		21000		11000		12000		16000		11000		13000	
Lead	80		29		19		21		63		15		71		100	
Magnesium	1600		3400		6900		2500		2900		6000		3200		3600	
Manganese	54		80		530		76		94		130		110		99	
Mercury	0.14	J	0.1	J	0.031	J	0.061	J	0.096	J	0.032	J	0.064	J	0.12	J
Molybdenum	0.64	U	0.34	U	0.71	U	0.56	U	0.64	U	1.4	UJ	0.5	J	0.97	U
Nickel	330		400		29		340		240		130		180		170	
Potassium	1200		1900		1800		1300		1700		2100		1300		1500	
Selenium	1.2	U	0.7		1.3	U	1.1	U	1.4	U	1.4	U	1.1	U	1.2	U
Silver	1.2	U	1.1	U	1.3	U	1.1	U	1.4	U	1.4	U	1.1	U	1.3	
Sodium	110		130		190		110		140		270		180		300	
Thallium	0.73	U	0.78	U	2.1	U	1.1	U	0.92	U	1.4	U	1.9	U	1.4	U
Tin	5.2		5.5	U	6.3	U	5.3	U	6.8	U	7	U	5.5	U	7.3	
Vanadium	24		23		24		26		24		29		19		22	
Zinc	1500		2100		660		1700		1900		2700		1200		3800	
PCBs (ug/kg)																
Monochlorobiphenyl	3.9	UJ	4.3	UJ	4.6	UJ	3.9	UJ	4.4	UJ	5.1	U	4.3	U	4.8	U
Dichlorobiphenyl	3.9	UJ	4.3	UJ	4.6	UJ	3.9	UJ	4.4	UJ	5.1	U	4.3	U	4.8	U
Trichlorobiphenyl	7	J	17	J	4.6	UJ	1.6	J	2.8	J	5.1	U	4.3	U	2.8	J
Tetrachlorobiphenyl	46	J	87	J	9.3	UJ	9.3	J	19	J	10	U	36		16	

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T12-E1		CBS-CSB-T12-W1		CBS-CSB-T13-C1		CBS-CSB-T13-E1		CBS-CSB-T13-W1		CBS-CSB-T14-1		CBS-CSB-T15-1		CBS-CSB-T16-1	
Pentachlorobiphenyl	44	J	35	J	9.3	UJ	14	J	13	J	10	U	42		78	
Hexachlorobiphenyl	15	J	15	J	9.3	UJ	4.6	J	4	J	10	U	4.4	J	12	
Heptachlorobiphenyl	12	UJ	13	UJ	14	UJ	12	UJ	14	UJ	15	U	2.6	J	3.8	J
Octachlorobiphenyl	1.1	J	13	UJ	14	UJ	12	UJ	14	UJ	15	U	13	U	14	U
Nonachlorobiphenyl	6.3	J	22	UJ	23	UJ	20	UJ	22	UJ	26	U	2.8	J	24	U
Decachlorobiphenyl	10	J	5.6	J	23	UJ	20	UJ	22	UJ	26	U	8.3	J	7.4	J
Dioxins (ug/kg)																
1,2,3,4,6,7,8,9-OCDD	10.1		12		1.1	J	2.3	J	3.4	J	2.3	J	10.7		298	J
1,2,3,4,6,7,8-HpCDD	0.86	J	1	J	0.08	J	0.13	J	0.3	J	0.23	J	1.1	J	28.2	
1,2,3,4,7,8-HxCDD	0.04	J	0.03	J	0.01	U	0.01	U	0.01	U	0.03	U	0.03	U	0.02	U
1,2,3,6,7,8-HxCDD	0.03	U	0.02	J	0.01	U	0.01	U	0.02	U	0.03	U	0.03	U	0.99	J
1,2,3,7,8,9-HxCDD	0.02	U	0.03	J	0.01	U	0.01	U	0.01	U	0.03	U	0.03	U	0.17	J
1,2,3,7,8-PeCDD	0.03	U	0.02	U	0.02	U	0.02	U	0.02	U	0.03	U	0.04	U	0.58	J
2,3,7,8-TCDD	0.02	U	0.01	U	0.01	U	0.01	U	0.01	U	0.02	U	0.02	U	0.02	U
Total HpCDD	1.8	J	2.2	J	0.16	J	0.33	J	0.57	J	0.48	J	2.2	J	55.4	
Total HxCDD	0.69	J	0.49	J	0.01	U	0.12	J	0.15	J	0.03	U	0.29	J	10.1	J
Total PeCDD	0.22	J	0.24	J	0.02	U	0.02	U	0.02	U	0.03	U	0.04	U	2.3	J
Total TCDD	2.3	UJ	2.7	UJ	2.6	UJ	2.3	UJ	2.6	UJ	2.4	UJ	2.5	UJ	10.9	J
Furans (ug/kg)																
1,2,3,4,6,7,8,9-OCDF	2.9	J	1.8	J	0.3	J	0.36	J	0.63	J	0.36	U	2.4	J	115	
1,2,3,4,6,7,8-HpCDF	0.64	J	0.36	J	0.04	J	0.09	J	0.16	J	0.09	J	0.37	J	15.5	
1,2,3,4,7,8,9-HpCDF	0.03	U	0.01	U	0.01	U	0.01	U	0.02	U	0.02	U	0.03	U	0.95	J
1,2,3,4,7,8-HxCDF	0.02	U	0.006	U	0.007	U	0.008	U	0.01	U	0.01	U	0.02	U	0.41	J
1,2,3,6,7,8-HxCDF	0.02	U	0.006	U	0.007	U	0.007	U	0.009	U	0.02	U	0.02	U	0.13	J
1,2,3,7,8,9-HxCDF	0.02	U	0.007	U	0.008	U	0.009	U	0.01	U	0.02	U	0.02	U	0.02	U
1,2,3,7,8-PeCDF	0.02	U	0.01	U	0.01	U	0.01	U	0.02	U	0.02	U	0.03	U	1.4	J
2,3,4,6,7,8-HxCDF	0.02	U	0.007	U	0.008	U	0.008	U	0.01	U	0.02	U	0.02	U	0.18	J
2,3,4,7,8-PeCDF	0.03	U	0.01	U	0.01	U	0.01	U	0.02	U	0.03	U	0.03	U	0.19	J
2,3,7,8-TCDF	0.02	J	0.008	U	0.008	U	0.009	U	0.01	U	0.02	U	0.02	U	0.18	J
Total HpCDF	2	J	1.2	J	0.16	J	0.28	J	0.51	J	0.23	J	1.4	J	73.6	J
Total HxCDF	0.57	J	0.55	J	0.007	U	0.05	J	0.18	J	0.04	J	0.33	J	18.8	
Total PeCDF	0.2	J	0.01	U	0.01	U	0.01	U	0.02	U	0.02	U	0.03	U	3.8	J
Total TCDF	0.07	UJ	0.06	UJ	0.09	UJ	0.06	UJ	0.06	UJ	0.06	UJ	0.08	UJ	5	J

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T17-C1		CBS-CSB-T17-E1		CBS-CSB-T17-WI		CBS-CSB-T18-C1		CBS-CSB-T18-E1		CBS-CSB-T18-W1		CBS-CSB-T1-C1	
Cyanide	0.79	U	0.69	U	0.7	U	0.68	U	0.69	U	0.67	U	0.76	U
Pesticides/Herbicides (ug/kg)														
2,4,5-T	13	U	7.6	J	2	J	11	U	12	U	11	U	12	U
2,4,5-TP (Silvex)	13	U	1.9	J	12	U	11	U	12	U	11	U	12	U
2,4-D	13	U	12	U	12	U	11	U	12	U	11	U	12	U
2,4-DB	13	U	12	U	12	U	11	U	12	U	11	U	12	U
4,4'-DDD	5.3	U	23	U	4.6	UJ	4.4	UJ	4.6	UJ	4.4	U	5	U
4,4'-DDE	5.3	U	23	U	4.6	UJ	4.4	UJ	4.6	UJ	4.4	U	5	U
4,4'-DDT	5.3	U	160		4.6	UJ	4.4	UJ		R	4.4	U	5	U
Aldrin	2.7	U	12	U	2.4	UJ	2.3	UJ	2.4	UJ	2.3	U	2.6	U
alpha-BHC	0.81	U	3.5	U	0.7	UJ	0.68	UJ	0.69	UJ	0.68	U	0.76	U
alpha-Chlordane	2.7	U	12	U	2.4	UJ	2.3	UJ	2.4	UJ	2.3	U	2.6	U
beta-BHC	0.81	U	3.5	U	0.7	UJ	0.68	UJ	0.69	UJ	0.68	U	0.76	U
Dalapon	100	U	90	U	92	U	88	U	90	U	88	U	98	U
delta-BHC	0.81	U	3.5	U	0.7	UJ	0.68	UJ	0.69	UJ	0.68	U	0.76	U
Dicamba	32	U	28	U	28	U	4.0	J	28	U	27	U	1.9	J
Dichlorprop	160	U	140	U	140	U	140	U	140	U	140	U	150	U
Dieldrin	5.3	U	49		4.6	UJ	4.4	UJ	4.6	UJ	4.4	U	5	U
Dinoseb	160	UJ	140	U	140	UJ	140	UJ	140	UJ	140	U	150	U
Endosulfan I	2.7	U	12	U	2.4	UJ	2.3	UJ	2.4	UJ	2.3	U	2.6	U
Endosulfan II	5.3	U	23	U	4.6	UJ	4.4	UJ	4.6	UJ	4.4	U	5	U
Endosulfan sulfate	5.3	U	23	U	4.6	UJ	4.4	UJ	4.6	UJ	4.4	U	5	U
Endrin	5.3	U	23	U	4.6	UJ	4.4	UJ	4.6	UJ	4.4	U	5	U
Endrin aldehyde	5.3	U	23	U	4.6	UJ	4.4	UJ	4.6	UJ	4.4	U	5	U
Endrin ketone	5.3	U	23	U	4.6	UJ	4.4	U	4.6	UJ	4.4	U	5	U
gamma-BHC (Lindane)	2.7	U	12	U	2.4	UJ	2.3	UJ	2.4	UJ	2.3	U	0.15	J
gamma-Chlordane	2.7	U	12	U	2.4	UJ	2.3	UJ	2.4	UJ	2.3	U	2.6	U
Heptachlor	2.7	U	12	U	2.4	UJ	2.3	UJ	2.4	UJ	2.3	U	2.6	U
Heptachlor epoxide	2.7	U	12	U	2.4	UJ	2.3	UJ	2.4	UJ	2.3	U	0.43	J
MCPA	3200	U	2800	U	2800	U	2700	U	2800	U	2700	U	3000	U
MCPP	3200	U	2800	U	2800	U	2700	U	2800	U	2700	U	3000	U
Methoxychlor	27	U	120	U	24	UJ	23	UJ	24	UJ	23	U	26	U
Toxaphene	270	U	1200	U	240	UJ	230	U	240	UJ	230	U	260	U
Semivolatile Organic Compounds (ug/kg)														
1,2,4-Trichlorobenzene	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
1,2-Dichlorobenzene	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
1,3-Dichlorobenzene	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
1,4-Dichlorobenzene	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
2,4,5-Trichlorophenol	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
2,4,6-Trichlorophenol	110	UJ	97	U	98	UJ	94	UJ	97	UJ	94	U	110	UJ
2,4-Dichlorophenol	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
2,4-Dinitrophenol	1400	UJ	1200	U	1200	UJ	1100	UJ	1200	UJ	1100	U	1300	UJ
2,4-Dinitrotoluene	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
2,6-Dinitrotoluene	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
2-Chloronaphthalene	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
2-Chlorophenol	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
2-Methylnaphthalene	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
2-Methylphenol (o-Cresol)	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
2-Nitroaniline	1400	UJ	1200	U	1200	UJ	1100	UJ	1200	UJ	1100	U	1300	UJ
2-Nitrophenol	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
3&4Methylphenol	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
3,3'-Dichlorobenzidine	530	UJ	460	U	460	UJ	440	UJ	460	UJ	440	U	500	UJ
3-Nitroaniline	1400	UJ	1200	U	1200	UJ	1100	UJ	1200	UJ	1100	U	1300	UJ
4,6-Dinitro-2-methylphenol	1400	UJ	1200	U	1200	UJ	1100	UJ	1200	UJ	1100	U	1300	UJ

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T17-C1		CBS-CSB-T17-E1		CBS-CSB-T17-WI		CBS-CSB-T18-C1		CBS-CSB-T18-E1		CBS-CSB-T18-W1		CBS-CSB-T1-C1	
4-Bromophenyl phenyl ether	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
4-Chloro-3-methylphenol	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
4-Chloroaniline	530	UJ	460	U	460	UJ	440	UJ	460	UJ	440	U	500	UJ
4-Chlorophenyl phenyl ether	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
4-Nitroaniline	1400	UJ	1200	U	1200	UJ	1100	UJ	1200	UJ	1100	U	1300	UJ
4-Nitrophenol	1400	UJ	1200	U	1200	UJ	1100	UJ	1200	UJ	1100	U	1300	UJ
Acenaphthene	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Acenaphthylene	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Anthracene	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Benzo(a)anthracene	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Benzo(a)pyrene	89	J	42.5		130	UJ	120	UJ	120	UJ	120	U	140	UJ
Benzo(b)fluoranthene	84	J	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Benzo(g,h,i)perylene	190	J	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Benzo(k)fluoranthene	58	J	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Bis(2-chloroethoxy)methane	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Bis(2-chloroethyl)ether	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Bis(2-chloroisopropyl ether)	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Bis(2-ethylhexyl)phthalate	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Butylbenzylphthalate	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Carbazole	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Chrysene	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Dibenzo(a,h)anthracene	190	J	120	U	130	UJ	120	UJ	120	UJ	120	U	140	UJ
Dibenzofuran	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Diethyl phthalate	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Dimethyl phthalate	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
di-n-Butylphthalate	100	J	58.5		98	J	74	J	56	J	78		260	UJ
di-n-Octylphthalate	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Fluoranthene	270	UJ	64		240	UJ	230	UJ	240	UJ	230	U	260	UJ
Fluorene	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Hexachlorobenzene	110	UJ	97	U	98	UJ	94	UJ	97	UJ	94	U	110	UJ
Hexachlorobutadiene	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Hexachlorocyclopentadiene	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Hexachloroethane	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Indeno(1,2,3-cd)pyrene	200	J	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Isophorone	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Naphthalene	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	71	J
Nitrobenzene	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
N-Nitroso-di-N-propylamine	270	UJ	240	U	240	UJ	150	UJ	240	UJ	230	U	260	UJ
N-Nitrosodiphenylamine	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Pentachlorophenol	27	U	62		24	U	23	U	3.7	J	23	U	26	U
Phenanthrene	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Phenol	270	UJ	240	U	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Pyrene	270	UJ	93	J	240	UJ	230	UJ	240	UJ	230	U	260	UJ
Volatile Organic Compounds (ug/kg)														
1,1,1-Trichloroethane	10	U	6.9	U	7.2	U	7.8	U	6.6	U	6.4	U	8.2	U
1,1,2,2-Tetrachloroethane	10	U	6.9	U	7.2	U	7.8	U	6.6	U	6.4	U	8.2	U
1,1,2-Trichloroethane	10	U	6.9	U	7.2	U	7.8	U	6.6	U	6.4	U	8.2	U
1,1-Dichloroethane	10	U	6.9	U	7.2	U	7.8	U	6.6	U	6.4	U	8.2	U
1,1-Dichloroethene	9.3	U	6.4	U	6.6	U	7.2	U	6	U	5.9	U	7.6	U
1,2-Dichloroethane	10	U	6.9	U	7.2	U	7.8	U	6.6	U	6.4	U	8.2	U
1,2-Dichloroethene (total)	10	U	6.9	U	7.2	U	7.8	U	6.6	U	6.4	U	8.2	U
1,2-Dichloropropane	10	U	6.9	U	7.2	U	7.8	U	6.6	U	6.4	U	8.2	U
2-Butanone (MEK)	59		15.4		14	J	32	J	33	U	14.6		29	J
2-Hexanone	50	U	35	U	36	U	39	U	33	UJ	32	U	41	U

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T17-C1		CBS-CSB-T17-E1		CBS-CSB-T17-WI		CBS-CSB-T18-C1		CBS-CSB-T18-E1		CBS-CSB-T18-W1		CBS-CSB-T1-C1	
4-Methyl-2-pentanone (MIBK)	50	U	35	U	36	U	39	U	33	UJ	32	U	41	U
Acetone	340	J	165		110	J	180	J	53	J	122.5		290	
Benzene	10	U	4.75		3.8	J	18		6.6	U	6.4	U	7.2	J
Bromodichloromethane	10	U	6.9	U	7.2	U	7.8	U	6.6	U	6.4	U	8.2	U
Bromoform	10	U	6.9	U	7.2	U	7.8	U	6.6	U	6.4	U	8.2	U
Bromomethane	20	U	14	U	14	U	16	U	13	UJ	13	U	16	U
Carbon disulfide	30		5.1	J	4.7	J	7.2	J	6.6	U	6.4	U	8.2	U
Carbon tetrachloride	10	U	6.9	U	7.2	U	7.8	U	6.6	U	6.4	U	8.2	U
Chlorobenzene	110		73.5		13		2700		6.6	U	4.8		580	
Chloroform	10	U	6.9	U	7.2	U	7.8	U	6.6	U	6.4	U	8.2	U
Chloroethane	20	U	14	U	14	U	16	U	13	U	13	U	16	U
Chloromethane	20	U	14	U	14	U	16	U	13	U	13	U	16	U
cis-1,3-Dichloropropene	8.1	U	5.6	U	5.7	U	6.3	U	5.2	U	5.1	U	6.6	U
Dibromochloromethane	10	U	6.9	U	7.2	U	7.8	U	6.6	U	6.4	U	8.2	U
Ethylbenzene	10	U	6.9	U	7.2	U	7.8	U	6.6	U	6.4	U	10	
Methylene chloride	10	U	6.9	U	7.2	U	7.8	U	6.6	U	6.4	U	8.2	U
Styrene	10	U	6.9	U	7.2	U	7.8	U	6.6	U	6.4	U	8.2	U
Tetrachloroethene	10	U	6.9	U	7.2	U	7.8	U	6.6	U	6.4	U	8.2	U
Toluene	10	U	3.9		6.3	J	3.2	J	6.6	U	6.4	U	8.2	U
trans-1,3-Dichloropropene	8.1	U	5.6	U	5.7	U	6.3	U	5.2	U	5.1	U	6.6	U
Trichloroethene	10	U	6.9	U	7.2	U	7.8	U	6.6	U	6.4	U	8.2	U
Vinyl chloride	20	U	14	U	14	U	16	U	13	U	13	U	16	U
Xylenes (total)	10	U	6.9	U	7.2	U	11		6.6	U	6.4	U	80	
Inorganics (mg/kg)														
Aluminum	14000		11450		8400		8500		13000		16000		12000	
Antimony	2.9	UJ	4.6	U	2.6	UJ	2.5	UJ	2.3	UJ	2.5	U	2.6	UJ
Arsenic	16		14		5.2		4.1		11		9.9		5.5	
Barium	230		345		200		190		270		265		280	
Beryllium	0.82	J	0.72		0.54	J	0.54	J	0.8	J	0.905		0.82	
Cadmium	0.68	J	12.05		0.4	J	0.38	J	11		13		0.43	
Calcium	6300		7150		9900		14000		2200		4300		11000	J
Chromium	19		55.5		14		14		26		88		18	
Cobalt	14		10.3		6.9		8.4		6.8		6.6		7.4	
Copper	29		610		17		17		49		48.5		23	
Iron	18000		18500		16000		19000		12000		16500		18000	
Lead	27		123		10		11		26		44.5		48	J
Magnesium	3900		4200		6400		6900		2800		3500		6700	J
Manganese	120		155		170		370		75		96.5		190	
Mercury	0.072	J	0.27		0.028	J	0.029	J	0.029	J	0.053		0.045	J
Molybdenum	2.1		1.1		1.2		0.85	U	1.3		0.75	U	0.66	U
Nickel	89	J	250		17	J	28	J	210	J	79.5		21	
Potassium	2400		2000		1800		1700		1800		2200		2200	J
Selenium	1	UJ	2.3	U	1.3	UJ	0.65	UJ	1.1	UJ	0.87	U	1.4	UJ
Silver	1.5	U	0.46		1.3	U	1.2	U	1.2	U	1.2	U	1.4	U
Sodium	150		145		160		150		140		130		340	
Thallium	1.5	U	1.2	U	1.3	U	0.81	UJ	1.2	U	0.99	U	1.4	U
Tin	7.3	U	10.9		6.4	U	6.1	U	5.8	U	6.2	U	6.9	U
Vanadium	36		32		24		25		33		37		30	
Zinc	1300	J	3100		120	J	300	J	1900	J	2150		220	
PCBs (ug/kg)														
Monochlorobiphenyl	5.3	U	2.2	J	4.6	U	4.4	U	4.6	U	4.4	U	5	U
Dichlorobiphenyl	5.3	U	14	J	4.6	U	4.4	U	4.6	U	4.4	U	3.5	J
Trichlorobiphenyl	5.3	U	33.5		4.6	U	4.4	U	4.6	U	4.4	U	1.8	J
Tetrachlorobiphenyl	11	U	147.5		9.4	U	9	U	9.3	U	9	U	8.8	J

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T17-C1		CBS-CSB-T17-E1		CBS-CSB-T17-WI		CBS-CSB-T18-C1		CBS-CSB-T18-E1		CBS-CSB-T18-W1		CBS-CSB-T1-C1	
Pentachlorobiphenyl	11	U	425		9.4	U	9	U	9.3	U	9	U	24	
Hexachlorobiphenyl	11	U	77.5		9.4	U	9	U	9.3	U	9	U	7.1	J
Heptachlorobiphenyl	16	U	50		14	U	14	U	14	U	14	U	15	U
Octachlorobiphenyl	16	U	14.05		14	U	14	U	14	U	14	U	15	U
Nonachlorobiphenyl	27	U	23	U	24	U	22	U	23	U	22	U	25	U
Decachlorobiphenyl	27	U	33.5		24	U	22	U	23	U	22	U	25	U
Dioxins (ug/kg)														
1,2,3,4,6,7,8,9-OCDD	0.74	J	246.6		0.51	J	0.46	J	1.8	J	1.5		2.1	J
1,2,3,4,6,7,8-HpCDD	0.03	U	23.2		0.008	U	0.03	J	0.1	UJ	0.1	U	0.21	J
1,2,3,4,7,8-HxCDD	0.02	U	0.1	U	0.005	U	0.005	U	0.07	U	0.07	U	0.03	U
1,2,3,6,7,8-HxCDD	0.02	U	11.6	J	0.006	U	0.006	U	0.1	U	0.1	U	0.04	U
1,2,3,7,8,9-HxCDD	0.02	U	0.2	U	0.005	U	0.005	U	0.09	U	0.1	U	0.03	U
1,2,3,7,8-PeCDD	0.02	U	0.1	U	0.009	U	0.008	U	0.06	U	0.07	U	0.04	U
2,3,7,8-TCDD	0.01	U	0.08	U	0.006	U	0.005	U	0.03	U	0.04	U	0.03	U
Total HpCDD	0.03	U	43.35		0.008	U	0.05	J	0.1	U	0.1	U	0.42	J
Total HxCDD	0.02	U	10.35		0.005	U	0.01	J	0.07	U	0.07	U	0.03	U
Total PeCDD	0.02	U	3.65		0.009	U	0.008	U	0.06	U	0.07	U	0.04	U
Total TCDD	3.2	UJ	29.2		2.7	UJ	2.7	UJ	3	UJ	3.2	U	3.2	UJ
Furans (ug/kg)														
1,2,3,4,6,7,8,9-OCDF	0.1	J	134.55		0.01	U	0.08	J	0.34	J	0.3	U	0.7	J
1,2,3,4,6,7,8-HpCDF	0.02	U	12.6		0.005	U	0.02	J	0.09	U	0.1	U	0.08	J
1,2,3,4,7,8,9-HpCDF	0.02	U	0.2	U	0.006	U	0.006	U	0.1	U	0.1	U	0.03	U
1,2,3,4,7,8-HxCDF	0.01	U	0.09	U	0.004	U	0.004	U	0.05	U	0.06	U	0.02	U
1,2,3,6,7,8-HxCDF	0.01	U	0.1	U	0.004	U	0.004	U	0.06	U	0.06	U	0.02	U
1,2,3,7,8,9-HxCDF	0.01	U	0.1	U	0.004	U	0.004	U	0.06	U	0.07	U	0.02	U
1,2,3,7,8-PeCDF	0.01	U	0.08	U	0.006	U	0.006	U	0.04	U	0.04	U	0.03	U
2,3,4,6,7,8-HxCDF	0.01	U	0.1	U	0.004	U	0.004	U	0.06	U	0.06	U	0.03	U
2,3,4,7,8-PeCDF	0.02	U	0.08	U	0.008	U	0.008	U	0.04	UJ	0.04	U	0.03	U
2,3,7,8-TCDF	0.01	U	0.05	U	0.005	U	0.005	U	0.02	U	0.03	U	0.02	U
Total HpCDF	0.02	U	52.35		0.005	U	0.05	J	0.09	U	0.1	U	0.41	J
Total HxCDF	0.01	U	11.4		0.004	U	0.004	U	0.05	U	0.06	U	0.05	J
Total PeCDF	0.01	U	0.87	J	0.006	U	0.006	U	0.04	U	0.04	U	0.03	U
Total TCDF	0.06	UJ	0.05	U	0.05	UJ	0.04	UJ	0.06	UJ	0.03	U	0.08	UJ

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T1-E1		CBS-CSB-T1-W1		CBS-CSB-T2-C1		CBS-CSB-T2-E1		CBS-CSB-T2-W1		CBS-CSB-T3-C1		CBS-CSB-T3-E1		CBS-CSB-T3-W1	
Cyanide	0.74	U	0.69	U	0.79	U	0.69	U	0.67	U	0.86	U	0.63	U	0.68	U
Pesticides/Herbicides (ug/kg)																
2,4,5-T	12	U	12	U	13	U	12	U	11	U	290	U	4200	U	27	J
2,4,5-TP (Silvex)	12	U	12	U	13	U	12	U	11	U	290	U	4200	U	11	UJ
2,4-D	12	U	12	U	13	U	12	U	11	U	290	U	4200	U	11	UJ
2,4-DB	12	U	12	U	13	U	12	U	11	U	290	U	4200	U	11	UJ
4,4'-DDD	4.8	U	4.6	U	100	U	9.2	U	88	U	110	U	84	U	4.5	U
4,4'-DDE	4.8	U	35	J	100	U	9.2	U	88	U	110	U	84	U	4.5	U
4,4'-DDT	17	J	51	J	100	U	9.2	U	88	U	110	U	84	U	4.5	U
Aldrin	2.5	U	2.4	U	54	U	4.7	U	45	U	59	U	43	U	2.3	U
alpha-BHC	0.74	U	0.69	U	16	U	1.4	U	13	U	17	U	13	U	0.82	J
alpha-Chlordane	2.5	U	2.4	U	54	U	4.7	U	45	U	59	U	43	U	2.3	U
beta-BHC	0.74	U	0.69	U	16	U	3.1	J	13	U	17	U	13	U	0.68	U
Dalapon	96	U	90	U	100	U	90	U	87	U	2200	U	33000	U	89	UJ
delta-BHC	0.74	U	0.69	U	16	U	1.4	U	13	U	17	U	13	U	0.68	U
Dicamba	29	U	28	U	32	U	28	U	1.7	J	690	U	10000	U	27	UJ
Dichlorprop	150	U	140	U	160	U	140	U	130	U	3400	U	51000	U	6.6	J
Dieldrin	7.4	J	30	J	100	U	9.2	U	88	U	110	U	84	U	0.42	J
Dinoseb	150	U	140	U	160	U	140	U	130	U	3400	U	51000	U	140	UJ
Endosulfan I	2.5	U	2.4	U	54	U	4.7	U	45	U	59	U	43	U	2.3	U
Endosulfan II	4.8	U	4.6	U	100	U	9.2	U	88	U	110	U	84	U	4.5	U
Endosulfan sulfate	4.8	U	4.6	U	100	U	9.2	U	88	U	110	U	84	U	4.5	U
Endrin	4.8	U	4.6	U	100	U	9.2	U	88	U	110	U	84	U	4.5	U
Endrin aldehyde	4.8	U	4.6	U	100	U	9.2	U	88	U	110	U	84	U	4.5	U
Endrin ketone	4.8	U	4.6	U	100	U	9.2	U	88	U	110	U	84	U	4.5	U
gamma-BHC (Lindane)	2.5	U	2.4	U	54	U	4.7	U	45	U	59	U	43	U	2.3	U
gamma-Chlordane	2.5	U	2.4	U	54	U	4.7	U	45	U	59	U	43	U	2.3	U
Heptachlor	2.5	U	2.4	U	54	U	4.7	U	45	U	59	U	43	U	2.3	U
Heptachlor epoxide	4.8	J	21	J	54	U	7.3	J	45	U	59	U	43	U	2.3	U
MCPA	2900	U	2800	U	3200	U	2800	U	2700	U	69000	U	1000000	U	2700	UJ
MCPP	2900	U	2800	U	3200	U	2800	U	2700	U	69000	U	1000000	U	2700	UJ
Methoxychlor	25	U	24	U	540	U	47	U	450	U	590	U	430	U	23	U
Toxaphene	250	U	240	U	5400	U	470	U	4500	U	5900	U	4300	U	230	U
Semivolatile Organic Compounds (ug/kg)																
1,2,4-Trichlorobenzene	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	80000	J	26000	J	230	UJ
1,2-Dichlorobenzene	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	53000	J	23000	J	230	UJ
1,3-Dichlorobenzene	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
1,4-Dichlorobenzene	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	5500		2400		230	UJ
2,4,5-Trichlorophenol	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	240	J	220	UJ	230	UJ
2,4,6-Trichlorophenol	100	UJ	97	UJ	110	UJ	97	UJ	93	UJ	4300		990		96	UJ
2,4-Dichlorophenol	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	6600		580		230	UJ
2,4-Dinitrophenol	1200	UJ	1200	UJ	1300	UJ	1200	UJ	1100	UJ	1500	UJ	1100	UJ	1200	UJ
2,4-Dinitrotoluene	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
2,6-Dinitrotoluene	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
2-Chloronaphthalene	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
2-Chlorophenol	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	510	J	97	J	230	UJ
2-Methylnaphthalene	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	400	J	7300		230	UJ
2-Methylphenol (o-Cresol)	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
2-Nitroaniline	1200	UJ	1200	UJ	1300	UJ	1200	UJ	1100	UJ	1500	UJ	1100	UJ	1200	UJ
2-Nitrophenol	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
3&4Methylphenol	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	1600		220	UJ	230	UJ
3,3'-Dichlorobenzidine	480	UJ	460	UJ	520	UJ	460	UJ	440	UJ	570	UJ	420	UJ	450	UJ
3-Nitroaniline	1200	UJ	1200	UJ	1300	UJ	1200	UJ	1100	UJ	1500	UJ	1100	UJ	1200	UJ
4,6-Dinitro-2-methylphenol	1200	UJ	1200	UJ	1300	UJ	1200	UJ	1100	UJ	1500	UJ	1100	UJ	1200	UJ

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area 1

	CBS-CSB-T1-E1		CBS-CSB-T1-W1		CBS-CSB-T2-C1		CBS-CSB-T2-E1		CBS-CSB-T2-W1		CBS-CSB-T3-C1		CBS-CSB-T3-E1		CBS-CSB-T3-W1	
4-Bromophenyl phenyl ether	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
4-Chloro-3-methylphenol	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
4-Chloroaniline	480	UJ	460	UJ	520	UJ	460	UJ	440	UJ	11000		7200		450	UJ
4-Chlorophenyl phenyl ether	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
4-Nitroaniline	1200	UJ	1200	UJ	1300	UJ	1200	UJ	1100	UJ	810	J	9000	J	1200	UJ
4-Nitrophenol	1200	UJ	1200	UJ	1300	UJ	1200	UJ	1100	UJ	1500	UJ	1100	UJ	1200	UJ
Acenaphthene	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
Acenaphthylene	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
Anthracene	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	310	J	230	UJ
Benzo(a)anthracene	250	UJ	51	J	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
Benzo(a)pyrene	130	UJ	120	UJ	140	UJ	120	UJ	120	UJ	160	UJ	220	J	120	UJ
Benzo(b)fluoranthene	250	UJ	53	J	270	UJ	240	UJ	230	UJ	290	UJ	140	J	230	UJ
Benzo(g,h,i)perylene	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	86	J	230	UJ
Benzo(k)fluoranthene	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	110	J	230	UJ
Bis(2-chloroethoxy)methane	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
Bis(2-chloroethyl)ether	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
Bis(2-chloroisopropyl ether)	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
Bis(2-ethylhexyl)phthalate	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	81000	J	65	J
Butylbenzylphthalate	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	82	J	3200		230	UJ
Carbazole	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
Chrysene	250	UJ	53	J	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
Dibenzo(a,h)anthracene	130	UJ	120	UJ	140	UJ	120	UJ	120	UJ	160	UJ	110	UJ	120	UJ
Dibenzofuran	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
Diethyl phthalate	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
Dimethyl phthalate	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
di-n-Butylphthalate	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	210	J	230	UJ
di-n-Octylphthalate	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
Fluoranthene	250	UJ	120	J	270	UJ	240	UJ	230	UJ	150	J	190	J	230	UJ
Fluorene	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	100	J	220	UJ	230	UJ
Hexachlorobenzene	100	UJ	97	UJ	110	UJ	97	UJ	93	UJ	120	UJ	89	UJ	96	UJ
Hexachlorobutadiene	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
Hexachlorocyclopentadiene	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
Hexachloroethane	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
Indeno(1,2,3-cd)pyrene	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
Isophorone	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
Naphthalene	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	160	J	1300		230	UJ
Nitrobenzene	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	160	J	520		230	UJ
N-Nitroso-di-N-propylamine	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
N-Nitrosodiphenylamine	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	220	UJ	230	UJ
Pentachlorophenol	15	J	48		26	U	13	J	23	U	1900		44000		61	J
Phenanthrene	250	UJ	62	J	270	UJ	240	UJ	230	UJ	130	J	2400		230	UJ
Phenol	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	3400		110	J	230	UJ
Pyrene	250	UJ	240	UJ	270	UJ	240	UJ	230	UJ	290	UJ	470		230	UJ
Volatile Organic Compounds (ug/kg)																
1,1,1-Trichloroethane	7.5	U	7.5	U	8.8	U	7.2	U	4.6	U	23		6.6	U	9.5	U
1,1,2,2-Tetrachloroethane	7.5	U	7.5	U	8.8	U	7.2	U	4.6	U	11	U	6.6	U	9.5	U
1,1,2-Trichloroethane	7.5	U	7.5	U	8.8	U	7.2	U	4.6	U	11	U	6.6	U	9.5	U
1,1-Dichloroethane	7.5	U	7.5	U	8.8	U	7.2	U	4.6	U	11	U	6.6	U	9.5	U
1,1-Dichloroethene	6.9	U	6.9	U	8.1	U	6.6	U	4.2	U	10	U	6.1	U	8.8	U
1,2-Dichloroethane	7.5	U	7.5	U	8.8	U	7.2	U	4.6	U	11	U	6.6	U	9.5	U
1,2-Dichloroethene (total)	7.5	U	7.5	U	8.8	U	7.2	U	4.6	U	12		6.6	U	9.5	U
1,2-Dichloropropane	7.5	U	7.5	U	8.8	U	7.2	U	4.6	U	11	U	6.6	U	9.5	U
2-Butanone (MEK)	38	U	5.2	J	42	J	8	J	8.5	J	610		15	J	8.8	J
2-Hexanone	38	U	38	U	44	U	36	U	23	U	57	U	77		48	U

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T1-E1		CBS-CSB-T1-W1		CBS-CSB-T2-C1		CBS-CSB-T2-E1		CBS-CSB-T2-W1		CBS-CSB-T3-C1		CBS-CSB-T3-E1		CBS-CSB-T3-W1	
4-Methyl-2-pentanone (MIBK)	38	U	38	U	44	U	36	U	23	U	110		15	J	48	U
Acetone	75	U	100	U	240		72	U	58	U	470		66	U	120	U
Benzene	7.5	U	7.5	U	8.8	U	7.2	U	2.4	J	4	J	6.6	U	9.5	U
Bromodichloromethane	7.5	U	7.5	U	8.8	U	7.2	U	4.6	U	11	U	6.6	U	9.5	U
Bromoform	7.5	U	7.5	U	8.8	U	7.2	U	4.6	U	11	U	6.6	U	9.5	U
Bromomethane	15	U	15	U	18	U	14	U	9.1	U	23	U	13	U	19	U
Carbon disulfide	7.5	U	14		25		7.2	U	3.3	J	20		6.6	U	9.5	U
Carbon tetrachloride	7.5	U	7.5	U	8.8	U	7.2	U	4.6	U	11	U	6.6	U	9.5	U
Chlorobenzene	3.5	J	6.1	J	80		3.8	J	54		4500		360		4.1	J
Chloroform	7.5	U	7.5	U	8.8	U	7.2	U	4.6	U	11	U	6.6	U	9.5	U
Chloroethane	15	U	15	U	18	U	14	U	9.1	U	23	U	13	U	19	U
Chloromethane	15	U	15	U	18	U	14	U	9.1	U	23	U	13	U	19	U
cis-1,3-Dichloropropene	6	U	6	U	7	U	5.8	U	3.6	U	9.1	U	5.3	U	7.6	U
Dibromochloromethane	7.5	U	7.5	U	8.8	U	7.2	U	4.6	U	11	U	6.6	U	9.5	U
Ethylbenzene	7.5	U	7.5	U	8.8	U	7.2	U	4.6	U	3200		150		9.5	U
Methylene chloride	7.5	U	7.5	U	8.8	U	7.2	U	4.6	U	11	U	6.6	U	9.5	U
Styrene	7.5	U	7.5	U	8.8	U	7.2	U	4.6	U	11	U	6.6	U	9.5	U
Tetrachloroethene	7.5	U	7.5	U	8.8	U	7.2	U	4.6	U	70		9.9		8.3	J
Toluene	7.5	U	7.5	U	8.8	U	7.2	U	4.6	U	290		14		5.1	J
trans-1,3-Dichloropropene	6	U	6	U	7	U	5.8	U	3.6	U	9.1	U	5.3	U	7.6	U
Trichloroethene	7.5	U	7.5	U	8.8	U	7.2	U	4.6	U	8.8	J	6.6	U	9.5	U
Vinyl chloride	15	U	15	U	18	U	14	U	9.1	U	23	U	13	U	19	U
Xylenes (total)	7.5	U	7.5	U	8.8	U	7.2	U	4.6	U	29000		1000		9.5	U
Inorganics (mg/kg)																
Aluminum	18000		10000		11000		4400		11000		1500		2100		7900	
Antimony	2.7	UJ	2.5	UJ	2.9	UJ	2.5	UJ	2.7	UJ	2.6	J	2.4	J	2.3	UJ
Arsenic	3.6		4.8		23		12		2.7		44		6		5	
Barium	210		310		390		300		250		310		320		260	
Beryllium	1.2		0.74		0.38	U	0.17	U	0.78		0.63	U	0.1	U	0.86	
Cadmium	7.4		19		37		4.1		0.34		0.78	U	0.58	U	10	
Calcium	9000	J	13000	J	5500	J	2700	J	12000	J	2100	J	1500	J	6200	J
Chromium	25		31		170		180		36		5.7		29		24	
Cobalt	16		14		2.7		3.6		8		1.9		0.64		5.9	
Copper	130		310		150		2000		17		390		38		180	
Iron	21000		14000		12000		10000		12000		440		1800		11000	
Lead	36	J	44	J	130	J	260	J	12	J	75	J	400	J	13	J
Magnesium	5100	J	6900	J	1600	J	820	J	6300	J	100	J	360	J	4700	J
Manganese	300		160		71		50		140		4		7.1		73	
Mercury	0.16	J	0.23	J	0.19	J	0.24	J	0.015	U	0.11	J	0.27	J	0.038	J
Molybdenum	1.5		1.5		1.3	U	0.85	U	0.7	U	2.8		2.6		0.53	U
Nickel	500		420		190		260		54		23		1.9		130	
Potassium	2600	J	2000	J	1900	J	1200	J	1700	J	1100	J	780	J	1800	J
Selenium	1.3	UJ	1.3	UJ	1.4	UJ	1.3	UJ	1.3	UJ	1.6	UJ	1.2	UJ	1.1	UJ
Silver	0.27		0.41		1.4	U	1.3	U	1.3	U	1.6	U	0.71		1.1	U
Sodium	410		370		460		89		200		220		87		160	
Thallium	0.98		0.76		1.4	U	1.3	U	1.3	U	1.6	U	1.2	U	1.1	U
Tin	6.7	U	6.3	U	7.2	U	470		6.7	U	7.8	U	11		5.7	U
Vanadium	42		31		24		12		29		4.4		5.2		23	
Zinc	2600		2700		2300		1200		490		20		21		2000	
PCBs (ug/kg)																
Monochlorobiphenyl	4.8	U	4.6	U	5.2	UJ	4.6	UJ	4.4	UJ	280	U	200	U	4.5	UJ
Dichlorobiphenyl	3.2	J	8.8		5.2	UJ	4.6	UJ	4.4	UJ	270		200	U	25	J
Trichlorobiphenyl	73	J	82		2.1	J	4.6	UJ	4.4	UJ	2000		15000		120	J
Tetrachlorobiphenyl	500	J	420		11	UJ	18	J	8.9	UJ	3200		51000		53	J

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T1-E1		CBS-CSB-T1-W1		CBS-CSB-T2-C1		CBS-CSB-T2-E1		CBS-CSB-T2-W1		CBS-CSB-T3-C1		CBS-CSB-T3-E1		CBS-CSB-T3-W1	
Pentachlorobiphenyl	600		340		11	UJ	150	J	8.9	UJ	770		18000		31	J
Hexachlorobiphenyl	260		180		11	UJ	40	J	8.9	UJ	140		830		3.4	J
Heptachlorobiphenyl	160		130		16	UJ	19	J	13	UJ	860	U	630	U	14	UJ
Octachlorobiphenyl	42		36		16	UJ	4.7	J	13	UJ	860	U	630	U	14	UJ
Nonachlorobiphenyl	24	U	24	U	26	UJ	24	UJ	23	UJ	1400	U	1000	U	23	UJ
Decachlorobiphenyl	15	J	23	J	26	UJ	17	J	23	UJ	1400	U	1000	U	23	UJ
Dioxins (ug/kg)																
1,2,3,4,6,7,8,9-OCDD	25		87.9		1.5	J	20.8		0.32	J	31.6		483		3.4	J
1,2,3,4,6,7,8-HpCDD	2.1	J	7.1		0.05	U	2	J	0.05	U	2.1	J	58.4		0.27	J
1,2,3,4,7,8-HxCDD	0.03	U	0.04	U	0.03	U	0.02	U	0.03	U	0.06	U	0.48	J	0.07	U
1,2,3,6,7,8-HxCDD	0.07	J	0.17	J	0.04	U	0.07	J	0.04	U	0.13	J	1.5	J	0.09	U
1,2,3,7,8,9-HxCDD	0.03	J	0.08	J	0.03	U	0.02	U	0.03	U	0.14	J	1.6	J	0.08	U
1,2,3,7,8-PeCDD	0.04	U	0.04	U	0.05	U	0.04	U	0.05	U	0.21	J	0.28	J	0.07	U
2,3,7,8-TCDD	0.03	U	0.03	U	0.04	U	0.02	U	0.03	U	0.05	U	0.06	U	0.05	U
Total HpCDD	4.2		13.7		0.05	U	3.9		0.05	U	3.6	J	98.6		0.49	J
Total HxCDD	0.31	J	1	J	0.03	U	0.42	J	0.03	U	1.1	J	10.1		0.07	U
Total PeCDD	0.04	U	0.18	J	0.05	U	0.04	U	0.05	U	1	J	2.8	J	0.07	U
Total TCDD	3.3	UJ	3.5	UJ	3.7	UJ	3.4	UJ	3.1	UJ	5.5	UJ	7.8	UJ	2.8	UJ
Furans (ug/kg)																
1,2,3,4,6,7,8,9-OCDF	5.3	J	22.6		0.17	J	4.2	J	0.06	J	3.2	J	39		0.62	J
1,2,3,4,6,7,8-HpCDF	0.67	J	2.5	J	0.03	U	0.79	J	0.03	U	1.1	J	9.7		0.07	U
1,2,3,4,7,8,9-HpCDF	0.06	J	0.15	J	0.04	U	0.03	U	0.03	U	0.13	J	0.09	U	0.08	U
1,2,3,4,7,8-HxCDF	0.03	J	0.02	U	0.02	U	0.02	U	0.02	U	0.74	J	0.33	J	0.05	U
1,2,3,6,7,8-HxCDF	0.02	U	0.02	U	0.03	U	0.02	U	0.02	U	0.3	J	0.06	U	0.06	U
1,2,3,7,8,9-HxCDF	0.02	U	0.03	U	0.03	U	0.02	U	0.03	U	0.04	U	0.07	U	0.06	U
1,2,3,7,8-PeCDF	0.02	U	0.03	U	0.03	U	0.02	U	0.03	U	0.09	J	0.11	J	0.05	U
2,3,4,6,7,8-HxCDF	0.02	U	0.03	U	0.03	U	0.02	U	0.03	U	0.04	U	0.07	U	0.06	U
2,3,4,7,8-PeCDF	0.02	U	0.03	U	0.03	U	0.02	U	0.03	U	0.04	U	0.31	J	0.05	U
2,3,7,8-TCDF	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.03	U	0.63	J	0.04	U
Total HpCDF	3	J	10.2		0.03	U	2.9	J	0.03	U	2.5	J	41.5		0.28	J
Total HxCDF	0.5	J	1.2	J	0.02	U	0.81	J	0.02	U	2.4	J	21.4		0.05	U
Total PeCDF	0.02	U	0.07	J	0.03	U	0.02	U	0.03	U	0.83	J	1.9	J	0.05	U
Total TCDF	0.07	UJ	0.02	U	0.08	UJ	0.02	U	0.06	UJ	0.18	J	0.63	J	0.1	UJ

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T4-C1		CBS-CSB-T4-E1		CBS-CSB-T4-W1		CBS-CSB-T5-C1		CBS-CSB-T5-E1		CBS-CSB-T5-W1		CBS-CSB-T6-C1		CBS-CSB-T6-E1	
Cyanide	1		0.69	U	0.75	U	0.74	U	0.66	U	0.55	U	0.68	U	0.58	U
Pesticides/Herbicides (ug/kg)																
2,4,5-T	27		12	U	610		12	U	4.9	J	11	U	12	U	3.4	J
2,4,5-TP (Silvex)	14	U	12	U	25	U	12	U	11	U	11	U	12	U	9.6	U
2,4-D	14	U	12	U	140	J	12	U	17	J	11	U	12	U	9.6	U
2,4-DB	14	U	12	U	25	U	12	U	11	U	11	U	12	U	9.6	U
4,4'-DDD	5.4	U	4.6	U	4.9	U	4.8	U	4.3	U	0.83	J	4.6	U	3.8	U
4,4'-DDE	5.4	U	4.6	U	4.9	U	4.8	U	4.3	U	4.5	U	4.6	U	3.8	U
4,4'-DDT	5.4	U	4.6	U	4.9	U	4.8	U	51	J	4.5	U	2.3	J	3.8	U
Aldrin	2.8	U	2.4	U	2.5	U	2.5	U	2.2	U	2.3	U	2.4	U	2	U
alpha-BHC	0.82	U	0.69	U	0.75	U	0.74	U	0.66	U	0.68	U	0.69	U	0.55	J
alpha-Chlordane	2.8	U	2.4	U	2.5	U	2.5	U	2.2	U	2.3	U	2.4	U	2	UJ
beta-BHC	0.82	U	0.69	U	0.75	U	0.74	U	0.66	U	0.68	U	0.69	U	1.9	J
Dalapon	110	U	90	U	190	U	96	U	86	U	89	U	90	U	76	U
delta-BHC	0.82	U	0.69	U	0.75	U	0.74	U	0.66	U	0.68	U	0.69	U	0.58	U
Dicamba	2.2	J	28	U	60	U	3	J	26	U	27	U	28	U	23	U
Dichlorprop	160	U	140	U	300	U	150	U	130	U	140	U	140	U	120	U
Dieldrin	5.4	U	4.6	U	4.9	U	4.8	U	4.3	U	4.5	U	4.6	U	3.8	U
Dinoseb	160	U	140	U	300	U	150	U	130	U	140	U	140	U	120	U
Endosulfan I	2.8	U	2.4	U	2.5	U	2.5	U	2.2	U	2.3	U	2.4	U	2	U
Endosulfan II	5.4	U	4.6	U	4.9	U	4.8	U	4.3	U	4.5	U	4.6	U	3.8	U
Endosulfan sulfate	5.4	U	4.6	U	4.9	U	4.8	U	4.3	U	4.5	U	4.6	U	3.8	U
Endrin	5.4	U	4.6	U	4.9	U	4.8	U	4.3	U	4.5	U	4.6	U	3.8	U
Endrin aldehyde	5.4	U	4.6	U	4.9	U	4.8	U	4.3	U	4.5	U	4.6	U	3.8	U
Endrin ketone	5.4	U	4.6	U	4.9	U	4.8	U	4.3	U	4.5	U	4.6	U	3.8	U
gamma-BHC (Lindane)	1.4	J	2.4	U	2.5	U	2.5	U	2.2	U	2.3	U	2.4	U	2	U
gamma-Chlordane	2.8	U	2.4	U	2.5	U	2.5	U	2.2	U	2.3	U	2.4	U	2	U
Heptachlor	2.8	U	2.4	U	2.5	U	2.5	U	2.2	U	2.3	U	2.4	U	2	U
Heptachlor epoxide	2.8	U	3.2	J	2.5	U	0.34	J	95	J	0.2	J	2.4	U	2	U
MCPA	3300	U	2800	U	6000	U	2900	U	2600	U	2700	U	2800	U	2300	U
MCPP	3300	U	2800	U	6000	U	2900	U	2600	U	2700	U	2800	U	6100	J
Methoxychlor	28	U	24	U	25	U	25	U	22	U	23	U	0.41	J	1.1	J
Toxaphene	280	U	240	U	250	U	250	U	220	U	230	U	240	U	200	U
Semivolatile Organic Compounds (ug/kg)																
1,2,4-Trichlorobenzene	66	J	48	J	250	UJ	250	UJ	300	J	230	UJ	240	U	200	UJ
1,2-Dichlorobenzene	110	J	57	J	370		250	UJ	310	J	230	UJ	240	U	200	UJ
1,3-Dichlorobenzene	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
1,4-Dichlorobenzene	64	J	240	UJ	250	J	250	UJ	39	J	230	UJ	240	U	200	UJ
2,4,5-Trichlorophenol	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
2,4,6-Trichlorophenol	130	J	97	UJ	150	J	100	UJ	65	J	96	UJ	97	U	81	UJ
2,4-Dichlorophenol	120	J	240	UJ	670		250	UJ	69	J	230	UJ	240	U	200	UJ
2,4-Dinitrophenol	1400	UJ	1200	UJ	1300	UJ	1200	UJ	1100	UJ	1200	UJ	1200	U	990	UJ
2,4-Dinitrotoluene	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
2,6-Dinitrotoluene	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
2-Chloronaphthalene	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
2-Chlorophenol	280	UJ	240	UJ	98	J	250	UJ	220	UJ	230	UJ	240	U	200	UJ
2-Methylnaphthalene	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
2-Methylphenol (o-Cresol)	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
2-Nitroaniline	1400	UJ	1200	UJ	1300	UJ	1200	UJ	1100	UJ	1200	UJ	1200	U	990	UJ
2-Nitrophenol	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
3&4Methylphenol	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
3,3'-Dichlorobenzidine	540	UJ	460	UJ	490	UJ	480	UJ	430	UJ	450	UJ	460	U	380	UJ
3-Nitroaniline	1400	UJ	1200	UJ	1300	UJ	1200	UJ	1100	UJ	1200	UJ	1200	U	990	UJ
4,6-Dinitro-2-methylphenol	1400	UJ	1200	UJ	1300	UJ	1200	UJ	1100	UJ	1200	UJ	1200	U	990	UJ

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T4-C1		CBS-CSB-T4-E1		CBS-CSB-T4-W1		CBS-CSB-T5-C1		CBS-CSB-T5-E1		CBS-CSB-T5-W1		CBS-CSB-T6-C1		CBS-CSB-T6-E1	
4-Bromophenyl phenyl ether	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
4-Chloro-3-methylphenol	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
4-Chloroaniline	76	J	460	UJ	480	J	480	UJ	430	UJ	450	UJ	460	U	380	UJ
4-Chlorophenyl phenyl ether	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
4-Nitroaniline	1400	UJ	1200	UJ	1300	UJ	1200	UJ	1100	UJ	1200	UJ	1200	U	990	UJ
4-Nitrophenol	1400	UJ	1200	UJ	1300	UJ	1200	UJ	1100	UJ	1200	UJ	1200	U	990	UJ
Acenaphthene	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Acenaphthylene	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Anthracene	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Benzo(a)anthracene	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Benzo(a)pyrene	150	UJ	120	UJ	130	UJ	130	UJ	120	UJ	120	UJ	120	U	100	UJ
Benzo(b)fluoranthene	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Benzo(g,h,i)perylene	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Benzo(k)fluoranthene	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Bis(2-chloroethoxy)methane	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Bis(2-chloroethyl)ether	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Bis(2-chloroisopropyl ether)	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Bis(2-ethylhexyl)phthalate	280	UJ	240	UJ	250	UJ	250	UJ	82	J	230	UJ	240	U	200	UJ
Butylbenzylphthalate	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Carbazole	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Chrysene	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Dibenzo(a,h)anthracene	150	UJ	120	UJ	130	UJ	130	UJ	120	UJ	120	UJ	120	U	100	UJ
Dibenzofuran	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Diethyl phthalate	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Dimethyl phthalate	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
di-n-Butylphthalate	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
di-n-Octylphthalate	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Fluoranthene	280	UJ	240	UJ	79	J	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Fluorene	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Hexachlorobenzene	110	UJ	97	UJ	100	UJ	100	UJ	92	UJ	96	UJ	97	U	81	UJ
Hexachlorobutadiene	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Hexachlorocyclopentadiene	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Hexachloroethane	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Indeno(1,2,3-cd)pyrene	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Isophorone	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Naphthalene	280	UJ	240	UJ	100	J	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Nitrobenzene	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
N-Nitroso-di-N-propylamine	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
N-Nitrosodiphenylamine	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	73	J	240	U	200	UJ
Pentachlorophenol	92		230		33	J	25	U	1000		23	U	4.7		280	
Phenanthrene	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Phenol	280	UJ	240	UJ	160	J	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Pyrene	280	UJ	240	UJ	250	UJ	250	UJ	220	UJ	230	UJ	240	U	200	UJ
Volatile Organic Compounds (ug/kg)																
1,1,1-Trichloroethane	9.8	U	3.8	J	7.5	U	7.4	U	7.5	U	6.8	U	6.6	U	5.7	U
1,1,2,2-Tetrachloroethane	9.8	U	5.9	U	7.5	U	7.4	U	7.5	U	6.8	U	6.6	U	5.7	U
1,1,2-Trichloroethane	9.8	U	5.9	U	7.5	U	7.4	U	7.5	U	6.8	U	6.6	U	5.7	U
1,1-Dichloroethane	9.8	U	5.9	U	7.5	U	7.4	U	7.5	U	6.8	U	6.6	U	5.7	U
1,1-Dichloroethene	9	U	5.4	U	7.5	U	6.8	U	6.9	U	6.3	U	6	U	5.2	U
1,2-Dichloroethane	9.8	U	5.9	U	7.5	U	7.4	U	7.5	U	6.8	U	6.6	U	5.7	U
1,2-Dichloroethene (total)	9.8	U	5.9	U	7.5	U	7.4	U	7.5	U	6.8	U	6.6	U	5.7	U
1,2-Dichloropropane	9.8	U	5.9	U	7.5	U	7.4	U	7.5	U	6.8	U	6.6	U	5.7	U
2-Butanone (MEK)	72		6.2	J	57		86		6.2	J	13	J	33	U	28	U
2-Hexanone	49	U	29	U	37	U	37	U	37	U	34	U	33	U	28	U

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T4-C1		CBS-CSB-T4-E1		CBS-CSB-T4-W1		CBS-CSB-T5-C1		CBS-CSB-T5-E1		CBS-CSB-T5-W1		CBS-CSB-T6-C1		CBS-CSB-T6-E1	
4-Methyl-2-pentanone (MIBK)	19	J	29	U	35	J	37	U	9.3	J	34	U	33	U	28	U
Acetone	340		86		200		360		90		150		28.5		19	J
Benzene	9.8	U	5.9	U	3.3	J	7.4	U	7.5	U	6.8	U	16		5.7	U
Bromodichloromethane	9.8	U	5.9	U	7.5	U	7.4	U	7.5	U	6.8	U	6.6	U	5.7	U
Bromoform	9.8	U	5.9	U	7.5	U	7.4	U	7.5	U	6.8	U	6.6	U	5.7	U
Bromomethane	20	U	12	U	15	U	15	U	15	U	14	U	13	U	11	U
Carbon disulfide	9.8	U	5.9	U	73		42		7.5	U	8.8		6.6	U	5.7	U
Carbon tetrachloride	9.8	U	5.9	U	7.5	U	7.4	U	7.5	U	6.8	U	6.6	U	5.7	U
Chlorobenzene	150		15		500		110		4.6	J	1500		11.15		5.7	U
Chloroform	9.8	U	5.9	U	7.5	U	7.4	U	7.5	U	6.8	U	6.6	U	5.7	U
Chloroethane	20	U	12	U	15	U	15	U	15	U	14	U	13	U	11	U
Chloromethane	20	U	12	U	15	U	15	U	15	U	14	U	13	U	11	U
cis-1,3-Dichloropropene	7.8	U	4.7	U	7.5	U	5.9	U	6	U	5.5	U	5.2	U	4.6	U
Dibromochloromethane	9.8	U	5.9	U	7.5	U	7.4	U	7.5	U	6.8	U	6.6	U	5.7	U
Ethylbenzene	4.7	J	5.9	U	43		7.4	U	7.5	U	6.8	U	6.6	U	5.7	U
Methylene chloride	9.8	U	5.9	U	7.5	U	7.4	U	7.5	U	6.8	U	6.6	U	5.7	U
Styrene	9.8	U	5.9	U	7.5	U	7.4	U	7.5	U	6.8	U	6.6	U	5.7	U
Tetrachloroethene	9.8	U	5.9	U	7.5	U	7.4	U	7.5	U	6.8	U	6.6	U	5.7	U
Toluene	9.8	U	5.9	U	16		3.4	J	7.5	U	6.8	U	6.6	U	5.7	U
trans-1,3-Dichloropropene	7.8	U	4.7	U	7.5	U	5.9	U	6	U	5.5	U	5.2	U	4.6	U
Trichloroethene	9.8	U	5.9	U	34		7.4	U	7.5	U	6.8	U	6.6	U	5.7	U
Vinyl chloride	20	U	12	U	15	U	15	U	15	U	14	U	13	U	11	U
Xylenes (total)	19		3.5	J	140		7.4	U	7.5	U	3.1	J	6.6	U	5.7	U
Inorganics (mg/kg)																
Aluminum	20000		9100		1200		13000		12000		7300		15500		9400	
Antimony	3	UJ	2.3	UJ	2.7	UJ	2.5	UJ	2.4	UJ	2.5	UJ	2.8	U	2.1	UJ
Arsenic	7.4		5		14		10		6.4		4.5		11		8.7	
Barium	300		270		380		250		270		350		295		260	
Beryllium	1.3		0.42		0.11	U	1.2		0.59		0.58		0.795		0.42	
Cadmium	2		4.8		0.75		1.4		6.1		0.23		12.5		4.4	
Calcium	5200		3900		520		4800		3900		12000		5400		3800	
Chromium	60	J	77	J	4.6	J	29	J	39	J	13	J	103		82	J
Cobalt	14		12		8.4		10		8.5		11		5.6		15	
Copper	47	J	440	J	30	J	26	J	250	J	14	J	110		570	
Iron	22000	J	13000	J	1200	J	19000	J	15000	J	13000	J	17000		12000	
Lead	28		66		77		20		52		9.6		74.5		67	J
Magnesium	4200	J	2100	J	94	J	4200	J	2900	J	6400	J	3250		2400	J
Manganese	130	J	160	J	6.4	J	110	J	130	J	160	J	107.5		200	
Mercury	0.068	J	0.099	J	0.014	J	0.054	J	0.049	J	0.024	J	0.205		0.15	J
Molybdenum	0.89	U	0.75	U	0.79	U	0.83	U	0.71	U	0.8	U	0.685		0.79	
Nickel	190		280		130		180		250		32		185		220	
Potassium	3200	J	1800	J	790	J	3000	J	1800	J	2400	J	2100		1600	
Selenium	1.5	UJ	1.2	UJ	1.4	UJ	1.2	UJ	1.2	UJ	1.2	UJ	1.1	U	0.86	UJ
Silver	1.5	U	1.2	U	1.4	U	1.2	U	1.2	U	1.2	U	1.4	U	0.23	
Sodium	290		130		200		190		140		230		165		130	
Thallium	1.5	U	1.2	U	1.4	U	1.2	U	1.2	U	1.2	U	0.87	U	0.71	U
Tin	7.5	U	5.8	U	6.8	U	6.1	U	6	U	6.2	U	6.9	U	5.3	U
Vanadium	47		25		3.8		32		26		24		40.5		23	
Zinc	7000		2100		58		3300		2200		390		2250		1500	
PCBs (ug/kg)																
Monochlorobiphenyl	5.4	R	4.6	UJ	4.9	UJ	4.8	U	8.7	UJ	4.5	U	4.6	U	3.8	UJ
Dichlorobiphenyl	2.2	J	4.6	UJ	4.9	UJ	4.8	U	29	J	4.5	U	4.6	U	2.8	J
Trichlorobiphenyl	4.5	J	2	J	3.2	J	24		480	J	4.5	U	4.05		74	J
Tetrachlorobiphenyl	25	J	56	J	1.6	J	27		1000	J	9.2	U	11.3		370	J

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T4-C1		CBS-CSB-T4-E1		CBS-CSB-T4-W1		CBS-CSB-T5-C1		CBS-CSB-T5-E1		CBS-CSB-T5-W1		CBS-CSB-T6-C1		CBS-CSB-T6-E1	
Pentachlorobiphenyl	15	J	150	J	1.3	J	42		840	J	9.2	U	6.75		240	J
Hexachlorobiphenyl	11	U	54	J	10	UJ	11		150	J	9.2	U	1.4	J	38	J
Heptachlorobiphenyl	16	U	16	J	15	UJ	15	U	40	J	14	U	14	U	14	J
Octachlorobiphenyl	16	U	31	J	15	UJ	15	U	13	J	14	U	14	U	4.5	J
Nonachlorobiphenyl	28	U	23	UJ	25	UJ	24	U	44	UJ	23	U	23	U	19	UJ
Decachlorobiphenyl	28	U	10	J	25	UJ	5.3	J	25	J	23	U	4.3	J	18	J
Dioxins (ug/kg)																
1,2,3,4,6,7,8,9-OCDD	3	J	7.3		0.18	J	0.72	J	61.1		0.23	J	12.5		7.5	
1,2,3,4,6,7,8-HpCDD	0.23	J	0.55	J	0.03	U	0.04	U	5.4		0.04	U	1.055		0.67	J
1,2,3,4,7,8-HxCDD	0.04	U	0.02	U	0.02	U	0.03	U	0.02	U	0.02	U	0.07	U	0.03	U
1,2,3,6,7,8-HxCDD	0.04	U	0.02	U	0.02	U	0.03	U	0.2	J	0.03	U	0.08	U	0.03	J
1,2,3,7,8,9-HxCDD	0.04	U	0.02	U	0.02	U	0.03	U	0.06	J	0.02	U	0.07	U	0.03	J
1,2,3,7,8-PeCDD	0.05	U	0.03	U	0.03	U	0.04	U	0.03	U	0.03	U	0.1	U	0.08	U
2,3,7,8-TCDD	0.03	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.09	U	0.05	U
Total HpCDD	0.43	J	1.1	J	0.03	U	0.04	U	10.2		0.04	U	2		1.4	J
Total HxCDD	0.04	U	0.3	J	0.02	U	0.03	U	1.3	J	0.02	U	0.25		0.22	J
Total PeCDD	0.05	U	0.03	U	0.03	U	0.04	U	0.59	J	0.03	U	0.1	U	0.08	J
Total TCDD	3.2	UJ	2.7	UJ	2.8	UJ	2.8	UJ	3.2	UJ	2.6	UJ	2.4	U	2.4	UJ
Furans (ug/kg)																
1,2,3,4,6,7,8,9-OCDF	0.68	J	1.2	J	0.06	J	0.19	J	22.8		0.07	U	4.4		0.79	J
1,2,3,4,6,7,8-HpCDF	0.11	J	0.26	J	0.02	U	0.03	U	3.2	J	0.02	U	0.64		0.23	J
1,2,3,4,7,8,9-HpCDF	0.04	U	0.02	U	0.02	U	0.03	U	0.12	J	0.03	U	0.06	U	0.03	U
1,2,3,4,7,8-HxCDF	0.03	U	0.01	U	0.01	U	0.02	U	0.08	J	0.02	U	0.05	U	0.03	U
1,2,3,6,7,8-HxCDF	0.02	U	0.01	U	0.01	U	0.02	U	0.02	U	0.02	U	0.05	U	0.03	U
1,2,3,7,8,9-HxCDF	0.03	U	0.02	U	0.02	U	0.03	U	0.02	U	0.02	U	0.05	U	0.03	U
1,2,3,7,8-PeCDF	0.03	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.09	U	0.05	U
2,3,4,6,7,8-HxCDF	0.03	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.06	U	0.03	U
2,3,4,7,8-PeCDF	0.03	U	0.02	U	0.02	U	0.03	U	0.02	U	0.02	U	0.1	U	0.05	U
2,3,7,8-TCDF	0.02	U	0.01	U	0.01	U	0.02	U	0.04	J	0.02	U	0.07	U	0.04	U
Total HpCDF	0.42	J	0.87	J	0.02	U	0.04	J	13.8		0.02	U	2.05		0.66	J
Total HxCDF	0.13	J	0.34	J	0.01	U	0.02	U	2.7	J	0.02	U	0.355		0.45	J
Total PeCDF	0.03	U	0.02	U	0.02	U	0.02	U	0.22	J	0.02	U	0.09	U	0.05	U
Total TCDF	0.09	UJ	0.07	UJ	0.09	UJ	0.09	UJ	0.2	UJ	0.1	UJ	0.13	J	0.47	J

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T6-W1		CBS-CSB-T7-C1		CBS-CSB-T7-E1		CBS-CSB-T7-W1		CBS-CSB-T8-C1		CBS-CSB-T8-E1		CBS-CSB-T8-W1		CBS-CSB-T9-C1	
Cyanide	0.66	U	0.66	U	0.66	U	0.63	U	0.68	U	0.7	U	0.66	U	0.68	U
Pesticides/Herbicides (ug/kg)																
2,4,5-T	11	U	3.2	J	11	U	11	U	12	U	12	U	11	U	3.2	J
2,4,5-TP (Silvex)	11	U	11	U	11	U	11	U	12	U	12	U	11	U	11	U
2,4-D	11	U	11	U	11	U	11	U	12	U	12	U	11	U	11	U
2,4-DB	11	U	11	U	11	U	11	U	12	U	12	U	11	U	11	U
4,4'-DDD	4.3	U	4.4	U	4.4	U	4.2	U	4.6	U	4.7	U	4.4	U	4.4	U
4,4'-DDE	4.3	U	4.4	U	4.4	U	4.2	UJ	4.6	U	4.7	U	4.4	U	4.4	U
4,4'-DDT	4.3	U	4.4	U	9.2	J	15	J	46	J	0.96	J	9.9		4.4	U
Aldrin	2.2	U	2.3	U	2.3	U	2.2	U	2.4	U	2.4	U	2.3	U	2.3	U
alpha-BHC	0.66	U	0.68	U	0.67	U	2.9	J	0.69	U	0.71	U	1.7	J	0.68	U
alpha-Chlordane	2.2	UJ	2.3	UJ	2.3	UJ	2.2	UJ	2.4	UJ	2.4	UJ	2.3	UJ	2.3	UJ
beta-BHC	0.66	U	0.68	U	0.67	U	7.7	J	0.57	J	0.71	U	5.4		0.68	U
Dalapon	86	U	88	U	87	U	83	U	90	U	93	U	88	U	88	U
delta-BHC	0.66	U	0.68	U	0.71	J	0.64	U	0.69	U	0.71	U	0.68	U	0.68	U
Dicamba	26	U	27	U	27	U	4.7	J	28	U	28	U	27	U	27	U
Dichlorprop	130	U	140	U	130	U	130	U	140	U	140	U	140	U	140	U
Dieldrin	4.3	U	4.4	U	4.4	U	4.2	U	9.4	J	4.7	U	4.4	U	0.62	J
Dinoseb	130	U	140	U	130	U	130	U	140	U	140	U	140	U	140	U
Endosulfan I	2.2	U	2.3	U	2.3	U		R	2.4	U	2.4	U	2.3	U	2.3	U
Endosulfan II	4.3	U	4.4	U	4.4	U	4.2	U	10	J	4.7	U	4.4	U	4.4	U
Endosulfan sulfate	4.3	U	4.4	U	4.4	U	4.2	UJ	4.6	U	4.7	U	4.4	U	4.4	U
Endrin	4.3	U	4.4	U	4.4	U	4.2	UJ	4.6	U	4.7	U	4.4	U	4.4	U
Endrin aldehyde	4.3	U	4.4	U	4.4	U	4.2	U	4.6	U	4.7	U	4.4	U	4.4	U
Endrin ketone	4.3	U	4.4	U	4.4	U	4.2	U	4.6	U	4.7	U	4.4	U	4.4	U
gamma-BHC (Lindane)	2.2	U	2.3	U	2.3	U	2.2	U	2.3	J	2.4	U	2.3	U	2.3	U
gamma-Chlordane	2.2	U	2.3	U	2.3	U	2.2	UJ	2.4	U	2.4	U	2.3	U	2.3	U
Heptachlor	0.32	J	2.3	U	2.3	U	2.2	U	2.4	U	2.4	U	2.3	U	2.3	U
Heptachlor epoxide	2.2	U	2.3	U	2.3	U	2.2	U	2.4	U	2.4	U	2.3	U	2.3	U
MCPA	2600	U	2700	U	2700	U	2600	U	2800	U	2800	U	2700	U	2700	U
MCPP	2600	U	2700	U	2700	U	4600	J	2800	U	2800	U	2700	U	2700	U
Methoxychlor	22	U	23	U	23	U	22	U	24	U	24	U	0.45	J	23	U
Toxaphene	220	U	230	U	230	U	220	U	240	U	240	U	230	U	230	U
Semivolatile Organic Compounds (ug/kg)																
1,2,4-Trichlorobenzene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
1,2-Dichlorobenzene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
1,3-Dichlorobenzene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
1,4-Dichlorobenzene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
2,4,5-Trichlorophenol	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
2,4,6-Trichlorophenol	92	UJ	94	UJ	93	UJ	90	UJ	97	UJ	100	UJ	94	UJ	94	UJ
2,4-Dichlorophenol	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
2,4-Dinitrophenol	1100	UJ	1100	UJ	1100	UJ	1100	UJ	1200	UJ	1200	UJ	1100	UJ	1100	UJ
2,4-Dinitrotoluene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
2,6-Dinitrotoluene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
2-Chloronaphthalene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
2-Chlorophenol	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
2-Methylnaphthalene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
2-Methylphenol (o-Cresol)	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
2-Nitroaniline	1100	UJ	1100	UJ	1100	UJ	1100	UJ	1200	UJ	1200	UJ	1100	UJ	1100	UJ
2-Nitrophenol	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
3&4Methylphenol	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
3,3'-Dichlorobenzidine	430	UJ	440	UJ	440	UJ	420	UJ	460	UJ	470	UJ	440	UJ	440	UJ
3-Nitroaniline	1100	UJ	1100	UJ	1100	UJ	1100	UJ	1200	UJ	1200	UJ	1100	UJ	1100	UJ
4,6-Dinitro-2-methylphenol	1100	UJ	1100	UJ	1100	UJ	1100	UJ	1200	UJ	1200	UJ	1100	UJ	1100	UJ

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T6-W1		CBS-CSB-T7-C1		CBS-CSB-T7-E1		CBS-CSB-T7-W1		CBS-CSB-T8-C1		CBS-CSB-T8-E1		CBS-CSB-T8-W1		CBS-CSB-T9-C1	
4-Bromophenyl phenyl ether	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
4-Chloro-3-methylphenol	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
4-Chloroaniline	430	UJ	440	UJ	440	UJ	420	UJ	460	UJ	470	UJ	440	UJ	440	UJ
4-Chlorophenyl phenyl ether	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
4-Nitroaniline	1100	UJ	1100	UJ	1100	UJ	1100	UJ	1200	UJ	1200	UJ	1100	UJ	1100	UJ
4-Nitrophenol	1100	UJ	1100	UJ	1100	UJ	1100	UJ	1200	UJ	1200	UJ	1100	UJ	1100	UJ
Acenaphthene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Acenaphthylene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Anthracene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Benzo(a)anthracene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Benzo(a)pyrene	120	UJ	120	UJ	120	UJ	120	UJ	120	UJ	130	UJ	120	UJ	120	UJ
Benzo(b)fluoranthene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Benzo(g,h,i)perylene	220	UJ	230	UJ	230	UJ	220	U	240	UJ	240	UJ	230	UJ	230	UJ
Benzo(k)fluoranthene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Bis(2-chloroethoxy)methane	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Bis(2-chloroethyl)ether	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Bis(2-chloroisopropyl ether)	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Bis(2-ethylhexyl)phthalate	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Butylbenzylphthalate	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Carbazole	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Chrysene	32	J	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Dibenzo(a,h)anthracene	120	UJ	120	UJ	120	UJ	120	U	120	UJ	130	UJ	120	UJ	120	UJ
Dibenzofuran	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Diethyl phthalate	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Dimethyl phthalate	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
di-n-Butylphthalate	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
di-n-Octylphthalate	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Fluoranthene	51	J	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Fluorene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Hexachlorobenzene	92	UJ	94	UJ	93	UJ	90	UJ	97	UJ	100	UJ	94	UJ	94	UJ
Hexachlorobutadiene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Hexachlorocyclopentadiene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Hexachloroethane	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Indeno(1,2,3-cd)pyrene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Isophorone	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Naphthalene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Nitrobenzene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
N-Nitroso-di-N-propylamine	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
N-Nitrosodiphenylamine	48	J	61	J	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Pentachlorophenol	3.3	J	23	U	2.5	J	17	J	39		2.1	J	4.9	J	23	U
Phenanthrene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Phenol	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Pyrene	220	UJ	230	UJ	230	UJ	220	UJ	240	UJ	240	UJ	230	UJ	230	UJ
Volatile Organic Compounds (ug/kg)																
1,1,1-Trichloroethane	7	U	7.8	U	6.9	U	7.6	UJ	7.5	U	7.8	U	6.6	U	7	U
1,1,2,2-Tetrachloroethane	7	U	7.8	U	6.9	U	7.6	UJ	7.5	U	7.8	U	6.6	U	7	U
1,1,2-Trichloroethane	7	U	7.8	U	6.9	U	7.6	UJ	7.5	U	7.8	U	6.6	U	7	U
1,1-Dichloroethane	7	U	7.8	U	6.9	U	7.6	UJ	7.5	U	7.8	U	6.6	U	7	U
1,1-Dichloroethene	6.4	U	7.2	U	6.4	U	7	UJ	6.9	U	7.1	U	6.1	U	6.5	U
1,2-Dichloroethane	7	U	7.8	U	6.9	U	7.6	UJ	7.5	U	7.8	U	6.6	U	7	U
1,2-Dichloroethene (total)	7	U	7.8	U	6.9	U	7.6	UJ	7.5	U	7.8	U	6.6	U	7	U
1,2-Dichloropropane	7	U	7.8	U	6.9	U	7.6	UJ	7.5	U	7.8	U	6.6	U	7	U
2-Butanone (MEK)	53		20	J	35	U	38	UJ	12	J	7.7	J	33	U	23	J
2-Hexanone	35	U	39	U	35	U	38	UJ	38	U	39	U	33	U	35	U

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T6-W1		CBS-CSB-T7-C1		CBS-CSB-T7-E1		CBS-CSB-T7-W1		CBS-CSB-T8-C1		CBS-CSB-T8-E1		CBS-CSB-T8-W1		CBS-CSB-T9-C1	
4-Methyl-2-pentanone (MIBK)	35	U	39	U	35	U	38	UJ	38	U	39	U	33	U	35	U
Acetone	250		87		33	J	76	UJ	60	J	46	J	25	J	120	
Benzene	7	U	7.8	U	4.3	J	7.6	UJ	3.6	J	19		6.6	U	4.8	J
Bromodichloromethane	7	U	7.8	U	6.9	U	7.6	UJ	7.5	U	7.8	U	6.6	U	7	U
Bromoform	7	U	7.8	U	6.9	U	7.6	UJ	7.5	U	7.8	U	6.6	U	7	U
Bromomethane	14	U	16	U	14	U	15	UJ	15	U	16	U	13	U	14	U
Carbon disulfide	77		6.8	J	6.9	U	7.6	UJ	19		7.8	U	6.6	U	10	
Carbon tetrachloride	7	U	7.8	U	6.9	U	7.6	UJ	7.5	U	7.8	U	6.6	U	7	U
Chlorobenzene	170		140		12		7.6	UJ	22		22		6.6	U	400	
Chloroform	7	U	7.8	U	6.9	U	7.6	UJ	7.5	U	7.8	U	6.6	U	7	U
Chloroethane	14	U	16	U	14	U	15	UJ	15	U	16	U	13	U	14	U
Chloromethane	14	U	16	U	14	U	15	UJ	15	U	16	U	13	U	14	U
cis-1,3-Dichloropropene	5.6	U	6.3	U	5.6	U	6.1	UJ	6	U	6.2	U	5.3	U	5.6	U
Dibromochloromethane	7	U	7.8	U	6.9	U	7.6	UJ	7.5	U	7.8	U	6.6	U	7	U
Ethylbenzene	7	U	7.8	U	6.9	U	7.6	UJ	7.5	U	7.8	U	6.6	U	7	U
Methylene chloride	7	U	2.2	J	6.9	U	7.6	UJ	7.5	U	7.8	U	6.6	U	7	U
Styrene	7	U	7.8	U	6.9	U	7.6	UJ	7.5	U	7.8	U	6.6	U	7	U
Tetrachloroethene	7	U	7.8	U	6.9	U	7.6	UJ	7.5	U	7.8	U	6.6	U	7	U
Toluene	7	U	7.8	U	6.9	U	7.6	UJ	7.8		7.8	U	6.6	U	7.9	
trans-1,3-Dichloropropene	5.6	U	6.3	U	5.6	U	6.1	UJ	6	U	6.2	U	5.3	U	5.6	U
Trichloroethene	7	U	7.8	U	6.9	U	7.6	UJ	7.5	U	7.8	U	6.6	U	7	U
Vinyl chloride	14	U	16	U	14	U	15	UJ	15	U	16	U	13	U	14	U
Xylenes (total)	7	U	7.8	U	6.9	U	7.6	UJ	4.7	J	7.8	U	6.6	U	9	
Inorganics (mg/kg)																
Aluminum	10000		5800		14000		4400		4200		17000		9600		7400	
Antimony	4.8	U	2.3	UJ	4.8	UJ	2.6	UJ	12	UJ	5.2	UJ	2.3	UJ	2.7	UJ
Arsenic	3.9		4.4		8.8		5.1		3.3		18		16		5	
Barium	390		180		220		180		99		360		260		160	
Beryllium	0.68		0.39		0.84		0.19		0.32		0.75		0.42		0.47	
Cadmium	5.1		0.31		22		3.1		0.58	U	29		4.4		0.25	
Calcium	5100		11000		5100		2000		9900		5100		3400		10000	
Chromium	38	J	10	J	44	J	83	J	7.6	J	76	J	44	J	13	J
Cobalt	6		7.4		8.4		4.7		5.9		5.5		5.5		11	
Copper	38		14		140		500		6.2		470		910		15	
Iron	22000		16000		16000		5900		8700		21000		12000		16000	
Lead	64	J	7.4	J	55	J	55	J	5.5	J	84	J	43	J	9.3	J
Magnesium	3400	J	5500	J	3600	J	1400	J	6300	J	3500	J	2700	J	6200	J
Manganese	94		190		130		59		63		99		80		170	
Mercury	0.055	J	0.022	J	0.094	J	0.12	J	0.013	J	0.073	J	0.15	J	0.026	J
Molybdenum	0.43		0.87		0.85		0.28		0.54		0.96		0.54		0.83	
Nickel	22		16		190		110		26		210		180		23	
Potassium	1900		1900		1900		1200		1000		2200		1700		2100	
Selenium	2.1	UJ	0.9	UJ	1.4	UJ	1.3	UJ	5.8	UJ	2.6	UJ	1.1	UJ	0.94	UJ
Silver	1.2	U	1.1	U	1.2	U	1.3	U	1.2	U	1.3	U	0.24		1.4	U
Sodium	210		200		210		130		190		190		160		210	
Thallium	1.2	U	1.1	U	1.2	U	1.3	U	1.2	U	1.1	U	1.1	U	1.4	U
Tin	5.6		5.6	U	6.1	U	6.4	U	5.8	U	6.2		5.6	U	6.8	U
Vanadium	29		18		32		13		12		42		28		22	
Zinc	2600		210		2900		710		5400		3400		1000		300	
PCBs (ug/kg)																
Monochlorobiphenyl	4.3	UJ	4.4	UJ	4.4	UJ	4.2	UJ	4.6	UJ	4.7	UJ	4.4	UJ	4.4	UJ
Dichlorobiphenyl	4.3	UJ	4.4	UJ	4.4	UJ	4.2	UJ	3.6	J	4.7	UJ	4.4	UJ	4.4	UJ
Trichlorobiphenyl	1.8	J	5.4	J	4.4	UJ	8.1	J	22	J	4.7	UJ	4.5	J	4.4	UJ
Tetrachlorobiphenyl	8.8	UJ	28	J	8.9	UJ	61	J	150	J	9.6	UJ	29	J	9	UJ

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T6-W1		CBS-CSB-T7-C1		CBS-CSB-T7-E1		CBS-CSB-T7-W1		CBS-CSB-T8-C1		CBS-CSB-T8-E1		CBS-CSB-T8-W1		CBS-CSB-T9-C1	
Pentachlorobiphenyl	8.8	UJ	20	J	5.1	J	74	J	110	J	9.6	UJ	17	J	9	UJ
Hexachlorobiphenyl	8.8	UJ	2.1	J	1.5	J	9.2	J	19	J	9.6	UJ	2.3	J	9	UJ
Heptachlorobiphenyl	13	UJ	14	UJ	13	UJ	2.9	J	4.8	J	14	UJ	14	UJ	14	UJ
Octachlorobiphenyl	13	UJ	14	UJ	13	UJ	13	UJ	14	UJ	14	UJ	14	UJ	14	UJ
Nonachlorobiphenyl	22	UJ	22	UJ	22	UJ	21	UJ	23	UJ	24	UJ	22	UJ	22	UJ
Decachlorobiphenyl	22	UJ	22	UJ	22	UJ	21	UJ	9	J	24	UJ	22	UJ	22	UJ
Dioxins (ug/kg)																
1,2,3,4,6,7,8,9-OCDD	1.1	J	0.69	J	3	J	16.6	J	0.54	J	2.9	J	7.1		0.17	J
1,2,3,4,6,7,8-HpCDD	0.13	J	0.07	U	0.11	J	1.2	J	0.08	U	0.18	J	0.65	J	0.02	U
1,2,3,4,7,8-HxCDD	0.05	U	0.04	U	0.04	U	0.04	U	0.05	U	0.01	U	0.01	U	0.01	U
1,2,3,6,7,8-HxCDD	0.06	U	0.05	U	0.05	U	0.04	J	0.06	U	0.01	U	0.03	J	0.01	U
1,2,3,7,8,9-HxCDD	0.05	U	0.04	U	0.04	U	0.04	U	0.05	U	0.01	U	0.01	U	0.01	U
1,2,3,7,8-PeCDD	0.08	U	0.08	U	0.09	U	0.07	U	0.09	U	0.02	U	0.02	U	0.02	U
2,3,7,8-TCDD	0.05	U	0.06	U	0.06	U	0.04	U	0.06	U	0.01	U	0.01	U	0.01	U
Total HpCDD	0.24	J	0.07	U	0.24	J	2.3	J	0.08	U	0.37	J	1.2	J	0.02	U
Total HxCDD	0.05	U	0.04	U	0.04	U	0.32	J	0.05	U	0.02	J	0.16	J	0.01	U
Total PeCDD	0.08	U	0.08	U	0.09	U	0.07	U	0.09	U	0.02	U	0.02	U	0.02	U
Total TCDD	3.1	UJ	2.9	UJ	2.7	UJ	2.6	UJ	3.1	UJ	2.5	UJ	2.4	UJ	2.6	UJ
Furans (ug/kg)																
1,2,3,4,6,7,8,9-OCDF	0.39	J	0.14	J	0.24	J	1.3	J	0.2	J	0.46	J	0.63	J	0.04	J
1,2,3,4,6,7,8-HpCDF	0.06	J	0.03	J	0.06	J	0.38	J	0.04	J	0.11	J	0.23	J	0.009	U
1,2,3,4,7,8,9-HpCDF	0.05	U	0.03	U	0.04	U	0.04	U	0.04	U	0.01	U	0.01	U	0.01	U
1,2,3,4,7,8-HxCDF	0.04	U	0.03	U	0.03	U	0.03	U	0.03	U	0.007	U	0.008	U	0.007	U
1,2,3,6,7,8-HxCDF	0.04	U	0.03	U	0.03	U	0.03	U	0.03	U	0.007	U	0.007	U	0.006	U
1,2,3,7,8,9-HxCDF	0.05	U	0.03	U	0.03	U	0.03	U	0.03	U	0.008	U	0.009	U	0.007	U
1,2,3,7,8-PeCDF	0.05	U	0.05	U	0.06	U	0.04	U	0.06	U	0.01	U	0.01	U	0.01	U
2,3,4,6,7,8-HxCDF	0.05	U	0.03	U	0.04	U	0.04	U	0.04	U	0.008	U	0.009	U	0.008	U
2,3,4,7,8-PeCDF	0.05	U	0.05	U	0.06	U	0.04	U	0.06	U	0.02	U	0.02	U	0.01	U
2,3,7,8-TCDF	0.04	U	0.04	U	0.04	U	0.03	U	0.04	U	0.01	U	0.01	U	0.01	U
Total HpCDF	0.22	J	0.09	J	0.17	J	1.2	J	0.13	J	0.34	J	0.69	J	0.009	U
Total HxCDF	0.04	U	0.03	U	0.03	U	0.58	J	0.03	U	0.07	J	0.22	J	0.006	U
Total PeCDF	0.05	U	0.05	U	0.06	U	0.04	U	1.1	J	0.01	U	0.01	U	0.01	U
Total TCDF	0.04	U	0.07	J	0.06	J	0.07	J	0.08	J	0.07	J	0.06	J	0.06	J

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T9-E1		CBS-CSB-T9-W1	
Cyanide	0.66	U	0.64	U
Pesticides/Herbicides (ug/kg)				
2,4,5-T	11	U	11	U
2,4,5-TP (Silvex)	11	U	11	U
2,4-D	11	U	11	U
2,4-DB	11	U	11	U
4,4'-DDD	4.3	U	4.3	U
4,4'-DDE	4.3	U	4.3	U
4,4'-DDT	5.3	J	13	
Aldrin	2.2	U	0.36	J
alpha-BHC	0.66	U	1.6	J
alpha-Chlordane	2.2	UJ	2.2	UJ
beta-BHC	0.66	U	4.3	J
Dalapon	86	U	84	U
delta-BHC	0.66	U	4.1	J
Dicamba	1.7	J	5.3	J
Dichlorprop	130	U	130	U
Dieldrin	4.3	U	4.3	U
Dinoseb	130	U	130	U
Endosulfan I	2.2	U	2.2	U
Endosulfan II	4.3	U	4.3	U
Endosulfan sulfate	4.3	U	4.3	U
Endrin	4.3	U	4.3	U
Endrin aldehyde	4.3	U	4.3	U
Endrin ketone	4.3	U	4.3	U
gamma-BHC (Lindane)	2.2	U	2.2	U
gamma-Chlordane	2.2	U	2.2	U
Heptachlor	2.2	U	2.2	U
Heptachlor epoxide	2.2	U	2.2	U
MCPA	2600	U	2600	U
MCPP	2600	U	2400	J
Methoxychlor	22	U	22	U
Toxaphene	220	U	220	U
Semivolatile Organic Compounds (ug/kg)				
1,2,4-Trichlorobenzene	220	UJ	220	UJ
1,2-Dichlorobenzene	220	UJ	220	UJ
1,3-Dichlorobenzene	220	UJ	220	UJ
1,4-Dichlorobenzene	220	UJ	220	UJ
2,4,5-Trichlorophenol	220	UJ	220	UJ
2,4,6-Trichlorophenol	92	UJ	91	UJ
2,4-Dichlorophenol	220	UJ	220	UJ
2,4-Dinitrophenol	1100	UJ	1100	UJ
2,4-Dinitrotoluene	220	UJ	220	UJ
2,6-Dinitrotoluene	220	UJ	220	UJ
2-Chloronaphthalene	220	UJ	220	UJ
2-Chlorophenol	220	UJ	220	UJ
2-Methylnaphthalene	220	UJ	220	UJ
2-Methylphenol (o-Cresol)	220	UJ	220	UJ
2-Nitroaniline	1100	UJ	1100	UJ
2-Nitrophenol	220	UJ	220	UJ
3&4Methylphenol	220	UJ	220	UJ
3,3'-Dichlorobenzidine	430	UJ	430	UJ
3-Nitroaniline	1100	UJ	1100	UJ
4,6-Dinitro-2-methylphenol	1100	UJ	1100	UJ

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T9-E1		CBS-CSB-T9-W1	
4-Bromophenyl phenyl ether	220	UJ	220	UJ
4-Chloro-3-methylphenol	220	UJ	220	UJ
4-Chloroaniline	430	UJ	430	UJ
4-Chlorophenyl phenyl ether	220	UJ	220	UJ
4-Nitroaniline	1100	UJ	1100	UJ
4-Nitrophenol	1100	UJ	1100	UJ
Acenaphthene	220	UJ	220	UJ
Acenaphthylene	220	UJ	220	UJ
Anthracene	220	UJ	220	UJ
Benzo(a)anthracene	220	UJ	220	UJ
Benzo(a)pyrene	120	UJ	120	UJ
Benzo(b)fluoranthene	220	UJ	220	UJ
Benzo(g,h,i)perylene	220	UJ	220	UJ
Benzo(k)fluoranthene	220	UJ	220	UJ
Bis(2-chloroethoxy)methane	220	UJ	220	UJ
Bis(2-chloroethyl)ether	220	UJ	220	UJ
Bis(2-chloroisopropyl ether)	220	UJ	220	UJ
Bis(2-ethylhexyl)phthalate	220	UJ	220	UJ
Butylbenzylphthalate	220	UJ	220	UJ
Carbazole	220	UJ	220	UJ
Chrysene	220	UJ	220	UJ
Dibenzo(a,h)anthracene	120	UJ	120	UJ
Dibenzofuran	220	UJ	220	UJ
Diethyl phthalate	220	UJ	220	UJ
Dimethyl phthalate	220	UJ	220	UJ
di-n-Butylphthalate	220	UJ	220	UJ
di-n-Octylphthalate	220	UJ	220	UJ
Fluoranthene	220	UJ	220	UJ
Fluorene	220	UJ	220	UJ
Hexachlorobenzene	92	UJ	91	UJ
Hexachlorobutadiene	220	UJ	220	UJ
Hexachlorocyclopentadiene	220	UJ	220	UJ
Hexachloroethane	220	UJ	220	UJ
Indeno(1,2,3-cd)pyrene	220	UJ	220	UJ
Isophorone	220	UJ	220	UJ
Naphthalene	220	UJ	220	UJ
Nitrobenzene	220	UJ	220	UJ
N-Nitroso-di-N-propylamine	220	UJ	220	UJ
N-Nitrosodiphenylamine	220	UJ	220	UJ
Pentachlorophenol	1.9	J	13	J
Phenanthrene	220	UJ	220	UJ
Phenol	220	UJ	220	UJ
Pyrene	220	UJ	220	UJ
Volatile Organic Compounds (ug/kg)				
1,1,1-Trichloroethane	7.8	U	7.4	U
1,1,2,2-Tetrachloroethane	7.8	U	7.4	U
1,1,2-Trichloroethane	7.8	U	7.4	U
1,1-Dichloroethane	7.8	U	7.4	U
1,1-Dichloroethene	7.2	U	6.8	U
1,2-Dichloroethane	7.8	U	7.4	U
1,2-Dichloroethene (total)	7.8	U	7.4	U
1,2-Dichloropropane	7.8	U	7.4	U
2-Butanone (MEK)	39	U	37	U
2-Hexanone	39	U	37	U

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T9-E1		CBS-CSB-T9-W1	
4-Methyl-2-pentanone (MIBK)	39	U	37	U
Acetone	30	J	31	J
Benzene	9.5		7.4	U
Bromodichloromethane	7.8	U	7.4	U
Bromoform	7.8	U	7.4	U
Bromomethane	16	U	15	U
Carbon disulfide	7.8	U	7.4	U
Carbon tetrachloride	7.8	U	7.4	U
Chlorobenzene	11		7.4	U
Chloroform	7.8	U	7.4	U
Chloroethane	16	U	15	U
Chloromethane	16	U	15	U
cis-1,3-Dichloropropene	6.3	U	5.9	U
Dibromochloromethane	7.8	U	7.4	U
Ethylbenzene	7.8	U	7.4	U
Methylene chloride	7.8	U	7.4	U
Styrene	7.8	U	7.4	U
Tetrachloroethene	7.8	U	7.4	U
Toluene	7.8	U	7.4	U
trans-1,3-Dichloropropene	6.3	U	5.9	U
Trichloroethene	7.8	U	7.4	U
Vinyl chloride	16	U	15	U
Xylenes (total)	7.8	U	7.4	U
Inorganics (mg/kg)				
Aluminum	11000		9900	
Antimony	2.4	UJ	2.4	UJ
Arsenic	5.1		7.3	
Barium	260		220	
Beryllium	0.59		0.46	
Cadmium	10		4.9	
Calcium	3500		3800	
Chromium	180	J	52	J
Cobalt	4.3		13	
Copper	230		500	
Iron	10000		12000	
Lead	76	J	53	J
Magnesium	2300	J	2700	J
Manganese	70		130	
Mercury	0.077	J	0.29	J
Molybdenum	0.34		0.75	
Nickel	200		230	
Potassium	1600		1700	
Selenium	1	UJ	0.58	UJ
Silver	1.2	U	1.2	U
Sodium	160		130	
Thallium	1.2	U	1.2	U
Tin	6	U	5.9	U
Vanadium	27		24	
Zinc	1900		1500	
PCBs (ug/kg)				
Monochlorobiphenyl	4.3	UJ	4.3	U
Dichlorobiphenyl	4.3	UJ	4.3	U
Trichlorobiphenyl	4.3	UJ	6.9	
Tetrachlorobiphenyl	8.8	UJ	64	

Appendix B-2a
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment B
Dead Creek
Sauget Area I

	CBS-CSB-T9-E1		CBS-CSB-T9-W1	
Pentachlorobiphenyl	8.8	J	43	
Hexachlorobiphenyl	2.1	J	8.4	J
Heptachlorobiphenyl	13	UJ	2.2	J
Octachlorobiphenyl	13	UJ	13	U
Nonachlorobiphenyl	22	UJ	22	U
Decachlorobiphenyl	2.8	J	2.7	J
Dioxins (ug/kg)				
1,2,3,4,6,7,8,9-OCDD	5.4	J	9.2	
1,2,3,4,6,7,8-HpCDD	0.52	J	0.93	J
1,2,3,4,7,8-HxCDD	0.01	U	0.01	U
1,2,3,6,7,8-HxCDD	0.01	U	0.03	J
1,2,3,7,8,9-HxCDD	0.01	U	0.02	J
1,2,3,7,8-PeCDD	0.02	U	0.02	U
2,3,7,8-TCDD	0.01	U	0.01	U
Total HpCDD	1.1	J	1.8	J
Total HxCDD	0.18	J	0.27	J
Total PeCDD	0.07	J	0.02	U
Total TCDD	2.4	UJ	2.3	UJ
Furans (ug/kg)				
1,2,3,4,6,7,8,9-OCDF	1.4	J	1.1	J
1,2,3,4,6,7,8-HpCDF	0.36	J	0.34	J
1,2,3,4,7,8,9-HpCDF	0.01	U	0.01	U
1,2,3,4,7,8-HxCDF	0.008	U	0.007	U
1,2,3,6,7,8-HxCDF	0.008	U	0.007	U
1,2,3,7,8,9-HxCDF	0.009	U	0.008	U
1,2,3,7,8-PeCDF	0.01	U	0.01	U
2,3,4,6,7,8-HxCDF	0.01	U	0.008	U
2,3,4,7,8-PeCDF	0.02	U	0.02	U
2,3,7,8-TCDF	0.01	U	0.01	U
Total HpCDF	1.1	J	1	J
Total HxCDF	0.23	J	0.36	J
Total PeCDF	0.01	U	0.01	U
Total TCDF	0.07	J	0.07	J

J = value is estimated
U = not detected and detection limit is shown
UJ = not detected and estimated detection limit shown
Duplicates have been averaged.
See text for details.
Data are screened for high detection limits before summary statistics are calculated.
A high detection limit is defined as a detection limit which exceeds twice the maximum detected concentration.

Appendix B-2b
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment C
Dead Creek
Sauget Area I

	CBS-CSC-T1-1		CBS-CSC-T2-1		CBS-CSC-T3-1		CBS-CSC-T4-1		CBS-CSC-T5-1		CBS-CSC-T6-1		CBS-CSC-T7-1	
Cyanide	0.67	U	0.71	U	0.74	U	0.72	U	0.77	U	0.76	U	0.71	U
Pesticides/Herbicides (ug/kg)														
2,4,5-T	11	U	12	U	13	U	12	U	13	U	13	U	12	U
2,4,5-TP (Silvex)	11	U	12	U	13	U	12	U	13	U	13	U	12	U
2,4-D	11	U	12	U	13	U	12	U	13	U	13	U	12	U
2,4-DB	11	U	12	U	13	U	12	U	13	U	13	U	12	U
4,4'-DDD	9	U	9.4	U	10	U	9.8	U	10	U	26	U	24	U
4,4'-DDE	9	U	9.4	U	10	U	9.8	U	10	U	26	U	24	U
4,4'-DDT	9	U	9.4	U	10	U	9.8	U	10	U	26	U	24	U
Aldrin	4.6	U	4.8	U	5.2	U	5.1	U	5.3	U	13	U	12	U
alpha-BHC	1.4	U	1.4	U	1.5	U	1.5	U	1.6	U	4	U	3.7	U
alpha-Chlordane	4.6	U	4.8	U	5.2	U	0.92	J	5.3	U	13	U	12	U
beta-BHC	1.4	U	1.4	U	1.5	U	1.5	U	1.6	U	4	U	3.7	U
Dalapon	89	U	93	U	100	U	97	U	100	U	100	U	96	U
delta-BHC	1.4	U	0.99	J	1.5	U	0.38		1.6	U	4	U	3.7	U
Dicamba	27	U	28	U	31	U	30	U	31	U	32	U	29	U
Dichlorprop	6.2	J	140	U	150	U	150	U	160	U	160	U	150	U
Dieldrin	1.4	J	11	J	1.2	J	3.15		0.46	J	7.8	J	1.3	J
Dinoseb	140	U	140	U	150	U	150	U	160	U	160	U	150	U
Endosulfan I	4.6	U	4.8	U	5.2	U	5.1	U	5.3	U	13	U	12	U
Endosulfan II	9	U	9.4	U	10	U	9.8	U	10	U	26	U	24	U
Endosulfan sulfate	9	U	7	J	10	U	9.8	U	10	U	2	J	24	U
Endrin	9	U	9.4	U	10	U	9.8	U	10	U	26	U	24	U
Endrin aldehyde	9	U	9.4	U	10	U	9.8	U	10	U	26	U	24	U
Endrin ketone	9	U	10	J	10	U	9.8	U	10	U	26	U	24	U
gamma-BHC (Lindane)	4.6	U	4.8	U	5.2	U	5.1	U	5.3	U	13	U	12	U
gamma-Chlordane	1.1	J	4.8	U	5.2	U	5.1	U	5.3	U	13	U	12	U
Heptachlor	4.6	U	4.8	U	5.2	U	5.1	U	5.3	U	13	U	12	U
Heptachlor epoxide	4.6	U	4.8	U	5.2	U	5.1	U	5.3	U	13	U	12	U
MCPA	2700	U	2800	U	3100	U	3000	U	3100	U	3200	U	2900	U
MCPP	2700	U	2800	U	3100	U	3000	U	3100	U	3200	U	2900	U
Methoxychlor	46	U	7.1	J	52	U	2.85		53	U	130	U	120	U
Toxaphene	460	U	480	U	520	U	510	U	530	U	1300	U	1200	U
Semivolatile Organic Compounds (ug/kg)														
1,2,4-Trichlorobenzene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
1,2-Dichlorobenzene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
1,3-Dichlorobenzene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
1,4-Dichlorobenzene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
2,4,5-Trichlorophenol	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
2,4,6-Trichlorophenol	96	UJ	100	UJ	110	UJ	100	U	110	UJ	110	UJ	100	UJ
2,4-Dichlorophenol	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
2,4-Dinitrophenol	1200	UJ	1200	UJ	1300	UJ	1300	U	1300	UJ	1300	UJ	1200	UJ
2,4-Dinitrotoluene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
2,6-Dinitrotoluene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
2-Chloronaphthalene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
2-Chlorophenol	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
2-Methylnaphthalene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
2-Methylphenol (o-Cresol)	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
2-Nitroaniline	1200	UJ	1200	UJ	1300	UJ	1300	U	1300	UJ	1300	UJ	1200	UJ
2-Nitrophenol	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
3&4Methylphenol	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
3,3'-Dichlorobenzidine	450	UJ	470	UJ	510	UJ	490	U	520	UJ	520	UJ	480	UJ
3-Nitroaniline	1200	UJ	1200	UJ	1300	UJ	1300	U	1300	UJ	1300	UJ	1200	UJ
4,6-Dinitro-2-methylphenol	1200	UJ	1200	UJ	1300	UJ	1300	U	1300	UJ	1300	UJ	1200	UJ

Appendix B-2b
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment C
Dead Creek
Sauget Area I

	CBS-CSC-T1-1		CBS-CSC-T2-1		CBS-CSC-T3-1		CBS-CSC-T4-1		CBS-CSC-T5-1		CBS-CSC-T6-1		CBS-CSC-T7-1	
4-Bromophenyl phenyl ether	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
4-Chloro-3-methylphenol	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
4-Chloroaniline	450	UJ	470	UJ	510	UJ	490	U	520	UJ	520	UJ	480	UJ
4-Chlorophenyl phenyl ether	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
4-Nitroaniline	1200	UJ	1200	UJ	1300	UJ	1300	U	1300	UJ	1300	UJ	1200	UJ
4-Nitrophenol	1200	UJ	1200	UJ	1300	UJ	1300	U	1300	UJ	1300	UJ	1200	UJ
Acenaphthene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Acenaphthylene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Anthracene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Benzo(a)anthracene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Benzo(a)pyrene	120	UJ	130	UJ	140	UJ	130	U	140	UJ	140	UJ	130	UJ
Benzo(b)fluoranthene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Benzo(g,h,i)perylene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	65	J	250	UJ
Benzo(k)fluoranthene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Bis(2-chloroethoxy)methane	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Bis(2-chloroethyl)ether	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Bis(2-chloroisopropyl ether)	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Bis(2-ethylhexyl)phthalate	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Butylbenzylphthalate	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Carbazole	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Chrysene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Dibenzo(a,h)anthracene	120	UJ	130	UJ	140	UJ	130	U	140	UJ	140	UJ	130	UJ
Dibenzofuran	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Diethyl phthalate	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Dimethyl phthalate	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
di-n-Butylphthalate	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
di-n-Octylphthalate	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Fluoranthene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Fluorene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Hexachlorobenzene	96	UJ	100	UJ	110	UJ	100	U	110	UJ	110	UJ	100	UJ
Hexachlorobutadiene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Hexachlorocyclopentadiene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Hexachloroethane	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Indeno(1,2,3-cd)pyrene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Isophorone	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Naphthalene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Nitrobenzene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
N-Nitroso-di-N-propylamine	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
N-Nitrosodiphenylamine	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Pentachlorophenol	23	U	3.8	J	3.0	J	3.9		26	U	14	J	1.7	J
Phenanthrene	230	UJ	25	J	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Phenol	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Pyrene	230	UJ	240	UJ	260	UJ	250	U	260	UJ	270	UJ	250	UJ
Volatile Organic Compounds (ug/kg)														
1,1,1-Trichloroethane	6.8	U	7.1	U	7.7	U	7.5	U	7.8	U	7.9	U	7.4	U
1,1,2,2-Tetrachloroethane	6.8	U	7.1	U	7.7	U	7.5	U	7.8	U	7.9	U	7.4	U
1,1,2-Trichloroethane	6.8	U	7.1	U	7.7	U	7.5	U	7.8	U	7.9	U	7.4	U
1,1-Dichloroethane	6.8	U	7.1	U	7.7	U	7.5	U	7.8	U	7.9	U	7.4	U
1,1-Dichloroethene	6.3	U	6.6	U	7.1	U	6.9	U	7.2	U	7.3	U	6.8	U
1,2-Dichloroethane	6.8	U	7.1	U	7.7	U	7.5	U	7.8	U	7.9	U	7.4	U
1,2-Dichloroethene (total)	6.8	U	7.1	U	7.7	U	7.5	U	7.8	U	7.9	U	7.4	U
1,2-Dichloropropane	6.8	U	7.1	U	7.7	U	7.5	U	7.8	U	7.9	U	7.4	U
2-Butanone (MEK)	7.2	J	5.7	J	38	U	37	U	39	U	9.9	J	37	U
2-Hexanone	34	U	36	U	38	U	37	U	39	U	40	U	37	U

Appendix B-2b
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment C
Dead Creek
Sauget Area I

	CBS-CSC-T1-1		CBS-CSC-T2-1		CBS-CSC-T3-1		CBS-CSC-T4-1		CBS-CSC-T5-1		CBS-CSC-T6-1		CBS-CSC-T7-1	
4-Methyl-2-pentanone (MIBK)	34	U	36	U	38	U	37	U	39	U	40	U	37	U
Acetone	68	U	41	J	77	U	13.5		9.6	J	83		74	U
Benzene	6.8	U	7.1	U	7.7	U	7.5	U	7.8	U	3	J	7.4	U
Bromodichloromethane	6.8	U	7.1	U	7.7	U	7.5	U	7.8	U	7.9	U	7.4	U
Bromoform	6.8	U	7.1	U	7.7	U	7.5	U	7.8	U	7.9	U	7.4	U
Bromomethane	14	U	14	U	15	U	15	U	16	U	16	U	15	U
Carbon disulfide	6.8	U	7.1	U	7.7	U	7.5	U	7.8	U	7.9	U	7.4	U
Carbon tetrachloride	6.8	U	7.1	U	7.7	U	7.5	U	7.8	U	7.9	U	7.4	U
Chlorobenzene	230		110		46		16		2.3	J	700		42	
Chloroform	6.8	U	7.1	U	7.7	U	7.5	U	7.8	U	7.9	U	7.4	U
Chloroethane	14	U	14	U	15	U	15	U	16	U	16	U	15	U
Chloromethane	14	U	14	U	15	U	15	U	16	U	16	U	15	U
cis-1,3-Dichloropropene	5.5	U	5.7	U	6.2	U	6	U	6.2	U	6.3	U	5.9	U
Dibromochloromethane	6.8	U	7.1	U	7.7	U	7.5	U	7.8	U	7.9	U	7.4	U
Ethylbenzene	6.8	U	7.1	U	7.7	U	7.5	U	7.8	U	7.9	U	7.4	U
Methylene chloride	2.3	J	2.3	J	7.7	U	2.6	J	7.8	U	4.8	J	7.4	U
Styrene	6.8	U	2.7	J	7.7	U	7.5	U	7.8	U	7.9	U	7.4	U
Tetrachloroethene	6.8	U	7.1	U	7.7	U	7.5	U	7.8	U	7.9	U	7.4	U
Toluene	6.8	U	3.9	J	7.7	U	4.6	J	7.8	U	7.5	J	3.3	J
trans-1,3-Dichloropropene	5.5	U	5.7	U	6.2	U	6	U	6.2	U	6.3	U	5.9	U
Trichloroethene	6.8	U	7.1	U	7.7	U	7.5	U	7.8	U	7.9	U	7.4	U
Vinyl chloride	14	U	14	U	15	U	15	U	16	U	16	U	15	U
Xylenes (total)	6.8	U	7.1	U	7.7	U	7.5	U	7.8	U	4.3	J	7.4	U
Inorganics (mg/kg)														
Aluminum	10000		9200		13000		11000		13000		11000		11000	
Antimony	2.5	U	2.6	U	5.8	U	2.5	U	0.79		5.3	U	5.9	U
Arsenic	14		13		14		7.1		3		12		7	
Barium	250		220		250		245		240		330		270	
Beryllium	0.8		0.68		0.74		0.8		0.94		0.79		0.92	
Cadmium	14	J	11	J	18	J	4.95		1.6	J	14	J	24	J
Calcium	10000		5500		6100		10750		14000		7700		6100	
Chromium	27		110		21		24		20		42		22	
Cobalt	8.9		7.4		14		9.4		9.6		9.1		12	
Copper	81	J	160	J	120	J	125		40	J	250	J	53	J
Iron	19000		15000		20000		17500		21000		20000		17000	
Lead	22		65		28		31		18		140		32	
Magnesium	5100		3200		3800		5650		6700		4000		4400	
Manganese	200		160		200		270		390		140		140	
Mercury	0.046	J	0.06	J	0.048	J	0.1015		0.074	J	0.31	J	0.094	J
Molybdenum	1.3	U	1	U	1.5	U	0.78	U	1.1	U	1.4	U	1.6	U
Nickel	200	J	260	J	570		127.5		60	J	170		400	
Potassium	1800		1700		2100		1850		2300		1800		2000	
Selenium	0.9	U	1.8	U	2.8	U	0.76	U	0.97	U	2	U	2.2	U
Silver	1.2	U	1.3	U	1.4	U	1.2	U	1.6	U	1.3	U	1.5	U
Sodium	120		110		110		155		200		120		100	
Thallium	1.2	U	1.3	U	1.4	U	1.1	U	1.2	U	0.78	U	1.5	U
Tin	6.2	U	6.5	U	7	U	6.2	U	7.8	U	7.5		7.4	U
Vanadium	30		27		37		28		34		32		36	J
Zinc	1800	J	1900	J	3200	J	890		340	J	3000	J	3400	J
PCBs (ug/kg)														
Monochlorobiphenyl	4.5	U	1.4	J	5.1	U	4.9	U	5.2	U	5.2	U	4.8	U
Dichlorobiphenyl	4.5	U	7.9		5.1	U	4.9	U	5.2	U	5.2	U	4.8	U
Trichlorobiphenyl	4.5	U	4.9		5.1	U	4.9	U	5.2	U	5.2	U	4.8	U
Tetrachlorobiphenyl	9.2	U	30		10	U	6.8	J	10	U	6.8	J	9.8	U

Appendix B-2b
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment C
Dead Creek
Sauget Area I

	CBS-CSC-T1-1		CBS-CSC-T2-1		CBS-CSC-T3-1		CBS-CSC-T4-1		CBS-CSC-T5-1		CBS-CSC-T6-1		CBS-CSC-T7-1	
Pentachlorobiphenyl	1.1	J	27		2.9	J	18.95		10	U	24		9.8	U
Hexachlorobiphenyl	9.2	U	38		10	U	9.2		10	U	10	J	9.8	U
Heptachlorobiphenyl	14	U	18		15	U	15	U	16	U	3.6	J	15	U
Octachlorobiphenyl	14	U	11	J	15	U	15	U	16	U	16	U	15	U
Nonachlorobiphenyl	23	U	11	J	26	U	25	U	26	U	5.2	J	24	U
Decachlorobiphenyl	23	U	29		26	U	8.9	J	26	U	21	J	24	U
Dioxins (ug/kg)														
1,2,3,4,6,7,8,9-OCDD	0.74	J	8.1		0.6	J	12.3		1.2	J	10.5		0.69	J
1,2,3,4,6,7,8-HpCDD	0.05	J	0.55	J	0.04	J	1.2		0.09	J	0.64	J	0.02	U
1,2,3,4,7,8-HxCDD	0.01	U	0.01	U	0.009	U	0.01	U	0.02	U	0.01	U	0.02	U
1,2,3,6,7,8-HxCDD	0.01	U	0.02	J	0.01	U	0.06	J	0.02	U	0.03	J	0.02	U
1,2,3,7,8,9-HxCDD	0.01	U	0.01	U	0.01	U	0.03	J	0.02	U	0.02	U	0.02	U
1,2,3,7,8-PeCDD	0.01	U	0.02	U	0.01	U	0.02	U	0.02	U	0.02	U	0.02	U
2,3,7,8-TCDD	0.008	U	0.01	U	0.008	U	0.01	U	0.01	U	0.01	U	0.01	U
Total HpCDD	0.12	J	1.2	J	0.1	J	2.29		0.22	J	1.5	J	0.02	U
Total HxCDD	0.01	U	0.29	J	0.009	U	0.66	J	0.02	U	0.69	J	0.02	U
Total PeCDD	0.01	U	0.15	J	0.01	U	0.39	J	0.02	U	0.58	J	0.02	U
Total TCDD	2.3	UJ	2.5	UJ	2.5	UJ	2.7	U	2.2	UJ	2.9	UJ	2.2	UJ
Furans (ug/kg)														
1,2,3,4,6,7,8,9-OCDF	0.14	J	2.7	J	0.06	J	5.805		0.3	J	2.5	J	0.08	J
1,2,3,4,6,7,8-HpCDF	0.03	J	0.36	J	0.02	J	1.175		0.06	J	0.34	J	0.02	J
1,2,3,4,7,8,9-HpCDF	0.01	U	0.01	U	0.01	U	0.05	J	0.01	U	0.01	U	0.02	U
1,2,3,4,7,8-HxCDF	0.006	U	0.01	J	0.006	U	0.03	J	0.01	U	0.02	J	0.01	U
1,2,3,6,7,8-HxCDF	0.006	U	0.006	U	0.005	U	0.01	J	0.008	U	0.007	U	0.01	U
1,2,3,7,8,9-HxCDF	0.007	U	0.007	U	0.006	U	0.007	U	0.01	U	0.009	U	0.01	U
1,2,3,7,8-PeCDF	0.01	U	0.01	U	0.01	U	0.01	U	0.02	U	0.02	U	0.02	U
2,3,4,6,7,8-HxCDF	0.007	U	0.007	U	0.006	U	0.02	J	0.01	U	0.008	U	0.01	U
2,3,4,7,8-PeCDF	0.01	U	0.01	U	0.01	U	0.01	U	0.02	U	0.02	U	0.02	U
2,3,7,8-TCDF	0.009	U	0.01	U	0.008	U	0.02	J	0.01	U	0.02	J	0.01	U
Total HpCDF	0.1	J	1.2	J	0.06	J	4.135		0.18	J	1.3	J	0.05	J
Total HxCDF	0.01	J	0.15	J	0.005	U	10.4	J	0.02	J	0.28	J	0.01	U
Total PeCDF	0.01	U	0.01	U	0.01	U	2.7	J	0.02	U	0.07	J	0.02	U
Total TCDF	0.07	UJ	0.06	UJ	0.06	UJ	0.2	J	0.06	UJ	0.13	UJ	0.07	UJ

Appendix B-2b
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment C
Dead Creek
Sauget Area I

	CBS-CSC-T8-1		CBS-CSC-T9-1	
Cyanide	0.74	U	0.64	U
Pesticides/Herbicides (ug/kg)				
2,4,5-T	12	U	11	U
2,4,5-TP (Silvex)	12	U	11	U
2,4-D	12	U	11	U
2,4-DB	12	U	11	U
4,4'-DDD	9.8	U	22	U
4,4'-DDE	9.8	U	22	U
4,4'-DDT	9.8	U	22	U
Aldrin	5.1	U	11	U
alpha-BHC	1.5	U	3.4	U
alpha-Chlordane	5.1	U	11	U
beta-BHC	1.5	U	3.4	U
Dalapon	97	U	88	U
delta-BHC	0.37	J	3.4	U
Dicamba	6.6	J	27	U
Dichlorprop	150	U	140	U
Dieldrin	5.5	J	22	U
Dinoseb	150	U	140	U
Endosulfan I	5.1	U	11	U
Endosulfan II	9.8	U	22	U
Endosulfan sulfate	0.72	J	22	U
Endrin	9.8	U	22	U
Endrin aldehyde	9.8	U	22	U
Endrin ketone	9.8	U	22	U
gamma-BHC (Lindane)	5.1	U	11	U
gamma-Chlordane	5.1	U	11	U
Heptachlor	5.1	U	11	U
Heptachlor epoxide	5.1	U	11	U
MCPA	3000	U	2700	U
MCPP	3000	U	2700	U
Methoxychlor	2.5	J	110	U
Toxaphene	510	U	1100	U
Semivolatile Organic Compounds (ug/kg)				
1,2,4-Trichlorobenzene	250	UJ	230	UJ
1,2-Dichlorobenzene	250	UJ	230	UJ
1,3-Dichlorobenzene	250	UJ	230	UJ
1,4-Dichlorobenzene	250	UJ	230	UJ
2,4,5-Trichlorophenol	250	UJ	230	UJ
2,4,6-Trichlorophenol	100	UJ	94	UJ
2,4-Dichlorophenol	250	UJ	230	UJ
2,4-Dinitrophenol	1300	UJ	1100	UJ
2,4-Dinitrotoluene	250	UJ	230	UJ
2,6-Dinitrotoluene	250	UJ	230	UJ
2-Chloronaphthalene	250	UJ	230	UJ
2-Chlorophenol	250	UJ	230	UJ
2-Methylnaphthalene	250	UJ	230	UJ
2-Methylphenol (o-Cresol)	250	UJ	230	UJ
2-Nitroaniline	1300	UJ	1100	UJ
2-Nitrophenol	250	UJ	230	UJ
3&4Methylphenol	250	UJ	230	UJ
3,3'-Dichlorobenzidine	490	UJ	440	UJ
3-Nitroaniline	1300	UJ	1100	UJ
4,6-Dinitro-2-methylphenol	1300	UJ	1100	UJ

Appendix B-2b
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment C
Dead Creek
Sauget Area I

	CBS-CSC-T8-1		CBS-CSC-T9-1	
4-Bromophenyl phenyl ether	250	UJ	230	UJ
4-Chloro-3-methylphenol	250	UJ	230	UJ
4-Chloroaniline	490	UJ	440	UJ
4-Chlorophenyl phenyl ether	250	UJ	230	UJ
4-Nitroaniline	1300	UJ	1100	UJ
4-Nitrophenol	1300	UJ	1100	UJ
Acenaphthene	250	UJ	230	UJ
Acenaphthylene	250	UJ	230	UJ
Anthracene	250	UJ	230	UJ
Benzo(a)anthracene	250	UJ	230	UJ
Benzo(a)pyrene	130	UJ	120	UJ
Benzo(b)fluoranthene	250	UJ	230	UJ
Benzo(g,h,i)perylene	250	UJ	230	UJ
Benzo(k)fluoranthene	250	UJ	230	UJ
Bis(2-chloroethoxy)methane	250	UJ	230	UJ
Bis(2-chloroethyl)ether	250	UJ	230	UJ
Bis(2-chloroisopropyl ether)	250	UJ	230	UJ
Bis(2-ethylhexyl)phthalate	250	UJ	230	UJ
Butylbenzylphthalate	250	UJ	230	UJ
Carbazole	250	UJ	230	UJ
Chrysene	250	UJ	230	UJ
Dibenzo(a,h)anthracene	130	UJ	120	UJ
Dibenzofuran	250	UJ	230	UJ
Diethyl phthalate	250	UJ	230	UJ
Dimethyl phthalate	250	UJ	230	UJ
di-n-Butylphthalate	250	UJ	230	UJ
di-n-Octylphthalate	250	UJ	230	UJ
Fluoranthene	250	UJ	230	UJ
Fluorene	250	UJ	230	UJ
Hexachlorobenzene	100	UJ	94	UJ
Hexachlorobutadiene	250	UJ	230	UJ
Hexachlorocyclopentadiene	250	UJ	230	UJ
Hexachloroethane	250	UJ	230	UJ
Indeno(1,2,3-cd)pyrene	250	UJ	230	UJ
Isophorone	250	UJ	230	UJ
Naphthalene	250	UJ	230	UJ
Nitrobenzene	250	UJ	230	UJ
N-Nitroso-di-N-propylamine	250	UJ	230	UJ
N-Nitrosodiphenylamine	250	UJ	230	UJ
Pentachlorophenol	2.0	J	1.6	J
Phenanthrene	250	UJ	230	UJ
Phenol	250	UJ	230	UJ
Pyrene	250	UJ	230	UJ
Volatile Organic Compounds (ug/kg)				
1,1,1-Trichloroethane	7.5	U	6.8	U
1,1,2,2-Tetrachloroethane	7.5	U	6.8	U
1,1,2-Trichloroethane	7.5	U	6.8	U
1,1-Dichloroethane	7.5	U	6.8	U
1,1-Dichloroethene	6.9	U	6.2	U
1,2-Dichloroethane	7.5	U	6.8	U
1,2-Dichloroethene (total)	7.5	U	6.8	U
1,2-Dichloropropane	7.5	U	6.8	U
2-Butanone (MEK)	37	U	34	U
2-Hexanone	37	U	34	U

Appendix B-2b
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment C
Dead Creek
Sauget Area I

	CBS-CSC-T8-1		CBS-CSC-T9-1	
4-Methyl-2-pentanone (MIBK)	37	U	34	U
Acetone	75	U	14	J
Benzene	7.5	U	6.8	U
Bromodichloromethane	7.5	U	6.8	U
Bromoform	7.5	U	6.8	U
Bromomethane	15	U	14	U
Carbon disulfide	7.5	U	6.8	U
Carbon tetrachloride	7.5	U	6.8	U
Chlorobenzene	22		3.8	J
Chloroform	7.5	U	6.8	U
Chloroethane	15	U	14	U
Chloromethane	15	U	14	U
cis-1,3-Dichloropropene	6	U	5.4	U
Dibromochloromethane	7.5	U	6.8	U
Ethylbenzene	7.5	U	6.8	U
Methylene chloride	7.5	U	6.8	U
Styrene	7.5	U	6.8	U
Tetrachloroethene	7.5	U	6.8	U
Toluene	7.5	U	6.8	U
trans-1,3-Dichloropropene	6	U	5.4	U
Trichloroethene	7.5	U	6.8	U
Vinyl chloride	15	U	14	U
Xylenes (total)	7.5	U	6.8	U
Inorganics (mg/kg)				
Aluminum	11000		8100	
Antimony	3	U	2.7	U
Arsenic	11		6.2	
Barium	240		200	
Beryllium	0.82		0.96	
Cadmium	17	J	15	J
Calcium	6500		3600	
Chromium	41		18	
Cobalt	9.3		5	
Copper	100	J	53	J
Iron	17000		12000	
Lead	33		20	
Magnesium	4200		2800	
Manganese	120		79	
Mercury	0.05	J	0.077	J
Molybdenum	1.6	U	1.5	U
Nickel	330		250	J
Potassium	1900		1400	
Selenium	1.1	U	0.78	U
Silver	1.5	U	1.4	U
Sodium	110		90	
Thallium	0.87	U	1.4	U
Tin	7.5	U	6.8	U
Vanadium	32		23	
Zinc	2700	J	2000	J
PCBs (ug/kg)				
Monochlorobiphenyl	4.9	U	4.4	U
Dichlorobiphenyl	4.9	U	4.4	U
Trichlorobiphenyl	4.9	U	4.4	U
Tetrachlorobiphenyl	2.3	J	9.0	U

Appendix B-2b
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment C
Dead Creek
Sauget Area I

	CBS-CSC-T8-1		CBS-CSC-T9-1	
Pentachlorobiphenyl	17		9.0	U
Hexachlorobiphenyl	7.3	J	9.0	U
Heptachlorobiphenyl	15	U	14	U
Octachlorobiphenyl	15	U	14	U
Nonachlorobiphenyl	25	U	22	U
Decachlorobiphenyl	25	U	22	U
Dioxins (ug/kg)				
1,2,3,4,6,7,8,9-OCDD	2.5	J	3.1	J
1,2,3,4,6,7,8-HpCDD	0.22	J	0.18	J
1,2,3,4,7,8-HxCDD	0.02	U	0.01	U
1,2,3,6,7,8-HxCDD	0.02	U	0.01	U
1,2,3,7,8,9-HxCDD	0.02	U	0.01	U
1,2,3,7,8-PeCDD	0.02	U	0.02	U
2,3,7,8-TCDD	0.01	U	0.01	U
Total HpCDD	0.42	J	0.46	J
Total HxCDD	0.02	J	0.04	J
Total PeCDD	0.02	U	0.02	U
Total TCDD	2.5	UJ	2.3	UJ
Furans (ug/kg)				
1,2,3,4,6,7,8,9-OCDF	1	J	0.54	J
1,2,3,4,6,7,8-HpCDF	0.13	J	0.08	J
1,2,3,4,7,8,9-HpCDF	0.02	U	0.01	U
1,2,3,4,7,8-HxCDF	0.01	U	0.007	U
1,2,3,6,7,8-HxCDF	0.009	U	0.006	U
1,2,3,7,8,9-HxCDF	0.01	U	0.008	U
1,2,3,7,8-PeCDF	0.02	U	0.01	U
2,3,4,6,7,8-HxCDF	0.01	U	0.008	U
2,3,4,7,8-PeCDF	0.02	U	0.01	U
2,3,7,8-TCDF	0.01	U	0.01	U
Total HpCDF	0.48	J	0.28	J
Total HxCDF	0.08	J	0.04	J
Total PeCDF	0.02	U	0.01	U
Total TCDF	0.07	UJ	0.06	UJ

J = value is estimated
U = not detected and detection limit is shown
UJ = not detected and estimated detection limit shown
Duplicates have been averaged.
See text for details.
Data are screened for high detection limits before summary statistics are calculated.
A high detection limit is defined as a detection limit which exceeds twice the maximum detected concentration.

Appendix B-2c
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment D
Dead Creek
Sauget Area I

	CBS-CSD-T1-1		CBS-CSD-T2-1		CBS-CSD-T3-1		CBS-CSD-T4-1		CBS-CSD-T5-1		CBS-CSD-T6-1	
Cyanide	0.72	UJ	0.74	UJ	0.71	UJ	0.72	UJ	0.67	UJ	0.7	UJ
Pesticides/Herbicides (ug/kg)												
2,4,5-T	5.4	J	12	U	12	U	12	U	11	U	12	UJ
2,4,5-TP (Silvex)	12	U	12	U	12	U	12	U	11	U	12	UJ
2,4-D	12	U	12	U	12	U	12	U	11	U	12	UJ
2,4-DB	12	U	12	U	12	U	12	U	11	U	12	UJ
4,4'-DDD	1.4	J	25	U	9.4	U	25	U	110	U	24	U
4,4'-DDE	25	U	25	U	9.4	U	25	U	110	U	24	U
4,4'-DDT	25	U	25	U	9.4	U	25	U	110	U	240	
Aldrin	0.75	J	13	U	4.8	U	13	U	58	U	9	J
alpha-BHC	3.7	U	3.8	U	1.4	U	3.7	U	17	U	3.6	U
alpha-Chlordane	13	U	13	U	4.8	U	13	U	58	U	12	J
beta-BHC	3.7	U	3.8	U	1.4	U	3.7	U	17	U	3.6	U
Dalapon	97	U	50	J	93	U	97	U	89	U	94	UJ
delta-BHC	0.43	J	0.53	J	1.4	U	0.56	J	17	U	1.9	J
Dicamba	30	U	30	U	1.8	J	30	U	27	U	29	UJ
Dichlorprop	150	U	21	J	140	U	150	U	140	U	140	UJ
Dieldrin	1.3	J	14	J	2.1	J	2.2	J	110	U	690	
Dinoseb	150	U	150	U	140	U	150	U	140	U	140	UJ
Endosulfan I	13	U	13	U	4.8	U	13	U	58	U	12	U
Endosulfan II	25	U	25	U	9.4	U	25	U	110	U	24	U
Endosulfan sulfate	25	U	25	U	9.4	U	25	U	110	U	9.5	J
Endrin	25	U	25	U	9.4	U	25	U	110	U	24	U
Endrin aldehyde	25	U	25	U	9.4	U	25	U	110	U	24	U
Endrin ketone	25	U	25	U	9.4	U	25	U	110	U	24	U
gamma-BHC (Lindane)	13	U	13	U	4.8	U	13	U	58	U	12	U
gamma-Chlordane	13	U	13	U	4.8	U	13	U	4	J	67	
Heptachlor	13	U	13	U	4.8	U	13	U	58	U	12	U
Heptachlor epoxide	13	U	13	U	4.8	U	13	U	58	U	12	U
MCPA	3000	U	3000	U	2800	U	3000	U	2700	U	2900	UJ
MCPP	3000	U	3000	U	2800	U	3000	U	2700	U	2900	UJ
Methoxychlor	130	U	130	U	48	U	4	J	8.8	J	62	J
Toxaphene	1300	U	1300	U	480	U	1300	U	5800	U	1200	U
Semivolatile Organic Compounds (ug/kg)												
1,2,4-Trichlorobenzene	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
1,2-Dichlorobenzene	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
1,3-Dichlorobenzene	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
1,4-Dichlorobenzene	130	J	260	UJ	240	UJ	53	J	230	UJ	250	UJ
2,4,5-Trichlorophenol	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
2,4,6-Trichlorophenol	100	UJ	110	UJ	100	UJ	100	UJ	98	UJ	100	UJ
2,4-Dichlorophenol	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
2,4-Dinitrophenol	1300	UJ	1300	UJ	1200	UJ	1300	UJ	1200	UJ	1200	UJ
2,4-Dinitrotoluene	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
2,6-Dinitrotoluene	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
2-Chloronaphthalene	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
2-Chlorophenol	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
2-Methylnaphthalene	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
2-Methylphenol (o-Cresol)	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
2-Nitroaniline	1300	UJ	1300	UJ	1200	UJ	1300	UJ	1200	UJ	1200	UJ
2-Nitrophenol	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
3&4Methylphenol	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
3,3'-Dichlorobenzidine	490	UJ	500	UJ	470	UJ	490	UJ	450	UJ	480	U
3-Nitroaniline	1300	UJ	1300	UJ	1200	UJ	1300	UJ	1200	UJ	1200	UJ
4,6-Dinitro-2-methylphenol	1300	UJ	1300	UJ	1200	UJ	1300	UJ	1200	UJ	1200	UJ

Appendix B-2c
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment D
Dead Creek
Sauget Area I

	CBS-CSD-T1-1		CBS-CSD-T2-1		CBS-CSD-T3-1		CBS-CSD-T4-1		CBS-CSD-T5-1		CBS-CSD-T6-1	
4-Bromophenyl phenyl ether	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
4-Chloro-3-methylphenol	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
4-Chloroaniline	490	UJ	500	UJ	470	UJ	490	UJ	450	UJ	480	UJ
4-Chlorophenyl phenyl ether	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
4-Nitroaniline	1300	UJ	1300	UJ	1200	UJ	1300	UJ	1200	UJ	1200	UJ
4-Nitrophenol	1300	UJ	1300	UJ	1200	UJ	1300	UJ	1200	UJ	1200	UJ
Acenaphthene	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
Acenaphthylene	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
Anthracene	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
Benzo(a)anthracene	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
Benzo(a)pyrene	130	UJ	49	J	130	UJ	130	J	120	UJ	140	J
Benzo(b)fluoranthene	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	200	J
Benzo(g,h,i)perylene	250	UJ	260	UJ	240	UJ	130	J	230	UJ	220	J
Benzo(k)fluoranthene	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	210	J
Bis(2-chloroethoxy)methane	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
Bis(2-chloroethyl)ether	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
Bis(2-chloroisopropyl ether)	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
Bis(2-ethylhexyl)phthalate	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	U
Butylbenzylphthalate	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
Carbazole	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	U
Chrysene	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
Dibenzo(a,h)anthracene	130	UJ	140	UJ	130	UJ	130	UJ	120	UJ	130	U
Dibenzofuran	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
Diethyl phthalate	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
Dimethyl phthalate	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
di-n-Butylphthalate	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
di-n-Octylphthalate	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	U
Fluoranthene	69	J	170	J	240	UJ	120	J	230	UJ	190	J
Fluorene	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
Hexachlorobenzene	100	UJ	110	UJ	100	UJ	100	UJ	96	UJ	100	UJ
Hexachlorobutadiene	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
Hexachlorocyclopentadiene	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
Hexachloroethane	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
Indeno(1,2,3-cd)pyrene	250	UJ	260	UJ	240	UJ	110	J	230	UJ	180	J
Isophorone	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
Naphthalene	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
Nitrobenzene	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
N-Nitroso-di-N-propylamine	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
N-Nitrosodiphenylamine	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
Pentachlorophenol	3.2	J	13	J	2.4	J	3.3	J	23	U	8	J
Phenanthrene	250	UJ	260	UJ	240	UJ	47	J	230	UJ	120	J
Phenol	250	UJ	260	UJ	240	UJ	250	UJ	230	UJ	250	UJ
Pyrene	250	UJ	150	J	240	UJ	120	J	230	UJ	160	J
Volatile Organic Compounds (ug/kg)												
1,1,1-Trichloroethane	7.5	U	7.6	U	7.1	U	7.5	U	6.8	U	7.2	U
1,1,2,2-Tetrachloroethane	7.5	U	7.6	U	7.1	U	7.5	U	6.8	U	7.2	U
1,1,2-Trichloroethane	7.5	U	7.6	U	7.1	U	7.5	U	6.8	U	7.2	U
1,1-Dichloroethane	7.5	U	7.6	U	7.1	U	7.5	U	6.8	U	7.2	U
1,1-Dichloroethene	6.9	U	7	U	6.6	U	6.9	U	6.3	U	6.7	U
1,2-Dichloroethane	7.5	U	7.6	U	7.1	U	7.5	U	6.8	U	7.2	U
1,2-Dichloroethene (total)	7.5	U	7.6	U	7.1	U	7.5	U	6.8	U	7.2	U
1,2-Dichloropropane	7.5	U	7.6	U	7.1	U	7.5	U	6.8	U	7.2	U
2-Butanone (MEK)	10	J	38	U	7.9	J	37	U	34	U	6.3	J
2-Hexanone	37	U	38	U	36	U	37	U	34	U	36	U

Appendix B-2c
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment D
Dead Creek
Sauget Area I

	CBS-CSD-T1-1		CBS-CSD-T2-1		CBS-CSD-T3-1		CBS-CSD-T4-1		CBS-CSD-T5-1		CBS-CSD-T6-1	
4-Methyl-2-pentanone (MIBK)	37	U	38	U	36	U	37	U	34	U	36	U
Acetone	75	U	76	U	71	U	75	U	68	U	72	U
Benzene	7.5	U	7.6	U	7.1	U	7.5	U	6.8	U	7.2	U
Bromodichloromethane	7.5	U	7.6	U	7.1	U	7.5	U	6.8	U	7.2	U
Bromoform	7.5	U	7.6	U	7.1	U	7.5	U	6.8	U	7.2	U
Bromomethane	15	U	15	U	14	U	15	U	14	U	14	U
Carbon disulfide	7.5	U	7.6	U	7.1	U	7.5	U	6.8	U	7.2	U
Carbon tetrachloride	7.5	U	7.6	U	7.1	U	7.5	U	6.8	U	7.2	U
Chlorobenzene	150		3.4	J	21		7.7		6.8	U	2	J
Chloroform	7.5	U	7.6	U	7.1	U	7.5	U	6.8	U	7.2	U
Chloroethane	15	U	15	U	14	U	15	U	14	U	14	U
Chloromethane	15	U	15	U	14	U	15	U	14	U	14	U
cis-1,3-Dichloropropene	6	U	6.1	U	5.7	U	6	U	5.5	U	5.8	U
Dibromochloromethane	7.5	U	7.6	U	7.1	U	7.5	U	6.8	U	7.2	U
Ethylbenzene	7.5	U	7.6	U	7.1	U	7.5	U	6.8	U	7.2	U
Methylene chloride	2.3	J	2.3	J	7.1	U	2.9	J	6.8	U	3.2	J
Styrene	7.5	U	7.6	U	7.1	U	7.5	U	6.8	U	7.2	U
Tetrachloroethene	7.5	U	7.6	U	7.1	U	7.5	U	6.8	U	7.2	U
Toluene	7.5	U	7.6	U	7.1	U	7.5	U	6.8	U	2.9	J
trans-1,3-Dichloropropene	6	U	6.1	U	5.7	U	6	U	5.5	U	5.8	U
Trichloroethene	7.5	U	7.6	U	7.1	U	7.5	U	6.8	U	7.2	U
Vinyl chloride	15	U	15	U	14	U	15	U	14	U	14	U
Xylenes (total)	7.5	U	7.6	U	7.1	U	7.5	U	6.8	U	7.2	U
Inorganics (mg/kg)												
Aluminum	9300		8300		12000		14000		12000		9800	
Antimony	12	U	14	U	2.9	U	6	U	2.7	U	5.3	U
Arsenic	11		18		8.7		15		5.7		10	
Barium	240		320		250		290		200		570	
Beryllium	0.89		0.65		0.94		0.99		0.66		0.9	
Cadmium	14	J	40	J	15	J	28	J	8.5	J	13	J
Calcium	5900		5500		5600		5200		4000		25000	
Chromium	44		55		57		46		41		53	
Cobalt	12		11		11		9.2		6		7.6	
Copper	79	J	130	J	84	J	230	J	190	J	1600	J
Iron	16000		18000		17000		20000		14000		18000	
Lead	39		150		36		61		23		280	
Magnesium	3300		3700		4100		3600		2900		5000	
Manganese	110		100		190		150		110		180	
Mercury	0.14	J	0.11	J	0.07	J	0.71	J	0.065	J	0.33	J
Molybdenum	1.1	U	4.7		1	U	1.5	U	0.96	U	7	
Nickel	90		180	J	250		410	J	260	J	530	J
Potassium	1600		1700		2100		2100		1600		1700	
Selenium	2.8		6.9	U	1	U	3	U	1.4	U	1.7	U
Silver	1.2	U	1.4	U	1.4	U	1.5	U	1.4	U	1.5	
Sodium	120		120		160		180		140		330	
Thallium	0.94	U	0.85	U	1.1	U	1.5	U	1.4	U	1.3	U
Tin	6.2	U	6.6		7.1	U	7.5	U	6.8	U	11	
Vanadium	32		26		34		36		33		28	
Zinc	6400	J	8200	J	2000	J	3100	J	1800	J	3100	J
PCBs (ug/kg)												
Monochlorobiphenyl	4.9	U	3.9	J	4.7	U	4.9	U	4.5	U	4.8	U
Dichlorobiphenyl	4.9	U	5	U	4.7	U	4.9	U	4.5	U	4.8	U
Trichlorobiphenyl	4.9	U	21		4.7	U	4.9	U	4.5	U	8.2	
Tetrachlorobiphenyl	10	U	33		9.6	U	10	U	9.2	U	340	

Appendix B-2c
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment D
Dead Creek
Sauget Area I

	CBS-CSD-T1-1		CBS-CSD-T2-1		CBS-CSD-T3-1		CBS-CSD-T4-1		CBS-CSD-T5-1		CBS-CSD-T6-1	
Pentachlorobiphenyl	10	U	60		4.4	J	5.7	J	4.7	J	1000	
Hexachlorobiphenyl	10	U	63		1.5	J	3.3	J	2.7	J	620	
Heptachlorobiphenyl	15	U	26		14	U	15	U	14	U	190	
Octachlorobiphenyl	15	U	9.9	J	14	U	15	U	14	U	50	
Nonachlorobiphenyl	25	U	16	J	24	U	25	U	23	U	39	
Decachlorobiphenyl	25	U	59		4	J	25	U	23	U	190	
Dioxins (ug/kg)												
1,2,3,4,6,7,8,9-OCDD	3.3	J	13.6		1.4	J	1.1	J	3.7	J	312	J
1,2,3,4,6,7,8-HpCDD	0.17	J	1.2	J	0.09	J	0.1	J	0.29	J	27.7	
1,2,3,4,7,8-HxCDD	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.1	J
1,2,3,6,7,8-HxCDD	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.99	J
1,2,3,7,8,9-HxCDD	0.02	U	0.06	J	0.02	U	0.02	U	0.02	U	0.29	J
1,2,3,7,8-PeCDD	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
2,3,7,8-TCDD	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
Total HpCDD	0.35	J	2.1	J	0.21	J	0.19	J	0.59	J	52.6	
Total HxCDD	0.02	U	0.51	J	0.02	U	0.02	U	0.02	U	6.2	
Total PeCDD	0.02	U	0.1	J	0.02	U	0.02	U	0.02	U	1.6	J
Total TCDD	2.4	UJ	2.6	UJ	2.7	UJ	2.9	UJ	2.8	UJ	10.5	J
Furans (ug/kg)												
1,2,3,4,6,7,8,9-OCDF	0.47	J	8.9		0.31	J	0.44	J	1.6	J	174	J
1,2,3,4,6,7,8-HpCDF	0.1	J	1.3	J	0.02	U	0.09	J	0.26	J	22.6	
1,2,3,4,7,8,9-HpCDF	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	1.1	J
1,2,3,4,7,8-HxCDF	0.01	UJ	0.01	UJ	0.02	UJ	0.01	UJ	0.01	UJ	0.48	J
1,2,3,6,7,8-HxCDF	0.02	UJ	0.01	UJ	0.02	UJ	0.02	UJ	0.01	UJ	0.12	J
1,2,3,7,8,9-HxCDF	0.01	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.01	UJ	0.1	J
1,2,3,7,8-PeCDF	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.38	J
2,3,4,6,7,8-HxCDF	0.01	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.01	UJ	0.31	J
2,3,4,7,8-PeCDF	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.09	J
2,3,7,8-TCDF	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.2	J
Total HpCDF	0.31	J	4	J	0.1	J	0.27	J	0.86	J	85	
Total HxCDF	0.04	J	0.59	J	0.02	U	0.01	U	0.08	J	15.6	J
Total PeCDF	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	2.5	J
Total TCDF	0.07	UJ	0.06	UJ	0.07	UJ	0.07	UJ	0.07	UJ	2.1	J

J = value is estimated
U = not detected and detection limit is shown
UJ = not detected and estimated detection limit shown
Duplicates have been averaged. See text for details.
Data are screened for high detection limits before summary statistics are calculated.
A high detection limit is defined as a detection limit which exceeds twice the maximum detected concentration.

Appenaix B-2d
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment E
Dead Creek
Sauget Area I

	CBS-CSE-T10-1		CBS-CSE-T1-1		CBS-CSE-T11-1		CBS-CSE-T12-1		CBS-CSE-T13-2		CBS-CSE-T14-1	
Cyanide	0.69	U	0.72	U	0.72	U	0.8	U	0.75	U	0.77	U
Pesticides/Herbicides (ug/kg)												
2,4,5-T	12	U	12	U	12	U	13	U	12	U	12	U
2,4,5-TP (Silvex)	12	U	12	U	12	U	13	U	12	U	12	U
2,4-D	12	U	12	U	12	U	13	U	12	U	12	U
2,4-DB	12	U	12	U	12	U	13	U	12	U	12	U
4,4'-DDD	4.6	U	4.9	U	4.8	U	5.1	U	20	U	4.8	U
4,4'-DDE	4.6	U	0.63	J	4.8	U	5.1	U	20	U	0.85	J
4,4'-DDT	4.6	U	0.68	J	1.7	J	5.1	U	20	U	4.8	U
Aldrin	2.4	UJ	2.5	U	2.5	U	2.6	U	10	U	2.5	U
alpha-BHC	0.69	U	0.75	U	0.74	U	0.77	U	3	U	0.74	U
alpha-Chlordane	2.4	UJ	2.5	U	2.5	U	2.6	U	10	U	2.5	U
beta-BHC	0.69	U	0.75	U	0.74	U	0.77	U	3	U	0.74	U
Dalapon	90	UJ	97	U	96	U	100	U	97	U	96	U
delta-BHC	0.69	U	0.75	U	0.74	U	0.77	U	3	U	0.74	U
Dicamba	2.5	J	30	U	29	U	31	U	30	U	29	U
Dichlorprop	140	U	150	U	150	U	150	U	150	U	150	U
Dieldrin	4.6	UJ	1.3	J	0.31	J	5.1	U	27	J	0.67	J
Dinoseb	140	U			150	U	150	U	150	U	150	U
Endosulfan I	0.11	J	2.5	U	2.5	U	0.17	J	10	U	2.5	U
Endosulfan II	4.6	U	4.9	U	4.8	U	5.1	U	20	U	4.8	U
Endosulfan sulfate	4.6	U	4.9	U	4.8	U	5.1	U	20	U	4.8	U
Endrin	4.6	U	4.9	U	4.8	U	5.1	U	20	U	4.8	U
Endrin aldehyde	4.6	U	4.9	U	4.8	U	5.1	U	20	U	4.8	U
Endrin ketone	4.6	U	4.9	U	4.8	U	5.1	U	20	U	4.8	U
gamma-BHC (Lindane)	2.4	U	2.5	U	2.5	U	2.6	U	10	U	2.5	U
gamma-Chlordane	2.4	U	2.5	U	2.5	U	2.6	U	10	U	2.5	U
Heptachlor	2.4	U	2.5	U	2.5	U	2.6	U	10	U	2.5	U
Heptachlor epoxide	0.52	J	2.5	U	0.58	J	2.6	U	10	U	2.5	U
MCPA	2800	U	3000	U	2900	U	3100	U	3000	UJ	2900	U
MCPP	2800	U	3000	U	2900	U	3100	U	3000	U	2900	U
Methoxychlor	24	U	25	U	25	U	26	U	100	U	25	U
Toxaphene	240	U	250	U	250	U	260	U	1000	U	250	U
Semivolatile Organic Compounds (ug/kg)												
1,2,4-Trichlorobenzene	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
1,2-Dichlorobenzene	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
1,3-Dichlorobenzene	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
1,4-Dichlorobenzene	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
2,4,5-Trichlorophenol	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
2,4,6-Trichlorophenol	97	UJ	100	UJ	100	UJ	110	UJ	100	UJ	100	UJ
2,4-Dichlorophenol	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
2,4-Dinitrophenol	1200	UJ	1300	UJ	1200	UJ	1300	UJ	1300	UJ	1200	UJ
2,4-Dinitrotoluene	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
2,6-Dinitrotoluene	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
2-Chloronaphthalene	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
2-Chlorophenol	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
2-Methylnaphthalene	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
2-Methylphenol (o-Cresol)	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
2-Nitroaniline	1200	UJ	1300	UJ	1200	UJ	1300	UJ	1300	UJ	1200	UJ
2-Nitrophenol	240	U	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
3&4Methylphenol	240	U	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
3,3'-Dichlorobenzidine	480	UJ	490	UJ	480	UJ	510	UJ	490	UJ	480	UJ
3-Nitroaniline	1200	UJ	1300	UJ	1200	UJ	1300	UJ	1300	UJ	1200	UJ
4,6-Dinitro-2-methylphenol	1200	UJ	1300	UJ	1200	UJ	1300	UJ	1300	UJ	1200	UJ

Appendix B-2d
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment E
Dead Creek
Sauget Area I

	CBS-CSE-T10-1		CBS-CSE-T1-1		CBS-CSE-T11-1		CBS-CSE-T12-1		CBS-CSE-T13-2		CBS-CSE-T14-1	
4-Bromophenyl phenyl ether	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
4-Chloro-3-methylphenol	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
4-Chloroaniline	460	UJ	490	UJ	480	UJ	510	UJ	490	UJ	480	UJ
4-Chlorophenyl phenyl ether	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
4-Nitroaniline	1200	UJ	1300	UJ	1200	UJ	1300	UJ	1300	UJ	1200	UJ
4-Nitrophenol	1200	UJ	1300	UJ	1200	UJ	1300	UJ	1300	UJ	1200	UJ
Acenaphthene	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
Acenaphthylene	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
Anthracene	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
Benzo(a)anthracene	240	UJ	250	UJ	250	UJ	260	UJ	58	J	250	UJ
Benzo(a)pyrene	120	UJ	130	UJ	130	UJ	140	UJ	72	J	130	UJ
Benzo(b)fluoranthene	240	UJ	250	UJ	37	J	260	UJ	92	J	250	UJ
Benzo(g,h,i)perylene	240	UJ	250	UJ	250	UJ	260	UJ	69	J	250	UJ
Benzo(k)fluoranthene	240	UJ	250	UJ	250	UJ	260	UJ	83	J	250	UJ
Bis(2-chloroethoxy)methane	240	U	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
Bis(2-chloroethyl)ether	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
Bis(2-chloroisopropyl ether)	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
Bis(2-ethylhexyl)phthalate	240	UJ	250	UJ	77	J	260	UJ	250	UJ	250	UJ
Butylbenzylphthalate	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
Carbazole	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
Chrysene	240	UJ	250	UJ	37	J	260	UJ	86	J	250	UJ
Dibenzo(a,h)anthracene	120	UJ	130	UJ	130	UJ	140	UJ	130	UJ	130	UJ
Dibenzofuran	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
Diethyl phthalate	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
Dimethyl phthalate	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
di-n-Butylphthalate	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
di-n-Octylphthalate	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
Fluoranthene	240	UJ	250	UJ	59	J	260	UJ	120	J	250	UJ
Fluorene	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
Hexachlorobenzene	97	UJ	100	UJ	100	UJ	110	UJ	100	UJ	100	UJ
Hexachlorobutadiene	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
Hexachlorocyclopentadiene		R	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
Hexachloroethane	240	U	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
Indeno(1,2,3-cd)pyrene	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
Isophorone	240	U	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
Naphthalene	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
Nitrobenzene	240	U	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
N-Nitroso-di-N-propylamine	240	U	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
N-Nitrosodiphenylamine	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
Pentachlorophenol	24	U	3.3	J	25	U	26	U	16	J	25	U
Phenanthrene	240	UJ	250	UJ	250	UJ	260	UJ	51	J	250	UJ
Phenol	240	UJ	250	UJ	250	UJ	260	UJ	250	UJ	250	UJ
Pyrene	240	UJ	250	UJ	250	UJ	260	UJ	100	J	250	UJ
Volatile Organic Compounds (ug/kg)												
1,1,1-Trichloroethane	6.4	U	7.5	U	5.8	U	7.5	U	6.7	U	7.4	U
1,1,2,2-Tetrachloroethane	6.4	UJ	7.5	U	5.8	U	7.5	U	6.7	U	7.4	U
1,1,2-Trichloroethane	6.4	UJ	7.5	U	5.8	U	7.5	U	6.7	U	7.4	U
1,1-Dichloroethane	6.4	U	7.5	U	5.8	U	7.5	U	6.7	U	7.4	U
1,1-Dichloroethene	5.9	U	6.9	U	5.4	U	6.9	U	6.1	U	6.8	U
1,2-Dichloroethane	6.4	UJ	7.5	U	5.8	U	7.5	U	6.7	U	7.4	U
1,2-Dichloroethene (total)	6.4	U	7.5	U	5.8	U	7.5	U	6.7	U	7.4	U
1,2-Dichloropropane	6.4	UJ	7.5	U	5.8	U	7.5	U	6.7	U	7.4	U
2-Butanone (MEK)	12	J	14	J	29	U	7.3	J	33	U	37	U
2-Hexanone	32	U	37	U	29	U	38	U	33	U	37	U

Appendix B-2d
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment E
Dead Creek
Sauget Area I

	CBS-CSE-T10-1		CBS-CSE-T1-1		CBS-CSE-T11-1		CBS-CSE-T12-1		CBS-CSE-T13-2		CBS-CSE-T14-1	
4-Methyl-2-pentanone (MIBK)	32	U	37	U	29	U	38	U	33	U	37	U
Acetone	64	U	73	J	74	U	77	U	29	J	18	J
Benzene	6.4	U	7.5	U	5.8	U	7.5	U	6.7	U	7.4	U
Bromodichloromethane	6.4	U	7.5	U	5.8	U	7.5	U	6.7	U	7.4	U
Bromoform	6.4	UJ	7.5	U	5.8	U	7.5	U	6.7	U	7.4	U
Bromomethane	13	U	15	U	12	U	15	U	13	U	15	U
Carbon disulfide	6.4	U	7.5	U	5.8	U	7.5	U	6.7	U	7.4	U
Carbon tetrachloride	6.4	U	7.5	U	5.8	U	7.5	U	6.7	U	7.4	U
Chlorobenzene	15	J	7.1	J	2.2	J	66		12		5.1	J
Chloroform	6.4	U	7.5	U	5.8	U	7.5	U	6.7	U	7.4	U
Chloroethane	13	U	15	U	12	U	15	U	13	U	15	U
Chloromethane	13	U	15	U	12	U	15	U	13	U	15	U
cis-1,3-Dichloropropene	5.1	U	6	U	4.7	U	6	U	5.3	U	5.9	U
Dibromochloromethane	6.4	UJ	7.5	U	5.8	U	7.5	U	6.7	U	7.4	U
Ethylbenzene	6.4	U	7.5	U	5.8	U	7.5	U	6.7	U	7.4	U
Methylene chloride	6.4	UJ	7.5	U	5.8	U	7.5	U	6.7	U	7.4	U
Styrene	6.4	U	7.5	U	5.8	U	7.5	U	6.7	U	7.4	U
Tetrachloroethene	6.4	U	7.5	U	5.8	U	7.5	U	6.7	U	7.4	U
Toluene	6.4	UJ	7.5	U	5.8	U	7.5	U	2.6	J	7.4	U
trans-1,3-Dichloropropene	5.1	U	6	U	4.7	U	6	U	5.3	U	5.9	U
Trichloroethene	6.4	U	7.5	U	5.8	U	7.5	U	6.7	U	7.4	U
Vinyl chloride	13	U	15	U	12	U	15	U	13	U	15	U
Xylenes (total)	6.4	U	7.5	U	5.8	U	7.5	U	6.7	U	7.4	U
Inorganics (mg/kg)												
Aluminum	7300		9800		11000		14000		10000		12000	
Antimony	0.98	J	2.7	UJ	2.9	UJ	2.8	UJ	1	U	2.7	UJ
Arsenic	9.4		8.8		6.9		5.5		5.8		6.8	
Barium	280		230		250		260		220		250	
Beryllium	0.55		0.78		0.81		1.1		0.79		0.92	
Cadmium	15	J	13	J	4.6	J	12	J	3.1		5.6	J
Calcium	12000	J	6600		12000	J	8500	J	12000		7300	
Chromium	19		57	J	19		21		18		19	J
Cobalt	7.8		6.9		9		11		8.2		13	
Copper	300		380	J	88		33		94		40	J
Iron	16000		17000		21000		24000		20000		20000	
Lead	170	J	58	J	33	J	28	J	44		25	J
Magnesium	5600		3800		6100		5300		6500		5300	
Manganese	200		120		240		210		210		170	
Mercury	0.6		0.11	J	0.46		0.69		0.84		0.28	J
Molybdenum	0.37	UJ	0.55	U	0.46	UJ	0.21	UJ	1.3	U	0.23	U
Nickel	170	J	260		67	J	120	J	52		140	
Potassium	1700	J	1900	J	2400	J	2900	J	2200		2600	J
Selenium	1.4	U	0.71	U	1.5	U	1.4	U	1.4	U	1.3	U
Silver	0.61		1.4	U	1.5	U	1.4	U	1.4	UJ	1.3	U
Sodium	280		310		240		280		160		200	
Thallium	1.4	U	1.7	U	1.5	U	1.1	U	0.88		1.8	U
Tin	6.7		6.8	U	7.4	U	7	U	6.8	U	6.7	U
Vanadium	25		29		31		37		31		34	
Zinc	2500		2900		690		1300		320		830	
PCBs (ug/kg)												
Monochlorobiphenyl	4.6	UJ	4.9	U	4.8	U	5.1	U	4.9	U	4.8	U
Dichlorobiphenyl	4.6	UJ	4.9	U	4.8	U	5.1	U	4.9	U	4.8	U
Trichlorobiphenyl	4.6	UJ	4.9	U	4.8	U	5.1	U	1.1	J	4.8	U
Tetrachlorobiphenyl	9.3	UJ	10	U	9.8	U	10	U	140		9.8	U

Appendix B-2d
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment E
Dead Creek
Sauget Area I

	CBS-CSE-T10-1		CBS-CSE-T1-1		CBS-CSE-T11-1		CBS-CSE-T12-1		CBS-CSE-T13-2		CBS-CSE-T14-1	
Pentachlorobiphenyl	9.3	UJ	9.1	J	18		10	U	380	J	9.8	U
Hexachlorobiphenyl	9.3	UJ	6.7	J	10		10	U	240		9.8	U
Heptachlorobiphenyl	14	UJ	15	U	15	U	15	U	41		15	U
Octachlorobiphenyl	14	UJ	15	U	15	U	15	U	16		15	U
Nonachlorobiphenyl	23	UJ	25	U	24	U	26	U	35		24	U
Decachlorobiphenyl	23	UJ	7.4	J	7.9	J	26	U	64		24	U
Dioxins (ug/kg)												
1,2,3,4,6,7,8,9-OCDD	0.19	U	0.74	J	2.3	J	0.26	U	3.8	J	2.6	J
1,2,3,4,6,7,8-HpCDD	0.06	U	0.07	J	0.23	J	0.04	U	0.3	J	0.24	J
1,2,3,4,7,8-HxCDD	0.04	U	0.02	U	0.03	U	0.03	U	0.007	U	0.007	U
1,2,3,6,7,8-HxCDD	0.04	U	0.02	U	0.03	U	0.03	U	0.01	J	0.01	J
1,2,3,7,8,9-HxCDD	0.05	U	0.02	U	0.03	U	0.03	U	0.007	U	0.008	U
1,2,3,7,8-PeCDD	0.05	U	0.03	U	0.04	U	0.03	U	0.01	U	0.01	U
2,3,7,8-TCDD	0.03	U	0.02	U	0.02	U	0.02	U	0.008	U	0.007	U
Total HpCDD	0.06	U	0.15	J	0.46	J	0.04	U	0.59	J	0.46	J
Total HxCDD	0.04	U	0.02	U	0.03	U	0.03	U	0.09	J	0.05	J
Total PeCDD	0.05	U	0.03	U	0.04	U	0.03	U	0.03	J	0.01	U
Total TCDD	2.4	UJ	2.3	UJ	2.6	UJ	2.6	UJ	2.5	UJ	2.2	UJ
Furans (ug/kg)												
1,2,3,4,6,7,8,9-OCDF	0.08	U	0.17	J	0.99	J	0.06	U	1.5	J	1.1	J
1,2,3,4,6,7,8-HpCDF	0.04	U	0.02	U	0.15	J	0.03	U	0.22	J	0.19	J
1,2,3,4,7,8,9-HpCDF	0.04	U	0.02	U	0.03	U	0.03	U	0.007	U	0.007	U
1,2,3,4,7,8-HxCDF	0.02	U	0.02	U	0.02	U	0.02	U	0.005	U	0.005	U
1,2,3,6,7,8-HxCDF	0.03	U	0.02	U	0.02	U	0.02	U	0.004	U	0.005	U
1,2,3,7,8,9-HxCDF	0.03	U	0.02	U	0.02	U	0.02	U	0.005	U	0.005	U
1,2,3,7,8-PeCDF	0.04	U	0.02	U	0.03	U	0.03	U	0.008	U	0.008	U
2,3,4,6,7,8-HxCDF	0.03	U	0.02	U	0.02	U	0.02	U	0.005	U	0.005	U
2,3,4,7,8-PeCDF	0.04	U	0.02	U	0.03	U	0.03	U	0.008	U	0.008	U
2,3,7,8-TCDF	0.02	U	0.01	U	0.02	U	0.02	U	0.007	U	0.007	U
Total HpCDF	0.04	U	0.08	J	0.55	J	0.03	U	0.83	J	0.61	J
Total HxCDF	0.02	U	0.02	U	0.05	J	0.02	U	0.12	J	0.09	J
Total PeCDF	0.04	U	0.02	U	0.03	U	0.03	U	0.008	U	0.008	U
Total TCDF	0.08	UJ	0.07	UJ	0.07	UJ	0.07	UJ	0.06	UJ	0.06	UJ

Appendix B-2d
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment E
Dead Creek
Sauget Area I

	CBS-CSE-T15-1		CBS-CSE-T16-1		CBS-CSE-T17-1		CBS-CSE-T2-1		CBS-CSE-T3-1		CBS-CSE-T4-1	
Cyanide	0.63	U	1	UJ	0.88	U	0.64	U	0.68	U	0.68	U
Pesticides/Herbicides (ug/kg)												
2,4,5-T	10	U	17	UJ	14	U	11	U	12	U	12	U
2,4,5-TP (Silvex)	10	U	17	UJ	14	U	11	U	12	U	12	U
2,4-D	10	U	16	J	14	U	11	U	12	U	12	U
2,4-DB	10	U	17	UJ	14	U	11	U	12	U	12	U
4,4'-DDD	4.2	U	34	UJ	47	J	4.4	U	4.6	U	4.6	U
4,4'-DDE	4.2	U	34	UJ	7.2	J	0.24	J	0.44		0.24	J
4,4'-DDT	4.2	U	34	UJ	9.1	J	0.56	J	0.77	J	4.6	U
Aldrin	2.2	U	17	UJ	15	U	2.3	U	2.4	U	2.4	U
alpha-BHC	0.63	U	1.3	J	4.4	U	0.68	U	0.7	U	0.69	U
alpha-Chlordane	2.2	U	17	UJ	8.7	J	2.3	U	2.4	U	2.4	U
beta-BHC	0.63	U	5.1	UJ	4.4	U	0.68	U	0.7	U	0.69	U
Dalapon	82	U	130	UJ	110	U	88	U	92	U	90	U
delta-BHC	0.63	U	5.1	UJ	4.4	U	0.68	U	0.7	U	0.69	U
Dicamba	25	U	41	UJ	35	U	27	U	28	U	28	U
Dichlorprop	130	U	200	UJ	180	U	140	U	140	U	140	U
Dieldrin	0.6	J	34	J	9.8	J	1.2	J	0.74		0.46	J
Dinoseb			200	UJ	180	U	140	U	140	U	140	U
Endosulfan I	2.2	U	17	UJ	15	U	2.3	U	2.4	U	2.4	U
Endosulfan II	4.2	U	34	UJ	29	U	0.66	J	4.6	U	4.6	U
Endosulfan sulfate	4.2	U	16	J	1.5	J	4.4	U	4.6	U	4.6	U
Endrin	4.2	U	34	UJ	29	U	4.4	U	4.6	U	4.6	U
Endrin aldehyde	4.2	U	34	UJ	29	U	4.4	U	4.6	U	4.6	U
Endrin ketone	4.2	U	34	UJ	29	U	4.4	U	4.6	U	4.6	U
gamma-BHC (Lindane)	2.2	U	17	UJ	15	U	2.3	U	2.4	U	2.4	U
gamma-Chlordane	2.2	U	17	UJ	5.5	J	2.3	U	2.4	U	2.4	U
Heptachlor	2.2	U	17	UJ	15	U	2.3	U	2.4	U	2.4	U
Heptachlor epoxide	2.2	U	17	UJ	15	U	2.3	U	2.4	U	2.4	U
MCPA	2500	U	4100	UJ	3500	U	2700	U	2800	U	2800	U
MCPP	2500	U	4100	UJ	3500	U	2700	U	2800	U	2800	U
Methoxychlor	22	U	170	UJ	150	U	23	U	24	U	0.49	J
Toxaphene	220	U	1700	UJ	1500	U	230	U	240	U	240	U
Semivolatile Organic Compounds (ug/kg)												
1,2,4-Trichlorobenzene	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
1,2-Dichlorobenzene	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
1,3-Dichlorobenzene	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
1,4-Dichlorobenzene	220	U	230	J	300	UJ	230	UJ	240	U	240	UJ
2,4,5-Trichlorophenol	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
2,4,6-Trichlorophenol	89	U	140	UJ	120	UJ	94	UJ	98	U	97	UJ
2,4-Dichlorophenol	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
2,4-Dinitrophenol	1100	U	1700	UJ	1500	UJ	1100	UJ	1200	U	1200	UJ
2,4-Dinitrotoluene	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
2,6-Dinitrotoluene	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
2-Chloronaphthalene	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
2-Chlorophenol	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
2-Methylnaphthalene	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
2-Methylphenol (o-Cresol)	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
2-Nitroaniline	1100	U	1700	UJ	1500	UJ	1100	UJ	1200	U	1200	UJ
2-Nitrophenol	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
3&4Methylphenol	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
3,3'-Dichlorobenzidine	420	U	670	UJ	580	UJ	440	UJ	460	U	460	UJ
3-Nitroaniline	1100	U	1700	UJ	1500	UJ	1100	UJ	1200	U	1200	UJ
4,6-Dinitro-2-methylphenol	1100	U	1700	UJ	1500	UJ	1100	UJ	1200	U	1200	UJ

Appendix B-2d
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment E
Dead Creek
Sauget Area I

	CBS-CSE-T15-1		CBS-CSE-T16-1		CBS-CSE-T17-1		CBS-CSE-T2-1		CBS-CSE-T3-1		CBS-CSE-T4-1	
4-Bromophenyl phenyl ether	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
4-Chloro-3-methylphenol	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
4-Chloroaniline	420	U	670	UJ	580	UJ	440	UJ	460	U	460	UJ
4-Chlorophenyl phenyl ether	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
4-Nitroaniline	1100	U	1700	UJ	1500	UJ	1100	UJ	1200	U	1200	UJ
4-Nitrophenol	1100	U	1700	UJ	1500	UJ	1100	UJ	1200	U	1200	UJ
Acenaphthene	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
Acenaphthylene	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
Anthracene	220	U	50	J	300	UJ	230	UJ	240	U	240	UJ
Benzo(a)anthracene	220	U	260	J	110	J	230	UJ	240	U	240	UJ
Benzo(a)pyrene	110	U	420	J	140	J	120	UJ	130	U	120	UJ
Benzo(b)fluoranthene	220	U	510	J	170	J	230	UJ	240	U	240	UJ
Benzo(g,h,i)perylene	220	U	350	J	170	J	230	UJ	240	U	240	UJ
Benzo(k)fluoranthene	220	U	370	J	140	J	230	UJ	240	U	240	UJ
Bis(2-chloroethoxy)methane	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
Bis(2-chloroethyl)ether	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
Bis(2-chloroisopropyl ether)	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
Bis(2-ethylhexyl)phthalate	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
Butylbenzylphthalate	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
Carbazole	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
Chrysene	220	U	370	J	160	J	230	UJ	240	U	240	UJ
Dibenzo(a,h)anthracene	110	U	140	J	160	UJ	120	UJ	130	U	120	UJ
Dibenzofuran	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
Diethyl phthalate	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
Dimethyl phthalate	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
di-n-Butylphthalate	74	J	350	UJ	300	UJ	230	UJ	240	U	240	UJ
di-n-Octylphthalate	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
Fluoranthene	220	U	710	J	300	J	230	UJ	240	U	240	UJ
Fluorene	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
Hexachlorobenzene	89	U	140	UJ	120	UJ	94	UJ	98	U	97	UJ
Hexachlorobutadiene	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
Hexachlorocyclopentadiene	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
Hexachloroethane	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
Indeno(1,2,3-cd)pyrene	220	U	350	J	160	J	230	UJ	240	U	240	UJ
Isophorone	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
Naphthalene	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
Nitrobenzene	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
N-Nitroso-di-N-propylamine	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
N-Nitrosodiphenylamine	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
Pentachlorophenol	22	U	33	J	10	J	2	J	24	U	24	U
Phenanthrene	23	J	290	J	130	J	230	UJ	240	U	240	UJ
Phenol	220	U	350	UJ	300	UJ	230	UJ	240	U	240	UJ
Pyrene	220	U	480	J	220	J	230	UJ	240	U	240	UJ
Volatile Organic Compounds (ug/kg)												
1,1,1-Trichloroethane	6.3	U	11	UJ	9.5	U	6.8	U	7	U	6.9	U
1,1,2,2-Tetrachloroethane	6.3	U	11	UJ	9.5	U	6.8	U	7	U	6.9	U
1,1,2-Trichloroethane	6.3	U	11	UJ	9.5	U	6.8	U	7	U	6.9	U
1,1-Dichloroethane	6.3	U	11	UJ	9.5	U	6.8	U	7	U	6.9	U
1,1-Dichloroethene	5.8	U	10	UJ	8.8	U	6.2	U	6.5	U	6.4	U
1,2-Dichloroethane	6.3	U	11	UJ	9.5	U	6.8	U	7	U	6.9	U
1,2-Dichloroethene (total)	6.3	U	11	UJ	9.5	U	6.8	U	7	U	6.9	U
1,2-Dichloropropane	6.3	U	11	UJ	9.5	U	6.8	U	7	U	6.9	U
2-Butanone (MEK)	32	U	55	UJ	48	U	34	U	35	U	8.9	J
2-Hexanone	32	U	55	UJ	48	U	34	U	35	U	35	U

Appendix B-2d
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment E
Dead Creek
Sauget Area I

	CBS-CSE-T15-1		CBS-CSE-T16-1		CBS-CSE-T17-1		CBS-CSE-T2-1		CBS-CSE-T3-1		CBS-CSE-T4-1	
4-Methyl-2-pentanone (MIBK)	32	U	55	UJ	48	U	34	U	35	U	35	U
Acetone	63	U	48	J	34	J	68	U	24	J	48	J
Benzene	6.3	U	11	UJ	9.5	U	6.8	U	7	U	6.9	U
Bromodichloromethane	6.3	U	11	UJ	9.5	U	6.8	U	7	U	6.9	U
Bromoform	6.3	U	11	UJ	9.5	U	6.8	U	7	U	6.9	U
Bromomethane	13	U	22	UJ	19	U	14	U	14	U	14	U
Carbon disulfide	6.3	U	11	UJ	9.5	U	6.8	U	7	U	6.9	U
Carbon tetrachloride	6.3	U	11	UJ	9.5	U	6.8	U	7	U	6.9	U
Chlorobenzene	8.95		210	J	4.2	J	6.8	U	7	U	13	
Chloroform	6.3	U	11	UJ	9.5	U	6.8	U	7	U	6.9	U
Chloroethane	13	U	22	UJ	19	U	14	U	14	U	14	U
Chloromethane	13	U	22	UJ	19	U	14	U	14	U	14	U
cis-1,3-Dichloropropene	5.1	U	8.9	UJ	7.6	U	5.4	U	5.6	U	5.6	U
Dibromochloromethane	6.3	U	11	UJ	9.5	U	6.8	U	7	U	6.9	U
Ethylbenzene	6.3	U	4.9	J	9.5	U	6.8	U	7	U	6.9	U
Methylene chloride	3.3	J	11	UJ	9.5	U	6.8	U	2.3	J	6.9	U
Styrene	6.3	U	11	UJ	9.5	U	6.8	U	7	U	6.9	U
Tetrachloroethene	6.3	U	11	UJ	9.5	U	6.8	U	7	U	6.9	U
Toluene	5.7	J	11	UJ	9.5	U	6.8	U	3.7	J	6.9	U
trans-1,3-Dichloropropene	5.1	U	8.9	UJ	7.6	U	5.4	U	5.6	U	5.6	U
Trichloroethene	6.3	U	11	UJ	9.5	U	6.8	U	7	U	6.9	U
Vinyl chloride	13	U	22	UJ	19	U	14	U	14	U	14	U
Xylenes (total)	6.3	U	11	UJ	9.5	U	6.8	U	7	U	6.9	U
Inorganics (mg/kg)												
Aluminum	7050		12000	J	10000		7000		10100		8700	
Antimony	2.3	U	4.7	J	3.2	U	0.75	J	2.3	U	2.5	UJ
Arsenic	6.7		20	J	13		8.5		13		7.4	
Barium	150		640	J	270		170		205		220	
Beryllium	0.545		0.91	J	0.74		0.39		0.7		0.8	
Cadmium	3.15		38	J	16		11	J	19.5		16	J
Calcium	6600		8800	J	13000		3500		4500		5300	
Chromium	14		56	J	37		120	J	110		29	J
Cobalt	6.5		9.5	J	11		3.2		6.35		6.6	
Copper	24.5		4300	J	350		480	J	91		240	J
Iron	14500		27000	J	20000		8700		14500		14000	
Lead	22		400	J	120		130	J	54.5		39	J
Magnesium	3750		4600	J	6600		1500		2950		3300	
Manganese	200		210	J	300		61		115		110	
Mercury	0.22		1.6	J	0.27	J	0.25	J	0.093		0.083	J
Molybdenum	0.22	U	1.5	J	0.46	J	0.35	U	0.39	U	0.39	U
Nickel	58.5		600	J	200		190		200		220	
Potassium	1600		2300	J	2100		1300	J	1800		1600	J
Selenium	1.2	U	2	UJ	1.6	U	0.83	U	1.2	U	1.3	U
Silver	1.2	U	9.8	J	0.64		1.4	U	1.2	U	1.3	U
Sodium	170		390	J	270		190		230		290	
Thallium	1.1	U	1.3	U	0.93	U	1.2	U	0.91	U	1.6	U
Tin	5.8	U	31	J	11		6.8	U	5.9	U	6.3	U
Vanadium	22		39	J	31		18		31		27	
Zinc	625		5900	J	2100		1300		2150		2600	
PCBs (ug/kg)												
Monochlorobiphenyl	4.2	U	6.7	UJ	5.8	U	4.4	U	4.6	U	4.6	U
Dichlorobiphenyl	4.2	U	5.7	J	5.8	U	4.4	U	4.6	U	4.6	U
Trichlorobiphenyl	4.2	U	64	J	5.8	U	4.4	U	4.6	U	4.6	U
Tetrachlorobiphenyl	8.5	U	160	J	3.6	J	2.4	J	9.4	U	9.3	U

Appendix B-2d
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment E
Dead Creek
Sauget Area I

	CBS-CSE-T15-1		CBS-CSE-T16-1		CBS-CSE-T17-1		CBS-CSE-T2-1		CBS-CSE-T3-1		CBS-CSE-T4-1	
Pentachlorobiphenyl	8.5	U	570	J	61		18		3.45		9.3	U
Hexachlorobiphenyl	8.5	U	82	J	12		9.5		9.4	U	9.3	U
Heptachlorobiphenyl	13	U	64	J	5.9	J	14	U	14	U	14	U
Octachlorobiphenyl	13	U	32		18	U	14	U	14	U	14	U
Nonachlorobiphenyl	21	U	94		3.9	J	22	U	24	U	23	U
Decachlorobiphenyl	21	U	180		17	J	22	U	24	U	23	U
Dioxins (ug/kg)												
1,2,3,4,6,7,8,9-OCDD	0.61		37		47.4		3.5	J	1.6		1	J
1,2,3,4,6,7,8-HpCDD	0.045		2.9	J	4.5		0.31	J	0.15		0.06	J
1,2,3,4,7,8-HxCDD	0.006	U	0.02	U	0.01	U	0.02	U	0.02	U	0.03	U
1,2,3,6,7,8-HxCDD	0.006	U	0.09	J	0.12	J	0.02	U	0.02	U	0.04	U
1,2,3,7,8,9-HxCDD	0.006	U	0.02	U	0.11	J	0.02	U	0.02	U	0.03	U
1,2,3,7,8-PeCDD	0.008	U	0.02	U	0.04	J	0.03	U	0.02	U	0.04	U
2,3,7,8-TCDD	0.006	U	0.02	U	0.01	U	0.02	U	0.01	U	0.02	U
Total HpCDD	0.095		5.8		8.6		0.67	J	0.31		0.14	J
Total HxCDD	0.006	U	1.8	J	1.2	J	0.07	J	0.02	U	0.03	U
Total PeCDD	0.008	U	1.5	J	0.7	J	0.03	U	0.02	U	0.04	U
Total TCDD	2	U	3	UJ	2.7	UJ	2.5	UJ	2.5	U	2.4	UJ
Furans (ug/kg)												
1,2,3,4,6,7,8,9-OCDF	0.105		16.6		14.9		0.98	J	0.645		0.11	J
1,2,3,4,6,7,8-HpCDF	0.025		1.7	J	2.1	J	0.2	J	0.115		0.03	U
1,2,3,4,7,8,9-HpCDF	0.005	U	0.1	J	0.1	J	0.02	U	0.02	U	0.03	U
1,2,3,4,7,8-HxCDF	0.004	U	0.05	J	0.05	J	0.01	U	0.01	U	0.02	U
1,2,3,6,7,8-HxCDF	0.003	U	0.03	J	0.04	J	0.02	U	0.01	U	0.03	U
1,2,3,7,8,9-HxCDF	0.004	U	0.01	U	0.01	U	0.02	U	0.01	U	0.03	U
1,2,3,7,8-PeCDF	0.007	U	0.02	U	0.01	U	0.02	U	0.02	U	0.03	U
2,3,4,6,7,8-HxCDF	0.004	U	0.01	U	0.01	U	0.02	U	0.01	U	0.03	U
2,3,4,7,8-PeCDF	0.007	U	0.02	U	0.01	U	0.02	U	0.02	U	0.03	U
2,3,7,8-TCDF	0.006	U	0.04	J	0.05	J	0.01	U	0.01	U	0.02	U
Total HpCDF	0.06		7.8		8.3		0.56	J	0.375		0.03	U
Total HxCDF	0.009	J	0.91	J	2.2	J	0.1	J	0.03	J	0.02	U
Total PeCDF	0.007	U	0.91	J	1.3	J	0.02	U	0.02	U	0.03	U
Total TCDF	0.05	U	1.3	J	1.6	J	0.06	UJ	0.07	U	0.1	UJ

Appendix B-2d
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment E
Dead Creek
Sauget Area I

	CBS-CSE-T5-1		CBS-CSE-T6-1		CBS-CSE-T7-1		CBS-CSE-T8-1		CBS-CSE-T9-1	
Cyanide	0.63	U	0.74	U			0.79	U	0.75	U
Pesticides/Herbicides (ug/kg)										
2,4,5-T	11	U	12	U	12	U	13	U	12	U
2,4,5-TP (Silvex)	11	U	12	U	12	U	13	U	12	U
2,4-D	35		12	U	12	U	13	U	12	U
2,4-DB	11	U	12	U	12	U	13	U	12	U
4,4'-DDD	4.3	U	4.7	U	0.59	J	5.2	U	4.9	U
4,4'-DDE	4.3	U	4.7	U	4.8	U	5.2	U	4.9	U
4,4'-DDT	4.3	U	17	J	4.8	U	0.73	J	4.9	U
Aldrin	2.2	U	2.4	U	2.5	U	2.7	U	2.5	U
alpha-BHC	0.65	U	0.71	U	0.72	U	0.79	U	0.75	U
alpha-Chlordane	2.2	U	2.4	U	2.5	U	2.7	U	2.5	U
beta-BHC	0.65	U	0.71	U	0.72	U	0.79	U	0.75	U
Dalapon	84	U	93	U	94	U	100	U	97	U
delta-BHC	0.65	U	0.71	U	0.72	U	0.79	U	0.75	U
Dicamba	26	U	28	U	29	U	32	U	30	U
Dichlorprop	130	U	140	U	140	U	160	U	150	U
Dieldrin	0.19	J	6.4	J	4.8	U	0.2	J	4.9	U
Dinoseb			140	U	140	U	160	U	150	U
Endosulfan I	2.2	U	2.4	U	2.5	U	0.15	J	2.5	U
Endosulfan II	4.3	U	4.7	U	4.8	U	5.2	U	4.9	U
Endosulfan sulfate	4.3	U	4.7	U	4.8	U	5.2	U	4.9	U
Endrin	4.3	U	4.7	U	4.8	U	5.2	U	4.9	U
Endrin aldehyde	4.3	U	4.7	U	4.8	U	5.2	U	4.9	U
Endrin ketone	4.3	U	4.7	U	4.8	U	5.2	U	4.9	U
gamma-BHC (Lindane)	2.2	U	2.4	U	2.5	U	2.7	U	2.5	U
gamma-Chlordane	2.2	U	2.4	U	2.5	U	2.7	U	0.24	J
Heptachlor	2.2	U	2.4	U	2.5	U	2.7	U	2.5	U
Heptachlor epoxide	2.2	U	2.4	U	0.18	J	0.3	J	0.59	J
MCPA	2600	U	2800	U	2900	U	3200	U	3000	U
MCPP	2600	U	2800	U	2900	U	3200	U	3000	U
Methoxychlor	22	U	24	U	0.78	J	27	U	0.89	J
Toxaphene	220	U	240	U	250	U	270	U	250	U
Semivolatile Organic Compounds (ug/kg)										
1,2,4-Trichlorobenzene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
1,2-Dichlorobenzene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
1,3-Dichlorobenzene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
1,4-Dichlorobenzene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
2,4,5-Trichlorophenol	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
2,4,6-Trichlorophenol	91	UJ	100	UJ	100	UJ	110	UJ	100	UJ
2,4-Dichlorophenol	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
2,4-Dinitrophenol	1100	UJ	1200	UJ	1200	UJ	1300	UJ	1300	UJ
2,4-Dinitrotoluene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
2,6-Dinitrotoluene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
2-Chloronaphthalene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
2-Chlorophenol	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
2-Methylnaphthalene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
2-Methylphenol (o-Cresol)	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
2-Nitroaniline	1100	UJ	1200	UJ	1200	UJ	1300	UJ	1300	UJ
2-Nitrophenol	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
3&4Methylphenol	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
3,3`-Dichlorobenzidine	430	UJ	470	UJ	480	UJ	520	UJ	490	UJ
3-Nitroaniline	1100	UJ	1200	UJ	1200	UJ	1300	UJ	1300	UJ
4,6-Dinitro-2-methylphenol	1100	UJ	1200	UJ	1200	UJ	1300	UJ	1300	UJ

Appendix B-2d
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment E
Dead Creek
Sauget Area I

	CBS-CSE-T5-1		CBS-CSE-T6-1		CBS-CSE-T7-1		CBS-CSE-T8-1		CBS-CSE-T9-1	
4-Bromophenyl phenyl ether	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
4-Chloro-3-methylphenol	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
4-Chloroaniline	430	UJ	470	UJ	480	UJ	520	UJ	490	UJ
4-Chlorophenyl phenyl ether	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
4-Nitroaniline	1100	UJ	1200	UJ	1200	UJ	1300	UJ	1300	UJ
4-Nitrophenol	1100	UJ	1200	UJ	1200	UJ	1300	UJ	1300	UJ
Acenaphthene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Acenaphthylene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Anthracene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Benzo(a)anthracene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Benzo(a)pyrene	120	UJ	130	UJ	130	UJ	140	UJ	130	UJ
Benzo(b)fluoranthene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Benzo(g,h,i)perylene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Benzo(k)fluoranthene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Bis(2-chloroethoxy)methane	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Bis(2-chloroethyl)ether	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Bis(2-chloroisopropyl ether)	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Bis(2-ethylhexyl)phthalate	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Butylbenzylphthalate	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Carbazole	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Chrysene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Dibenzo(a,h)anthracene	120	UJ	130	UJ	130	UJ	140	UJ	130	UJ
Dibenzofuran	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Diethyl phthalate	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Dimethyl phthalate	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
di-n-Butylphthalate	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
di-n-Octylphthalate	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Fluoranthene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Fluorene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Hexachlorobenzene	91	UJ	100	UJ	100	UJ	110	UJ	100	UJ
Hexachlorobutadiene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Hexachlorocyclopentadiene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Hexachloroethane	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Indeno(1,2,3-cd)pyrene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Isophorone	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Naphthalene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Nitrobenzene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
N-Nitroso-di-N-propylamine	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
N-Nitrosodiphenylamine	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Pentachlorophenol	2.2	J	1.6	J	25	U	27	U	25	U
Phenanthrene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Phenol	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Pyrene	220	UJ	240	UJ	250	UJ	270	UJ	250	UJ
Volatile Organic Compounds (ug/kg)										
1,1,1-Trichloroethane	6.5	U	7.1	U	8.6	U	7.6	U	6	U
1,1,2,2-Tetrachloroethane	6.5	U	7.1	U	8.6	U	7.6	U	6	U
1,1,2-Trichloroethane	6.5	U	7.1	U	8.6	U	7.6	U	6	U
1,1-Dichloroethane	6.5	U	7.1	U	8.6	U	7.6	U	6	U
1,1-Dichloroethene	6	U	6.6	U	7.9	U	7	U	5.5	U
1,2-Dichloroethane	6.5	U	7.1	U	8.6	U	7.6	U	6	U
1,2-Dichloroethene (total)	6.5	U	7.1	U	8.6	U	7.6	U	6	U
1,2-Dichloropropane	6.5	U	7.1	U	8.6	U	7.6	U	6	U
2-Butanone (MEK)	32	U	36	U	43	U	11	J	30	U
2-Hexanone	32	U	36	U	43	U	38	U	30	U

Appendix B-2d
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment E
Dead Creek
Sauget Area I

	CBS-CSE-T5-1		CBS-CSE-T6-1		CBS-CSE-T7-1		CBS-CSE-T8-1		CBS-CSE-T9-1	
4-Methyl-2-pentanone (MIBK)	32	U	36	U	43	U	38	U	30	U
Acetone	18	J	71	U	72	U	62	J	75	U
Benzene	6.5	U	7.1	U	8.6	U	7.6	U	6	U
Bromodichloromethane	6.5	U	7.1	U	8.6	U	7.6	U	6	U
Bromoform	6.5	U	7.1	U	8.6	U	7.6	U	6	U
Bromomethane	13	U	14	U	17	U	15	U	12	U
Carbon disulfide	6.5	U	7.1	U	8.6	U	7.6	U	6	U
Carbon tetrachloride	6.5	U	7.1	U	8.6	U	7.6	U	6	U
Chlorobenzene	2	J	7.1	U	8.6	U	33		6	U
Chloroform	6.5	U	7.1	U	8.6	U	7.6	U	6	U
Chloroethane	13	U	14	U	17	U	15	U	12	U
Chloromethane	13	U	14	U	17	U	15	U	12	U
cis-1,3-Dichloropropene	5.2	U	5.7	U	6.9	U	6.1	U	4.8	U
Dibromochloromethane	6.5	U	7.1	U	8.6	U	7.6	U	6	U
Ethylbenzene	6.5	U	7.1	U	8.6	U	7.6	U	6	U
Methylene chloride	6.5	U	7.1	U	8.6	U	7.6	U	1.8	J
Styrene	6.5	U	7.1	U	8.6	U	7.6	U	6	U
Tetrachloroethene	6.5	U	7.1	U	8.6	U	7.6	U	6	U
Toluene	6.5	U	7.1	U	8.6	U	7.6	U	6	U
trans-1,3-Dichloropropene	5.2	U	5.7	U	6.9	U	6.1	U	4.8	U
Trichloroethene	6.5	U	7.1	U	8.6	U	7.6	U	6	U
Vinyl chloride	13	U	14	U	17	U	15	U	12	U
Xylenes (total)	6.5	U	7.1	U	8.6	U	7.6	U	6	U
Inorganics (mg/kg)										
Aluminum	5500		11000		12000		11000		11000	
Antimony	2.4	UJ	2.6	UJ	2.9	UJ	2.6	UJ	2.7	UJ
Arsenic	2.8		7.1		7.1		3.4	U	7.1	
Barium	200		240		220		240		240	
Beryllium	0.31		0.84		0.89		0.77		0.81	
Cadmium	10	J	22	J	33	J	3.7	J	16	J
Calcium	3300		6900		7100	J	13000	J	5900	J
Chromium	170	J	60	J	19		18		18	
Cobalt	4.3		8.1		8.7		8.3		8.9	
Copper	64		170	J	510		25		39	
Iron	7500		19000		19000		18000		22000	
Lead	89	J	50	J	29	J	17	J	26	J
Magnesium	1900		4400		3900		6900		4200	
Manganese	95		140		150		260		150	
Mercury	0.094	J	0.25	J	0.12		0.34		0.6	
Molybdenum	1.2	U	1.3	U	0.54	UJ	0.29	UJ	0.7	UJ
Nickel	120		170		310	J	44	J	160	J
Potassium	1400	J	2200	J	2400	J	2300	J	2500	J
Selenium	1.2	U	1.3	U	1.4	U	1.3	U	1.4	U
Silver	1.2	U	1.3	U	1.4	U	1.3	U	1.4	U
Sodium	190		240		250		190		220	
Thallium	1.4	U	1.2	U	1.2	U	1.3	U	1.4	U
Tin	5.9	U	6.5	U	7.2	U	6.6	U	6.8	U
Vanadium	18		31		35		30		32	
Zinc	1600		2600		2900		490		1900	
PCBs (ug/kg)										
Monochlorobiphenyl	4.3	U	4.7	U	4.8	U	5.2	U	4.9	U
Dichlorobiphenyl	4.3	U	4.7	U	4.8	U	5.2	U	4.9	U
Trichlorobiphenyl	4.3	U	1.1	J	4.8	U	5.2	U	4.9	U
Tetrachlorobiphenyl	8.7	U	12		9.7	U	11	U	10	U

Appendix B-2d
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment E
Dead Creek
Sauget Area I

	CBS-CSE-T5-1		CBS-CSE-T6-1		CBS-CSE-T7-1		CBS-CSE-T8-1		CBS-CSE-T9-1	
Pentachlorobiphenyl	1.1	J	46		9.7	U	15		10	U
Hexachlorobiphenyl	1.3	J	18		9.7	U	7.7	J	10	U
Heptachlorobiphenyl	13	U	14	U	14	U	16	U	15	U
Octachlorobiphenyl	13	U	14	U	14	U	16	U	15	U
Nonachlorobiphenyl	22	U	24	U	24	U	26	U	25	U
Decachlorobiphenyl	22	U	8.4	J	24	U	6.2	J	25	U
Dioxins (ug/kg)										
1,2,3,4,6,7,8,9-OCDD	0.51	J	2.8	J	5.2	J	3.1	J	0.32	U
1,2,3,4,6,7,8-HpCDD	0.05	U	0.26	J	0.43	J	0.23	J	0.03	U
1,2,3,4,7,8-HxCDD	0.04	U	0.007	U	0.02	U	0.02	U	0.02	U
1,2,3,6,7,8-HxCDD	0.04	U	0.01	J	0.03	U	0.02	U	0.03	U
1,2,3,7,8,9-HxCDD	0.04	U	0.007	U	0.03	U	0.02	U	0.03	U
1,2,3,7,8-PeCDD	0.05	U	0.01	U	0.03	U	0.03	U	0.03	U
2,3,7,8-TCDD	0.03	U	0.007	U	0.02	U	0.02	U	0.02	U
Total HpCDD	0.05	U	0.48	J	0.95	J	0.48	J	0.03	U
Total HxCDD	0.04	U	0.06	J	0.09	J	0.02	U	0.02	U
Total PeCDD	0.05	U	0.01	U	0.03	U	0.03	U	0.03	U
Total TCDD	2.3	UJ	2.5	UJ	2.5	UJ	2.6	UJ	2.7	UJ
Furans (ug/kg)										
1,2,3,4,6,7,8,9-OCDF	0.13	J	1.4	J	1.3	J	1.3	J	0.05	U
1,2,3,4,6,7,8-HpCDF	0.05	U	0.19	J	0.19	J	0.16	J	0.02	U
1,2,3,4,7,8,9-HpCDF	0.05	U	0.006	U	0.03	U	0.02	U	0.03	U
1,2,3,4,7,8-HxCDF	0.03	U	0.004	U	0.02	U	0.01	U	0.02	U
1,2,3,6,7,8-HxCDF	0.04	U	0.004	U	0.02	U	0.02	U	0.02	U
1,2,3,7,8,9-HxCDF	0.04	U	0.005	U	0.02	U	0.02	U	0.02	U
1,2,3,7,8-PeCDF	0.04	U	0.007	U	0.02	U	0.02	U	0.02	U
2,3,4,6,7,8-HxCDF	0.03	U	0.005	U	0.02	U	0.02	U	0.02	U
2,3,4,7,8-PeCDF	0.04	U	0.007	U	0.03	U	0.03	U	0.03	U
2,3,7,8-TCDF	0.03	U	0.006	U	0.02	U	0.02	U	0.02	U
Total HpCDF	0.05	U	0.72	J	0.72	J	0.67	J	0.02	U
Total HxCDF	0.03	U	0.11	J	0.16	J	0.14	J	0.02	U
Total PeCDF	0.04	U	0.007	U	0.02	U	0.02	U	0.02	U
Total TCDF	0.11	UJ	0.06	UJ	0.08	UJ	0.08	UJ	0.08	UJ

J = value is estimated
U = not detected and detection limit is shown
UJ = not detected and estimated detection limit shown
Duplicates have been averaged. See text for details.
Data are screened for high detection limits before summary statistics are calculated.
A high detection limit is defined as a detection limit which exceeds twice the maximum detected concentration.

Appendix B-2e
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment F
Dead Creek
Sauget Area I

	CBS-CSF-T10-1		CBS-CSF-T1-1		CBS-CSF-T11-1		CBS-CSF-T12-1		CBS-CSF-T13-1	
Cyanide	0.63	U	1.2		0.67	U	0.66	U	0.66	UJ
Pesticides/Herbicides (ug/kg)										
2,4,5-T	11	U	14	U	12	U	11	U	11	U
2,4,5-TP (Silvex)	11	U	14	U	12	U	11	U	11	U
2,4-D	11	U	14	U	2.3	J	11	U	11	U
2,4-DB	11	U	14	U	12	UJ	11	U	11	U
4,4'-DDD	8.6	U	5.5	U	9.2	U	18	U	4.4	U
4,4'-DDE	8.6	U	0.36	J	9.2	U	18	U	4.4	U
4,4'-DDT	8.6	U	5.5	UJ	9.2	U	18	U	4.4	UJ
Aldrin	4.4	U	2.8	UJ	4.7	U	9.2	U	2.3	U
alpha-BHC	1.3	U	0.83	U	1.4	U	2.7	U	0.67	U
alpha-Chlordane	4.4	U	2.8	U	4.7	U	9.2	U	2.3	U
beta-BHC	1.3	U	0.83	U	1.4	U	2.7	U	0.67	U
Dalapon	84	U	110	U	90	U	88	U	87	U
delta-BHC	1.3	U	0.83	U	1.4	U	2.7	U	0.67	U
Dicamba	26	U	33	U	2.1	J	27	U	27	U
Dichlorprop	130	U	170	U	140	U	140	U	130	U
Dieldrin	0.8	J	0.35	J	0.72	J	0.8	J	4.4	U
Dinoseb	130	U	170	U	140	U	140	U	130	U
Endosulfan I	4.4	U	2.8	U	4.7	U	9.2	U	2.3	U
Endosulfan II	8.6	U	5.5	U	9.2	U	18	U	4.4	U
Endosulfan sulfate	8.6	U	5.5	U	9.2	U	18	U	4.4	U
Endrin	8.6	U	5.5	U	9.2	U	18	U	4.4	U
Endrin aldehyde	8.6	U	5.5	U	9.2	U	18	U	4.4	U
Endrin ketone	8.6	U	5.5	U	9.2	U	18	U	4.4	U
gamma-BHC (Lindane)	4.4	U	2.8	U	4.7	U	9.2	U	2.3	U
gamma-Chlordane	4.4	U	2.8	UJ	0.46	J	0.82	J	2.3	U
Heptachlor	4.4	U	2.8	U	4.7	U	9.2	U	2.3	U
Heptachlor epoxide	4.4	U	2.8	UJ	4.7	U	9.2	U	2.3	U
MCPA	2600	U	3300	U	2800	U	2700	U	2700	U
MCPP	2600	U	3300	U	2300	J	2700	U	2700	U
Methoxychlor	44	U	28	U	47	U	92	U	23	UJ
Toxaphene	440	U	280	U	470	U	920	U	230	U
Semivolatile Organic Compounds (ug/kg)										
1,2,4-Trichlorobenzene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
1,2-Dichlorobenzene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
1,3-Dichlorobenzene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
1,4-Dichlorobenzene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
2,4,5-Trichlorophenol	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
2,4,6-Trichlorophenol	91	UJ	120	UJ	97	UJ	94	UJ	93	UJ
2,4-Dichlorophenol	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
2,4-Dinitrophenol	1100	UJ	1400	UJ	1200	UJ	1100	UJ	1100	UJ
2,4-Dinitrotoluene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
2,6-Dinitrotoluene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
2-Chloronaphthalene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
2-Chlorophenol	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
2-Methylnaphthalene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
2-Methylphenol (o-Cresol)	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
2-Nitroaniline	1100	UJ	1400	UJ	1200	UJ	1100	UJ	1100	UJ
2-Nitrophenol	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
3&4Methylphenol	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
3,3'-Dichlorobenzidine	430	UJ	550	UJ	460	UJ	440	UJ	440	UJ
3-Nitroaniline	1100	UJ	1400	UJ	1200	UJ	1100	UJ	1100	UJ
4,6-Dinitro-2-methylphenol	1100	UJ	1400	UJ	1200	UJ	1100	UJ	1100	UJ
4-Bromophenyl phenyl ether	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ

Appendix B-2e
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment F
Dead Creek
Sauget Area I

	CBS-CSF-T10-1		CBS-CSF-T1-1		CBS-CSF-T11-1		CBS-CSF-T12-1		CBS-CSF-T13-1	
4-Chloro-3-methylphenol	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
4-Chloroaniline	430	UJ	550	UJ	460	UJ	440	UJ	440	UJ
4-Chlorophenyl phenyl ether	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
4-Nitroaniline	1100	UJ	1400	UJ	1200	UJ	1100	UJ	1100	UJ
4-Nitrophenol	1100	UJ	1400	UJ	1200	UJ	1100	UJ	1100	UJ
Acenaphthene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Acenaphthylene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Anthracene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Benzo(a)anthracene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Benzo(a)pyrene	120	UJ	150	UJ	120	UJ	120	UJ	120	UJ
Benzo(b)fluoranthene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Benzo(g,h,i)perylene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Benzo(k)fluoranthene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Bis(2-chloroethoxy)methane	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Bis(2-chloroethyl)ether	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Bis(2-chloroisopropyl ether)	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Bis(2-ethylhexyl)phthalate	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Butylbenzylphthalate	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Carbazole	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Chrysene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Dibenzo(a,h)anthracene	120	UJ	150	UJ	120	UJ	120	UJ	120	UJ
Dibenzofuran	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Diethyl phthalate	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Dimethyl phthalate	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
di-n-Butylphthalate	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
di-n-Octylphthalate	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Fluoranthene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Fluorene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Hexachlorobenzene	91	UJ	120	UJ	97	UJ	94	UJ	93	UJ
Hexachlorobutadiene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Hexachlorocyclopentadiene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Hexachloroethane	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Indeno(1,2,3-cd)pyrene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Isophorone	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Naphthalene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Nitrobenzene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
N-Nitroso-di-N-propylamine	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
N-Nitrosodiphenylamine	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Pentachlorophenol	22	U	28	U	1.5	J	23	U	23	U
Phenanthrene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Phenol	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Pyrene	220	UJ	280	UJ	240	UJ	230	UJ	230	UJ
Volatile Organic Compounds (ug/kg)										
1,1,1-Trichloroethane	5.8	U	9.9	U	6.8	U	6.2	U	6.7	U
1,1,2,2-Tetrachloroethane	5.8	U	9.9	U	6.8	U	6.2	U	6.7	U
1,1,2-Trichloroethane	5.8	U	9.9	U	6.8	U	6.2	U	6.7	U
1,1-Dichloroethane	5.8	U	9.9	U	6.8	U	6.2	U	6.7	U
1,1-Dichloroethene	5.3	U	9.1	U	6.3	U	5.8	U	6.1	U
1,2-Dichloroethane	5.8	U	9.9	U	6.8	U	6.2	U	6.7	U
1,2-Dichloroethene (total)	5.8	U	9.9	U	6.8	U	6.2	U	6.7	U
1,2-Dichloropropane	5.8	U	9.9	U	6.8	U	6.2	U	6.7	U
2-Butanone (MEK)	29	U	8.7	J	34	U	31	U	33	U
2-Hexanone	29	U	50	U	34	U	31	U	33	U
4-Methyl-2-pentanone (MIBK)	29	U	50	U	34	U	31	U	33	U
Acetone	58	U	37	J	68	U	68	U	67	U

Appendix B-2e
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment F
Dead Creek
Sauget Area I

	CBS-CSF-T10-1		CBS-CSF-T1-1		CBS-CSF-T11-1		CBS-CSF-T12-1		CBS-CSF-T13-1	
Benzene	5.8	U	9.9	U	6.8	U	6.2	U	6.7	U
Bromodichloromethane	5.8	U	9.9	U	6.8	U	6.2	U	6.7	U
Bromoform	5.8	U	9.9	U	6.8	U	6.2	U	6.7	U
Bromomethane	12	U	20	U	14	U	12	U	13	UJ
Carbon disulfide	5.8	U	9.9	U	6.8	U	6.2	U	6.7	U
Carbon tetrachloride	5.8	U	9.9	U	6.8	U	6.2	U	6.7	U
Chlorobenzene	5.8	U	5.2	J	6.8	U	6.2	U	6.7	U
Chloroform	5.8	U	9.9	U	6.8	U	6.2	U	6.7	U
Chloroethane	12	U	20	U	14	U	12	U	13	U
Chloromethane	12	U	20	U	14	U	12	U	13	U
cis-1,3-Dichloropropene	4.6	U	7.9	U	5.4	U	5	U	5.3	U
Dibromochloromethane	5.8	U	9.9	U	6.8	U	6.2	U	6.7	U
Ethylbenzene	5.8	U	9.9	U	6.8	U	6.2	U	6.7	U
Methylene chloride	5.8	U	9.9	U	6.8	U	6.2	U	6.7	U
Styrene	5.8	U	9.9	U	6.8	U	6.2	U	6.7	U
Tetrachloroethene	5.8	U	9.9	U	6.8	U	6.2	U	6.7	U
Toluene	5.8	U	9.9	U	6.8	U	7.7		6.7	U
trans-1,3-Dichloropropene	4.6	U	7.9	U	5.4	U	5	U	5.3	U
Trichloroethene	5.8	U	9.9	U	6.8	U	6.2	U	6.7	U
Vinyl chloride	12	U	20	U	14	U	12	U	13	U
Xylenes (total)	5.8	U	9.9	U	6.8	U	6.2	U	6.7	U
Inorganics (mg/kg)										
Aluminum	5100		9500		10000		8100		5900	
Antimony	2.4	UJ	3	U	2.5	UJ	2.7	UJ	2.4	UJ
Arsenic	8.2		8.6		9.7		12		4.1	
Barium	160		270		200		240		170	
Beryllium	0.47		0.65		0.72		0.56		0.38	
Cadmium	23		0.77		35		38		6.9	
Calcium	8400		17000		7300		6400		14000	
Chromium	9.7		16		16		13		9.3	
Cobalt	6.1		9.4		10		7.9		5.6	
Copper	180	J	73		110	J	92	J	23	
Iron	13000		19000		18000		16000		11000	
Lead	41		21		23		18		7.5	
Magnesium	5300		8200		5200		4400		6100	
Manganese	170	J	410		240	J	190	J	180	
Mercury	0.11		0.12	J	0.093		0.031		0.018	J
Molybdenum	0.87	U	0.37	J	0.79	U	1.4	U	0.8	UJ
Nickel	94		93		300		270		68	
Potassium	1000		2300		1700		1300		1100	J
Selenium	1	U	1.5	U	1.8		1.4	U	0.76	U
Silver	1.2	U	1.5	U	1.3	U	1.4	U	1.2	U
Sodium	120		290		110		110		140	
Thallium	0.73	UJ	1.5	U	1.1	UJ	1.4	UJ	1.2	U
Tin	5.9	U	7.6	U	6.3	U	6.8	U	6.1	U
Vanadium	19		25		29		27		17	
Zinc	1200		530		2400		2400		400	
PCBs (ug/kg)										
Monochlorobiphenyl	4.3	U	5.5	U	4.6	U	4.4	U	4.4	U
Dichlorobiphenyl	4.3	U	5.5	U	4.6	U	4.4	U	4.4	U
Trichlorobiphenyl	4.3	U	5.5	U	4.6	U	4.4	U	4.4	U
Tetrachlorobiphenyl	8.7	U	11	U	9.3	U	9	U	8.9	U
Pentachlorobiphenyl	8.7	U	11	U	9.3	U	9	U	8.9	U
Hexachlorobiphenyl	8.7	U	11	U	9.3	U	9	U	8.9	U
Heptachlorobiphenyl	13	U	17	U	14	U	14	U	13	U

Appendix B-2e
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment F
Dead Creek
Sauget Area I

	CBS-CSF-T10-1		CBS-CSF-T1-1		CBS-CSF-T11-1		CBS-CSF-T12-1		CBS-CSF-T13-1	
Octachlorobiphenyl	13	U	17	U	14	U	14	U	13	U
Nonachlorobiphenyl	22	U	28	U	23	U	22	U	22	U
Decachlorobiphenyl	22	U	28	U	23	U	22	U	22	U
Dioxins (ug/kg)										
1,2,3,4,6,7,8,9-OCDD	0.37	J	1.1	J	1.1	J	0.87	J	0.14	J
1,2,3,4,6,7,8-HpCDD	0.06	J	0.1	J	0.08	J	0.11	J	0.03	U
1,2,3,4,7,8-HxCDD	0.02	U	0.01	U	0.03	U	0.04	U	0.02	U
1,2,3,6,7,8-HxCDD	0.02	U	0.01	U	0.03	U	0.04	U	0.02	U
1,2,3,7,8,9-HxCDD	0.02	U	0.01	U	0.03	U	0.04	U	0.02	U
1,2,3,7,8-PeCDD	0.03	U	0.02	U	0.04	U	0.05	U	0.03	U
2,3,7,8-TCDD	0.02	U	0.01	U	0.02	U	0.03	U	0.02	U
Total HpCDD	0.13	J	0.21	J	0.16	J	0.11	J	0.03	U
Total HxCDD	0.02	U	0.02	J	0.03	U	0.04	U	0.02	U
Total PeCDD	0.03	U	0.02	U	0.04	U	0.05	U	0.03	U
Total TCDD	2.5	UJ	2.2	UJ	2.7	UJ	2.4	UJ	2.2	UJ
Furans (ug/kg)										
1,2,3,4,6,7,8,9-OCDF	0.10	J	0.38	U	0.15	J	0.19	U	0.04	U
1,2,3,4,6,7,8-HpCDF	0.02	U	0.05	J	0.03	U	0.06	J	0.02	U
1,2,3,4,7,8,9-HpCDF	0.02	U	0.01	U	0.03	U	0.04	U	0.02	U
1,2,3,4,7,8-HxCDF	0.01	U	0.009	U	0.02	U	0.02	U	0.02	U
1,2,3,6,7,8-HxCDF	0.01	U	0.008	U	0.02	U	0.02	U	0.02	U
1,2,3,7,8,9-HxCDF	0.02	U	0.01	U	0.02	U	0.03	U	0.02	U
1,2,3,7,8-PeCDF	0.02	U	0.02	U	0.03	U	0.04	U	0.02	U
2,3,4,6,7,8-HxCDF	0.02	U	0.01	U	0.02	U	0.03	U	0.02	U
2,3,4,7,8-PeCDF	0.02	U	0.02	U	0.03	U	0.04	U	0.02	U
2,3,7,8-TCDF	0.01	U	0.01	U	0.02	U	0.03	U	0.02	U
Total HpCDF	0.05	J	0.2	J	0.07	J	0.14	J	0.02	U
Total HxCDF	0.01	U	0.04	J	0.02	U	0.02	U	0.02	U
Total PeCDF	0.02	U	0.02	U	0.03	U	0.04	U	0.02	U
Total TCDF	0.07	UJ	0.07	UJ	0.08	UJ	0.08	UJ	0.07	UJ

Appendix B-2e
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment F
Dead Creek
Sauget Area I

	CBS-CSF-T14-1		CBS-CSF-T15-1		CBS-CSF-T16-1		CBS-CSF-T2-1		CBS-CSF-T3-1	
Cyanide	0.65	U	0.63	U	0.68	U	0.71	U	0.76	U
Pesticides/Herbicides (ug/kg)										
2,4,5-T	11	U	11	U	12	U	12	U	13	U
2,4,5-TP (Silvex)	11	U	11	U	12	U	12	U	13	U
2,4-D	11	U	47	J	12	U	12	U	13	U
2,4-DB	11	U	11	U	12	U	12	U	13	U
4,4'-DDD	4.4	U	4.3	U	4.7	U	4.8	U	5.1	U
4,4'-DDE	4.4	U		R	0.86	J	4.8	U	5.1	U
4,4'-DDT	4.4	U		R	4.7	U	0.29	J	7.5	J
Aldrin	2.3	U	2.2	U	2.4	U	2.5	U	0.23	J
alpha-BHC	0.68	U	0.66	U	0.71	U	0.74	U	0.77	U
alpha-Chlordane	2.3	U	2.2	U	2.8	J	2.5	U	4.1	J
beta-BHC	0.68	U	0.66	U	0.71	U	0.74	U	3.9	J
Dalapon	88	U	86	U	93	U	96	U	100	U
delta-BHC	0.68	U	0.66	U	0.71	U	0.74	U	0.77	U
Dicamba	2.1	J	6.25		28	U	29	U	31	U
Dichlorprop	140	U	130	U	140	U	150	U	150	U
Dieldrin	4.4	U	4.3	U	1	J	4.8	U	8.2	J
Dinoseb	140	U	130	U	140	U	150	U	150	U
Endosulfan I	2.3	U	2.2	U	2.4	U	2.5	U	2.6	U
Endosulfan II	4.4	U	4.3	U	4.7	U	4.8	U	5.1	U
Endosulfan sulfate	4.4	U	4.3	U	4.7	U	4.8	U	4.3	J
Endrin	4.4	U	4.3	U	4.7	U	4.8	U	5.1	U
Endrin aldehyde	4.4	U	4.3	U	4.7	U	4.8	U	5.1	U
Endrin ketone	4.4	U	4.3	U	4.7	U	4.8	U	5.1	U
gamma-BHC (Lindane)	2.3	U	2.2	U	2.4	U	2.5	U	2.6	U
gamma-Chlordane	2.3	U	2.2	U	1.6	J	2.5	U	3.8	J
Heptachlor	2.3	U		R	2.4	U	2.5	U	2.6	U
Heptachlor epoxide	2.3	U	2.2	U	2.4	U	2.5	U	2.6	U
MCPA	2700	U	2600	U	2800	U	2900	U	3100	U
MCPP	2700	U	2600	U	2800	U	2900	U	3100	U
Methoxychlor	23	U	22	U	24	U	25	U	26	U
Toxaphene	230	U	220	U	240	U	250	U	260	U
Semivolatile Organic Compounds (ug/kg)										
1,2,4-Trichlorobenzene	230	UJ	220	U	240	UJ	250	UJ	260	UJ
1,2-Dichlorobenzene	230	U	220	U	240	UJ	250	UJ	260	UJ
1,3-Dichlorobenzene	230	U	220	U	240	UJ	250	UJ	260	UJ
1,4-Dichlorobenzene	230	U	220	U	240	UJ	250	UJ	94	J
2,4,5-Trichlorophenol	230	UJ	220	U	240	UJ	250	UJ	260	UJ
2,4,6-Trichlorophenol	94	UJ	92	U	100	UJ	100	UJ	110	UJ
2,4-Dichlorophenol	230	UJ	220	U	240	UJ	250	UJ	260	UJ
2,4-Dinitrophenol	1100	UJ	1100	U	1200	UJ	1200	UJ	1300	UJ
2,4-Dinitrotoluene	230	UJ	220	U	240	UJ	250	UJ	260	UJ
2,6-Dinitrotoluene	230	UJ	220	U	240	UJ	250	UJ	260	UJ
2-Chloronaphthalene	230	UJ	220	U	240	UJ	250	UJ	260	UJ
2-Chlorophenol	230	U	220	U	240	UJ	250	UJ	260	UJ
2-Methylnaphthalene	230	UJ	220	U	240	UJ	250	UJ	260	UJ
2-Methylphenol (o-Cresol)	230	U	220	U	240	UJ	250	UJ	260	UJ
2-Nitroaniline	1100	UJ	1100	U	1200	UJ	1200	UJ	1300	UJ
2-Nitrophenol	230	UJ	220	U	240	UJ	250	UJ	260	UJ
3&4Methylphenol	230	UJ	220	U	240	UJ	250	UJ	260	UJ
3,3'-Dichlorobenzidine	440	UJ	430	U	470	UJ	480	UJ	510	UJ
3-Nitroaniline	1100	UJ	1100	U	1200	UJ	1200	UJ	1300	UJ
4,6-Dinitro-2-methylphenol	1100	UJ	1100	U	1200	UJ	1200	UJ	1300	UJ
4-Bromophenyl phenyl ether	230	UJ	220	U	240	UJ	250	UJ	260	UJ

Appendix B-2e
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment F
Dead Creek
Sauget Area I

	CBS-CSF-T14-1		CBS-CSF-T15-1		CBS-CSF-T16-1		CBS-CSF-T2-1		CBS-CSF-T3-1	
4-Chloro-3-methylphenol	230	UJ	220	U	240	UJ	250	UJ	260	UJ
4-Chloroaniline	440	UJ	430	U	470	UJ	480	UJ	510	UJ
4-Chlorophenyl phenyl ether	230	UJ	220	U	240	UJ	250	UJ	260	UJ
4-Nitroaniline	1100	UJ	1100	U	1200	UJ	1200	UJ	1300	UJ
4-Nitrophenol	1100	UJ	1100	U	1200	UJ	1200	UJ	1300	UJ
Acenaphthene	230	UJ	220	U	240	UJ	250	UJ	260	UJ
Acenaphthylene	230	UJ	220	U	240	UJ	250	UJ	260	UJ
Anthracene	230	UJ	220	U	240	UJ	250	UJ	260	UJ
Benzo(a)anthracene	84	J	38		240	UJ	250	UJ	92	J
Benzo(a)pyrene	80	J	52.5		130	UJ	49	J	190	J
Benzo(b)fluoranthene	180	J	42		240	UJ	39	J	180	J
Benzo(g,h,i)perylene	100	J	68.5		240	UJ	250	UJ	130	J
Benzo(k)fluoranthene	130	J	57.5		240	UJ	44	J	130	J
Bis(2-chloroethoxy)methane	230	UJ	220	U	240	UJ	250	UJ	260	UJ
Bis(2-chloroethyl)ether	230	U	220	U	240	UJ	250	UJ	260	UJ
Bis(2-chloroisopropyl ether)	230	UJ	220	U	240	UJ	250	UJ	260	UJ
Bis(2-ethylhexyl)phthalate	68	J	74.5		240	UJ	250	UJ	110	J
Butylbenzylphthalate	230	UJ	220	U	240	UJ	250	UJ	260	UJ
Carbazole	230	UJ	220	U	240	UJ	250	UJ	260	UJ
Chrysene	120	J	38.5		240	UJ	250	UJ	140	J
Dibenzo(a,h)anthracene	120	UJ	120	U	130	UJ	130	UJ	140	UJ
Dibenzofuran	230	UJ	220	U	240	UJ	250	UJ	260	UJ
Diethyl phthalate	230	UJ	220	U	240	UJ	250	UJ	260	UJ
Dimethyl phthalate	230	UJ	220	U	240	UJ	250	UJ	260	UJ
di-n-Butylphthalate	230	UJ	220	U	240	UJ	250	UJ	260	UJ
di-n-Octylphthalate	230	UJ	220	U	240	UJ	250	UJ	260	UJ
Fluoranthene	110	J	52.5		240	UJ	250	UJ	170	J
Fluorene	230	UJ	220	U	240	UJ	250	UJ	260	UJ
Hexachlorobenzene	94	UJ	92	U	100	UJ	100	UJ	110	UJ
Hexachlorobutadiene	61	J	220	U	240	UJ	250	UJ	260	UJ
Hexachlorocyclopentadiene	230	UJ	220	U	240	UJ	250	UJ	260	UJ
Hexachloroethane	230	UJ	220	U	240	UJ	250	UJ	260	UJ
Indeno(1,2,3-cd)pyrene	92	J	220	U	240	UJ	250	UJ	110	J
Isophorone	230	UJ	220	U	240	UJ	250	UJ	260	UJ
Naphthalene	230	UJ	220	U	240	UJ	250	UJ	260	UJ
Nitrobenzene	230	UJ	220	U	240	UJ	250	UJ	260	UJ
N-Nitroso-di-N-propylamine	230	UJ	220	U	240	UJ	250	UJ	260	UJ
N-Nitrosodiphenylamine	230	UJ	220	U	240	UJ	250	UJ	260	UJ
Pentachlorophenol	4.0	J	5.75		24	U	25	U	24	J
Phenanthrene	72	J	37	J	240	UJ	250	UJ	98	J
Phenol	230	U	220	U	240	UJ	250	UJ	260	UJ
Pyrene	110	J	220	U	240	UJ	250	UJ	160	J
Volatile Organic Compounds (ug/kg)										
1,1,1-Trichloroethane	7.3	U	6.6	U	5.3	U	7.4	U	7.7	U
1,1,2,2-Tetrachloroethane	7.3	U	6.6	U	10		7.4	U	7.7	U
1,1,2-Trichloroethane	7.3	U	6.6	U	6.1		7.4	U	7.7	U
1,1-Dichloroethane	7.3	U	6.6	U	5.3	U	7.4	U	7.7	U
1,1-Dichloroethene	6.8	U	6	U	4.9	U	6.8	U	7.1	U
1,2-Dichloroethane	7.3	U	6.6	U	2.1	J	7.4	U	7.7	U
1,2-Dichloroethene (total)	7.3	U	6.6	U	5.3	U	7.4	U	7.7	U
1,2-Dichloropropane	7.3	U	6.6	U	5.3	U	7.4	U	7.7	U
2-Butanone (MEK)	10	J	33	U	27	U	14	J	38	U
2-Hexanone	37	U	33	U	27	U	37	U	38	U
4-Methyl-2-pentanone (MIBK)	37	U	33	U	27	U	37	U	38	U
Acetone	58	J	66	U	29	J	140	U	77	U

Appendix B-2e
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment F
Dead Creek
Sauget Area I

	CBS-CSF-T14-1		CBS-CSF-T15-1		CBS-CSF-T16-1		CBS-CSF-T2-1		CBS-CSF-T3-1	
Benzene	7.3	U	6.6	U	5.3	U	7.4	U	7.7	U
Bromodichloromethane	7.3	U	6.6	U	1.3	J	7.4	U	7.7	U
Bromoform	7.3	U	6.6	U	3	J	7.4	U	7.7	U
Bromomethane	15	U	13	U	11	U	15	U	15	U
Carbon disulfide	7.3	U	6.6	U	5.3	U	7.4	U	7.7	U
Carbon tetrachloride	7.3	U	6.6	U	5.3	U	7.4	U	7.7	U
Chlorobenzene	7.3	U	6.6	U	5.3	U	8.6		14	
Chloroform	7.3	U	6.6	U	5.3	U	7.4	U	7.7	U
Chloroethane	15	U	13	U	11	U	15	U	15	U
Chloromethane	15	U	13	U	11	U	15	U	15	U
cis-1,3-Dichloropropene	5.9	U	5.3	U	4.3	U	5.9	U	6.2	U
Dibromochloromethane	7.3	U	6.6	U	2	J	7.4	U	7.7	U
Ethylbenzene	7.3	U	6.6	U	5.3	U	7.4	U	7.7	U
Methylene chloride	7.3	U	2.4	J	1.8	J	7.4	U	3	J
Styrene	7.3	U	6.6	U	5.3	U	7.4	U	7.7	U
Tetrachloroethene	7.3	U	6.6	U	5.3	U	7.4	U	7.7	U
Toluene	7.3	U	12		2.3	J	3.2	J	7.7	U
trans-1,3-Dichloropropene	5.9	U	5.3	U	4.3	U	5.9	U	6.2	U
Trichloroethene	7.3	U	6.6	U	5.3	U	7.4	U	7.7	U
Vinyl chloride	15	U	13	U	11	U	15	U	15	U
Xylenes (total)	7.3	U	4.8	J	5.3	U	7.4	U	7.7	U
Inorganics (mg/kg)										
Aluminum	8500		7450		6000		11000		12000	
Antimony	0.66	J	2.4	U	1.2	U	2.7	UJ	2.8	UJ
Arsenic	14		7.15		5.8	U	13		8	
Barium	200		170		160		330		290	
Beryllium	0.65	U	1.2		0.57	U	0.82		0.89	
Cadmium	28	J	19.5		0.71	U	4.4		3.2	
Calcium	6100		5600		9400		15000	J	16000	J
Chromium	16		12.95		11		19		23	
Cobalt	9		6.7		6.3		12		9.4	
Copper	150	J	505		20		45		27	
Iron	21000		13950		13000		26000		24000	
Lead	100	J	37		15		29		24	
Magnesium	4200		4000		4200		6900		6500	
Manganese	350	J	207.5		290		550		460	
Mercury	0.32	J	0.165		0.04	J	0.074		0.63	
Molybdenum	0.95	U	0.38	U	0.5	U	1.3	U	1.2	U
Nickel	230	J	170		15		95		36	
Potassium	1400	J	1195		940		2300		2300	
Selenium	0.99	U	0.61	U	1.4	UJ	1.5	U	0.82	U
Silver	1.2	U	1.2	U	1.4	UJ	1.3	U	1.4	U
Sodium	110		96		140		220		170	U
Thallium	0.99	U	1.2	U	1.4	U	1.7	U	1.6	U
Tin	6.1	U	6	U	7.1	U	3	U	2.9	U
Vanadium	25		19.5		19		31		34	
Zinc	1700		1475		59		1100	J	1200	J
PCBs (ug/kg)										
Monochlorobiphenyl	4.4	U	4.3	U	4.7	U	4.8	U	5.6	
Dichlorobiphenyl	4.4	U	4.3	U	4.7	U	4.8	U	5.1	U
Trichlorobiphenyl	4.4	U	4.3	U	4.7	U	4.8	U	7.1	
Tetrachlorobiphenyl	9.0	U	8.8	U	9.6	U	9.8	U	77	
Pentachlorobiphenyl	11		4.85		9.6	U	9.8	U	130	
Hexachlorobiphenyl	7.9	J	6.6		9.6	U	9.8	U	70	
Heptachlorobiphenyl	14	U	13	U	14	U	15	U	16	

Appendix B-2e
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment F
Dead Creek
Sauget Area I

	CBS-CSF-T14-1		CBS-CSF-T15-1		CBS-CSF-T16-1		CBS-CSF-T2-1		CBS-CSF-T3-1	
Octachlorobiphenyl	14	U	13	U	14	U	15	U	6.2	J
Nonachlorobiphenyl	22	U	3.3	J	24	U	24	U	13	J
Decachlorobiphenyl	6.1	J	8.1		24	U	24	U	32	
Dioxins (ug/kg)										
1,2,3,4,6,7,8,9-OCDD	9.2		7.35		2.2	J	0.58	J	7.4	
1,2,3,4,6,7,8-HpCDD	1.1	J	0.64		0.05	U	0.01	U	0.61	J
1,2,3,4,7,8-HxCDD	0.05	J	0.02	U	0.04	U	0.01	U	0.01	U
1,2,3,6,7,8-HxCDD	0.14	J	0.045		0.04	U	0.01	U	0.01	U
1,2,3,7,8,9-HxCDD	0.14	J	0.06		0.04	U	0.01	U	0.01	U
1,2,3,7,8-PeCDD	0.08	J	0.02	U	0.04	U	0.01	U	0.01	U
2,3,7,8-TCDD	0.01	U	0.01	U	0.02	U	0.009	U	0.008	U
Total HpCDD	2	J	1.2		0.05	U	0.01	U	1.2	J
Total HxCDD	1.1	J	0.37		0.04	U	0.01	U	0.07	J
Total PeCDD	0.83	J	0.04		0.04	U	0.01	U	0.01	U
Total TCDD	2.7	UJ	2.4	U	2.4	UJ	2.7	UJ	2.8	UJ
Furans (ug/kg)										
1,2,3,4,6,7,8,9-OCDF	7.6		4.45		0.07	U	0.13	J	2.5	J
1,2,3,4,6,7,8-HpCDF	0.93	J	0.645		0.04	U	0.01	U	0.37	J
1,2,3,4,7,8,9-HpCDF	0.1	J	0.02	U	0.04	U	0.01	U	0.01	U
1,2,3,4,7,8-HxCDF	0.17	UJ	0.05	U	0.02	U	0.01	UJ	0.01	UJ
1,2,3,6,7,8-HxCDF	0.08	UJ	0.02	U	0.02	U	0.01	UJ	0.01	UJ
1,2,3,7,8,9-HxCDF	0.02	UJ	0.02	U	0.03	U	0.01	UJ	0.01	UJ
1,2,3,7,8-PeCDF	0.08	J	0.02	U	0.03	U	0.01	U	0.01	U
2,3,4,6,7,8-HxCDF	0.02	UJ	0.02	U	0.03	U	0.01	UJ	0.01	UJ
2,3,4,7,8-PeCDF	0.1	J	0.02	U	0.03	U	0.01	U	0.01	U
2,3,7,8-TCDF	0.17	J	0.045		0.02	U	0.007	U	0.007	U
Total HpCDF	3.6		2		0.04	U	0.05	J	1.4	J
Total HxCDF	1.7	J	0.41	U	0.02	U	0.01	U	0.29	J
Total PeCDF	0.61	J	0.08	J	0.03	U	0.01	U	0.08	J
Total TCDF	1.1	J	0.1	U	0.05	UJ	0.06	UJ	0.23	J

Appendix B-2e
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment F
Dead Creek
Sauget Area I

	CBS-CSF-T4-1		CBS-CSF-T5-1		CBS-CSF-T6-1		CBS-CSF-T7-1		CBS-CSF-T8-1		CBS-CSF-T9-1	
Cyanide	0.66	U	0.67	U	4.57		0.67	UJ	0.68	U	0.64	U
Pesticides/Herbicides (ug/kg)												
2,4,5-T	11	U	12	U	12	U	12	U	11	U	11	U
2,4,5-TP (Silvex)	11	U	12	U	12	U	12	U	11	U	11	U
2,4-D	11	U	12	U	12	U	12	U	11	U	8.4	J
2,4-DB	11	U	12	U	12	U	12	U	11	U	11	U
4,4'-DDD	4.5	U	4.6	U	9.4	U	9.2	U	9	U	9.8	U
4,4'-DDE	4.5	U	4.6	U	1.2	J	1.6	J	9	U	9.8	U
4,4'-DDT	4.5	U	4.6	U	4.0	J	9.2	UJ	9	U	9.8	U
Aldrin	2.3	U	2.4	U	4.8	U	4.7	U	4.6	U	5.1	U
alpha-BHC	0.68	U	0.69	U	1.4	U	1.4	U	1.4	U	1.5	U
alpha-Chlordane	2.3	U	2.4	U	4.8	U	4.7	U	4.6	U	5.1	U
beta-BHC	0.68	U	0.69	U	1.4	U	1.4	U	1.4	U	1.5	U
Dalapon	89	U	90	U	93	U	90	U	89	U	86	U
delta-BHC	0.68	U	0.69	U	1.4	U	1.4	U	1.4	U	1.5	U
Dicamba	27	U	5.9	J	28	U	28	U	27	U	26	U
Dichlorprop	140	U	140	U	140	U	140	U	140	U	130	U
Dieldrin	4.5	U	4.6	U	1.8		3.0	J	9	U	2	
Dinoseb	140	U	140	U	140	U	140	U	140	U	130	U
Endosulfan I	2.3	U	2.4	U	4.8	U	4.7	U	4.6	U	5.1	U
Endosulfan II	4.5	U	4.6	U	9.4	U	9.2	U	9	U	9.8	U
Endosulfan sulfate	4.5	U	4.6	U	9.4	U	9.2	U	9	U	9.8	U
Endrin	4.5	U	4.6	U	9.4	U	9.2	U	9	U	9.8	U
Endrin aldehyde	4.5	U	4.6	U	9.4	U	9.2	U	9	U	9.8	U
Endrin ketone	4.5	U	4.6	U	9.4	U	9.2	U	9	U	9.8	U
gamma-BHC (Lindane)	2.3	U	2.4	U	4.8	U	4.7	U	4.6	U	5.1	U
gamma-Chlordane	2.3	U	2.4	U	4.8	U	4.7	U	0.54	J	0.92	J
Heptachlor	2.3	U	2.4	U	4.8	U	4.7	U	4.6	U	5.1	U
Heptachlor epoxide	2.3	U	2.4	U	4.8	U	4.7	U	4.6	U	5.1	U
MCPA	2700	U	2800	U	2800	U	2800	U	2700	U	2600	U
MCPP	2700	U	2800	U	2800	U	2800	U	2700	U	2600	U
Methoxychlor	23	U	24	U	48	U	47	UJ	46	U	51	U
Toxaphene	230	U	240	U	480	U	470	U	460	U	510	U
Semivolatile Organic Compounds (ug/kg)												
1,2,4-Trichlorobenzene	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
1,2-Dichlorobenzene	230	UJ	240	UJ	240	U	240	UJ	230	U	220	U
1,3-Dichlorobenzene	230	UJ	240	UJ	240	U	240	UJ	230	U	220	U
1,4-Dichlorobenzene	230	UJ	240	UJ	240	U	240	UJ	230	U	220	U
2,4,5-Trichlorophenol	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
2,4,6-Trichlorophenol	96	UJ	97	UJ	100	U	97	UJ	96	UJ	92	U
2,4-Dichlorophenol	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
2,4-Dinitrophenol	1200	UJ	1200	UJ	1200	U	1200	UJ	1200	UJ	1100	U
2,4-Dinitrotoluene	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
2,6-Dinitrotoluene	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
2-Chloronaphthalene	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
2-Chlorophenol	230	UJ	240	UJ	240	U	240	UJ	230	U	220	U
2-Methylnaphthalene	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
2-Methylphenol (o-Cresol)	230	UJ	240	UJ	240	U	240	UJ	230	U	220	U
2-Nitroaniline	1200	UJ	1200	UJ	1200	U	1200	UJ	1200	UJ	1100	U
2-Nitrophenol	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
3&4Methylphenol	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
3,3'-Dichlorobenzidine	450	UJ	460	UJ	470	U	460	UJ	450	UJ	430	U
3-Nitroaniline	1200	UJ	1200	UJ	1200	U	1200	UJ	1200	UJ	1100	U
4,6-Dinitro-2-methylphenol	1200	UJ	1200	UJ	1200	U	1200	UJ	1200	UJ	1100	U
4-Bromophenyl phenyl ether	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U

Appendix B-2e
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment F
Dead Creek
Sauget Area I

	CBS-CSF-T4-1		CBS-CSF-T5-1		CBS-CSF-T6-1		CBS-CSF-T7-1		CBS-CSF-T8-1		CBS-CSF-T9-1	
4-Chloro-3-methylphenol	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
4-Chloroaniline	450	UJ	460	UJ	470	U	460	UJ	450	UJ	430	U
4-Chlorophenyl phenyl ether	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
4-Nitroaniline	1200	UJ	1200	UJ	1200	U	1200	UJ	1200	UJ	1100	U
4-Nitrophenol	1200	UJ	1200	UJ	1200	U	1200	UJ	1200	UJ	1100	U
Acenaphthene	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
Acenaphthylene	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
Anthracene	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
Benzo(a)anthracene	230	UJ	35	J	240	U	240	UJ	230	UJ	220	U
Benzo(a)pyrene	120	UJ	53	J	130	U	120	UJ	120	UJ	120	U
Benzo(b)fluoranthene	230	UJ	240	UJ	40	J	240	UJ	230	UJ	220	U
Benzo(g,h,i)perylene	230	UJ	49	J	58	J	240	UJ	230	UJ	220	U
Benzo(k)fluoranthene	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
Bis(2-chloroethoxy)methane	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
Bis(2-chloroethyl)ether	230	UJ	240	UJ	240	U	240	UJ	230	U	220	U
Bis(2-chloroisopropyl ether)	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
Bis(2-ethylhexyl)phthalate	230	UJ	71	J	240	U	240	UJ	230	UJ	220	U
Butylbenzylphthalate	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
Carbazole	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
Chrysene	230	UJ	46	J	35	J	240	UJ	230	UJ	220	U
Dibenzo(a,h)anthracene	120	UJ	120	UJ	130	U	120	UJ	120	UJ	120	U
Dibenzofuran	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
Diethyl phthalate	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
Dimethyl phthalate	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
di-n-Butylphthalate	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
di-n-Octylphthalate	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
Fluoranthene	230	UJ	53	J	62	J	240	UJ	230	UJ	220	U
Fluorene	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
Hexachlorobenzene	96	UJ	97	UJ	100	U	97	UJ	96	UJ	92	U
Hexachlorobutadiene	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
Hexachlorocyclopentadiene	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
Hexachloroethane	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
Indeno(1,2,3-cd)pyrene	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
Isophorone	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
Naphthalene	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
Nitrobenzene	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
N-Nitroso-di-N-propylamine	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
N-Nitrosodiphenylamine	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
Pentachlorophenol	23	U	24	U	2.4	J	3.1	J	2.3	J	1.9	
Phenanthrene	230	UJ	30	J	240	U	240	UJ	230	UJ	220	U
Phenol	230	UJ	240	UJ	240	U	240	UJ	230	U	220	U
Pyrene	230	UJ	240	UJ	240	U	240	UJ	230	UJ	220	U
Volatile Organic Compounds (ug/kg)												
1,1,1-Trichloroethane	6.8	U	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
1,1,2,2-Tetrachloroethane	6.8	U	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
1,1,2-Trichloroethane	6.8	U	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
1,1-Dichloroethane	6.8	U	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
1,1-Dichloroethene	6.3	U	6.4	U	6.6	U	6.4	U	5.6	U	5.6	U
1,2-Dichloroethane	6.8	U	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
1,2-Dichloroethene (total)	6.8	U	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
1,2-Dichloropropane	6.8	U	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
2-Butanone (MEK)	7.5	J	10	J	10		8.3	J	30	U	30	U
2-Hexanone	34	U	35	U	36	U	35	U	30	U	30	U
4-Methyl-2-pentanone (MIBK)	34	U	35	U	36	U	35	U	30	U	30	U
Acetone	68	U	64	J	62		48	J	36	J	61	U

Appendix B-2e
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment F
Dead Creek
Sauget Area I

	CBS-CSF-T4-1		CBS-CSF-T5-1		CBS-CSF-T6-1		CBS-CSF-T7-1		CBS-CSF-T8-1		CBS-CSF-T9-1	
Benzene	6.8	U	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
Bromodichloromethane	6.8	U	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
Bromoform	6.8	U	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
Bromomethane	14	U	14	U	14	U	14	UJ	12	U	12	U
Carbon disulfide	6.8	U	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
Carbon tetrachloride	6.8	U	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
Chlorobenzene	6.8	U	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
Chloroform	6.8	U	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
Chloroethane	14	U	14	U	14	U	14	U	12	U	12	U
Chloromethane	14	U	14	U	14	U	14	U	12	U	12	U
cis-1,3-Dichloropropene	5.5	U	5.6	U	5.7	U	5.6	U	4.9	U	4.9	U
Dibromochloromethane	6.8	U	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
Ethylbenzene	6.8	U	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
Methylene chloride	4.3	J	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
Styrene	6.8	U	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
Tetrachloroethene	6.8	U	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
Toluene	6.2	J	6.9	U	8.4		4.7	J	2.5	J	6.1	U
trans-1,3-Dichloropropene	5.5	U	5.6	U	5.7	U	5.6	U	4.9	U	4.9	U
Trichloroethene	6.8	U	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
Vinyl chloride	14	U	14	U	14	U	14	U	12	U	12	U
Xylenes (total)	6.8	U	6.9	U	7.1	U	6.9	U	6.1	U	6.1	U
Inorganics (mg/kg)												
Aluminum	11000		8400		12000		9100		8900		10850	
Antimony	2.5	UJ	25	UJ	2.6	U	2.8	UJ	2.5	UJ	0.62	J
Arsenic	7.9		19		9.25		8.6		11		11	
Barium	260		270		245		200		160		175	
Beryllium	0.78		0.49	U	0.8		0.66		0.65		0.71	
Cadmium	2.8		57	J	48.5		25		20		12.5	
Calcium	14000	J	10000		8600		7700		5900		5450	
Chromium	21		29		27.5		14		14		17.5	
Cobalt	8.4		13		12.75		8.8		8		8.05	
Copper	24		190	J	182		80		99	J	115	
Iron	21000		41000		20500		16000		18000		18000	
Lead	21		450	J	37		27		28		51.5	
Magnesium	5800		4500		5950		5200		4200		3700	
Manganese	400		890	J	305		210		200	J	305	
Mercury	0.038		0.82	J	0.1175		0.086	J	0.09		0.305	
Molybdenum	1	U	2.2		0.9	U	1.2	UJ	1.4	U	0.85	U
Nickel	32		630	J	230		160		150		105	
Potassium	2000		1300	J	2050		1400	J	1500		1700	
Selenium	1.1	U	9.3	U	1.3	U	1.2	UJ	1.2	U	1.3	U
Silver	1.2	U	0.79		1.3	U	1.4	U	1.2	U	1.2	U
Sodium	150		130		150		120		120		114.5	
Thallium	1.6	U	3.2	U	1.2	U	1.4	U	1.1	UJ	0.89	U
Tin	1.9	U	17		6.5	U	6.9	U	6.2	U	6	U
Vanadium	30		26		30		25		26		28	
Zinc	1100	J	15000		2850		1600		1500		1300	
PCBs (ug/kg)												
Monochlorobiphenyl	4.5	U	4.6	U	4.7	U	4.6	U	4.5	U	4.3	U
Dichlorobiphenyl	4.5	U	4.6	U	4.7	U	4.6	U	4.5	U	4.3	U
Trichlorobiphenyl	4.5	U	1.0	J	4.7	U	4.6	U	4.5	U	4.3	U
Tetrachlorobiphenyl	9.2	U	9.3	U	4.95		9.3	U	9.2	U	8.8	U
Pentachlorobiphenyl	9.2	U	9.3	U	12.85		9.1	J	9.2	U	2.3	
Hexachlorobiphenyl	9.2	U	9.3	U	6.3		4.9	J	9.2	U	3.35	
Heptachlorobiphenyl	14	U	14	U	14	U	14	U	14	U	13	U

Appendix B-2e
Analytical Data for Post Remediation Creek Bottom Soils
Creek Segment F
Dead Creek
Sauget Area I

	CBS-CSF-T4-1		CBS-CSF-T5-1		CBS-CSF-T6-1		CBS-CSF-T7-1		CBS-CSF-T8-1		CBS-CSF-T9-1	
Octachlorobiphenyl	14	U	14	U	14	U	14	U	14	U	13	U
Nonachlorobiphenyl	23	U	23	U	24	U	23	U	23	U	22	U
Decachlorobiphenyl	23	U	23	U	24	U	23	U	23	U	3.2	
Dioxins (ug/kg)												
1,2,3,4,6,7,8,9-OCDD	0.84	J	5.9	J	1.4		0.66	J	0.31	J	0.76	
1,2,3,4,6,7,8-HpCDD	0.02	U	1.5	J	0.075		0.08	J	0.05	U	0.075	
1,2,3,4,7,8-HxCDD	0.02	U	0.18	J	0.03	U	0.02	U	0.04	U	0.01	U
1,2,3,6,7,8-HxCDD	0.02	U	0.41	J	0.03	U	0.03	U	0.05	U	0.01	U
1,2,3,7,8,9-HxCDD	0.02	U	0.55	J	0.03	U	0.03	U	0.05	U	0.01	U
1,2,3,7,8-PeCDD	0.02	U	0.25	J	0.03	U	0.03	U	0.05	U	0.01	U
2,3,7,8-TCDD	0.01	U	0.06	U	0.02	U	0.02	U	0.03	U	0.01	U
Total HpCDD	0.02	U	2.8	J	0.115		0.08	J	0.05	U	0.165	
Total HxCDD	0.02	U	4.2	J	0.03	U	0.02	U	0.04	U	0.01	U
Total PeCDD	0.02	U	3.6	J	0.03	U	0.03	U	0.05	U	0.01	U
Total TCDD	2.6	UJ	30.7	J	2.6	U	2.4	UJ	2.5	UJ	2.2	U
Furans (ug/kg)												
1,2,3,4,6,7,8,9-OCDF	0.03	U	3.1	J	0.205		0.14	J	0.09	UJ	0.28	J
1,2,3,4,6,7,8-HpCDF	0.02	U	0.84	J	0.03	U	0.02	U	0.04	U	0.045	
1,2,3,4,7,8,9-HpCDF	0.02	U	0.27	J	0.03	U	0.02	U	0.04	U	0.008	U
1,2,3,4,7,8-HxCDF	0.02	UJ	0.64	J	0.02	U	0.02	U	0.03	U	0.006	U
1,2,3,6,7,8-HxCDF	0.02	UJ	0.26	U	0.02	U	0.02	U	0.03	U	0.006	U
1,2,3,7,8,9-HxCDF	0.02	UJ	0.38	J	0.02	U	0.02	U	0.03	U	0.006	U
1,2,3,7,8-PeCDF	0.02	U	0.3	J	0.03	U	0.03	U	0.04	U	0.01	U
2,3,4,6,7,8-HxCDF	0.02	UJ	0.26	J	0.02	U	0.02	U	0.03	U	0.006	U
2,3,4,7,8-PeCDF	0.02	U	0.35	J	0.03	U	0.03	U	0.04	U	0.01	U
2,3,7,8-TCDF	0.01	U	0.75	J	0.02	U	0.02	U	0.03	U	0.009	U
Total HpCDF	0.02	U	2.4	J	0.05	J	0.07	J	0.04	U	0.16	
Total HxCDF	0.02	U	7	J	0.02	U	0.02	U	0.03	U	0.015	
Total PeCDF	0.02	U	2.9	J	0.03	U	0.03	U	0.04	U	0.01	U
Total TCDF	0.07	UJ	4.2	J	0.07	U	0.07	UJ	0.09	UJ	0.06	U

J = value is estimated
U = not detected and detection limit is shown
UJ = not detected and estimated detection limit shown
Duplicates have been averaged. See text for details.
Data are screened for high detection limits before summary statistics are calculated.
A high detection limit is defined as a detection limit which exceeds twice the maximum detected concentration.

Appendix B-3a
Creek Segment B Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Number Analyzed	Number Used in Analyses	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Standard Deviation[2]	Minimum Detection Limit	Maximum Detection Limit
Cyanide (mg/kg)	49	49	3	6	0.81	1.1	0.379	0.34	0.355	0.658	0.147	0.55	0.86
Pesticides/Herbicides (ug/kg)													
2,4,5-T	49	48	12	25	2	610	22	5.5	6	27	174	9.8	290
2,4,5-TP (Silvex)	49	3	3	100	1.4	2	1.77	1.9	1.95	1.99	0.321	0	0
2,4-D	49	47	3	6	17	140	9.06	5.5	6	14	71	9.6	14
2,4-DB	49	47	2	4	36	57	7.6	5.5	6	10.9		9.6	25
4,4'-DDD	49	49	3	6	0.83	470	16	2.3	2.65	47.6	270	3.8	110
4,4'-DDE	49	44	2	5	4	35	3.58	2.25	2.41	10.5		3.8	24
4,4'-DDT	48	48	15	31	0.96	160	18.2	2.48	15.5	58.3	47.3	3.8	120
Total DDT[3]	49	49	19	39	0.83	470	37.1	7.5	19.2	136	110	4.6	220
Aldrin	49	1	1	100	0.36	0.36	0.36	0.36	0.36	0.36		0	0
alpha-BHC	49	44	9	20	0.087	2.9	0.599	0.348	0.575	1.74	0.888	0.59	3.6
alpha-Chlordane	49	49	0	0	0	0	4	1.2	1.3	25.2		2	62
beta-BHC	49	46	10	22	0.57	7.7	1.26	0.363	0.98	6.23	2.26	0.59	13
Dalapon	49	5	1	20	41	41	39.5	39.5	41	41		76	82
delta-BHC	49	44	2	5	0.71	4.1	0.526	0.345	0.375	1.6		0.58	3.6
Dicamba	49	12	12	100	1.6	5.3	2.84	2.5	3.33	4.97	1.24	0	0
Dichlorprop	49	1	1	100	6.6	6.6	6.6	6.6	6.6	6.6		0	0
Dieldrin	49	46	8	17	0.42	49	6.8	2.28	2.61	41	18.7	3.8	88
Dinoseb	49	49	0	0	0	0	641	70	75	363		120	51000
Endosulfan I	48	48	0	0	0	0	4.06	1.2	1.31	25.4		2	62
Endosulfan II	49	42	1	2	10	10	2.6	2.25	2.39	4.59		3.8	10
Endosulfan sulfate	49	44	1	2	12	12	2.84	2.25	2.4	4.94		3.8	23
Endrin	49	49	0	0	0	0	7.68	2.3	2.5	47.6		3.8	120
Endrin aldehyde	49	49	0	0	0	0	7.68	2.3	2.5	47.6		3.8	120
Endrin ketone	49	3	3	100	0.64	1.5	0.957	0.73	1.12	1.42	0.473	0	0
gamma-BHC (Lindane)	49	40	10	25	0.15	2.3	1.09	1.15	1.2	1.44	0.647	2	4.5
gamma-Chlordane	49	2	2	100	0.34	0.44	0.39	0.39	0.415	0.435		0	0
Heptachlor	49	32	3	9	0.32	1.2	1.1	1.15	1.2	1.2	0.44	2	2.4
Heptachlor epoxide	49	49	14	29	0.2	410	14.3	1.2	2.7	28.5	110	2	59
MCPA	49	49	0	0	0	0	12300	1350	1450	2460		2300	1000000
MCPP	49	47	3	6	2400	6100	1610	1400	1450	2820	1860	2400	6000
Methoxychlor	49	6	6	100	0.41	6.6	1.72	0.625	1.18	5.25	2.42	0	0
Toxaphene	49	49	0	0	0	0	400	120	130	2520		200	6200
SVOCs (ug/kg)													
1,2,4-Trichlorobenzene	49	49	6	12	40	80000	2280	115	120	234	32200	200	270
1,2-Dichlorobenzene	49	49	6	12	57	53000	1670	115	125	346	21700	200	270
1,3-Dichlorobenzene	49	4	1	25	100	100	100	100	100	100		200	200
1,4-Dichlorobenzene	49	49	7	14	39	5500	293	115	120	682	2010	200	270
2,4,5-Trichlorophenol	49	49	1	2	240	240	120	115	120	135		200	280
2,4,6-Trichlorophenol	49	49	5	10	65	4300	158	48.5	50	142	1810	81	110
2,4-Dichlorophenol	49	49	5	10	69	6600	269	115	120	402	2800	200	270
2,4-Dinitrophenol	49	49	0	0	0	0	585	600	600	680		990	1500
2,4-Dinitrotoluene	49	49	0	0	0	0	118	115	120	135		200	290
2,6-Dinitrotoluene	49	49	0	0	0	0	118	115	120	135		200	290
2-Chloronaphthalene	49	49	0	0	0	0	118	115	120	135		200	290
2-Chlorophenol	49	49	3	6	97	510	124	115	120	135	238	200	280
2-Methylnaphthalene	49	49	3	6	400	7300	353	115	125	296	3460	200	280
2-Methylphenol (o-Cresol)	49	49	0	0	0	0	118	115	120	135		200	290
2-Nitroaniline	49	49	0	0	0	0	585	600	600	680		990	1500
2-Nitrophenol	49	49	0	0	0	0	118	115	120	135		200	290
3&4Methylphenol	49	49	1	2	1600	1600	148	115	120	135		200	280
3,3'-Dichlorobenzidine	49	49	0	0	0	0	228	225	235	263		380	570
3-Nitroaniline	49	49	0	0	0	0	585	600	600	680		990	1500
4,6-Dinitro-2-methylphenol	49	49	0	0	0	0	585	600	600	680		990	1500
4-Bromophenyl phenyl ether	49	49	0	0	0	0	118	115	120	135		200	290
4-Chloro-3-methylphenol	49	49	0	0	0	0	118	115	120	135		200	290
4-Chloroaniline	49	49	5	10	76	11000	594	225	235	468	4990	380	530
4-Chlorophenyl phenyl ether	49	49	0	0	0	0	118	115	120	135		200	290

Appendix B-3a
Creek Segment B Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Number Analyzed	Number Used in Analyses	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Standard Deviation[2]	Minimum Detection Limit	Maximum Detection Limit
4-Nitroaniline	49	49	2	4	810	9000	758	600	600	700		990	1400
4-Nitrophenol	49	1	1	100	440	440	440	440	440	440		0	0
Acenaphthene	49	49	2	4	62	860	132	115	120	138		200	290
Acenaphthylene	49	49	1	2	240	240	120	115	120	138		200	290
Anthracene	49	49	4	8	42	1400	148	115	120	172	619	200	290
Benzo(a)anthracene	49	49	4	8	51	1900	169	115	120	214	827	200	290
Benzo(a)pyrene	49	49	7	14	42.5	1200	109	60	65	262	448	100	160
Benzo(b)fluoranthene	49	49	6	12	53	1400	156	115	120	196	532	200	290
Benzo(g,h,i)perylene	49	49	6	12	41	890	137	115	120	178	313	200	290
Benzo(k)fluoranthene	49	49	5	10	58	900	149	115	120	208	399	200	290
Bis(2-chloroethoxy)methane	49	49	0	0	0	0	118	115	120	135		200	290
Bis(2-chloroethyl)ether	49	49	0	0	0	0	118	115	120	135		200	290
Bis(2-chloroisopropyl ether)	49	49	0	0	0	0	118	115	120	135		200	290
Bis(2-ethylhexyl)phthalate	49	49	5	10	65	81000	1770	115	120	138	36200	200	290
Butylbenzylphthalate	49	49	2	4	82	3200	180	115	120	135		200	280
Carbazole	49	49	1	2	620	620	128	115	120	138		200	290
Chrysene	49	49	5	10	32	1900	167	115	120	220	783	200	290
Dibenzo(a,h)anthracene	49	49	3	6	180	340	71.9	60	65	140	89.6	100	160
Dibenzofuran	49	49	1	2	1600	1600	148	115	120	138		200	290
Diethyl phthalate	49	49	0	0	0	0	118	115	120	135		200	290
Dimethyl phthalate	49	49	0	0	0	0	118	115	120	135		200	290
di-n-Butylphthalate	49	49	7	14	56	210	115	115	120	138	53	200	290
di-n-Octylphthalate	49	49	0	0	0	0	118	115	120	135		200	290
Fluoranthene	49	49	9	18	51	4000	235	115	120	424	1310	200	280
Fluorene	49	49	2	4	100	3500	186	115	120	135		200	280
Hexachlorobenzene	49	49	0	0	0	0	48.2	48	50	55		81	120
Hexachlorobutadiene	49	49	0	0	0	0	118	115	120	135		200	290
Hexachlorocyclopentadiene	49	49	0	0	0	0	118	115	120	135		200	290
Hexachloroethane	49	49	0	0	0	0	118	115	120	135		200	290
Indeno(1,2,3-cd)pyrene	49	49	4	8	150	830	138	115	120	180	311	200	290
Isophorone	49	49	0	0	0	0	118	115	120	135		200	290
Naphthalene	49	49	5	10	71	6000	261	115	120	152	2550	200	280
Nitrobenzene	49	49	2	4	160	520	127	115	125	138		200	280
N-Nitroso-di-N-propylamine	49	49	0	0	0	0	117	115	120	135		150	290
N-Nitrosodiphenylamine	49	49	4	8	48	1200	137	115	120	138	570	200	290
Pentachlorophenol	49	49	37	76	1.9	44000	987	12	31	712	7220	23	27
Phenanthrene	49	49	6	12	52	7000	301	115	120	138	2790	200	280
Phenol	49	49	3	6	110	3400	185	115	120	138	1890	200	280
Pyrene	49	49	5	10	93	4000	242	115	125	568	1570	200	290
Total PAHs[6]	49	49	12	24	41	34560	2810	1730	1830	6520	10000	750	4220
VOCs (ug/kg)													
1,1,1-Trichloroethane	49	48	3	6	3.8	23	4.14	3.7	3.9	4.97	10.4	4.6	10
1,1,2,2-Tetrachloroethane	49	49	0	0	0	0	7.08	3.6	3.9	4.96		4.6	340
1,1,2-Trichloroethane	49	49	0	0	0	0	7.09	3.65	3.9	4.96		4.6	340
1,1-Dichloroethane	49	49	0	0	0	0	7.09	3.65	3.9	4.96		4.6	340
1,1-Dichloroethene	49	49	0	0	0	0	6.4	3.35	3.6	4.59		4.2	300
1,2-Dichloroethane	49	49	0	0	0	0	7.09	3.65	3.9	4.96		4.6	340
1,2-Dichloroethene (total)	49	48	1	2	12	12	3.84	3.63	3.86	4.85		4.6	10
1,2-Dichloropropane	49	49	0	0	0	0	7.09	3.65	3.9	4.96		4.6	340
2-Butanone (MEK)	49	48	29	60	5.2	610	35	17.5	21.9	72.7	111	24	47
2-Hexanone	49	48	1	2	77	77	19.8	18.3	19.5	24.8		23	57
4-Methyl-2-pentanone (MIBK)	49	48	5	10	9.3	110	20.2	18	19.1	24.7	41.6	23	50
Acetone	49	48	38	79	11	470	116	69.5	154	353	121	58	120
Benzene	49	49	19	39	2.4	180	8.43	3.8	4.7	17.2	40.1	4.8	10
Bromodichloromethane	49	49	0	0	0	0	7.09	3.65	3.9	4.96		4.6	340
Bromoform	49	49	0	0	0	0	7.09	3.65	3.9	4.96		4.6	340
Bromomethane	49	49	0	0	0	0	14.2	7.5	8	10		9.1	680
Carbon disulfide	49	48	19	40	3.3	77	11	3.88	7.6	44	22.3	4.8	9.8
Carbon tetrachloride	49	49	0	0	0	0	7.09	3.65	3.9	4.96		4.6	340

Appendix B-3a
Creek Segment B Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Number Analyzed	Number Used in Analyses	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Standard Deviation[2]	Minimum Detection Limit	Maximum Detection Limit
Chlorobenzene	49	49	38	78	3.5	9700	450	13	110	2220	1740	4.8	9.4
Chloroform	49	5	1	20	3.1	3.1	2.72	2.85	2.95	3.07		4.6	5.9
Chloroethane	49	49	0	0	0	0	14.2	7.5	8	10		9.1	680
Chloromethane	49	49	0	0	0	0	14.2	7.5	8	10		9.1	680
cis-1,3-Dichloropropene	49	49	0	0	0	0	5.68	2.9	3.15	3.99		3.6	270
Dibromochloromethane	49	49	0	0	0	0	7.09	3.65	3.9	4.96		4.6	340
Ethylbenzene	49	49	7	14	4.7	3200	114	3.7	3.9	107	1300	4.6	10
Methylene chloride	49	6	4	67	1.8	2.9	2.39	2.3	2.71	2.89	0.455	4.6	5.7
Styrene	49	3	1	33	2.8	2.8	2.5	2.4	2.6	2.76		4.6	4.8
Tetrachloroethene	49	48	3	6	8.3	70	5.26	3.68	3.9	7.15	35.2	4.6	10
Toluene	49	49	16	33	2	290	14.6	3.8	4.9	41.2	71.2	4.6	300
trans-1,3-Dichloropropene	49	49	0	0	0	0	5.68	2.9	3.15	3.99		3.6	270
Trichloroethene	49	48	3	6	6.8	34	4.47	3.68	3.9	6.17	15.2	4.6	10
Vinyl chloride	49	49	0	0	0	0	14.2	7.5	8	10		9.1	680
Xylenes (total)	49	49	13	27	3.1	29000	764	3.75	4.7	656	8080	4.6	10
Inorganics (mg/kg)													
Aluminum	49	49	49	100	1200	20000	9350	9100	11000	16600	4030	0	0
Antimony	49	46	4	9	0.71	3.9	1.44	1.25	1.4	2.55	1.31	0.9	5.2
Arsenic	49	49	49	100	2.7	44	9.72	7.4	12	21	7.2	0	0
Barium	49	49	49	100	99	1500	298	270	320	390	189	0	0
Beryllium	49	49	36	73	0.19	1.3	0.538	0.51	0.77	1.08	0.254	0.1	0.65
Cadmium	49	49	46	94	0.23	54	8.25	4.4	10	33.8	11.5	0.58	0.78
Calcium	49	49	49	100	520	21000	6490	5100	9000	14000	4340	0	0
Chromium	49	49	49	100	4.6	180	51.3	36	76	158	45.5	0	0
Cobalt	49	49	49	100	0.64	23	8.55	7.9	11	15.6	4.29	0	0
Copper	49	49	49	100	6.2	10000	484	170	440	1260	1440	0	0
Iron	49	49	49	100	440	28000	13800	13000	16500	21600	5340	0	0
Lead	49	49	49	100	5.5	700	74.6	48	75	232	114	0	0
Magnesium	49	49	49	100	94	6900	3720	3400	5500	6820	1960	0	0
Manganese	49	49	49	100	4	530	130	110	160	292	93	0	0
Mercury	49	49	48	98	0.013	0.84	0.134	0.084	0.15	0.366	0.17	0.015	0.015
Molybdenum	49	49	27	55	0.28	2.8	0.779	0.54	0.96	1.86	0.626	0.34	1.4
Nickel	49	49	49	100	1.9	630	192	165	250	503	154	0	0
Potassium	49	49	49	100	780	3200	1760	1800	2000	2520	486	0	0
Selenium	49	49	2	4	0.7	5.9	0.829	0.6	0.7	2.26		0.58	6.8
Silver	49	49	10	20	0.23	9	0.777	0.6	0.7	0.78	2.71	1.1	1.6
Sodium	49	49	49	100	87	670	199	170	210	394	103	0	0
Thallium	49	49	3	6	0.76	1.3	0.625	0.6	0.7	0.968	0.272	0.71	2.1
Tin	49	49	9	18	5.2	470	14.4	3.2	3.6	11	153	5.3	7.8
Vanadium	49	49	49	100	3.8	47	25.3	24	30	41.4	9.04	0	0
Zinc	49	49	49	100	20	10450	2160	1900	2600	6720	2060	0	0
PCBs (ug/kg)													
Monochlorobiphenyl	49	45	1	2	2.2	2.2	2.3	2.25	2.35	2.59		3.8	8.7
Dichlorobiphenyl	49	49	13	27	2.2	300	17.4	2.3	2.8	71.6	104	3.9	200
Trichlorobiphenyl	49	49	33	67	1.4	15000	385	3.2	22	630	2620	4.3	5.3
Tetrachlorobiphenyl	49	49	32	65	1.6	51000	1300	19	64	2320	9010	8.8	11
Pentachlorobiphenyl	49	49	36	73	1.3	18000	707	24	110	812	3530	8.8	11
Hexachlorobiphenyl	49	49	33	67	1.4	4800	140	5.5	15	228	838	8.8	11
Heptachlorobiphenyl	49	49	15	31	2.2	4000	111	7	8	253	1020	12	860
Octachlorobiphenyl	49	49	11	22	1.1	1100	46.1	7	7.5	206	327	12	860
Nonachlorobiphenyl	49	45	4	9	2.8	17.5	11.2	11.5	12	13.4	6.55	19	28
Decachlorobiphenyl	49	49	21	43	2.7	1300	62.6	11.5	13	319	281	20	1400
Total PCBs[3]	49	49	38	78	1.8	84830	2780	96.2	272	5800	14400	4.5	3120
Dioxins (ug/kg)													
1,2,3,4,6,7,8,9-OCDD	49	49	49	100	0.17	2490	81.9	3.4	15.9	277	362	0	0
1,2,3,4,6,7,8-HpCDD	48	48	36	75	0.03	58.4	3.22	0.3	1.28	18.1	11	0.008	0.1
1,2,3,4,7,8-HxCDD	49	49	4	8	0.03	1.5	0.0559	0.015	0.02	0.046	0.691	0.005	0.1
1,2,3,6,7,8-HxCDD	49	49	18	37	0.02	11.6	0.457	0.025	0.06	1.3	3.01	0.006	0.1
1,2,3,7,8,9-HxCDD	49	49	13	27	0.02	2.5	0.113	0.015	0.04	0.162	0.767	0.005	0.2

Appendix B-3a
Creek Segment B Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Number Analyzed	Number Used in Analyses	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Standard Deviation[2]	Minimum Detection Limit	Maximum Detection Limit
1,2,3,7,8-PeCDD	49	49	5	10	0.09	1.5	0.0733	0.02	0.035	0.252	0.57	0.008	0.1
2,3,7,8-TCDD	49	49	0	0	0	0	0.0147	0.01	0.02	0.036		0.005	0.1
Total HpCDD	49	49	37	76	0.05	457	15.1	0.57	2.8	50.6	76.3	0.008	0.1
Total HxCDD	49	49	30	61	0.01	139	3.71	0.16	0.49	10.1	25.3	0.005	0.07
Total PeCDD	49	49	16	33	0.07	22.8	0.752	0.03	0.18	2.6	5.58	0.008	0.1
Total TCDD	49	49	3	6	10.9	53.2	3.31	1.4	1.6	8.1	21.2	2.3	7.8
Furans (ug/kg)													
1,2,3,4,6,7,8,9-OCDF	49	49	45	92	0.04	517	19.2	0.68	3.2	84.6	80.2	0.01	0.36
1,2,3,4,6,7,8-HpCDF	49	49	38	78	0.02	68.6	2.61	0.17	0.84	11.4	11.4	0.005	0.1
1,2,3,4,7,8,9-HpCDF	49	49	9	18	0.06	5.6	0.175	0.015	0.045	0.4	1.79	0.006	0.2
1,2,3,4,7,8-HxCDF	49	49	10	20	0.02	6.3	0.178	0.01	0.025	0.378	1.94	0.004	0.09
1,2,3,6,7,8-HxCDF	49	49	3	6	0.13	2.9	0.079	0.01	0.015	0.098	1.55	0.004	0.1
1,2,3,7,8,9-HxCDF	49	49	0	0	0	0	0.0206	0.01	0.015	0.035		0.004	0.8
1,2,3,7,8-PeCDF	49	49	4	8	0.08	1.4	0.0479	0.01	0.025	0.086	0.653	0.006	0.1
2,3,4,6,7,8-HxCDF	49	48	1	2	0.18	0.18	0.0166	0.01	0.0163	0.0333		0.004	0.1
2,3,4,7,8-PeCDF	49	49	3	6	0.14	0.31	0.0281	0.015	0.02	0.104	0.0874	0.008	0.1
2,3,7,8-TCDF	49	49	6	12	0.02	0.63	0.0327	0.01	0.02	0.132	0.229	0.005	0.09
Total HpCDF	49	49	40	82	0.04	393	13.1	0.54	2.05	48	63	0.005	0.1
Total HxCDF	49	49	32	65	0.04	76.1	3.01	0.22	0.72	15.8	14	0.004	0.06
Total PeCDF	49	49	13	27	0.05	3.8	0.283	0.015	0.05	1.58	1.3	0.006	0.09
Total TCDF	49	49	19	39	0.06	5.8	0.31	0.045	0.07	0.912	1.67	0.02	0.2
Total TEQ[10]	49	49	49	100	0.000021	4.5127	0.269	0.0655	0.104	1.58	0.729	0.02106	0.3

Appendix B-3a
Creek Segment B Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Normality Test[3]	Normal UCL[1]	Log Normal UCL[1]	Distribution[4]	Selected UCL[5]	Creek Segment Specific EPC[6]
Cyanide (mg/kg)	FALSE	0.380	0.400	LOGNORMAL	0.4	0.4
Pesticides/Herbicides (ug/kg)						
2,4,5-T	FALSE	22.8	13.8	LOGNORMAL	13.8	13.8
2,4,5-TP (Silvex)	TRUE	1.8	1.7	NORMAL	1.78	1.77
2,4-D	FALSE	9.2	8.4	LOGNORMAL	8.44	8.44
2,4-DB	FALSE	7.7	7.9	LOGNORMAL	7.89	7.89
4,4'-DDD	FALSE	16.6	10.5	LOGNORMAL	10.5	10.5
4,4'-DDE	FALSE	3.63	3.70	LOGNORMAL	3.7	3.7
4,4'-DDT	FALSE	18.5	28.6	LOGNORMAL	28.6	28.6
Total DDT[7]	FALSE	37.9	43.2	LOGNORMAL	43.2	43.2
Aldrin	NA	NA	NA	NA	NA	0.36
alpha-BHC	FALSE	0.60	0.70	LOGNORMAL	0.7	0.7
alpha-Chlordane	FALSE	4.07	4.00	LOGNORMAL	4	ND
beta-BHC	FALSE	1.27	1.53	LOGNORMAL	1.53	1.53
Dalapon	TRUE	40	39	NORMAL	39.5	39.5
delta-BHC	FALSE	0.53	0.56	LOGNORMAL	0.56	0.56
Dicamba	TRUE	3	3.7	NORMAL	2.86	2.86
Dichlorprop	NA	NA	NA	NA	NA	6.6
Dieldrin	FALSE	6.91	7.6	LOGNORMAL	7.55	7.55
Dinoseb	FALSE	673	219	LOGNORMAL	219	ND
Endosulfan I	FALSE	4.13	4.10	LOGNORMAL	4.1	ND
Endosulfan II	FALSE	2.62	2.78	LOGNORMAL	2.78	2.78
Endosulfan sulfate	FALSE	2.86	3.06	LOGNORMAL	3.06	3.06
Endrin	FALSE	7.81	7.70	LOGNORMAL	7.7	ND
Endrin aldehyde	FALSE	7.81	7.70	LOGNORMAL	7.7	ND
Endrin ketone	TRUE	0.98	0.89	NORMAL	0.976	0.957
gamma-BHC (Lindane)	FALSE	1.09	1.31	LOGNORMAL	1.31	1.31
gamma-Chlordane	NA	NA	NA	NA	NA	0.39
Heptachlor	FALSE	1.10	1.20	LOGNORMAL	1.2	1.2
Heptachlor epoxide	FALSE	14.8	11.3	LOGNORMAL	11.3	11.3
MCPA	FALSE	12,902	3,625	LOGNORMAL	3620	ND
MCPP	FALSE	1,616	1,710	LOGNORMAL	1710	1710
Methoxychlor	FALSE	1.8	6.6	LOGNORMAL	6.6	1.72
Toxaphene	FALSE	407	400	LOGNORMAL	400	ND
SVOCs (ug/kg)						
1,2,4-Trichlorobenzene	FALSE	2,382	492	LOGNORMAL	492	492
1,2-Dichlorobenzene	FALSE	1,744	455	LOGNORMAL	455	455
1,3-Dichlorobenzene	TRUE	100	100	NORMAL	100	100
1,4-Dichlorobenzene	FALSE	301	241	LOGNORMAL	241	241
2,4,5-Trichlorophenol	FALSE	120	123	LOGNORMAL	123	123
2,4,6-Trichlorophenol	FALSE	164	102	LOGNORMAL	102	102
2,4-Dichlorophenol	FALSE	277	204	LOGNORMAL	204	204
2,4-Dinitrophenol	FALSE	585	582	LOGNORMAL	582	ND
2,4-Dinitrotoluene	FALSE	118	117	LOGNORMAL	117	ND
2,6-Dinitrotoluene	FALSE	118	117	LOGNORMAL	117	ND
2-Chloronaphthalene	FALSE	118	117	LOGNORMAL	117	ND
2-Chlorophenol	FALSE	125	130	LOGNORMAL	130	130
2-Methylnaphthalene	FALSE	363	244	LOGNORMAL	244	244
2-Methylphenol (o-Cresol)	FALSE	118	117	LOGNORMAL	117	ND
2-Nitroaniline	FALSE	585	582	LOGNORMAL	582	ND
2-Nitrophenol	FALSE	118	117	LOGNORMAL	117	ND
3&4Methylphenol	FALSE	149	147	LOGNORMAL	147	147
3,3'-Dichlorobenzidine	TRUE	228	227	NORMAL	228	ND
3-Nitroaniline	FALSE	585	582	LOGNORMAL	582	ND
4,6-Dinitro-2-methylphenol	FALSE	585	582	LOGNORMAL	582	ND
4-Bromophenyl phenyl ether	FALSE	118	117	LOGNORMAL	117	ND
4-Chloro-3-methylphenol	FALSE	118	117	LOGNORMAL	117	ND
4-Chloroaniline	FALSE	610	446	LOGNORMAL	446	446
4-Chlorophenyl phenyl ether	FALSE	118	117	LOGNORMAL	117	ND

Appendix B-3a
Creek Segment B Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Normality Test[3]	Normal UCL[1]	Log Normal UCL[1]	Distribution[4]	Selected UCL[5]	Creek Segment Specific EPC[6]
4-Nitroaniline	FALSE	769	744	LOGNORMAL	744	744
4-Nitrophenol	NA	NA	NA	NA	NA	440
Acenaphthene	FALSE	133	137	LOGNORMAL	137	137
Acenaphthylene	FALSE	120	124	LOGNORMAL	124	124
Anthracene	FALSE	149	152	LOGNORMAL	152	152
Benzo(a)anthracene	FALSE	172	169	LOGNORMAL	169	169
Benzo(a)pyrene	FALSE	111	106	LOGNORMAL	106	106
Benzo(b)fluoranthene	FALSE	157	160	LOGNORMAL	160	160
Benzo(g,h,i)perylene	FALSE	138	145	LOGNORMAL	145	145
Benzo(k)fluoranthene	FALSE	150	156	LOGNORMAL	156	156
Bis(2-chloroethoxy)methane	FALSE	118	117	LOGNORMAL	117	ND
Bis(2-chloroethyl)ether	FALSE	118	117	LOGNORMAL	117	ND
Bis(2-chloroisopropyl ether)	FALSE	118	117	LOGNORMAL	117	ND
Bis(2-ethylhexyl)phthalate	FALSE	1,870	279	LOGNORMAL	279	279
Butylbenzylphthalate	FALSE	184	159	LOGNORMAL	159	159
Carbazole	FALSE	129	133	LOGNORMAL	133	133
Chrysene	FALSE	170	170	LOGNORMAL	170	170
Dibenzo(a,h)anthracene	FALSE	72.4	76.3	LOGNORMAL	76.3	76.3
Dibenzofuran	FALSE	150	147	LOGNORMAL	147	147
Diethyl phthalate	FALSE	118	117	LOGNORMAL	117	ND
Dimethyl phthalate	FALSE	118	117	LOGNORMAL	117	ND
di-n-Butylphthalate	FALSE	115	121	LOGNORMAL	121	121
di-n-Octylphthalate	FALSE	118	117	LOGNORMAL	117	ND
Fluoranthene	FALSE	240	207	LOGNORMAL	207	207
Fluorene	FALSE	190	161	LOGNORMAL	161	161
Hexachlorobenzene	FALSE	48.2	48.0	LOGNORMAL	48	ND
Hexachlorobutadiene	FALSE	118	117	LOGNORMAL	117	ND
Hexachlorocyclopentadiene	FALSE	118	117	LOGNORMAL	117	ND
Hexachloroethane	FALSE	118	117	LOGNORMAL	117	ND
Indeno(1,2,3-cd)pyrene	FALSE	139	145	LOGNORMAL	145	145
Isophorone	FALSE	118	117	LOGNORMAL	117	ND
Naphthalene	FALSE	268	199	LOGNORMAL	199	199
Nitrobenzene	FALSE	127	132	LOGNORMAL	132	132
N-Nitroso-di-N-propylamine	FALSE	117	120	LOGNORMAL	120	ND
N-Nitrosodiphenylamine	FALSE	138	141	LOGNORMAL	141	141
Pentachlorophenol	FALSE	1,044	271	LOGNORMAL	271	271
Phenanthrene	FALSE	310	215	LOGNORMAL	215	215
Phenol	FALSE	189	162	LOGNORMAL	162	162
Pyrene	FALSE	247	217	LOGNORMAL	217	217
Total PAHs[8]	FALSE	2,857	2,766	LOGNORMAL	2770	2770
VOCs (ug/kg)						
1,1,1-Trichloroethane	FALSE	4.16	4.36	LOGNORMAL	4.36	4.36
1,1,2,2-Tetrachloroethane	FALSE	7.29	5.43	LOGNORMAL	5.43	ND
1,1,2-Trichloroethane	FALSE	7.31	5.45	LOGNORMAL	5.45	ND
1,1-Dichloroethane	FALSE	7.31	5.45	LOGNORMAL	5.45	ND
1,1-Dichloroethene	FALSE	6.59	4.99	LOGNORMAL	4.99	ND
1,2-Dichloroethane	FALSE	7.31	5.45	LOGNORMAL	5.45	ND
1,2-Dichloroethene (total)	FALSE	3.85	4.04	LOGNORMAL	4.04	4.04
1,2-Dichloropropane	FALSE	7.31	5.45	LOGNORMAL	5.45	ND
2-Butanone (MEK)	FALSE	35.8	35.5	LOGNORMAL	35.5	35.5
2-Hexanone	FALSE	19.9	20.9	LOGNORMAL	20.9	20.9
4-Methyl-2-pentanone (MIBK)	FALSE	20.3	21.4	LOGNORMAL	21.4	21.4
Acetone	FALSE	117	160	LOGNORMAL	160	160
Benzene	FALSE	8.65	7.12	LOGNORMAL	7.12	7.12
Bromodichloromethane	FALSE	7.31	5.45	LOGNORMAL	5.45	ND
Bromoform	FALSE	7.31	5.45	LOGNORMAL	5.45	ND
Bromomethane	FALSE	14.6	10.9	LOGNORMAL	10.9	ND
Carbon disulfide	FALSE	11.2	12.7	LOGNORMAL	12.7	12.7
Carbon tetrachloride	FALSE	7.31	5.45	LOGNORMAL	5.45	ND

Appendix B-3a
Creek Segment B Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area 1

Compounds	Normality Test[3]	Normal UCL[1]	Log Normal UCL[1]	Distribution[4]	Selected UCL[5]	Creek Segment Specific EPC[6]
Chlorobenzene	FALSE	464	1,077	LOGNORMAL	1080	1080
Chloroform	TRUE	2.73	3.10	NORMAL	2.73	2.72
Chloroethane	FALSE	14.6	10.9	LOGNORMAL	10.9	ND
Chloromethane	FALSE	14.6	10.9	LOGNORMAL	10.9	ND
cis-1,3-Dichloropropene	FALSE	5.85	4.39	LOGNORMAL	4.39	ND
Dibromochloromethane	FALSE	7.31	5.45	LOGNORMAL	5.45	ND
Ethylbenzene	FALSE	118	28.6	LOGNORMAL	28.6	28.6
Methylene chloride	TRUE	2.40	2.82	NORMAL	2.4	2.39
Styrene	TRUE	2.51	2.49	NORMAL	2.51	2.5
Tetrachloroethene	FALSE	5.34	5.12	LOGNORMAL	5.12	5.12
Toluene	FALSE	15.0	11.1	LOGNORMAL	11.1	11.1
trans-1,3-Dichloropropene	FALSE	5.85	4.39	LOGNORMAL	4.39	ND
Trichloroethene	FALSE	4.51	4.67	LOGNORMAL	4.67	4.67
Vinyl chloride	FALSE	14.6	10.9	LOGNORMAL	10.9	ND
Xylenes (total)	FALSE	802	122	LOGNORMAL	122	122
Inorganics (mg/kg)						
Aluminum	TRUE	9,385	11,324	NORMAL	9390	9390
Antimony	FALSE	1.45	1.58	LOGNORMAL	1.58	1.58
Arsenic	FALSE	9.78	11.3	LOGNORMAL	11.3	11.3
Barium	FALSE	300	322	LOGNORMAL	322	322
Beryllium	TRUE	0.541	0.708	NORMAL	0.541	0.541
Cadmium	FALSE	8.35	20.2	LOGNORMAL	20.2	20.2
Calcium	FALSE	6,530	8,160	LOGNORMAL	8160	8160
Chromium	FALSE	51.7	71.0	LOGNORMAL	71	71
Cobalt	TRUE	8.59	10.6	NORMAL	8.59	8.59
Copper	FALSE	497	898	LOGNORMAL	898	898
Iron	TRUE	13,804	19,043	NORMAL	13800	13800
Lead	FALSE	75.6	99.5	LOGNORMAL	99.5	99.5
Magnesium	FALSE	3,733	5,977	LOGNORMAL	5980	5980
Manganese	FALSE	131	197	LOGNORMAL	197	197
Mercury	FALSE	0.136	0.190	LOGNORMAL	0.19	0.19
Molybdenum	FALSE	0.785	0.937	LOGNORMAL	0.937	0.937
Nickel	FALSE	193	385	LOGNORMAL	385	385
Potassium	TRUE	1,763	1,897	NORMAL	1760	1760
Selenium	FALSE	0.837	0.891	LOGNORMAL	0.891	0.891
Silver	FALSE	0.787	0.793	LOGNORMAL	0.793	0.793
Sodium	FALSE	200	219	LOGNORMAL	219	219
Thallium	FALSE	0.626	0.666	LOGNORMAL	0.666	0.666
Tin	FALSE	15.0	7.84	LOGNORMAL	7.84	7.84
Vanadium	TRUE	25.4	30.2	NORMAL	25.4	25.4
Zinc	FALSE	2,179	5,336	LOGNORMAL	5340	5340
PCBs (ug/kg)						
Monochlorobiphenyl	FALSE	2.30	2.37	LOGNORMAL	2.37	2.2
Dichlorobiphenyl	FALSE	17.9	12.0	LOGNORMAL	12	12
Trichlorobiphenyl	FALSE	405	209	LOGNORMAL	209	209
Tetrachlorobiphenyl	FALSE	1,361	1,001	LOGNORMAL	1000	1000
Pentachlorobiphenyl	FALSE	734	861	LOGNORMAL	861	861
Hexachlorobiphenyl	FALSE	146	94.6	LOGNORMAL	94.6	94.6
Heptachlorobiphenyl	FALSE	117	53.9	LOGNORMAL	53.9	53.9
Octachlorobiphenyl	FALSE	47.6	29.4	LOGNORMAL	29.4	29.4
Nonachlorobiphenyl	FALSE	11.3	12.2	LOGNORMAL	12.2	12.2
Decachlorobiphenyl	FALSE	64.6	41.6	LOGNORMAL	41.6	41.6
Total PCBs[6]	FALSE	2,894	1,478	LOGNORMAL	1480	1480
Dioxins (ug/kg)						
1,2,3,4,6,7,8,9-OCDD	FALSE	85.1	150	LOGNORMAL	150	150
1,2,3,4,6,7,8-HpCDD	FALSE	3.31	13.1	LOGNORMAL	13.1	13.1
1,2,3,4,7,8-HxCDD	FALSE	0.0579	0.0414	LOGNORMAL	0.0414	0.0414
1,2,3,6,7,8-HxCDD	FALSE	0.474	0.351	LOGNORMAL	0.351	0.351
1,2,3,7,8,9-HxCDD	FALSE	0.117	0.0982	LOGNORMAL	0.0982	0.0982

Appendix B-3a
Creek Segment B Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Normality Test[3]	Normal UCL[1]	Log Normal UCL[1]	Distribution[4]	Selected UCL[5]	Creek Segment Specific EPC[6]
1,2,3,7,8-PeCDD	FALSE	0.0754	0.0664	LOGNORMAL	0.0664	0.0664
2,3,7,8-TCDD	FALSE	0.0148	0.0184	LOGNORMAL	0.0184	ND
Total HpCDD	FALSE	15.7	89.1	LOGNORMAL	89.1	89.1
Total HxCDD	FALSE	3.89	6.98	LOGNORMAL	6.98	6.98
Total PeCDD	FALSE	0.782	0.927	LOGNORMAL	0.927	0.927
Total TCDD	FALSE	3.39	2.87	LOGNORMAL	2.87	2.87
Furans (ug/kg)						
1,2,3,4,6,7,8,9-OCDF	FALSE	19.9	53.0	LOGNORMAL	53	53
1,2,3,4,6,7,8-HpCDF	FALSE	2.70	7.62	LOGNORMAL	7.62	7.62
1,2,3,4,7,8,9-HpCDF	FALSE	0.182	0.135	LOGNORMAL	0.135	0.135
1,2,3,4,7,8-HxCDF	FALSE	0.186	0.115	LOGNORMAL	0.115	0.115
1,2,3,6,7,8-HxCDF	FALSE	0.0827	0.0414	LOGNORMAL	0.0414	0.0414
1,2,3,7,8,9-HxCDF	FALSE	0.0211	0.0214	LOGNORMAL	0.0214	ND
1,2,3,7,8-PeCDF	FALSE	0.0497	0.0373	LOGNORMAL	0.0373	0.0373
2,3,4,6,7,8-HxCDF	FALSE	0.0168	0.0204	LOGNORMAL	0.0204	0.0204
2,3,4,7,8-PeCDF	FALSE	0.0286	0.0309	LOGNORMAL	0.0309	0.0309
2,3,7,8-TCDF	FALSE	0.0336	0.0323	LOGNORMAL	0.0323	0.0323
Total HpCDF	FALSE	13.6	84.1	LOGNORMAL	84.1	84.1
Total HxCDF	FALSE	3.12	20.2	LOGNORMAL	20.2	20.2
Total PeCDF	FALSE	0.290	0.457	LOGNORMAL	0.457	0.457
Total TCDF	FALSE	0.320	0.228	LOGNORMAL	0.228	0.228
Total TEQ[10]	FALSE	0.276	0.279	LOGNORMAL	0.279	0.279

ND = not detected
NA = not available
EPC = Exposure Point Concentration
UCL = 95th Percent Upper Confidence Limit on the mean
Duplicates have been averaged (see text for details).
[1]Average and percentiles calculated assuming 1/2 detection limit for non-detects
[2]Standard deviation calculated for detected concentrations only
[3]Normality Test based on Shapiro-Wilks W Test (p = 0.05). If NA, insufficient amount of data (N<3) to conduct test. If FALSE, data does not have a normal distribution. If TRUE, data has a normal underlying distribution.
[4]Data are assumed to be either normally or lognormally distributed. If the data do not have a normal underlying distribution as determined by the Shapiro-Wilks W Test, data are assumed to be lognormal.
[5]Selected UCL determined by the determined distribution of the data (either normally or lognormally distributed).
[6]For compounds with less than 10 samples available for analyses, the EPC is the average concentration. If the selected UCL exceeds the maximum detected concentration, the maximum is used. Otherwise, the selected UCL is used as the EPC.
[7]Total DDT is the sum of 4,4'-DDD, 4,4'-DDE and 4,4'-DDT. For nondetects, half the detection limit is used.
[8]Total PAHs is the sum of all measured carcinogenic and noncarcinogenic PAHs. For nondetects, half the detection is used.
[9]Total PCBs equals the sum of the homologs. For nondetects, half the detection limit is used.
[10]Total TEQ is based on Toxic Equivalency Factors for Humans/Mammals as developed by Van den Berg, et al., 1998. For nondetects, half the detection limit is used

Appendix B-3b
Creek Segment C Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

	Number Analyzed	Number Used in Analyses	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Standard Deviation[2]	Minimum Detection Limit	Maximum Detection Limit
Cyanide (mg/kg)	9	9	0	0	0	0	0.359	0.36	0.37	0.383		0.64	0.77
Pesticides/Herbicides (ug/kg)													
2,4,5-T	9	9	0	0	0	0	6.06	6	6.5	6.5		11	13
2,4,5-TP (Silvex)	9	9	0	0	0	0	6.06	6	6.5	6.5		11	13
2,4-D	9	9	0	0	0	0	6.06	6	6.5	6.5		11	13
2,4-DB	9	9	0	0	0	0	6.06	6	6.5	6.5		11	13
4,4'-DDD	9	9	0	0	0	0	7.22	5	11	12.6		9	26
4,4'-DDE	9	9	0	0	0	0	7.22	5	11	12.6		9	26
4,4'-DDT	9	9	0	0	0	0	7.22	5	11	12.6		9	26
Total DDT[7]	9	9	0	0	0	0	21.7	15	33	37.8		27	78
Aldrin	9	9	0	0	0	0	3.67	2.6	5.5	6.3		4.6	13
alpha-BHC	9	9	0	0	0	0	1.11	0.75	1.7	1.94		1.4	4
alpha-Chlordane	9	1	1	100	0.92	0.92	0.92	0.92	0.92	0.92		0	0
beta-BHC	9	9	0	0	0	0	1.11	0.75	1.7	1.94		1.4	4
Dalapon	9	9	0	0	0	0	47.8	48.5	50	50		88	100
delta-BHC	9	6	3	50	0.37	0.99	0.665	0.725	0.788	0.943	0.355	1.4	1.6
Dicamba	9	1	1	100	6.6	6.6	6.6	6.6	6.6	6.6		0	0
Dichlorprop	9	1	1	100	6.2	6.2	6.2	6.2	6.2	6.2		0	0
Dieldrin	9	9	8	89	0.46	11	4.76	3.15	7.8	11	3.8	22	22
Dinoseb	9	9	0	0	0	0	74.4	75	75	80		140	160
Endosulfan I	9	9	0	0	0	0	3.67	2.6	5.5	6.3		4.6	13
Endosulfan II	9	9	0	0	0	0	7.22	5	11	12.6		9	26
Endosulfan sulfate	9	7	3	43	0.72	7	4.16	4.9	5	6.4	3.32	9	10
Endrin	9	9	0	0	0	0	7.22	5	11	12.6		9	26
Endrin aldehyde	9	9	0	0	0	0	7.22	5	11	12.6		9	26
Endrin ketone	9	6	1	17	10	10	5.72	4.95	5	8.75		9	10
gamma-BHC (Lindane)	9	9	0	0	0	0	3.67	2.6	5.5	6.3		4.6	13
gamma-Chlordane	9	1	1	100	1.1	1.1	1.1	1.1	1.1	1.1		0	0
Heptachlor	9	9	0	0	0	0	3.67	2.6	5.5	6.3		4.6	13
Heptachlor epoxide	9	9	0	0	0	0	3.67	2.6	5.5	6.3		4.6	13
MCPA	9	9	0	0	0	0	1470	1500	1550	1580		2700	3200
MCPP	9	9	0	0	0	0	1470	1500	1550	1580		2700	3200
Methoxychlor	9	3	3	100	2.5	7.1	4.15	2.85	4.98	6.68	2.56	0	0
Toxaphene	9	9	0	0	0	0	367	260	550	630		460	1300
SVOCs (ug/kg)													
1,2,4-Trichlorobenzene	9	9	0	0	0	0	124	125	130	133		230	270
1,2-Dichlorobenzene	9	9	0	0	0	0	124	125	130	133		230	270
1,3-Dichlorobenzene	9	9	0	0	0	0	124	125	130	133		230	270
1,4-Dichlorobenzene	9	9	0	0	0	0	124	125	130	133		230	270
2,4,5-Trichlorophenol	9	9	0	0	0	0	124	125	130	133		230	270
2,4,6-Trichlorophenol	9	9	0	0	0	0	51.1	50	55	55		94	110
2,4-Dichlorophenol	9	9	0	0	0	0	124	125	130	133		230	270
2,4-Dinitrophenol	9	9	0	0	0	0	622	650	650	650		1100	1300
2,4-Dinitrotoluene	9	9	0	0	0	0	124	125	130	133		230	270
2,6-Dinitrotoluene	9	9	0	0	0	0	124	125	130	133		230	270
2-Chloronaphthalene	9	9	0	0	0	0	124	125	130	133		230	270
2-Chlorophenol	9	9	0	0	0	0	124	125	130	133		230	270
2-Methylnaphthalene	9	9	0	0	0	0	124	125	130	133		230	270
2-Methylphenol (o-Cresol)	9	9	0	0	0	0	124	125	130	133		230	270
2-Nitroaniline	9	9	0	0	0	0	622	650	650	650		1100	1300
2-Nitrophenol	9	9	0	0	0	0	124	125	130	133		230	270
3&4Methylphenol	9	9	0	0	0	0	124	125	130	133		230	270
3,3'-Dichlorobenzidine	9	9	0	0	0	0	243	245	255	260		440	520
3-Nitroaniline	9	9	0	0	0	0	622	650	650	650		1100	1300
4,6-Dinitro-2-methylphenol	9	9	0	0	0	0	622	650	650	650		1100	1300
4-Bromophenyl phenyl ether	9	9	0	0	0	0	124	125	130	133		230	270
4-Chloro-3-methylphenol	9	9	0	0	0	0	124	125	130	133		230	270
4-Chloroaniline	9	9	0	0	0	0	243	245	255	260		440	520
4-Chlorophenyl phenyl ether	9	9	0	0	0	0	124	125	130	133		230	270

Appendix B-3b
Creek Segment C Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

	Number Analyzed	Number Used In Analyses	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Standard Deviation[2]	Minimum Detection Limit	Maximum Detection Limit
4-Nitroaniline	9	9	0	0	0	0	622	650	650	650		1100	1300
4-Nitrophenol	9	9	0	0	0	0	622	650	650	650		1100	1300
Acenaphthene	9	9	0	0	0	0	124	125	130	133		230	270
Acenaphthylene	9	9	0	0	0	0	124	125	130	133		230	270
Anthracene	9	9	0	0	0	0	124	125	130	133		230	270
Benzo(a)anthracene	9	9	0	0	0	0	124	125	130	133		230	270
Benzo(a)pyrene	9	9	0	0	0	0	65.6	65	70	70		120	140
Benzo(b)fluoranthene	9	9	0	0	0	0	124	125	130	133		230	270
Benzo(g,h,i)perylene	9	1	1	100	65	65	65	65	65	65		0	0
Benzo(k)fluoranthene	9	9	0	0	0	0	124	125	130	133		230	270
Bis(2-chloroethoxy)methane	9	9	0	0	0	0	124	125	130	133		230	270
Bis(2-chloroethyl)ether	9	9	0	0	0	0	124	125	130	133		230	270
Bis(2-chloroisopropyl ether)	9	9	0	0	0	0	124	125	130	133		230	270
Bis(2-ethylhexyl)phthalate	9	9	0	0	0	0	124	125	130	133		230	270
Butylbenzylphthalate	9	9	0	0	0	0	124	125	130	133		230	270
Carbazole	9	9	0	0	0	0	124	125	130	133		230	270
Chrysene	9	9	0	0	0	0	124	125	130	133		230	270
Dibenzo(a,h)anthracene	9	9	0	0	0	0	65.6	65	70	70		120	140
Dibenzofuran	9	9	0	0	0	0	124	125	130	133		230	270
Diethyl phthalate	9	9	0	0	0	0	124	125	130	133		230	270
Dimethyl phthalate	9	9	0	0	0	0	124	125	130	133		230	270
di-n-Butylphthalate	9	9	0	0	0	0	124	125	130	133		230	270
di-n-Octylphthalate	9	9	0	0	0	0	124	125	130	133		230	270
Fluoranthene	9	9	0	0	0	0	124	125	130	133		230	270
Fluorene	9	9	0	0	0	0	124	125	130	133		230	270
Hexachlorobenzene	9	9	0	0	0	0	51.1	50	55	55		94	110
Hexachlorobutadiene	9	9	0	0	0	0	124	125	130	133		230	270
Hexachlorocyclopentadiene	9	9	0	0	0	0	124	125	130	133		230	270
Hexachloroethane	9	9	0	0	0	0	124	125	130	133		230	270
Indeno(1,2,3-cd)pyrene	9	9	0	0	0	0	124	125	130	133		230	270
Isophorone	9	9	0	0	0	0	124	125	130	133		230	270
Naphthalene	9	9	0	0	0	0	124	125	130	133		230	270
Nitrobenzene	9	9	0	0	0	0	124	125	130	133		230	270
N-Nitroso-di-N-propylamine	9	9	0	0	0	0	124	125	130	133		230	270
N-nitrosodiphenylamine	9	9	0	0	0	0	124	125	130	133		230	270
Pentachlorophenol	9	9	7	78	1.6	14	6.06	3.8	11.5	13.6	4.39	23	26
Phenanthrene	9	1	1	100	25	25	25	25	25	25		0	0
Phenol	9	9	0	0	0	0	124	125	130	133		230	270
Pyrene	9	9	0	0	0	0	124	125	130	133		230	270
Total PAHs[6]	9	9	2	22	25	65	1760	1760	1830	1910	28.3	3230	3790
VOCs (ug/kg)													
1,1,1-Trichloroethane	9	9	0	0	0	0	3.69	3.75	3.85	3.93		6.8	7.9
1,1,2,2-Tetrachloroethane	9	9	0	0	0	0	3.69	3.75	3.85	3.93		6.8	7.9
1,1,2-Trichloroethane	9	9	0	0	0	0	3.69	3.75	3.85	3.93		6.8	7.9
1,1-Dichloroethane	9	9	0	0	0	0	3.69	3.75	3.85	3.93		6.8	7.9
1,1-Dichloroethene	9	9	0	0	0	0	3.41	3.45	3.55	3.63		6.2	7.3
1,2-Dichloroethane	9	9	0	0	0	0	3.69	3.75	3.85	3.93		6.8	7.9
1,2-Dichloroethene (total)	9	9	0	0	0	0	3.69	3.75	3.85	3.93		6.8	7.9
1,2-Dichloropropane	9	9	0	0	0	0	3.69	3.75	3.85	3.93		6.8	7.9
2-Butanone (MEK)	9	3	3	100	5.7	9.9	7.6	7.2	8.55	9.63	2.13	0	0
2-Hexanone	9	9	0	0	0	0	18.4	18.5	19	19.8		34	40
4-Methyl-2-pentanone (MIBK)	9	9	0	0	0	0	18.4	18.5	19	19.8		34	40
Acetone	9	9	5	56	9.6	83	34.2	37	38.5	66.2	31	68	77
Benzene	9	1	1	100	3	3	3	3	3	3		0	0
Bromodichloromethane	9	9	0	0	0	0	3.69	3.75	3.85	3.93		6.8	7.9
Bromoform	9	9	0	0	0	0	3.69	3.75	3.85	3.93		6.8	7.9
Bromomethane	9	9	0	0	0	0	7.44	7.5	7.5	8		14	16
Carbon disulfide	9	9	0	0	0	0	3.69	3.75	3.85	3.93		6.8	7.9
Carbon tetrachloride	9	9	0	0	0	0	3.69	3.75	3.85	3.93		6.8	7.9

Appendix B-3b
Creek Segment C Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

	Number Analyzed	Number Used in Analyses	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Standard Deviation[2]	Minimum Detection Limit	Maximum Detection Limit
Chlorobenzene	9	9	9	100	2.3	700	130	42	110	512	226	0	0
Chloroform	9	9	0	0	0	0	3.69	3.75	3.85	3.93		6.8	7.9
Chloroethane	9	9	0	0	0	0	7.44	7.5	7.5	8		14	16
Chloromethane	9	9	0	0	0	0	7.44	7.5	7.5	8		14	16
cis-1,3-Dichloropropene	9	9	0	0	0	0	2.96	3	3.1	3.13		5.4	6.3
Dibromochloromethane	9	9	0	0	0	0	3.69	3.75	3.85	3.93		6.8	7.9
Ethylbenzene	9	9	0	0	0	0	3.69	3.75	3.85	3.93		6.8	7.9
Methylene chloride	9	9	4	44	2.3	4.8	3.4	3.7	3.85	4.44	1.21	6.8	7.8
Styrene	9	1	1	100	2.7	2.7	2.7	2.7	2.7	2.7		0	0
Tetrachloroethene	9	9	0	0	0	0	3.69	3.75	3.85	3.93		6.8	7.9
Toluene	9	9	4	44	3.3	7.5	4.18	3.85	3.9	6.34	1.86	6.8	7.8
trans-1,3-Dichloropropene	9	9	0	0	0	0	2.96	3	3.1	3.13		5.4	6.3
Trichloroethene	9	9	0	0	0	0	3.69	3.75	3.85	3.93		6.8	7.9
Vinyl chloride	9	9	0	0	0	0	7.44	7.5	7.5	8		14	16
Xylenes (total)	9	9	1	11	4.3	4.3	3.73	3.75	3.85	4.14		6.8	7.8
Inorganics (mg/kg)													
Aluminum	9	9	9	100	8100	13000	10800	11000	11000	13000	1590	0	0
Antimony	9	1	1	100	0.79	0.79	0.79	0.79	0.79	0.79		0	0
Arsenic	9	9	9	100	3	14	9.7	11	13	14	3.97	0	0
Barium	9	9	9	100	200	330	249	245	250	306	36.1	0	0
Beryllium	9	9	9	100	0.68	0.96	0.828	0.8	0.92	0.952	0.0943	0	0
Cadmium	9	9	9	100	1.6	24	13.3	14	17	21.6	6.76	0	0
Calcium	9	9	9	100	3600	14000	7810	6500	10000	12700	3210	0	0
Chromium	9	9	9	100	18	110	36.1	24	41	82.8	29.1	0	0
Cobalt	9	9	9	100	5	14	9.41	9.3	9.6	13.2	2.54	0	0
Copper	9	9	9	100	40	250	109	100	125	214	65.9	0	0
Iron	9	9	9	100	12000	21000	17600	17500	20000	20600	2830	0	0
Lead	9	9	9	100	18	140	43.2	31	33	110	38.9	0	0
Magnesium	9	9	9	100	2800	6700	4430	4200	5100	6280	1220	0	0
Manganese	9	9	9	100	79	390	189	160	200	342	93.3	0	0
Mercury	9	9	9	100	0.046	0.31	0.0956	0.074	0.094	0.227	0.0828	0	0
Molybdenum	9	9	0	0	0	0	0.654	0.7	0.75	0.8		0.78	1.6
Nickel	9	9	9	100	60	570	263	250	330	502	154	0	0
Potassium	9	9	9	100	1400	2300	1870	1850	2000	2220	254	0	0
Selenium	9	9	0	0	0	0	0.739	0.55	1	1.28		0.76	2.8
Silver	9	9	0	0	0	0	0.689	0.7	0.75	0.78		1.2	1.6
Sodium	9	9	9	100	90	200	124	110	120	182	33.7	0	0
Thallium	9	9	0	0	0	0	0.597	0.6	0.7	0.73		0.78	1.5
Tin	9	9	1	11	7.5	7.5	3.91	3.5	3.75	6.06		6.2	7.8
Vanadium	9	9	9	100	23	37	31	32	34	36.6	4.5	0	0
Zinc	9	9	9	100	340	3400	2140	2000	3000	3320	1050	0	0
PCBs (ug/kg)													
Monochlorobiphenyl	9	1	1	100	1.4	1.4	1.4	1.4	1.4	1.4		0	0
Dichlorobiphenyl	9	9	1	11	7.9	7.9	3.04	2.45	2.6	5.78		4.4	5.2
Trichlorobiphenyl	9	9	1	11	4.9	4.9	2.71	2.45	2.6	3.98		4.4	5.2
Tetrachlorobiphenyl	9	9	4	44	2.3	30	7.77	5	6.8	20.7	12.5	9	10
Pentachlorobiphenyl	9	9	6	67	1.1	27	11.7	5	19	25.8	10.8	9	10
Hexachlorobiphenyl	9	9	4	44	7.3	38	9.83	5	9.2	26.8	14.6	9	10
Heptachlorobiphenyl	9	9	2	22	3.6	18	8.18	7.5	7.5	14	10.2	14	16
Octachlorobiphenyl	9	9	1	11	11	11	7.89	7.5	8	9.8		14	16
Nonachlorobiphenyl	9	3	2	67	5.2	11	9.07	11	11	11	4.1	22	22
Decachlorobiphenyl	9	9	3	33	8.9	29	14.7	12.5	13	25.8	10.1	22	26
Total PCBs[9]	9	9	6	67	1.1	178.2	69	53.9	63.8	140	66.3	26.4	107.8
Dioxins (ug/kg)													
1,2,3,4,6,7,8,9-OCDD	9	9	9	100	0.6	12.3	4.41	2.5	8.1	11.6	4.62	0	0
1,2,3,4,6,7,8-HpCDD	9	9	8	89	0.04	1.2	0.331	0.18	0.55	0.976	0.404	0.02	0.02
1,2,3,4,7,8-HxCDD	9	9	0	0	0	0	0.00661	0.005	0.01	0.01		0.009	0.02
1,2,3,6,7,8-HxCDD	9	9	3	33	0.02	0.06	0.0172	0.01	0.02	0.048	0.0208	0.01	0.02
1,2,3,7,8,9-HxCDD	9	9	1	11	0.03	0.03	0.01	0.01	0.01	0.022		0.01	0.02

Appendix B-3b
Creek Segment C Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

	Number Analyzed	Number Used In Analyses	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Standard Deviation[2]	Minimum Detection Limit	Maximum Detection Limit
1,2,3,7,8-PeCDD	9	9	0	0	0	0	0.00889	0.01	0.01	0.01		0.01	0.02
2,3,7,8-TCDD	9	9	0	0	0	0	0.00478	0.005	0.005	0.005		0.008	0.01
Total HpCDD	9	9	8	89	0.1	2.29	0.702	0.42	1.2	1.97	0.794	0.02	0.02
Total HxCDD	9	9	5	56	0.02	0.69	0.192	0.02	0.29	0.678	0.324	0.009	0.02
Total PeCDD	9	9	3	33	0.15	0.58	0.13	0.01	0.15	0.504	0.215	0.01	0.02
Total TCDD	9	9	0	0	0	0	1.23	1.25	1.25	1.41		2.2	2.9
Furans (ug/kg)													
1,2,3,4,6,7,8,9-OCDF	9	9	9	100	0.06	5.805	1.46	0.54	2.5	4.56	1.92	0	0
1,2,3,4,6,7,8-HpCDF	9	9	9	100	0.02	1.175	0.246	0.08	0.34	0.849	0.372	0	0
1,2,3,4,7,8,9-HpCDF	9	9	1	11	0.05	0.05	0.0111	0.005	0.01	0.034		0.01	0.02
1,2,3,4,7,8-HxCDF	9	9	3	33	0.01	0.03	0.00939	0.005	0.01	0.026	0.01	0.006	0.01
1,2,3,6,7,8-HxCDF	9	9	1	11	0.01	0.01	0.00428	0.0035	0.0045	0.008		0.005	0.01
1,2,3,7,8,9-HxCDF	9	9	0	0	0	0	0.00411	0.004	0.005	0.005		0.006	0.01
1,2,3,7,8-PeCDF	9	9	0	0	0	0	0.00722	0.005	0.01	0.01		0.01	0.02
2,3,4,6,7,8-HxCDF	9	9	1	11	0.02	0.02	0.00589	0.004	0.005	0.014		0.006	0.01
2,3,4,7,8-PeCDF	9	9	0	0	0	0	0.00722	0.005	0.01	0.01		0.01	0.02
2,3,7,8-TCDF	9	9	2	22	0.02	0.02	0.00817	0.005	0.005	0.02	0	0.008	0.01
Total HpCDF	9	9	9	100	0.05	4.135	0.865	0.28	1.2	3	1.32	0	0
Total HxCDF	9	9	7	78	0.01	10.4	1.22	0.04	0.15	6.35	3.9	0.005	0.01
Total PeCDF	9	9	2	22	0.07	2.7	0.313	0.01	0.01	1.65	1.86	0.01	0.02
Total TCDF	9	9	1	11	0.2	0.2	0.0544	0.035	0.035	0.146		0.06	0.13
Total TEQ[TU]	9	9	9	100	0.000277	0.0430605	0.0307	0.0276	0.0335	0.0535	0.0141	0.0296	0.0524

Appendix B-3b
Creek Segment C Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

	Normality Test[3]	Normal UCL[1]	Log Normal UCL[1]	Distribution[4]	Selected UCL[5]	Creek Segment Specific EPC[6]
Cyanide (mg/kg)	TRUE	0.359	0.358	NORMAL	0.359	ND
Pesticides/Herbicides (ug/kg)						
2,4,5-T	TRUE	6.06	6.04	NORMAL	6.06	ND
2,4,5-TP (Silvex)	TRUE	6.06	6.04	NORMAL	6.06	ND
2,4-D	TRUE	6.06	6.04	NORMAL	6.06	ND
2,4-DB	TRUE	6.06	6.04	NORMAL	6.06	ND
4,4'-DDD	FALSE	7.30	10.4	LOGNORMAL	10.4	ND
4,4'-DDE	FALSE	7.30	10.4	LOGNORMAL	10.4	ND
4,4'-DDT	FALSE	7.30	10.4	LOGNORMAL	10.4	ND
Total DDT[7]	FALSE	21.90	31.2	LOGNORMAL	31.2	ND
Aldrin	FALSE	3.71	5.19	LOGNORMAL	5.19	ND
alpha-BHC	FALSE	1.12	1.60	LOGNORMAL	1.6	ND
alpha-Chlordane	NA	NA	NA	NA	NA	0.92
beta-BHC	FALSE	1.12	1.60	LOGNORMAL	1.6	ND
Dalapon	TRUE	47.8	47.7	NORMAL	47.8	ND
delta-BHC	TRUE	0.67	0.99	NORMAL	0.672	0.665
Dicamba	NA	NA	NA	NA	NA	6.6
Dichlorprop	NA	NA	NA	NA	NA	6.2
Dieldrin	TRUE	4.85	11.0	NORMAL	4.85	4.76
Dinoseb	TRUE	74.5	74.4	NORMAL	74.5	ND
Endosulfan I	FALSE	3.71	5.19	LOGNORMAL	5.19	ND
Endosulfan II	FALSE	7.30	10.4	LOGNORMAL	10.4	ND
Endosulfan sulfate	TRUE	4.21	7.0	NORMAL	4.21	4.16
Endrin	FALSE	7.30	10.4	LOGNORMAL	10.4	ND
Endrin aldehyde	FALSE	7.30	10.4	LOGNORMAL	10.4	ND
Endrin ketone	FALSE	5.77	7.7	LOGNORMAL	7.7	5.72
gamma-BHC (Lindane)	FALSE	3.71	5.19	LOGNORMAL	5.19	ND
gamma-Chlordane	NA	NA	NA	NA	NA	1.1
Heptachlor	FALSE	3.71	5.19	LOGNORMAL	5.19	ND
Heptachlor epoxide	FALSE	3.71	5.19	LOGNORMAL	5.19	ND
MCPA	TRUE	1,474	1,470	NORMAL	1470	ND
MCPP	TRUE	1,474	1,470	NORMAL	1470	ND
Methoxychlor	TRUE	4.3	3.7	NORMAL	4.25	4.15
Toxaphene	FALSE	371	519	LOGNORMAL	519	ND
SVOCs (ug/kg)						
1,2,4-Trichlorobenzene	TRUE	125	124	NORMAL	125	ND
1,2-Dichlorobenzene	TRUE	125	124	NORMAL	125	ND
1,3-Dichlorobenzene	TRUE	125	124	NORMAL	125	ND
1,4-Dichlorobenzene	TRUE	125	124	NORMAL	125	ND
2,4,5-Trichlorophenol	TRUE	125	124	NORMAL	125	ND
2,4,6-Trichlorophenol	FALSE	51.2	51.0	LOGNORMAL	51	ND
2,4-Dichlorophenol	TRUE	125	124	NORMAL	125	ND
2,4-Dinitrophenol	FALSE	623	621	LOGNORMAL	621	ND
2,4-Dinitrotoluene	TRUE	125	124	NORMAL	125	ND
2,6-Dinitrotoluene	TRUE	125	124	NORMAL	125	ND
2-Chloronaphthalene	TRUE	125	124	NORMAL	125	ND
2-Chlorophenol	TRUE	125	124	NORMAL	125	ND
2-Methylnaphthalene	TRUE	125	124	NORMAL	125	ND
2-Methylphenol (o-Cresol)	TRUE	125	124	NORMAL	125	ND
2-Nitroaniline	FALSE	623	621	LOGNORMAL	621	ND
2-Nitrophenol	TRUE	125	124	NORMAL	125	ND
3&4Methylphenol	TRUE	125	124	NORMAL	125	ND
3,3'-Dichlorobenzidine	TRUE	243	242	NORMAL	243	ND
3-Nitroaniline	FALSE	623	621	LOGNORMAL	621	ND
4,6-Dinitro-2-methylphenol	FALSE	623	621	LOGNORMAL	621	ND
4-Bromophenyl phenyl ether	TRUE	125	124	NORMAL	125	ND
4-Chloro-3-methylphenol	TRUE	125	124	NORMAL	125	ND
4-Chloroaniline	TRUE	243	242	NORMAL	243	ND
4-Chlorophenyl phenyl ether	TRUE	125	124	NORMAL	125	ND

Appendix B-3b
Creek Segment C Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

	Normality Test[3]	Normal UCL[1]	Log Normal UCL[1]	Distribution[4]	Selected UCL[5]	Creek Segment Specific EPC[6]
4-Nitroaniline	FALSE	623	621	LOGNORMAL	621	ND
4-Nitrophenol	FALSE	623	621	LOGNORMAL	621	ND
Acenaphthene	TRUE	125	124	NORMAL	125	ND
Acenaphthylene	TRUE	125	124	NORMAL	125	ND
Anthracene	TRUE	125	124	NORMAL	125	ND
Benzo(a)anthracene	TRUE	125	124	NORMAL	125	ND
Benzo(a)pyrene	TRUE	65.6	65.5	NORMAL	65.6	ND
Benzo(b)fluoranthene	TRUE	125	124	NORMAL	125	ND
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	65
Benzo(k)fluoranthene	TRUE	125	124	NORMAL	125	ND
Bis(2-chloroethoxy)methane	TRUE	125	124	NORMAL	125	ND
Bis(2-chloroethyl)ether	TRUE	125	124	NORMAL	125	ND
Bis(2-chloroisopropyl ether)	TRUE	125	124	NORMAL	125	ND
Bis(2-ethylhexyl)phthalate	TRUE	125	124	NORMAL	125	ND
Butylbenzylphthalate	TRUE	125	124	NORMAL	125	ND
Carbazole	TRUE	125	124	NORMAL	125	ND
Chrysene	TRUE	125	124	NORMAL	125	ND
Dibenzo(a,h)anthracene	TRUE	65.6	65.5	NORMAL	65.6	ND
Dibenzofuran	TRUE	125	124	NORMAL	125	ND
Diethyl phthalate	TRUE	125	124	NORMAL	125	ND
Dimethyl phthalate	TRUE	125	124	NORMAL	125	ND
di-n-Butylphthalate	TRUE	125	124	NORMAL	125	ND
di-n-Octylphthalate	TRUE	125	124	NORMAL	125	ND
Fluoranthene	TRUE	125	124	NORMAL	125	ND
Fluorene	TRUE	125	124	NORMAL	125	ND
Hexachlorobenzene	FALSE	51.2	51.0	LOGNORMAL	51	ND
Hexachlorobutadiene	TRUE	125	124	NORMAL	125	ND
Hexachlorocyclopentadiene	TRUE	125	124	NORMAL	125	ND
Hexachloroethane	TRUE	125	124	NORMAL	125	ND
Indeno(1,2,3-cd)pyrene	TRUE	125	124	NORMAL	125	ND
Isophorone	TRUE	125	124	NORMAL	125	ND
Naphthalene	TRUE	125	124	NORMAL	125	ND
Nitrobenzene	TRUE	125	124	NORMAL	125	ND
N-Nitroso-di-N-propylamine	TRUE	125	124	NORMAL	125	ND
N-nitrosodiphenylamine	TRUE	125	124	NORMAL	125	ND
Pentachlorophenol	FALSE	6.17	14.0	LOGNORMAL	14	6.06
Phenanthrene	NA	NA	NA	NA	NA	25
Phenol	TRUE	125	124	NORMAL	125	ND
Pyrene	TRUE	125	124	NORMAL	125	ND
Total PAHs[6]	TRUE	1,761	1,756	NORMAL	1760	1760
VOCs (ug/kg)						
1,1,1-Trichloroethane	TRUE	3.70	3.69	NORMAL	3.7	ND
1,1,2,2-Tetrachloroethane	TRUE	3.70	3.69	NORMAL	3.7	ND
1,1,2-Trichloroethane	TRUE	3.70	3.69	NORMAL	3.7	ND
1,1-Dichloroethane	TRUE	3.70	3.69	NORMAL	3.7	ND
1,1-Dichloroethene	TRUE	3.41	3.40	NORMAL	3.41	ND
1,2-Dichloroethane	TRUE	3.70	3.69	NORMAL	3.7	ND
1,2-Dichloroethene (total)	TRUE	3.70	3.69	NORMAL	3.7	ND
1,2-Dichloropropane	TRUE	3.70	3.69	NORMAL	3.7	ND
2-Butanone (MEK)	TRUE	7.7	7.4	NORMAL	7.69	7.6
2-Hexanone	TRUE	18.5	18.4	NORMAL	18.5	ND
4-Methyl-2-pentanone (MIBK)	TRUE	18.5	18.4	NORMAL	18.5	ND
Acetone	TRUE	34.7	67.4	NORMAL	34.7	34.2
Benzene	NA	NA	NA	NA	NA	3
Bromodichloromethane	TRUE	3.70	3.69	NORMAL	3.7	ND
Bromoform	TRUE	3.70	3.69	NORMAL	3.7	ND
Bromomethane	TRUE	7.45	7.44	NORMAL	7.45	ND
Carbon disulfide	TRUE	3.70	3.69	NORMAL	3.7	ND
Carbon tetrachloride	TRUE	3.70	3.69	NORMAL	3.7	ND

Appendix B-3b
Creek Segment C Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

	Normality Test[3]	Normal UCL[1]	Log Normal UCL[1]	Distribution[4]	Selected UCL[5]	Creek Segment Specific EPC[6]
Chlorobenzene	FALSE	135	700	LOGNORMAL	700	130
Chloroform	TRUE	3.70	3.69	NORMAL	3.7	ND
Chloroethane	TRUE	7.45	7.44	NORMAL	7.45	ND
Chloromethane	TRUE	7.45	7.44	NORMAL	7.45	ND
cis-1,3-Dichloropropene	TRUE	2.96	2.95	NORMAL	2.96	ND
Dibromochloromethane	TRUE	3.70	3.69	NORMAL	3.7	ND
Ethylbenzene	TRUE	3.70	3.69	NORMAL	3.7	ND
Methylene chloride	TRUE	3.42	4.09	NORMAL	3.42	3.4
Styrene	NA	NA	NA	NA	NA	2.7
Tetrachloroethene	TRUE	3.70	3.69	NORMAL	3.7	ND
Toluene	FALSE	4.21	4.97	LOGNORMAL	4.97	4.18
trans-1,3-Dichloropropene	TRUE	2.96	2.95	NORMAL	2.96	ND
Trichloroethene	TRUE	3.70	3.69	NORMAL	3.7	ND
Vinyl chloride	TRUE	7.45	7.44	NORMAL	7.45	ND
Xylenes (total)	TRUE	3.74	3.72	NORMAL	3.74	3.73
Inorganics (mg/kg)						
Aluminum	TRUE	10,845	11,965	NORMAL	10800	10800
Antimony	NA	NA	NA	NA	NA	0.79
Arsenic	TRUE	9.79	14.0	NORMAL	9.79	9.7
Barium	TRUE	250	273	NORMAL	250	249
Beryllium	TRUE	0.830	0.892	NORMAL	0.83	0.828
Cadmium	TRUE	13.4	24.0	NORMAL	13.4	13.3
Calcium	TRUE	7,875	10,757	NORMAL	7870	7810
Chromium	FALSE	36.7	57.6	LOGNORMAL	57.6	36.1
Cobalt	TRUE	9.47	11.6	NORMAL	9.47	9.41
Copper	TRUE	111	185	NORMAL	111	109
Iron	TRUE	17,672	19,828	NORMAL	17700	17600
Lead	FALSE	44.1	75.6	LOGNORMAL	75.6	43.2
Magnesium	TRUE	4,454	5,381	NORMAL	4450	4430
Manganese	TRUE	191	276	NORMAL	191	189
Mercury	FALSE	0.097	0.155	LOGNORMAL	0.155	0.0956
Molybdenum	TRUE	0.658	0.780	NORMAL	0.658	ND
Nickel	TRUE	266	505	NORMAL	266	263
Potassium	TRUE	1,878	2,055	NORMAL	1880	1870
Selenium	TRUE	0.747	1.11	NORMAL	0.747	ND
Silver	TRUE	0.690	0.736	NORMAL	0.69	ND
Sodium	FALSE	125	146	LOGNORMAL	146	124
Thallium	TRUE	0.600	0.698	NORMAL	0.6	ND
Tin	FALSE	3.94	4.72	LOGNORMAL	4.72	3.91
Vanadium	TRUE	31.1	34.3	NORMAL	31.1	31
Zinc	TRUE	2,159	3,400	NORMAL	2160	2140
PCBs (ug/kg)						
Monochlorobiphenyl	NA	NA	NA	NA	NA	1.4
Dichlorobiphenyl	FALSE	3.08	4.05	LOGNORMAL	4.05	3.04
Trichlorobiphenyl	FALSE	2.73	3.20	LOGNORMAL	3.2	2.71
Tetrachlorobiphenyl	FALSE	7.95	14.0	LOGNORMAL	14	7.77
Pentachlorobiphenyl	TRUE	11.9	27.0	NORMAL	11.9	11.7
Hexachlorobiphenyl	FALSE	10.1	17.6	LOGNORMAL	17.6	9.83
Heptachlorobiphenyl	FALSE	8.26	11.2	LOGNORMAL	11.2	8.18
Octachlorobiphenyl	FALSE	7.92	8.63	LOGNORMAL	8.63	7.89
Nonachlorobiphenyl	FALSE	9.2	8.6	LOGNORMAL	8.57	9.07
Decachlorobiphenyl	FALSE	14.8	19.1	LOGNORMAL	19.1	14.7
Total PCBs[9]	FALSE	69.89	97.34	LOGNORMAL	97.3	69
Dioxins (ug/kg)						
1,2,3,4,6,7,8,9-OCDD	FALSE	4.51	12.3	LOGNORMAL	12.3	4.41
1,2,3,4,6,7,8-HpCDD	FALSE	0.340	1.20	LOGNORMAL	1.2	0.331
1,2,3,4,7,8-HxCDD	FALSE	0.00667	0.00864	LOGNORMAL	0.00864	ND
1,2,3,6,7,8-HxCDD	FALSE	0.0176	0.0434	LOGNORMAL	0.0434	0.0172
1,2,3,7,8,9-HxCDD	FALSE	0.0102	0.0165	LOGNORMAL	0.0165	0.01

Appendix B-3b
Creek Segment C Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

	Normality Test[3]	Normal UCL[1]	Log Normal UCL[1]	Distribution[4]	Selected UCL[5]	Creek Segment Specific EPC[6]
1,2,3,7,8-PeCDD	FALSE	0.00894	0.0100	LOGNORMAL	0.01	ND
2,3,7,8-TCDD	FALSE	0.00479	0.00476	LOGNORMAL	0.00476	ND
Total HpCDD	TRUE	0.719	2.29	NORMAL	0.719	0.702
Total HxCDD	FALSE	0.198	0.690	LOGNORMAL	0.69	0.192
Total PeCDD	FALSE	0.135	0.580	LOGNORMAL	0.58	0.13
Total TCDD	TRUE	1.23	1.22	NORMAL	1.23	ND
Furans (ug/kg)						
1,2,3,4,6,7,8,9-OCDF	FALSE	1.50	5.81	LOGNORMAL	5.81	1.46
1,2,3,4,6,7,8-HpCDF	FALSE	0.254	1.18	LOGNORMAL	1.18	0.246
1,2,3,4,7,8,9-HpCDF	FALSE	0.0114	0.0215	LOGNORMAL	0.0215	0.0111
1,2,3,4,7,8-HxCDF	FALSE	0.00959	0.0220	LOGNORMAL	0.022	0.00939
1,2,3,6,7,8-HxCDF	FALSE	0.00433	0.00586	LOGNORMAL	0.00586	0.00428
1,2,3,7,8,9-HxCDF	TRUE	0.00413	0.00469	NORMAL	0.00413	ND
1,2,3,7,8-PeCDF	FALSE	0.00728	0.00954	LOGNORMAL	0.00954	ND
2,3,4,6,7,8-HxCDF	FALSE	0.00600	0.00911	LOGNORMAL	0.00911	0.00589
2,3,4,7,8-PeCDF	FALSE	0.00728	0.00954	LOGNORMAL	0.00954	ND
2,3,7,8-TCDF	FALSE	0.00831	0.0142	LOGNORMAL	0.0142	0.00817
Total HpCDF	FALSE	0.893	4.14	LOGNORMAL	4.14	0.865
Total HxCDF	FALSE	1.30	10.4	LOGNORMAL	10.4	1.22
Total PeCDF	FALSE	0.333	2.70	LOGNORMAL	2.7	0.313
Total TCDF	FALSE	0.0556	0.0906	LOGNORMAL	0.0906	0.0544
Total TEQ[10]	TRUE	0.0310	0.0433	NORMAL	0.031	0.0307

ND = not detected
NA = not available
EPC = Exposure Point Concentration
UCL = 95th Percent Upper Confidence Limit on the mean
Duplicates have been averaged (see text for details).
[1]Average and percentiles calculated assuming 1/2 detection limit for non-detects
[2]Standard deviation calculated for detected concentrations only
[3]Normality Test based on Shapiro-Wilks W Test (p = 0.05). If NA, insufficient amount of data (N<3) to conduct test. If FALSE, data does not have a normal distribution. If TRUE, data has a normal underlying distribution.
[4]Data are assumed to be either normally or lognormally distributed. If the data do not have a normal underlying distribution as determined by the Shapiro-Wilks W Test, data are assumed to be lognormal.
[5]Selected UCL determined by the determined distribution of the data (either normally or lognormally distributed).
[6]For compounds with less than 10 samples available for analyses, the EPC is the average concentration. If the selected UCL exceeds the maximum detected concentration, the maximum is used. Otherwise, the selected UCL is used as the EPC.
[7]Total DDT is the sum of 4,4'-DDD, 4,4'-DDE and 4,4'-DDT. For nondetects, half the detection limit is used.
[8]Total PAHs is the sum of all measured carcinogenic and noncarcinogenic PAHs. For nondetects, half the detection is used.
[9]Total PCBs equals the sum of the homologs. For nondetects, half the detection limit is used.
[10]Total TEQ is based on Toxic Equivalency Factors for Humans/Mammals as developed by Van den Berg, et al., 1998. For nondetects, half the detection limit is used.

Appendix B-3c
Creek Segment D Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Number Analyzed	Number Used	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Standard Deviation[2]	Minimum Detection Limit	Maximum Detection Limit
Cyanide (mg/kg)	6	6	0	0	0	0	0.355	0.358	0.36	0.368		0.67	0.74
Pesticides/Herbicides (ug/kg)													
2,4,5-T	6	1	1	100	5.4	5.4	5.4	5.4	5.4	5.4		0	0
2,4,5-TP (Silvex)	6	6	0	0	0	0	5.92	6	6	6		11	12
2,4-D	6	6	0	0	0	0	5.92	6	6	6		11	12
2,4-DB	6	6	0	0	0	0	5.92	6	6	6		11	12
4,4'-DDD	6	1	1	100	1.4	1.4	1.4	1.4	1.4	1.4		0	0
4,4'-DDE	6	6	0	0	0	0	18.2	12.5	12.5	44.4		9.4	110
4,4'-DDT	6	6	1	17	240	240	56.2	12.5	44.4	194		9.4	110
Total DDT[7]	6	6	2	33	1.4	240	74.6	25.7	89.1	217	169	18.8	220
Aldrin	6	5	2	40	0.75	9	5.03	6.5	6.5	8.5	5.83	4.8	13
alpha-BHC	6	6	0	0	0	0	2.77	1.85	1.89	6.85		1.4	17
alpha-Chlordane	6	5	1	20	12	12	6.78	6.5	6.5	10.9		4.8	13
beta-BHC	6	6	0	0	0	0	2.77	1.85	1.89	6.85		1.4	17
Dalapon	6	6	1	17	50	50	47.5	47.8	48.5	49.6		89	97
delta-BHC	6	5	4	80	0.43	1.9	0.824	0.56	0.7	1.66	0.699	1.4	1.4
Dicamba	6	1	1	100	1.8	1.8	1.8	1.8	1.8	1.8		0	0
Dichlorprop	6	1	1	100	21	21	21	21	21	21		0	0
Dieldrin	6	6	5	83	1.3	690	127	8.1	44.8	531	306	110	110
Dinoseb	6	6	0	0	0	0	72.5	72.5	75	75		140	150
Endosulfan I	6	6	0	0	0	0	9.48	6.5	6.5	23.4		4.8	58
Endosulfan II	6	6	0	0	0	0	18.2	12.5	12.5	44.4		9.4	110
Endosulfan sulfate	6	2	1	50	9.5	9.5	7.1	7.1	8.3	9.26		9.4	9.4
Endrin	6	6	0	0	0	0	18.2	12.5	12.5	44.4		9.4	110
Endrin aldehyde	6	6	0	0	0	0	18.2	12.5	12.5	44.4		9.4	110
Endrin ketone	6	6	0	0	0	0	18.2	12.5	12.5	44.4		9.4	110
gamma-BHC (Lindane)	6	6	0	0	0	0	9.48	6.5	6.5	23.4		4.8	58
gamma-Chlordane	6	6	2	33	4	67	15.5	6.5	6.5	51.9	44.5	4.8	13
Heptachlor	6	6	0	0	0	0	9.48	6.5	6.5	23.4		4.8	58
Heptachlor epoxide	6	6	0	0	0	0	9.48	6.5	6.5	23.4		4.8	58
MCPA	6	6	0	0	0	0	1450	1480	1500	1500		2700	3000
MCPP	6	6	0	0	0	0	1450	1480	1500	1500		2700	3000
Methoxychlor	6	4	3	75	4	62	24.7	16.4	33.5	56.3	32.2	48	48
Toxaphene	6	6	0	0	0	0	948	650	650	2340		480	5800
SVOCs (ug/kg)													
1,2,4-Trichlorobenzene	6	6	0	0	0	0	123	125	125	129		230	260
1,2-Dichlorobenzene	6	6	0	0	0	0	123	125	125	129		230	260
1,3-Dichlorobenzene	6	6	0	0	0	0	123	125	125	129		230	260
1,4-Dichlorobenzene	6	6	2	33	53	130	112	123	129	130	54.4	230	260
2,4,5-Trichlorophenol	6	6	0	0	0	0	123	125	125	129		230	260
2,4,6-Trichlorophenol	6	6	0	0	0	0	50.5	50	50	53.8		96	110
2,4-Dichlorophenol	6	6	0	0	0	0	123	125	125	129		230	260
2,4-Dinitrophenol	6	6	0	0	0	0	625	625	650	650		1200	1300
2,4-Dinitrotoluene	6	6	0	0	0	0	123	125	125	129		230	260
2,6-Dinitrotoluene	6	6	0	0	0	0	123	125	125	129		230	260
2-Chloronaphthalene	6	6	0	0	0	0	123	125	125	129		230	260
2-Chlorophenol	6	6	0	0	0	0	123	125	125	129		230	260
2-Methylnaphthalene	6	6	0	0	0	0	123	125	125	129		230	260
2-Methylphenol (o-Cresol)	6	6	0	0	0	0	123	125	125	129		230	260
2-Nitroaniline	6	6	0	0	0	0	625	625	650	650		1200	1300
2-Nitrophenol	6	6	0	0	0	0	123	125	125	129		230	260
3&4Methylphenol	6	6	0	0	0	0	123	125	125	129		230	260
3,3'-Dichlorobenzidine	6	6	0	0	0	0	240	243	245	249		450	500
3-Nitroaniline	6	6	0	0	0	0	625	625	650	650		1200	1300
4,6-Dinitro-2-methylphenol	6	6	0	0	0	0	625	625	650	650		1200	1300
4-Bromophenyl phenyl ether	6	6	0	0	0	0	123	125	125	129		230	260
4-Chloro-3-methylphenol	6	6	0	0	0	0	123	125	125	129		230	260
4-Chloroaniline	6	6	0	0	0	0	240	243	245	249		450	500
4-Chlorophenyl phenyl ether	6	6	0	0	0	0	123	125	125	129		230	260

Appendix B-3c
Creek Segment D Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Number Analyzed	Number Used	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Standard Deviation[2]	Minimum Detection Limit	Maximum Detection Limit
4-Nitroaniline	6	6	0	0	0	0	625	625	650	650		1200	1300
4-Nitrophenol	6	6	0	0	0	0	625	625	650	650		1200	1300
Acenaphthene	6	6	0	0	0	0	123	125	125	129		230	260
Acenaphthylene	6	6	0	0	0	0	123	125	125	129		230	260
Anthracene	6	6	0	0	0	0	123	125	125	129		230	260
Benzo(a)anthracene	6	6	0	0	0	0	123	125	125	129		230	260
Benzo(a)pyrene	6	6	3	50	49	140	84.8	65	114	138	49.9	120	130
Benzo(b)fluoranthene	6	6	1	17	200	200	136	125	129	183		230	260
Benzo(g,h,i)perylene	6	6	2	33	130	220	140	128	130	198	63.6	230	260
Benzo(k)fluoranthene	6	6	1	17	210	210	138	125	129	190		230	260
Bis(2-chloroethoxy)methane	6	6	0	0	0	0	123	125	125	129		230	260
Bis(2-chloroethyl)ether	6	6	0	0	0	0	123	125	125	129		230	260
Bis(2-chloroisopropyl ether)	6	6	0	0	0	0	123	125	125	129		230	260
Bis(2-ethylhexyl)phthalate	6	6	0	0	0	0	123	125	125	129		230	260
Butylbenzylphthalate	6	6	0	0	0	0	123	125	125	129		230	260
Carbazole	6	6	0	0	0	0	123	125	125	129		230	260
Chrysene	6	6	0	0	0	0	123	125	125	129		230	260
Dibenzo(a,h)anthracene	6	6	0	0	0	0	65	65	65	68.8		120	140
Dibenzofuran	6	6	0	0	0	0	123	125	125	129		230	260
Diethyl phthalate	6	6	0	0	0	0	123	125	125	129		230	260
Dimethyl phthalate	6	6	0	0	0	0	123	125	125	129		230	260
di-n-Butylphthalate	6	6	0	0	0	0	123	125	125	129		230	260
di-n-Octylphthalate	6	6	0	0	0	0	123	125	125	129		230	260
Fluoranthene	6	6	4	67	69	190	131	120	158	185	54.2	230	240
Fluorene	6	6	0	0	0	0	123	125	125	129		230	260
Hexachlorobenzene	6	6	0	0	0	0	50.5	50	50	53.8		96	110
Hexachlorobutadiene	6	6	0	0	0	0	123	125	125	129		230	260
Hexachlorocyclopentadiene	6	6	0	0	0	0	123	125	125	129		230	260
Hexachloroethane	6	6	0	0	0	0	123	125	125	129		230	260
Indeno(1,2,3-cd)pyrene	6	6	2	33	110	160	130	123	129	168	49.5	230	260
Isophorone	6	6	0	0	0	0	123	125	125	129		230	260
Naphthalene	6	6	0	0	0	0	123	125	125	129		230	260
Nitrobenzene	6	6	0	0	0	0	123	125	125	129		230	260
N-Nitroso-di-N-propylamine	6	6	0	0	0	0	123	125	125	129		230	260
N-nitrosodiphenylamine	6	6	0	0	0	0	123	125	125	129		230	260
Pentachlorophenol	6	6	5	83	2.4	13	6.9	5.65	10.6	12.6	4.5	23	23
Phenanthrene	6	4	2	50	47	120	101	118	120	120	51.6	230	240
Phenol	6	6	0	0	0	0	123	125	125	129		230	260
Pyrene	6	6	3	50	120	160	132	123	144	158	20.8	230	250
Total PAHs[3]	6	6	4	67	69	1420	2010	1950	1990	2360	580	2130	3860
VOCs (ug/kg)													
1,1,1-Trichloroethane	6	6	0	0	0	0	3.64	3.68	3.75	3.79		6.8	7.6
1,1,2,2-Tetrachloroethane	6	6	0	0	0	0	3.64	3.68	3.75	3.79		6.8	7.6
1,1,2-Trichloroethane	6	6	0	0	0	0	3.64	3.68	3.75	3.79		6.8	7.6
1,1-Dichloroethane	6	6	0	0	0	0	3.64	3.68	3.75	3.79		6.8	7.6
1,1-Dichloroethene	6	6	0	0	0	0	3.37	3.4	3.45	3.49		6.3	7
1,2-Dichloroethane	6	6	0	0	0	0	3.64	3.68	3.75	3.79		6.8	7.6
1,2-Dichloroethene (total)	6	6	0	0	0	0	3.64	3.68	3.75	3.79		6.8	7.6
1,2-Dichloropropane	6	6	0	0	0	0	3.64	3.68	3.75	3.79		6.8	7.6
2-Butanone (MEK)	6	3	3	100	6.3	10	8.07	7.9	8.95	9.79	1.86	0	0
2-Hexanone	6	6	0	0	0	0	18.2	18.3	18.5	18.9		34	38
4-Methyl-2-pentanone (MIBK)	6	6	0	0	0	0	18.2	18.3	18.5	18.9		34	38
Acetone	6	6	0	0	0	0	36.4	36.6	37.5	37.9		68	76
Benzene	6	6	0	0	0	0	3.64	3.68	3.75	3.79		6.8	7.6
Bromodichloromethane	6	6	0	0	0	0	3.64	3.68	3.75	3.79		6.8	7.6
Bromoform	6	6	0	0	0	0	3.64	3.68	3.75	3.79		6.8	7.6
Bromomethane	6	6	0	0	0	0	7.25	7.25	7.5	7.5		14	15
Carbon disulfide	6	6	0	0	0	0	3.64	3.68	3.75	3.79		6.8	7.6
Carbon tetrachloride	6	6	0	0	0	0	3.64	3.68	3.75	3.79		6.8	7.6

Appendix B-3c
Creek Segment D Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Number Analyzed	Number Used	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Standard Deviation[2]	Minimum Detection Limit	Maximum Detection Limit
Chlorobenzene	6	6	5	83	2	150	31.3	5.55	17.7	118	63.7	6.8	6.8
Chloroform	6	6	0	0	0	0	3.64	3.68	3.75	3.79		6.8	7.6
Chloroethane	6	6	0	0	0	0	7.25	7.25	7.5	7.5		14	15
Chloromethane	6	6	0	0	0	0	7.25	7.25	7.5	7.5		14	15
cis-1,3-Dichloropropene	6	6	0	0	0	0	2.93	2.95	3	3.04		5.5	6.1
Dibromochloromethane	6	6	0	0	0	0	3.64	3.68	3.75	3.79		6.8	7.6
Ethylbenzene	6	6	0	0	0	0	3.64	3.68	3.75	3.79		6.8	7.6
Methylene chloride	6	4	4	100	2.3	3.2	2.68	2.6	2.98	3.16	0.45	0	0
Styrene	6	6	0	0	0	0	3.64	3.68	3.75	3.79		6.8	7.6
Tetrachloroethene	6	6	0	0	0	0	3.64	3.68	3.75	3.79		6.8	7.6
Toluene	6	1	1	100	2.9	2.9	2.9	2.9	2.9	2.9		0	0
trans-1,3-Dichloropropene	6	6	0	0	0	0	2.93	2.95	3	3.04		5.5	6.1
Trichloroethene	6	6	0	0	0	0	3.64	3.68	3.75	3.79		6.8	7.6
Vinyl chloride	6	6	0	0	0	0	7.25	7.25	7.5	7.5		14	15
Xylenes (total)	6	6	0	0	0	0	3.64	3.68	3.75	3.79		6.8	7.6
Inorganics (mg/kg)													
Aluminum	6	6	6	100	8300	14000	10900	10900	12000	13500	2120	0	0
Antimony	6	6	0	0	0	0	3.58	2.83	5.25	6.75		2.7	14
Arsenic	6	6	6	100	5.7	18	11.4	10.5	14	17.3	4.44	0	0
Barium	6	6	6	100	200	570	312	270	313	508	133	0	0
Beryllium	6	6	6	100	0.65	0.99	0.838	0.895	0.93	0.978	0.146	0	0
Cadmium	6	6	6	100	8.5	40	19.8	14.5	24.8	37	11.9	0	0
Calcium	6	6	6	100	4000	25000	8530	5550	5830	20200	8090	0	0
Chromium	6	6	6	100	41	57	49.3	49.5	54.5	56.5	6.53	0	0
Cobalt	6	6	6	100	6	12	9.47	10.1	11	11.8	2.31	0	0
Copper	6	6	6	100	79	1600	386	160	220	1260	598	0	0
Iron	6	6	6	100	14000	20000	17200	17500	18000	19500	2040	0	0
Lead	6	6	6	100	23	280	98.2	50	128	248	100	0	0
Magnesium	6	6	6	100	2900	5000	3770	3650	4000	4780	726	0	0
Manganese	6	6	6	100	100	190	137	130	158	183	35.6	0	0
Mercury	6	6	6	100	0.065	0.71	0.238	0.125	0.283	0.615	0.251	0	0
Molybdenum	6	6	2	33	4.7	7	2.33	0.65	3.71	6.43	1.63	0.96	1.5
Nickel	6	6	6	100	90	530	287	255	373	500	159	0	0
Potassium	6	6	6	100	1600	2100	1800	1700	2000	2100	237	0	0
Selenium	6	5	1	20	2.8	2.8	1.27	0.85	1.5	2.54		1	3
Silver	6	6	1	17	1.5	1.5	0.825	0.7	0.738	1.31		1.2	1.5
Sodium	6	6	6	100	120	330	175	150	175	293	79.4	0	0
Thallium	6	6	0	0	0	0	0.591	0.6	0.688	0.738		0.85	1.5
Tin	6	6	2	33	6.6	11	5.23	3.65	5.89	9.9	3.11	6.2	7.5
Vanadium	6	6	6	100	26	36	31.5	32.5	33.8	35.5	3.78	0	0
Zinc	6	6	6	100	1800	8200	4100	3100	5580	7750	2600	0	0
PCBs (ug/kg)													
Monochlorobiphenyl	6	6	1	17	3.9	3.9	2.63	2.43	2.45	3.54		4.5	4.9
Dichlorobiphenyl	6	6	0	0	0	0	2.4	2.43	2.45	2.49		4.5	5
Trichlorobiphenyl	6	6	2	33	8.2	21	6.45	2.45	6.76	17.8	9.05	4.5	4.9
Tetrachlorobiphenyl	6	6	2	33	33	340	65.4	5	26	263	217	9.2	10
Pentachlorobiphenyl	6	6	5	83	4.4	1000	180	5.35	46.4	765	439	10	10
Hexachlorobiphenyl	6	6	5	83	1.5	620	116	4.15	48.5	481	271	10	10
Heptachlorobiphenyl	6	6	2	33	26	190	40.8	7.5	21.4	149	116	14	15
Octachlorobiphenyl	6	6	2	33	9.9	50	14.8	7.5	9.3	40	28.4	14	15
Nonachlorobiphenyl	6	6	2	33	16	39	17.3	12.5	15.1	33.3	16.3	23	25
Decachlorobiphenyl	6	6	3	50	4	190	48.3	12.5	47.4	157	95.6	23	25
Total PCBs[3]	6	6	5	83	7.4	2437.2	494	61.9	236	1910	1060	5	124.7
Dioxins (ug/kg)													
1,2,3,4,6,7,8,9-OCDD	6	6	6	100	1.1	312	55.9	3.5	11.1	237	126	0	0
1,2,3,4,6,7,8-HpCDD	6	6	6	100	0.09	27.7	4.93	0.23	0.973	21.1	11.2	0	0
1,2,3,4,7,8-HxCDD	6	6	1	17	0.1	0.1	0.025	0.01	0.01	0.0775		0.02	0.02
1,2,3,6,7,8-HxCDD	6	6	1	17	0.99	0.99	0.173	0.01	0.01	0.745		0.02	0.02
1,2,3,7,8,9-HxCDD	6	6	2	33	0.06	0.29	0.065	0.01	0.0475	0.233	0.163	0.02	0.02

Appendix B-3c
Creek Segment D Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Number Analyzed	Number Used	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Standard Deviation[2]	Minimum Detection Limit	Maximum Detection Limit
1,2,3,7,8-PeCDD	6	6	0	0	0	0	0.01	0.01	0.01	0.01		0.02	0.02
2,3,7,8-TCDD	6	6	0	0	0	0	0.005	0.005	0.005	0.005		0.01	0.01
Total HpCDD	6	6	6	100	0.19	52.6	9.34	0.47	1.72	40	21.2	0	0
Total HxCDD	6	6	2	33	0.51	6.2	1.13	0.01	0.385	4.78	4.02	0.02	0.02
Total PeCDD	6	6	2	33	0.1	1.6	0.29	0.01	0.0775	1.23	1.06	0.02	0.02
Total TCDD	6	6	1	17	10.5	10.5	2.87	1.38	1.44	8.24		2.4	2.9
Furans (ug/kg)													
1,2,3,4,6,7,8,9-OCDF	6	6	6	100	0.31	174	31	1.04	7.08	133	70.2	0	0
1,2,3,4,6,7,8-HpCDF	6	6	5	83	0.09	22.6	4.06	0.18	1.04	17.3	9.92	0.02	0.02
1,2,3,4,7,8,9-HpCDF	6	6	1	17	1.1	1.1	0.192	0.01	0.01	0.828		0.02	0.02
1,2,3,4,7,8-HxCDF	6	6	1	17	0.48	0.48	0.085	0.005	0.00875	0.363		0.01	0.02
1,2,3,6,7,8-HxCDF	6	6	1	17	0.12	0.12	0.0267	0.01	0.01	0.0925		0.01	0.02
1,2,3,7,8,9-HxCDF	6	6	1	17	0.1	0.1	0.0233	0.01	0.01	0.0775		0.01	0.02
1,2,3,7,8-PeCDF	6	6	1	17	0.38	0.38	0.0717	0.01	0.01	0.288		0.02	0.02
2,3,4,6,7,8-HxCDF	6	6	1	17	0.31	0.31	0.0583	0.01	0.01	0.235		0.01	0.02
2,3,4,7,8-PeCDF	6	6	1	17	0.09	0.09	0.0233	0.01	0.01	0.07		0.02	0.02
2,3,7,8-TCDF	6	6	1	17	0.2	0.2	0.0375	0.005	0.005	0.151		0.01	0.01
Total HpCDF	6	6	6	100	0.1	85	15.1	0.585	3.22	64.8	34.3	0	0
Total HxCDF	6	6	4	67	0.04	15.6	2.72	0.06	0.463	11.8	7.69	0.01	0.02
Total PeCDF	6	6	1	17	2.5	2.5	0.425	0.01	0.01	1.88		0.02	0.02
Total TCDF	6	6	1	17	2.1	2.1	0.378	0.035	0.035	1.58		0.06	0.07
Total TEQ[10]	6	6	6	100	0.001071	0.8656	0.176	0.0304	0.052	0.675	0.35	0.03	0.0554

Appendix B-3c
Creek Segment D Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Normality Test[3]	Normal UCL[1]	Log Normal UCL[1]	Distribution[4]	Selected UCL[5]	Creek Segment Specific EPC[6]
Cyanide (mg/kg)	TRUE	0.355	0.355	NORMAL	0.355	ND
Pesticides/Herbicides (ug/kg)						
2,4,5-T	NA	NA	NA	NA	NA	5.4
2,4,5-TP (Silvex)	NA	5.92	5.91	LOGNORMAL	5.91	ND
2,4-D	NA	5.92	5.91	LOGNORMAL	5.91	ND
2,4-DB	NA	5.92	5.91	LOGNORMAL	5.91	ND
4,4'-DDD	NA	NA	NA	NA	NA	1.4
4,4'-DDE	FALSE	18.7	55.0	LOGNORMAL	55	ND
4,4'-DDT	FALSE	58.7	240	LOGNORMAL	240	56.2
Total DDT[7]	FALSE	77.2	252	LOGNORMAL	252	74.6
Aldrin	TRUE	5.13	9.0	NORMAL	5.13	5.03
alpha-BHC	FALSE	2.84	8.50	LOGNORMAL	8.5	ND
alpha-Chlordane	TRUE	6.9	12.0	NORMAL	6.88	6.78
beta-BHC	FALSE	2.84	8.50	LOGNORMAL	8.5	ND
Dalapon	TRUE	47.6	47.5	NORMAL	47.6	47.5
delta-BHC	FALSE	0.84	1.90	LOGNORMAL	1.9	0.824
Dicamba	NA	NA	NA	NA	NA	1.8
Dichlorprop	NA	NA	NA	NA	NA	21
Dieldrin	FALSE	135	690	LOGNORMAL	690	127
Dinoseb	FALSE	72.6	72.5	LOGNORMAL	72.5	ND
Endosulfan I	FALSE	9.74	29.0	LOGNORMAL	29	ND
Endosulfan II	FALSE	18.7	55.0	LOGNORMAL	55	ND
Endosulfan sulfate	NA	NA	NA	NA	NA	7.1
Endrin	FALSE	18.7	55.0	LOGNORMAL	55	ND
Endrin aldehyde	FALSE	18.7	55.0	LOGNORMAL	55	ND
Endrin ketone	FALSE	18.7	55.0	LOGNORMAL	55	ND
gamma-BHC (Lindane)	FALSE	9.74	29.0	LOGNORMAL	29	ND
gamma-Chlordane	FALSE	16.2	67.0	LOGNORMAL	67	15.5
Heptachlor	FALSE	9.74	29.0	LOGNORMAL	29	ND
Heptachlor epoxide	FALSE	9.74	29.0	LOGNORMAL	29	ND
MCPA	TRUE	1,452	1,449	NORMAL	1450	ND
MCPP	TRUE	1,452	1,449	NORMAL	1450	ND
Methoxychlor	TRUE	25.6	62.0	NORMAL	25.6	24.7
Toxaphene	FALSE	974	2,900	LOGNORMAL	2900	ND
SVOCs (ug/kg)						
1,2,4-Trichlorobenzene	TRUE	123	123	NORMAL	123	ND
1,2-Dichlorobenzene	TRUE	123	123	NORMAL	123	ND
1,3-Dichlorobenzene	TRUE	123	123	NORMAL	123	ND
1,4-Dichlorobenzene	FALSE	113	130	LOGNORMAL	130	112
2,4,5-Trichlorophenol	TRUE	123	123	NORMAL	123	ND
2,4,6-Trichlorophenol	FALSE	50.6	50.5	LOGNORMAL	50.5	ND
2,4-Dichlorophenol	TRUE	123	123	NORMAL	123	ND
2,4-Dinitrophenol	FALSE	626	624	LOGNORMAL	624	ND
2,4-Dinitrotoluene	TRUE	123	123	NORMAL	123	ND
2,6-Dinitrotoluene	TRUE	123	123	NORMAL	123	ND
2-Chloronaphthalene	TRUE	123	123	NORMAL	123	ND
2-Chlorophenol	TRUE	123	123	NORMAL	123	ND
2-Methylnaphthalene	TRUE	123	123	NORMAL	123	ND
2-Methylphenol (o-Cresol)	TRUE	123	123	NORMAL	123	ND
2-Nitroaniline	FALSE	626	624	LOGNORMAL	624	ND
2-Nitrophenol	TRUE	123	123	NORMAL	123	ND
3&4Methylphenol	TRUE	123	123	NORMAL	123	ND
3,3`-Dichlorobenzidine	TRUE	240	240	NORMAL	240	ND
3-Nitroaniline	FALSE	626	624	LOGNORMAL	624	ND
4,6-Dinitro-2-methylphenol	FALSE	626	624	LOGNORMAL	624	ND
4-Bromophenyl phenyl ether	TRUE	123	123	NORMAL	123	ND
4-Chloro-3-methylphenol	TRUE	123	123	NORMAL	123	ND
4-Chloroaniline	TRUE	240	240	NORMAL	240	ND
4-Chlorophenyl phenyl ether	TRUE	123	123	NORMAL	123	ND

Appendix B-3c
Creek Segment D Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Normality Test[3]	Normal UCL[1]	Log Normal UCL[1]	Distribution[4]	Selected UCL[5]	Creek Segment Specific EPC[6]
4-Nitroaniline	FALSE	626	624	LOGNORMAL	624	ND
4-Nitrophenol	FALSE	626	624	LOGNORMAL	624	ND
Acenaphthene	TRUE	123	123	NORMAL	123	ND
Acenaphthylene	TRUE	123	123	NORMAL	123	ND
Anthracene	TRUE	123	123	NORMAL	123	ND
Benzo(a)anthracene	TRUE	123	123	NORMAL	123	ND
Benzo(a)pyrene	FALSE	86	140	LOGNORMAL	140	84.8
Benzo(b)fluoranthene	FALSE	137	164	LOGNORMAL	164	136
Benzo(g,h,i)perylene	FALSE	141	176	LOGNORMAL	176	140
Benzo(k)fluoranthene	FALSE	138	170	LOGNORMAL	170	138
Bis(2-chloroethoxy)methane	TRUE	123	123	NORMAL	123	ND
Bis(2-chloroethyl)ether	TRUE	123	123	NORMAL	123	ND
Bis(2-chloroisopropyl ether)	TRUE	123	123	NORMAL	123	ND
Bis(2-ethylhexyl)phthalate	TRUE	123	123	NORMAL	123	ND
Butylbenzylphthalate	TRUE	123	123	NORMAL	123	ND
Carbazole	TRUE	123	123	NORMAL	123	ND
Chrysene	TRUE	123	123	NORMAL	123	ND
Dibenzo(a,h)anthracene	TRUE	65.1	64.9	NORMAL	65.1	ND
Dibenzofuran	TRUE	123	123	NORMAL	123	ND
Diethyl phthalate	TRUE	123	123	NORMAL	123	ND
Dimethyl phthalate	TRUE	123	123	NORMAL	123	ND
di-n-Butylphthalate	TRUE	123	123	NORMAL	123	ND
di-n-Octylphthalate	TRUE	123	123	NORMAL	123	ND
Fluoranthene	TRUE	132	190	NORMAL	132	131
Fluorene	TRUE	123	123	NORMAL	123	ND
Hexachlorobenzene	FALSE	50.6	50.5	LOGNORMAL	50.5	ND
Hexachlorobutadiene	TRUE	123	123	NORMAL	123	ND
Hexachlorocyclopentadiene	TRUE	123	123	NORMAL	123	ND
Hexachloroethane	TRUE	123	123	NORMAL	123	ND
Indeno(1,2,3-cd)pyrene	FALSE	131	153	LOGNORMAL	153	130
Isophorone	TRUE	123	123	NORMAL	123	ND
Naphthalene	TRUE	123	123	NORMAL	123	ND
Nitrobenzene	TRUE	123	123	NORMAL	123	ND
N-Nitroso-di-N-propylamine	TRUE	123	123	NORMAL	123	ND
N-nitrosodiphenylamine	TRUE	123	123	NORMAL	123	ND
Pentachlorophenol	TRUE	7.02	13.0	NORMAL	7.02	6.9
Phenanthrene	FALSE	102	120	LOGNORMAL	120	101
Phenol	TRUE	123	123	NORMAL	123	ND
Pyrene	TRUE	132	149	NORMAL	132	132
Total PAHs[8]	FALSE	2,016	2,219	LOGNORMAL	2220	2010
VOCs (ug/kg)						
1,1,1-Trichloroethane	TRUE	3.65	3.64	NORMAL	3.65	ND
1,1,2,2-Tetrachloroethane	TRUE	3.65	3.64	NORMAL	3.65	ND
1,1,2-Trichloroethane	TRUE	3.65	3.64	NORMAL	3.65	ND
1,1-Dichloroethane	TRUE	3.65	3.64	NORMAL	3.65	ND
1,1-Dichloroethene	TRUE	3.37	3.36	NORMAL	3.37	ND
1,2-Dichloroethane	TRUE	3.65	3.64	NORMAL	3.65	ND
1,2-Dichloroethene (total)	TRUE	3.65	3.64	NORMAL	3.65	ND
1,2-Dichloropropane	TRUE	3.65	3.64	NORMAL	3.65	ND
2-Butanone (MEK)	TRUE	8.1	7.9	NORMAL	8.14	8.07
2-Hexanone	TRUE	18.2	18.2	NORMAL	18.2	ND
4-Methyl-2-pentanone (MIBK)	TRUE	18.2	18.2	NORMAL	18.2	ND
Acetone	TRUE	36.5	36.4	NORMAL	36.5	ND
Benzene	TRUE	3.65	3.64	NORMAL	3.65	ND
Bromodichloromethane	TRUE	3.65	3.64	NORMAL	3.65	ND
Bromoform	TRUE	3.65	3.64	NORMAL	3.65	ND
Bromomethane	FALSE	7.26	7.25	LOGNORMAL	7.25	ND
Carbon disulfide	TRUE	3.65	3.64	NORMAL	3.65	ND
Carbon tetrachloride	TRUE	3.65	3.64	NORMAL	3.65	ND

Appendix B-3c
Creek Segment D Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Normality Test[3]	Normal UCL[1]	Log Normal UCL[1]	Distribution[4]	Selected UCL[5]	Creek Segment Specific EPC[6]
Chlorobenzene	FALSE	32.8	150	LOGNORMAL	150	31.3
Chloroform	TRUE	3.65	3.64	NORMAL	3.65	ND
Chloroethane	FALSE	7.26	7.25	LOGNORMAL	7.25	ND
Chloromethane	FALSE	7.26	7.25	LOGNORMAL	7.25	ND
cis-1,3-Dichloropropene	TRUE	2.93	2.92	NORMAL	2.93	ND
Dibromochloromethane	TRUE	3.65	3.64	NORMAL	3.65	ND
Ethylbenzene	TRUE	3.65	3.64	NORMAL	3.65	ND
Methylene chloride	TRUE	2.69	3.20	NORMAL	2.69	2.68
Styrene	TRUE	3.65	3.64	NORMAL	3.65	ND
Tetrachloroethene	TRUE	3.65	3.64	NORMAL	3.65	ND
Toluene	NA	NA	NA	NA	NA	2.9
trans-1,3-Dichloropropene	TRUE	2.93	2.92	NORMAL	2.93	ND
Trichloroethene	TRUE	3.65	3.64	NORMAL	3.65	ND
Vinyl chloride	FALSE	7.26	7.25	LOGNORMAL	7.25	ND
Xylenes (total)	TRUE	3.65	3.64	NORMAL	3.65	ND
Inorganics (mg/kg)						
Aluminum	TRUE	10,957	13,090	NORMAL	11000	10900
Antimony	TRUE	3.64	7.00	NORMAL	3.64	ND
Arsenic	TRUE	11.5	18.0	NORMAL	11.5	11.4
Barium	FALSE	315	459	LOGNORMAL	459	312
Beryllium	TRUE	0.842	0.990	NORMAL	0.842	0.838
Cadmium	TRUE	20.1	40.0	NORMAL	20.1	19.8
Calcium	FALSE	8,751	20,482	LOGNORMAL	20500	8530
Chromium	TRUE	49.5	55.6	NORMAL	49.5	49.3
Cobalt	TRUE	9.53	12.0	NORMAL	9.53	9.47
Copper	FALSE	402	1,600	LOGNORMAL	1600	386
Iron	TRUE	17,222	19,128	NORMAL	17200	17200
Lead	FALSE	101	280	LOGNORMAL	280	98.2
Magnesium	TRUE	3,786	4,481	NORMAL	3790	3770
Manganese	TRUE	138	176	NORMAL	138	137
Mercury	FALSE	0.244	0.710	LOGNORMAL	0.71	0.238
Molybdenum	FALSE	2.41	7.00	LOGNORMAL	7	2.33
Nickel	TRUE	291	530	NORMAL	291	287
Potassium	FALSE	1,806	2,016	LOGNORMAL	2020	1800
Selenium	TRUE	1.30	2.80	NORMAL	1.3	1.27
Silver	FALSE	0.834	1.15	LOGNORMAL	1.15	0.825
Sodium	FALSE	177	263	LOGNORMAL	263	175
Thallium	TRUE	0.594	0.736	NORMAL	0.594	ND
Tin	FALSE	5.32	9.50	LOGNORMAL	9.5	5.23
Vanadium	TRUE	31.6	35.2	NORMAL	31.6	31.5
Zinc	TRUE	4,170	8,200	NORMAL	4170	4100
PCBs (ug/kg)						
Monochlorobiphenyl	FALSE	2.65	3.19	LOGNORMAL	3.19	2.63
Dichlorobiphenyl	TRUE	2.40	2.40	NORMAL	2.4	ND
Trichlorobiphenyl	FALSE	6.65	21.0	LOGNORMAL	21	6.45
Tetrachlorobiphenyl	FALSE	69.0	340	LOGNORMAL	340	65.4
Pentachlorobiphenyl	FALSE	191	1,000	LOGNORMAL	1000	180
Hexachlorobiphenyl	FALSE	123	620	LOGNORMAL	620	116
Heptachlorobiphenyl	FALSE	42.8	190	LOGNORMAL	190	40.8
Octachlorobiphenyl	FALSE	15.3	45.9	LOGNORMAL	45.9	14.8
Nonachlorobiphenyl	FALSE	17.5	29.5	LOGNORMAL	29.5	17.3
Decachlorobiphenyl	FALSE	50.2	190	LOGNORMAL	190	48.3
Total PCBs[6]	FALSE	520	2,442	LOGNORMAL	2440	494
Dioxins (ug/kg)						
1,2,3,4,6,7,8,9-OCDD	FALSE	59.2	312	LOGNORMAL	312	55.9
1,2,3,4,6,7,8-HpCDD	FALSE	5.23	27.7	LOGNORMAL	27.7	4.93
1,2,3,4,7,8-HxCDD	NA	0.0260	0.100	LOGNORMAL	0.1	0.025
1,2,3,6,7,8-HxCDD	NA	0.184	0.990	LOGNORMAL	0.99	0.173
1,2,3,7,8,9-HxCDD	FALSE	0.0680	0.290	LOGNORMAL	0.29	0.065

Appendix B-3c
Creek Segment D Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Normality Test[3]	Normal UCL[1]	Log Normal UCL[1]	Distribution[4]	Selected UCL[5]	Creek Segment Specific EPC[6]
1,2,3,7,8-PeCDD	TRUE	0.0100	0.0100	NORMAL	0.01	ND
2,3,7,8-TCDD	TRUE	0.00500	0.00500	NORMAL	0.005	ND
Total HpCDD	FALSE	9.91	52.6	LOGNORMAL	52.6	9.34
Total HxCDD	FALSE	1.19	6.20	LOGNORMAL	6.2	1.13
Total PeCDD	FALSE	0.307	1.60	LOGNORMAL	1.6	0.29
Total TCDD	FALSE	2.97	10.5	LOGNORMAL	10.5	2.87
Furans (ug/kg)						
1,2,3,4,6,7,8,9-OCDF	FALSE	32.8	174	LOGNORMAL	174	31
1,2,3,4,6,7,8-HpCDF	FALSE	4.30	22.6	LOGNORMAL	22.6	4.06
1,2,3,4,7,8,9-HpCDF	NA	0.204	1.10	LOGNORMAL	1.1	0.192
1,2,3,4,7,8-HxCDF	FALSE	0.0902	0.480	LOGNORMAL	0.48	0.085
1,2,3,6,7,8-HxCDF	FALSE	0.0279	0.120	LOGNORMAL	0.12	0.0267
1,2,3,7,8,9-HxCDF	FALSE	0.0243	0.100	LOGNORMAL	0.1	0.0233
1,2,3,7,8-PeCDF	NA	0.0757	0.380	LOGNORMAL	0.38	0.0717
2,3,4,6,7,8-HxCDF	FALSE	0.0617	0.310	LOGNORMAL	0.31	0.0583
2,3,4,7,8-PeCDF	NA	0.0242	0.0900	LOGNORMAL	0.09	0.0233
2,3,7,8-TCDF	NA	0.0396	0.200	LOGNORMAL	0.2	0.0375
Total HpCDF	FALSE	16.0	85.0	LOGNORMAL	85	15.1
Total HxCDF	FALSE	2.89	15.6	LOGNORMAL	15.6	2.72
Total PeCDF	NA	0.452	2.50	LOGNORMAL	2.5	0.425
Total TCDF	FALSE	0.401	2.10	LOGNORMAL	2.1	0.378
Total TEQ[10]	FALSE	0.186	0.881	LOGNORMAL	0.881	0.176

ND = not detected
NA = not available
EPC = Exposure Point Concentration
UCL = 95th Percent Upper Confidence Limit on the mean
Duplicates have been averaged (see text for details).
[1]Average and percentiles calculated assuming 1/2 detection limit for non-detects
[2]Standard deviation calculated for detected concentrations only
[3]Normality Test based on Shapiro-Wilks W Test (p = 0.05). If NA, insufficient amount of data (N<3) to conduct test. If FALSE, data does not have a normal distribution. If TRUE, data has a normal underlying distribution.
[4]Data are assumed to be either normally or lognormally distributed. If the data do not have a normal underlying distribution as determined by the Shapiro-Wilks W Test, *data are assumed to be lognormal.*
[5]Selected UCL determined by the determined distribution of the data (either normally or lognormally distributed).
[6]For compounds with less than 10 samples available for analyses, the EPC is the average concentration. If the selected UCL exceeds the maximum detected concentration, the maximum is used. Otherwise, the selected UCL is used as the EPC.
[7]Total DDT is the sum of 4,4'-DDD, 4,4'-DDE and 4,4'-DDT. For nondetects, half the detection limit is used.
[8]Total PAHs is the sum of all measured carcinogenic and noncarcinogenic PAHs. For nondetects, half the detection is used.
[9]Total PCBs equals the sum of the homologs. For nondetects, half the detection limit is used.
[10]Total TEQ is based on Toxic Equivalency Factors for Humans/Mammals as developed by Van den Berg, et al., 1998. For nondetects, half the detection limit is used.

Appendix B-3d
Creek Segment E Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Number Analyzed	Number Used in Analyses	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Standard Deviation[2]	Minimum Detection Limit	Maximum Detection Limit
Cyanide (mg/kg)	16	16	0	0	0	0	0.371	0.365	0.388	0.455		0.63	1
Pesticides/Herbicides (ug/kg)													
2,4,5-T	17	17	0	0	0	0	6.15	6	6	7.3		10	17
2,4,5-TP (Silvex)	17	17	0	0	0	0	6.15	6	6	7.3		10	17
2,4-D	17	17	2	12	16	35	8.32	6	6.5	19.8	13.4	10	14
2,4-DB	17	17	0	0	0	0	6.15	6	6	7.3		10	17
4,4'-DDD	17	17	2	12	0.59	47	6.18	2.4	2.55	23	32.8	4.2	34
4,4'-DDE	17	15	6	40	0.24	7.2	2.06	2.3	2.43	3.98	2.75	4.2	5.2
4,4'-DDT	17	17	7	41	0.56	17	4.48	2.3	2.55	17	6.37	4.2	34
Total DDT[7]	17	17	10	59	0.24	63.3	12.5	6.45	7.65	39.9	19.8	4.4	68
Aldrin	17	17	0	0	0	0	2.24	1.25	1.3	7.7		2.2	17
alpha-BHC	17	15	1	7	1.3	1.3	0.42	0.36	0.375	0.666		0.63	0.79
alpha-Chlordane	17	17	1	6	8.7	8.7	2.31	1.25	1.3	8.54		2.2	17
beta-BHC	17	17	0	0	0	0	0.662	0.37	0.385	2.27		0.63	5.1
Dalapon	17	17	0	0	0	0	48.1	48	48.5	57		82	130
delta-BHC	17	17	0	0	0	0	0.662	0.37	0.385	2.27		0.63	5.1
Dicamba	17	1	1	100	2.5	2.5	2.5	2.5	2.5	2.5		0	0
Dichlorprop	17	17	0	0	0	0	74.7	75	75	92		130	200
Dieldrin	17	17	13	76	0.19	34	5.45	1.3	2.55	28.4	11.2	4.6	5.1
Dinoseb	14	14	0	0	0	0	76.1	75	75	93.5		140	200
Endosulfan I	17	3	3	100	0.11	0.17	0.143	0.15	0.16	0.168	0.0306	0	0
Endosulfan II	17	1	1	100	0.66	0.66	0.66	0.66	0.66	0.66		0	0
Endosulfan sulfate	17	17	2	12	1.5	16	3.56	2.4	2.45	11.2	10.3	4.2	20
Endrin	17	17	0	0	0	0	4.38	2.4	2.55	15		4.2	34
Endrin aldehyde	17	17	0	0	0	0	4.38	2.4	2.55	15		4.2	34
Endrin ketone	17	17	0	0	0	0	4.38	2.4	2.55	15		4.2	34
gamma-BHC (Lindane)	17	17	0	0	0	0	2.24	1.25	1.3	7.7		2.2	17
gamma-Chlordane	17	16	2	13	0.24	5.5	1.66	1.23	1.26	5.13	3.72	2.2	10
Heptachlor	17	17	0	0	0	0	2.24	1.25	1.3	7.7		2.2	17
Heptachlor epoxide	17	5	5	100	0.18	0.59	0.434	0.52	0.58	0.588	0.184	0	0
MCPA	17	17	0	0	0	0	1490	1450	1500	1810		2500	4100
MCPP	17	17	0	0	0	0	1490	1450	1500	1810		2500	4100
Methoxychlor	17	3	3	100	0.49	0.89	0.72	0.78	0.835	0.879	0.207	0	0
Toxaphene	17	17	0	0	0	0	224	125	130	770		220	1700
SVOCs (ug/kg)													
1,2,4-Trichlorobenzene	17	17	0	0	0	0	127	125	125	155		220	350
1,2-Dichlorobenzene	17	17	0	0	0	0	127	125	125	155		220	350
1,3-Dichlorobenzene	17	17	0	0	0	0	127	125	125	155		220	350
1,4-Dichlorobenzene	17	17	1	6	230	230	130	125	125	166		220	300
2,4,5-Trichlorophenol	17	17	0	0	0	0	127	125	125	155		220	350
2,4,6-Trichlorophenol	17	17	0	0	0	0	51.4	50	50	62		89	140
2,4-Dichlorophenol	17	17	0	0	0	0	127	125	125	155		220	350
2,4-Dinitrophenol	17	17	0	0	0	0	629	600	650	770		1100	1700
2,4-Dinitrotoluene	17	17	0	0	0	0	127	125	125	155		220	350
2,6-Dinitrotoluene	17	17	0	0	0	0	127	125	125	155		220	350
2-Chloronaphthalene	17	17	0	0	0	0	127	125	125	155		220	350
2-Chlorophenol	17	17	0	0	0	0	127	125	125	155		220	350
2-Methylnaphthalene	17	17	0	0	0	0	127	125	125	155		220	350
2-Methylphenol (o-Cresol)	17	17	0	0	0	0	127	125	125	155		220	350
2-Nitroaniline	17	17	0	0	0	0	629	600	650	770		1100	1700
2-Nitrophenol	17	17	0	0	0	0	127	125	125	155		220	350
3&4Methylphenol	17	17	0	0	0	0	127	125	125	155		220	350
3,3'-Dichlorobenzidine	17	17	0	0	0	0	245	240	245	299		420	670
3-Nitroaniline	17	17	0	0	0	0	629	600	650	770		1100	1700
4,6-Dinitro-2-methylphenol	17	17	0	0	0	0	629	600	650	770		1100	1700
4-Bromophenyl phenyl ether	17	17	0	0	0	0	127	125	125	155		220	350
4-Chloro-3-methylphenol	17	17	0	0	0	0	127	125	125	155		220	350
4-Chloroaniline	17	17	0	0	0	0	245	240	245	299		420	670
4-Chlorophenyl phenyl ether	17	17	0	0	0	0	127	125	125	155		220	350

Appendix B-3d
Creek Segment E Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Number Analyzed	Number Used in Analyses	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Standard Deviation[2]	Minimum Detection Limit	Maximum Detection Limit
4-Nitroaniline	17	17	0	0	0	0	629	600	650	770		1100	1700
4-Nitrophenol	17	17	0	0	0	0	629	600	650	770		1100	1700
Acenaphthene	17	17	0	0	0	0	127	125	125	155		220	350
Acenaphthylene	17	17	0	0	0	0	127	125	125	155		220	350
Anthracene	17	1	1	100	50	50	50	50	50	50		0	0
Benzo(a)anthracene	17	17	3	18	58	260	125	120	125	160	105	220	270
Benzo(a)pyrene	17	17	3	18	72	420	89.5	65	70	196	184	110	140
Benzo(b)fluoranthene	17	17	4	24	37	510	141	120	125	238	212	220	270
Benzo(g,h,i)perylene	17	17	3	18	69	350	135	125	125	206	142	220	270
Benzo(k)fluoranthene	17	17	3	18	83	370	135	125	125	186	152	220	270
Bis(2-chloroethoxy)methane	17	17	0	0	0	0	127	125	125	155		220	350
Bis(2-chloroethyl)ether	17	17	0	0	0	0	127	125	125	155		220	350
Bis(2-chloroisopropyl ether)	17	17	0	0	0	0	127	125	125	155		220	350
Bis(2-ethylhexyl)phthalate	17	1	1	100	77	77	77	77	77	77		0	0
Butylbenzylphthalate	17	17	0	0	0	0	127	125	125	155		220	350
Carbazole	17	17	0	0	0	0	127	125	125	155		220	350
Chrysene	17	17	4	24	37	370	131	120	125	202	147	220	270
Dibenzo(a,h)anthracene	17	17	1	6	140	140	69.1	65	65	92		110	160
Dibenzofuran	17	17	0	0	0	0	127	125	125	155		220	350
Diethyl phthalate	17	17	0	0	0	0	127	125	125	155		220	350
Dimethyl phthalate	17	17	0	0	0	0	127	125	125	155		220	350
di-n-Butylphthalate	17	1	1	100	74	74	74	74	74	74		0	0
di-n-Octylphthalate	17	17	0	0	0	0	127	125	125	155		220	350
Fluoranthene	17	17	4	24	59	710	163	120	125	382	294	220	270
Fluorene	17	17	0	0	0	0	127	125	125	155		220	350
Hexachlorobenzene	17	17	0	0	0	0	51.4	50	50	62		89	140
Hexachlorobutadiene	17	17	0	0	0	0	127	125	125	155		220	350
Hexachlorocyclopentadiene	16	16	0	0	0	0	127	125	126	156		220	350
Hexachloroethane	17	17	0	0	0	0	127	125	125	155		220	350
Indeno(1,2,3-cd)pyrene	17	17	2	12	160	350	138	125	125	198	134	220	270
Isophorone	17	17	0	0	0	0	127	125	125	155		220	350
Naphthalene	17	17	0	0	0	0	127	125	125	155		220	350
Nitrobenzene	17	17	0	0	0	0	127	125	125	155		220	350
N-Nitroso-di-N-propylamine	17	17	0	0	0	0	127	125	125	155		220	350
N-nitrosodiphenylamine	17	17	0	0	0	0	127	125	125	155		220	350
Pentachlorophenol	17	17	7	41	1.6	33	11.3	12	12.5	19.4	11.6	22	27
Phenanthrene	17	17	4	24	23	290	123	125	125	166	120	220	270
Phenol	17	17	0	0	0	0	127	125	125	155		220	350
Pyrene	17	17	3	18	100	480	147	125	125	272	194	220	270
Total PAHs[8]	17	17	5	29	23	4300	2030	1810	1880	3060	1760	1630	4060
VOCs (ug/kg)													
1,1,1-Trichloroethane	17	17	0	0	0	0	3.66	3.5	3.75	4.9		5.8	11
1,1,2,2-Tetrachloroethane	17	17	0	0	0	0	3.66	3.5	3.75	4.9		5.8	11
1,1,2-Trichloroethane	17	17	0	0	0	0	3.66	3.5	3.75	4.9		5.8	11
1,1-Dichloroethane	17	17	0	0	0	0	3.66	3.5	3.75	4.9		5.8	11
1,1-Dichloroethene	17	17	0	0	0	0	3.37	3.25	3.45	4.52		5.4	10
1,2-Dichloroethane	17	17	0	0	0	0	3.66	3.5	3.75	4.9		5.8	11
1,2-Dichloroethene (total)	17	17	0	0	0	0	3.66	3.5	3.75	4.9		5.8	11
1,2-Dichloropropane	17	17	0	0	0	0	3.66	3.5	3.75	4.9		5.8	11
2-Butanone (MEK)	17	5	5	100	7.3	14	10.6	11	12	13.6	2.62	0	0
2-Hexanone	17	17	0	0	0	0	18.4	17.5	19	24.7		29	55
4-Methyl-2-pentanone (MIBK)	17	17	0	0	0	0	18.4	17.5	19	24.7		29	55
Acetone	17	17	9	53	18	73	37.4	35.5	38.5	64.2	19.6	63	77
Benzene	17	17	0	0	0	0	3.66	3.5	3.75	4.9		5.8	11
Bromodichloromethane	17	17	0	0	0	0	3.66	3.5	3.75	4.9		5.8	11
Bromoform	17	17	0	0	0	0	3.66	3.5	3.75	4.9		5.8	11
Bromomethane	17	17	0	0	0	0	7.35	7	7.5	9.8		12	22
Carbon disulfide	17	17	0	0	0	0	3.66	3.5	3.75	4.9		5.8	11
Carbon tetrachloride	17	17	0	0	0	0	3.66	3.5	3.75	4.9		5.8	11

Appendix B-3d
Creek Segment E Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Number Analyzed	Number Used in Analyses	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Standard Deviation[2]	Minimum Detection Limit	Maximum Detection Limit
Chlorobenzene	17	17	12	71	2	210	23.3	5.1	13	94.8	59	6	8.6
Chloroform	17	17	0	0	0	0	3.66	3.5	3.75	4.9		5.8	11
Chloroethane	17	17	0	0	0	0	7.35	7	7.5	9.8		12	22
Chloromethane	17	17	0	0	0	0	7.35	7	7.5	9.8		12	22
cis-1,3-Dichloropropene	17	17	0	0	0	0	2.94	2.8	3	3.93		4.7	8.9
Dibromochloromethane	17	17	0	0	0	0	3.66	3.5	3.75	4.9		5.8	11
Ethylbenzene	17	17	1	6	4.9	4.9	3.63	3.5	3.75	4.78		5.8	9.5
Methylene chloride	17	6	3	50	1.8	3.3	2.79	3.05	3.24	3.29	0.764	5.8	6.5
Styrene	17	17	0	0	0	0	3.66	3.5	3.75	4.9		5.8	11
Tetrachloroethene	17	17	0	0	0	0	3.66	3.5	3.75	4.9		5.8	11
Toluene	17	17	3	18	2.6	5.7	3.78	3.7	3.8	5.54	1.57	5.8	11
trans-1,3-Dichloropropene	17	17	0	0	0	0	2.94	2.8	3	3.93		4.7	8.9
Trichloroethene	17	17	0	0	0	0	3.66	3.5	3.75	4.9		5.8	11
Vinyl chloride	17	17	0	0	0	0	7.35	7	7.5	9.8		12	22
Xylenes (total)	17	17	0	0	0	0	3.66	3.5	3.75	4.9		5.8	11
Inorganics (mg/kg)													
Aluminum	17	17	17	100	5500	14000	9970	10100	11000	12400	2220	0	0
Antimony	17	17	3	18	0.75	4.7	1.43	1.3	1.4	2.22	2.22	1	3.2
Arsenic	17	17	16	94	2.8	20	8.08	7.1	8.8	14.4	3.99	3.4	3.4
Barium	17	17	17	100	150	640	252	240	250	352	105	0	0
Beryllium	17	17	17	100	0.31	1.1	0.744	0.79	0.84	0.956	0.198	0	0
Cadmium	17	17	17	100	3.1	38	14.2	13	16	34	9.92	0	0
Calcium	17	17	17	100	3300	13000	8020	7100	12000	13000	3270	0	0
Chromium	17	17	17	100	14	170	47.3	21	57	130	45.2	0	0
Cobalt	17	17	17	100	3.2	13	8.08	8.2	9	11.4	2.4	0	0
Copper	17	17	17	100	24.5	4300	425	94	350	1270	1010	0	0
Iron	17	17	17	100	7500	27000	17800	19000	20000	24600	4980	0	0
Lead	17	17	17	100	17	400	78.5	44	89	216	93.7	0	0
Magnesium	17	17	17	100	1500	6900	4510	4400	5600	6660	1590	0	0
Manganese	17	17	17	100	61	300	173	170	210	268	63.6	0	0
Mercury	17	17	17	100	0.083	1.6	0.406	0.27	0.6	0.992	0.384	0	0
Molybdenum	17	17	2	12	0.46	1.5	0.365	0.23	0.46	0.82	0.735	0.21	1.3
Nickel	17	17	17	100	44	600	181	170	200	368	131	0	0
Potassium	17	17	17	100	1300	2900	2070	2200	2400	2660	450	0	0
Selenium	17	17	0	0	0	0	0.66	0.65	0.7	0.84		0.71	2
Silver	17	17	3	18	0.61	9.8	1.2	0.65	0.7	2.56	5.3	1.2	1.5
Sodium	17	17	17	100	160	390	241	240	280	326	58.6	0	0
Thallium	17	16	1	6	0.88	0.88	0.656	0.65	0.713	0.858		0.91	1.7
Tin	17	17	3	18	6.7	31	5.59	3.4	3.6	15	13	5.8	7.4
Vanadium	17	17	17	100	18	39	29.5	31	32	37.4	5.93	0	0
Zinc	17	17	17	100	320	5900	1920	1900	2600	3500	1350	0	0
PCBs (ug/kg)													
Monochlorobiphenyl	17	17	0	0	0	0	2.45	2.4	2.45	2.99		4.2	6.7
Dichlorobiphenyl	17	17	1	6	5.7	5.7	2.59	2.4	2.45	3.46		4.2	5.8
Trichlorobiphenyl	17	17	3	18	1.1	64	5.86	2.4	2.45	15.1	36.3	4.2	5.8
Tetrachlorobiphenyl	17	17	5	29	2.4	160	22.1	4.9	5	144	79.3	8.5	11
Pentachlorobiphenyl	17	17	10	59	1.1	570	67.9	5	18	418	197	8.5	10
Hexachlorobiphenyl	17	17	9	53	1.3	240	25	5	10	114	77.8	8.5	10
Heptachlorobiphenyl	17	17	3	18	5.9	64	12.4	7	7.5	45.8	29.3	13	16
Octachlorobiphenyl	17	17	2	12	16	32	9.26	7.5	7.5	19.2	11.3	13	18
Nonachlorobiphenyl	17	17	3	18	3.9	94	17.6	12	12.5	46.8	45.8	21	26
Decachlorobiphenyl	17	17	7	41	6.2	180	24	11.5	12.5	87.2	64.4	21	26
Total PCBs[3]	17	17	10	59	2.4	1251.7	189	63.1	75	989	449	6.7	127.3
Dioxins (ug/kg)													
1,2,3,4,6,7,8,9-OCDD	17	17	14	82	0.51	47.4	6.62	2.3	3.5	39.1	14.7	0.19	0.32
1,2,3,4,6,7,8-HpCDD	17	17	13	76	0.045	4.5	0.577	0.23	0.3	3.22	1.35	0.03	0.06
1,2,3,4,7,8-HxCDD	17	17	0	0	0	0	0.0102	0.01	0.015	0.02		0.006	0.04
1,2,3,6,7,8-HxCDD	17	17	5	29	0.01	0.12	0.0237	0.015	0.02	0.096	0.0531	0.006	0.04
1,2,3,7,8,9-HxCDD	17	17	1	6	0.11	0.11	0.0173	0.01	0.015	0.042		0.006	0.05

Appendix B-3d
Creek Segment E Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Number Analyzed	Number Used in Analyses	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Standard Deviation[2]	Minimum Detection Limit	Maximum Detection Limit
1,2,3,7,8-PeCDD	17	17	1	6	0.04	0.04	0.0152	0.015	0.02	0.028		0.008	0.05
2,3,7,8-TCDD	17	17	0	0	0	0	0.00847	0.01	0.01	0.015		0.006	0.03
Total HpCDD	17	17	13	76	0.095	8.6	1.13	0.46	0.59	6.36	2.61	0.03	0.06
Total HxCDD	17	17	7	41	0.05	1.8	0.205	0.02	0.07	1.32	0.718	0.006	0.04
Total PeCDD	17	17	3	18	0.03	1.5	0.143	0.015	0.025	0.86	0.736	0.008	0.05
Total TCDD	17	17	0	0	0	0	1.24	1.25	1.3	1.38		2	3
Furans (ug/kg)													
1,2,3,4,6,7,8,9-OCDF	17	17	14	82	0.105	16.6	2.43	0.98	1.3	15.2	5.46	0.05	0.08
1,2,3,4,6,7,8-HpCDF	17	17	11	65	0.025	2.1	0.314	0.15	0.19	1.78	0.712	0.02	0.05
1,2,3,4,7,8,9-HpCDF	17	17	2	12	0.1	0.1	0.0219	0.015	0.015	0.1	0	0.005	0.05
1,2,3,4,7,8-HxCDF	17	17	2	12	0.05	0.05	0.0123	0.01	0.01	0.05	0	0.004	0.03
1,2,3,6,7,8-HxCDF	17	17	2	12	0.03	0.04	0.0119	0.01	0.015	0.032	0.00707	0.003	0.04
1,2,3,7,8,9-HxCDF	17	17	0	0	0	0	0.0085	0.01	0.01	0.016		0.004	0.04
1,2,3,7,8-PeCDF	17	17	0	0	0	0	0.0103	0.01	0.015	0.02		0.007	0.04
2,3,4,6,7,8-HxCDF	17	17	0	0	0	0	0.00821	0.01	0.01	0.015		0.004	0.03
2,3,4,7,8-PeCDF	17	17	0	0	0	0	0.0112	0.01	0.015	0.02		0.007	0.04
2,3,7,8-TCDF	17	17	2	12	0.04	0.05	0.0119	0.01	0.01	0.042	0.00707	0.006	0.03
Total HpCDF	17	17	12	71	0.06	8.3	1.26	0.55	0.72	7.9	2.94	0.02	0.05
Total HxCDF	17	17	11	65	0.009	2.2	0.234	0.05	0.12	1.17	0.661	0.02	0.03
Total PeCDF	17	17	2	12	0.91	1.3	0.139	0.01	0.015	0.988	0.276	0.007	0.04
Total TCDF	17	17	2	12	1.3	1.6	0.203	0.035	0.04	1.36	0.212	0.05	0.11
Total TEQ[10]	17	17	14	82	0.000064	0.15023	0.0503	0.0433	0.052	0.113	0.0421	0.0185	0.1325

Appendix B-3d
Creek Segment E Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Normality Test[3]	Normal UCL[1]	Log Normal UCL[1]	Distribution[4]	Selected UCL[5]	Creek Segment Specific EPC[6]
Cyanide (mg/kg)	TRUE	0.372	0.392	NORMAL	0.372	ND
Pesticides/Herbicides (ug/kg)						
2,4,5-T	FALSE	6.16	6.46	LOGNORMAL	6.46	ND
2,4,5-TP (Silvex)	FALSE	6.16	6.46	LOGNORMAL	6.46	ND
2,4-D	FALSE	8.44	10.1	LOGNORMAL	10.1	10.1
2,4-DB	FALSE	6.16	6.46	LOGNORMAL	6.46	ND
4,4'-DDD	FALSE	6.36	9.85	LOGNORMAL	9.85	9.85
4,4'-DDE	FALSE	2.09	4.77	LOGNORMAL	4.77	4.77
4,4'-DDT	FALSE	4.57	9.37	LOGNORMAL	9.37	9.37
Total DDT[7]	FALSE	12.72	19.34	LOGNORMAL	19.3	19.3
Aldrin	FALSE	2.27	3.07	LOGNORMAL	3.07	ND
alpha-BHC	FALSE	0.424	0.490	LOGNORMAL	0.49	0.49
alpha-Chlordane	FALSE	2.35	3.19	LOGNORMAL	3.19	3.19
beta-BHC	FALSE	0.673	0.911	LOGNORMAL	0.911	ND
Dalapon	FALSE	48.2	50.4	LOGNORMAL	50.4	ND
delta-BHC	FALSE	0.673	0.911	LOGNORMAL	0.911	ND
Dicamba	NA	NA	NA	NA	NA	2.5
Dichlorprop	FALSE	74.8	78.3	LOGNORMAL	78.3	ND
Dieldrin	FALSE	5.60	22.6	LOGNORMAL	22.6	22.6
Dinoseb	FALSE	76.2	80.1	LOGNORMAL	80.1	ND
Endosulfan I	TRUE	0.14	0.14	NORMAL	0.145	0.143
Endosulfan II	NA	NA	NA	NA	NA	0.66
Endosulfan sulfate	FALSE	3.61	4.54	LOGNORMAL	4.54	4.54
Endrin	FALSE	4.45	6.03	LOGNORMAL	6.03	ND
Endrin aldehyde	FALSE	4.45	6.03	LOGNORMAL	6.03	ND
Endrin ketone	FALSE	4.45	6.03	LOGNORMAL	6.03	ND
gamma-BHC (Lindane)	FALSE	2.27	3.07	LOGNORMAL	3.07	ND
gamma-Chlordane	FALSE	1.68	2.45	LOGNORMAL	2.45	2.45
Heptachlor	FALSE	2.27	3.07	LOGNORMAL	3.07	ND
Heptachlor epoxide	TRUE	0.44	0.59	NORMAL	0.439	0.434
MCPA	FALSE	1,491	1,565	LOGNORMAL	1560	ND
MCPP	FALSE	1,491	1,565	LOGNORMAL	1560	ND
Methoxychlor	TRUE	0.7	0.7	NORMAL	0.728	0.72
Toxaphene	FALSE	227	307	LOGNORMAL	307	ND
SVOCs (ug/kg)						
1,2,4-Trichlorobenzene	FALSE	127	133	LOGNORMAL	133	ND
1,2-Dichlorobenzene	FALSE	127	133	LOGNORMAL	133	ND
1,3-Dichlorobenzene	FALSE	127	133	LOGNORMAL	133	ND
1,4-Dichlorobenzene	FALSE	130	140	LOGNORMAL	140	140
2,4,5-Trichlorophenol	FALSE	127	133	LOGNORMAL	133	ND
2,4,6-Trichlorophenol	FALSE	51.4	53.8	LOGNORMAL	53.8	ND
2,4-Dichlorophenol	FALSE	127	133	LOGNORMAL	133	ND
2,4-Dinitrophenol	FALSE	631	661	LOGNORMAL	661	ND
2,4-Dinitrotoluene	FALSE	127	133	LOGNORMAL	133	ND
2,6-Dinitrotoluene	FALSE	127	133	LOGNORMAL	133	ND
2-Chloronaphthalene	FALSE	127	133	LOGNORMAL	133	ND
2-Chlorophenol	FALSE	127	133	LOGNORMAL	133	ND
2-Methylnaphthalene	FALSE	127	133	LOGNORMAL	133	ND
2-Methylphenol (o-Cresol)	FALSE	127	133	LOGNORMAL	133	ND
2-Nitroaniline	FALSE	631	661	LOGNORMAL	661	ND
2-Nitrophenol	FALSE	127	133	LOGNORMAL	133	ND
3&4Methylphenol	FALSE	127	133	LOGNORMAL	133	ND
3,3'-Dichlorobenzidine	FALSE	245	257	LOGNORMAL	257	ND
3-Nitroaniline	FALSE	631	661	LOGNORMAL	661	ND
4,6-Dinitro-2-methylphenol	FALSE	631	661	LOGNORMAL	661	ND
4-Bromophenyl phenyl ether	FALSE	127	133	LOGNORMAL	133	ND
4-Chloro-3-methylphenol	FALSE	127	133	LOGNORMAL	133	ND
4-Chloroaniline	FALSE	245	257	LOGNORMAL	257	ND
4-Chlorophenyl phenyl ether	FALSE	127	133	LOGNORMAL	133	ND

Appendix B-3d
Creek Segment E Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Normality Test[2]	Normal UCL[1]	Log Normal UCL[1]	Distribution[4]	Selected UCL[5]	Creek Segment Specific EPC[6]
4-Nitroaniline	FALSE	631	661	LOGNORMAL	661	ND
4-Nitrophenol	FALSE	631	661	LOGNORMAL	661	ND
Acenaphthene	FALSE	127	133	LOGNORMAL	133	ND
Acenaphthylene	FALSE	127	133	LOGNORMAL	133	ND
Anthracene	NA	NA	NA	NA	NA	50
Benzo(a)anthracene	FALSE	126	142	LOGNORMAL	142	142
Benzo(a)pyrene	FALSE	90.9	108	LOGNORMAL	108	108
Benzo(b)fluoranthene	FALSE	142	177	LOGNORMAL	177	177
Benzo(g,h,i)perylene	FALSE	136	155	LOGNORMAL	155	155
Benzo(k)fluoranthene	FALSE	136	153	LOGNORMAL	153	153
Bis(2-chloroethoxy)methane	FALSE	127	133	LOGNORMAL	133	ND
Bis(2-chloroethyl)ether	FALSE	127	133	LOGNORMAL	133	ND
Bis(2-chloroisopropyl ether)	FALSE	127	133	LOGNORMAL	133	ND
Bis(2-ethylhexyl)phthalate	NA	NA	NA	NA	NA	77
Butylbenzylphthalate	FALSE	127	133	LOGNORMAL	133	ND
Carbazole	FALSE	127	133	LOGNORMAL	133	ND
Chrysene	FALSE	132	162	LOGNORMAL	162	162
Dibenzo(a,h)anthracene	FALSE	69.4	75.6	LOGNORMAL	75.6	75.6
Dibenzofuran	FALSE	127	133	LOGNORMAL	133	ND
Diethyl phthalate	FALSE	127	133	LOGNORMAL	133	ND
Dimethyl phthalate	FALSE	127	133	LOGNORMAL	133	ND
di-n-Butylphthalate	NA	NA	NA	NA	NA	74
di-n-Octylphthalate	FALSE	127	133	LOGNORMAL	133	ND
Fluoranthene	FALSE	165	203	LOGNORMAL	203	203
Fluorene	FALSE	127	133	LOGNORMAL	133	ND
Hexachlorobenzene	FALSE	51.4	53.8	LOGNORMAL	53.8	ND
Hexachlorobutadiene	FALSE	127	133	LOGNORMAL	133	ND
Hexachlorocyclopentadiene	FALSE	127	134	LOGNORMAL	134	ND
Hexachloroethane	FALSE	127	133	LOGNORMAL	133	ND
Indeno(1,2,3-cd)pyrene	FALSE	139	154	LOGNORMAL	154	154
Isophorone	FALSE	127	133	LOGNORMAL	133	ND
Naphthalene	FALSE	127	133	LOGNORMAL	133	ND
Nitrobenzene	FALSE	127	133	LOGNORMAL	133	ND
N-Nitroso-di-N-propylamine	FALSE	127	133	LOGNORMAL	133	ND
N-nitrosodiphenylamine	FALSE	127	133	LOGNORMAL	133	ND
Pentachlorophenol	FALSE	11.4	20.7	LOGNORMAL	20.7	20.7
Phenanthrene	FALSE	124	165	LOGNORMAL	165	165
Phenol	FALSE	127	133	LOGNORMAL	133	ND
Pyrene	FALSE	149	172	LOGNORMAL	172	172
Total PAHs[6]	FALSE	2,047	2,290	LOGNORMAL	2290	2290
VOCs (ug/kg)						
1,1,1-Trichloroethane	FALSE	3.67	3.94	LOGNORMAL	3.94	ND
1,1,2,2-Tetrachloroethane	FALSE	3.67	3.94	LOGNORMAL	3.94	ND
1,1,2-Trichloroethane	FALSE	3.67	3.94	LOGNORMAL	3.94	ND
1,1-Dichloroethane	FALSE	3.67	3.94	LOGNORMAL	3.94	ND
1,1-Dichloroethene	FALSE	3.38	3.62	LOGNORMAL	3.62	ND
1,2-Dichloroethane	FALSE	3.67	3.94	LOGNORMAL	3.94	ND
1,2-Dichloroethene (total)	FALSE	3.67	3.94	LOGNORMAL	3.94	ND
1,2-Dichloropropane	FALSE	3.67	3.94	LOGNORMAL	3.94	ND
2-Butanone (MEK)	TRUE	10.7	14.0	NORMAL	10.7	10.6
2-Hexanone	FALSE	18.4	19.7	LOGNORMAL	19.7	ND
4-Methyl-2-pentanone (MIBK)	FALSE	18.4	19.7	LOGNORMAL	19.7	ND
Acetone	TRUE	37.6	44.8	NORMAL	37.6	37.6
Benzene	FALSE	3.67	3.94	LOGNORMAL	3.94	ND
Bromodichloromethane	FALSE	3.67	3.94	LOGNORMAL	3.94	ND
Bromoform	FALSE	3.67	3.94	LOGNORMAL	3.94	ND
Bromomethane	FALSE	7.37	7.89	LOGNORMAL	7.89	ND
Carbon disulfide	FALSE	3.67	3.94	LOGNORMAL	3.94	ND
Carbon tetrachloride	FALSE	3.67	3.94	LOGNORMAL	3.94	ND

Appendix B-3d
Creek Segment E Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Normality Test[3]	Normal UCL[1]	Log Normal UCL[1]	Distribution[4]	Selected UCL[5]	Creek Segment Specific EPC[6]
Chlorobenzene	FALSE	24.1	48.1	LOGNORMAL	48.1	48.1
Chloroform	FALSE	3.67	3.94	LOGNORMAL	3.94	ND
Chloroethane	FALSE	7.37	7.89	LOGNORMAL	7.89	ND
Chloromethane	FALSE	7.37	7.89	LOGNORMAL	7.89	ND
cis-1,3-Dichloropropene	FALSE	2.95	3.16	LOGNORMAL	3.16	ND
Dibromochloromethane	FALSE	3.67	3.94	LOGNORMAL	3.94	ND
Ethylbenzene	FALSE	3.64	3.87	LOGNORMAL	3.87	3.87
Methylene chloride	TRUE	2.81	3.30	NORMAL	2.81	2.79
Styrene	FALSE	3.67	3.94	LOGNORMAL	3.94	ND
Tetrachloroethene	FALSE	3.67	3.94	LOGNORMAL	3.94	ND
Toluene	FALSE	3.80	4.16	LOGNORMAL	4.16	4.16
trans-1,3-Dichloropropene	FALSE	2.95	3.16	LOGNORMAL	3.16	ND
Trichloroethene	FALSE	3.67	3.94	LOGNORMAL	3.94	ND
Vinyl chloride	FALSE	7.37	7.89	LOGNORMAL	7.89	ND
Xylenes (total)	FALSE	3.67	3.94	LOGNORMAL	3.94	ND
Inorganics (mg/kg)						
Aluminum	TRUE	10,002	11,182	NORMAL	10000	10000
Antimony	FALSE	1.44	1.75	LOGNORMAL	1.75	1.75
Arsenic	FALSE	8.15	11.1	LOGNORMAL	11.1	11.1
Barium	FALSE	254	288	LOGNORMAL	288	288
Beryllium	TRUE	0.747	0.874	NORMAL	0.747	0.747
Cadmium	FALSE	14.4	23.6	LOGNORMAL	23.6	23.6
Calcium	TRUE	8,068	10,046	NORMAL	8070	8070
Chromium	FALSE	48.0	74.2	LOGNORMAL	74.2	74.2
Cobalt	TRUE	8.12	9.58	NORMAL	8.12	8.12
Copper	FALSE	441	1,084	LOGNORMAL	1080	1080
Iron	TRUE	17,853	20,981	NORMAL	17900	17900
Lead	FALSE	79.9	126	LOGNORMAL	126	126
Magnesium	TRUE	4,530	5,643	NORMAL	4530	4530
Manganese	TRUE	174	214	NORMAL	174	174
Mercury	FALSE	0.412	0.710	LOGNORMAL	0.71	0.71
Molybdenum	FALSE	0.371	0.552	LOGNORMAL	0.552	0.552
Nickel	FALSE	183	270	LOGNORMAL	270	270
Potassium	TRUE	2,078	2,301	NORMAL	2080	2080
Selenium	FALSE	0.662	0.736	LOGNORMAL	0.736	ND
Silver	FALSE	1.23	1.38	LOGNORMAL	1.38	1.38
Sodium	TRUE	242	269	NORMAL	242	242
Thallium	TRUE	0.658	0.719	NORMAL	0.658	0.658
Tin	FALSE	5.69	7.08	LOGNORMAL	7.08	7.08
Vanadium	TRUE	29.6	32.7	NORMAL	29.6	29.6
Zinc	FALSE	1,945	3,152	LOGNORMAL	3150	3150
PCBs (ug/kg)	NA	NA	NA	NA		
Monochlorobiphenyl	FALSE	2.45	2.57	LOGNORMAL	2.57	ND
Dichlorobiphenyl	FALSE	2.60	2.85	LOGNORMAL	2.85	2.85
Trichlorobiphenyl	FALSE	6.10	6.54	LOGNORMAL	6.54	6.54
Tetrachlorobiphenyl	FALSE	22.8	34.6	LOGNORMAL	34.6	34.6
Pentachlorobiphenyl	FALSE	70.4	259	LOGNORMAL	259	259
Hexachlorobiphenyl	FALSE	25.9	43.7	LOGNORMAL	43.7	43.7
Heptachlorobiphenyl	FALSE	12.7	16.1	LOGNORMAL	16.1	16.1
Octachlorobiphenyl	FALSE	9.36	11.0	LOGNORMAL	11	11
Nonachlorobiphenyl	FALSE	17.9	23.2	LOGNORMAL	23.2	23.2
Decachlorobiphenyl	FALSE	24.6	32.3	LOGNORMAL	32.3	32.3
Total PCBs[9]	FALSE	195	274	LOGNORMAL	274	274
Dioxins (ug/kg)						
1,2,3,4,6,7,8,9-OCDD	FALSE	6.83	40.1	LOGNORMAL	40.1	40.1
1,2,3,4,6,7,8-HpCDD	FALSE	0.596	2.45	LOGNORMAL	2.45	2.45
1,2,3,4,7,8-HxCDD	FALSE	0.0103	0.0149	LOGNORMAL	0.0149	ND
1,2,3,6,7,8-HxCDD	FALSE	0.0242	0.0368	LOGNORMAL	0.0368	0.0368
1,2,3,7,8,9-HxCDD	FALSE	0.0177	0.0280	LOGNORMAL	0.028	0.028

Appendix B-3d
Creek Segment E Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

Compounds	Normality Test[3]	Normal UCL[1]	Log Normal UCL[1]	Distribution[4]	Selected UCL[5]	Creek Segment Specific EPC[6]
1,2,3,7,8-PeCDD	FALSE	0.0154	0.0226	LOGNORMAL	0.0226	0.0226
2,3,7,8-TCDD	FALSE	0.00853	0.0114	LOGNORMAL	0.0114	ND
Total HpCDD	FALSE	1.17	8.60	LOGNORMAL	8.6	8.6
Total HxCDD	FALSE	0.213	0.744	LOGNORMAL	0.744	0.744
Total PeCDD	FALSE	0.149	0.306	LOGNORMAL	0.306	0.306
Total TCDD	TRUE	1.25	1.24	NORMAL	1.25	ND
Furans (ug/kg)						
1,2,3,4,6,7,8,9-OCDF	FALSE	2.51	16.6	LOGNORMAL	16.6	16.6
1,2,3,4,6,7,8-HpCDF	FALSE	0.323	1.65	LOGNORMAL	1.65	1.65
1,2,3,4,7,8,9-HpCDF	FALSE	0.0224	0.0441	LOGNORMAL	0.0441	0.0441
1,2,3,4,7,8-HxCDF	FALSE	0.0125	0.0228	LOGNORMAL	0.0228	0.0228
1,2,3,6,7,8-HxCDF	FALSE	0.0121	0.0243	LOGNORMAL	0.0243	0.0243
1,2,3,7,8,9-HxCDF	TRUE	0.0086	0.0134	NORMAL	0.00858	ND
1,2,3,7,8-PeCDF	FALSE	0.0104	0.0145	LOGNORMAL	0.0145	ND
2,3,4,6,7,8-HxCDF	FALSE	0.0083	0.0127	LOGNORMAL	0.0127	ND
2,3,4,7,8-PeCDF	FALSE	0.0113	0.0163	LOGNORMAL	0.0163	ND
2,3,7,8-TCDF	FALSE	0.0121	0.0189	LOGNORMAL	0.0189	0.0189
Total HpCDF	FALSE	1.30	8.30	LOGNORMAL	8.3	8.3
Total HxCDF	FALSE	0.243	1.04	LOGNORMAL	1.04	1.04
Total PeCDF	FALSE	0.145	0.340	LOGNORMAL	0.34	0.34
Total TCDF	FALSE	0.210	0.308	LOGNORMAL	0.308	0.308
Total TEQ[10]	FALSE	0.05	0.07	LOGNORMAL	0.0728	0.0728

ND = not detected
NA = not available
EPC = Exposure Point Concentration
UCL = 95th Percent Upper Confidence Limit on the mean
Duplicates have been averaged (see text for details).
[1]Average and percentiles calculated assuming 1/2 detection limit for non-detects
[2]Standard deviation calculated for detected concentrations only
[3]Normality Test based on Shapiro-Wilks W Test (p = 0.05). If NA, insufficient amount of data (N<3) to conduct test. If FALSE, data does not have a normal distribution. If TRUE, data has a normal underlying distribution.
[4]Data are assumed to be either normally or lognormally distributed. If the data do not have a normal underlying distribution as determined by the Shapiro-Wilks W Test, data are assumed to be lognormal.
[5]Selected UCL determined by the determined distribution of the data (either normally or lognormally distributed).
[6]For compounds with less than 10 samples available for analyses, the EPC is the average concentration. If the selected UCL exceeds the maximum detected concentration, the maximum is used. Otherwise, the selected UCL is used as the EPC.
[7]Total DDT is the sum of 4,4'-DDD, 4,4'-DDE and 4,4'-DDT. For nondetects, half the detection limit is used.
[8]Total PAHs is the sum of all measured carcinogenic and noncarcinogenic PAHs. For nondetects, half the detection is used.
[9]Total PCBs equals the sum of the homologs. For nondetects, half the detection limit is used.
[10]Total TEQ is based on Toxic Equivalency Factors for Humans/Mammals as developed by Van den Berg, et al., 1998. For nondetects, half the detection limit is used.

Appendix B-3e
Creek Segment F Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

	Number Analyzed	Number Used in Analyses	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Standard Deviation[2]	Minimum Detection Limit	Maximum Detection Limit
Cyanide (mg/kg)	16	16	2	13	1.2	4.57	0.653	0.335	0.344	2.04	2.38	0.63	0.76
Pesticides/Herbicides (ug/kg)													
2,4,5-T	16	16	0	0	0	0	5.84	5.75	6	6.63		11	14
2,4,5-TP (Silvex)	16	16	0	0	0	0	5.84	5.75	6	6.63		11	14
2,4-D	16	16	3	19	2.3	47	8.39	6	6.13	18.1	24.2	11	14
2,4-DB	16	16	0	0	0	0	5.84	5.75	6	6.63		11	14
4,4'-DDD	16	16	0	0	0	0	3.61	2.65	4.6	5.93		4.3	18
4,4'-DDE	15	4	4	100	0.36	1.6	1.01	1.03	1.3	1.54	0.526	0	0
4,4'-DDT	15	14	3	21	0.29	7.5	3.48	3.38	4.58	5.81	3.61	4.4	9.8
Total DDT[7]	16	16	6	38	0.29	7.5	6.91	7.23	9.35	10.2	3	4.3	19.6
Aldrin	16	1	1	100	0.23	0.23	0.23	0.23	0.23	0.23		0	0
alpha-BHC	16	16	0	0	0	0	0.548	0.4	0.7	0.9		0.66	2.7
alpha-Chlordane	16	15	2	13	2.8	4.1	1.96	2.2	2.38	3.19	0.919	2.2	5.1
beta-BHC	16	16	1	6	3.9	3.9	0.768	0.533	0.7	1.99		0.66	2.7
Dalapon	16	16	0	0	0	0	45.6	44.8	46.5	51.3		84	110
delta-BHC	16	16	0	0	0	0	0.548	0.4	0.7	0.9		0.66	2.7
Dicamba	16	4	4	100	2.1	6.25	4.09	4	5.99	6.2	2.3	0	0
Dichlorprop	16	16	0	0	0	0	70.3	70	70	77.5		130	170
Dieldrin	16	16	9	56	0.35	8.2	2.29	2.18	2.33	5.43	2.44	4.3	9
Dinoseb	16	16	0	0	0	0	70.3	70	70	77.5		130	170
Endosulfan I	16	16	0	0	0	0	1.85	1.35	2.35	3.06		2.2	9.2
Endosulfan II	16	16	0	0	0	0	3.61	2.65	4.6	5.93		4.3	18
Endosulfan sulfate	16	10	1	10	4.3	4.3	2.72	2.33	2.66	4.3		4.3	8.6
Endrin	16	16	0	0	0	0	3.61	2.65	4.6	5.93		4.3	18
Endrin aldehyde	16	16	0	0	0	0	3.61	2.65	4.6	5.93		4.3	18
Endrin ketone	16	16	0	0	0	0	3.61	2.65	4.6	5.93		4.3	18
gamma-BHC (Lindane)	16	16	0	0	0	0	1.85	1.35	2.35	3.06		2.2	9.2
gamma-Chlordane	16	16	6	38	0.46	3.8	1.47	1.18	1.75	2.75	1.26	2.2	4.8
Heptachlor	15	15	0	0	0	0	1.9	1.4	2.35	3.17		2.3	9.2
Heptachlor epoxide	16	16	0	0	0	0	1.85	1.35	2.35	3.06		2.2	9.2
MCPA	16	16	0	0	0	0	1390	1380	1400	1580		2600	3300
MCPP	16	16	1	6	2300	2300	1450	1380	1410	1810		2600	3300
Methoxychlor	16	16	0	0	0	0	18.5	13.5	23.5	30.6		22	92
Toxaphene	16	16	0	0	0	0	185	135	235	306		220	920
SVOCs (ug/kg)													
1,2,4-Trichlorobenzene	16	16	0	0	0	0	119	118	120	133		220	280
1,2-Dichlorobenzene	16	16	0	0	0	0	119	118	120	133		220	280
1,3-Dichlorobenzene	16	16	0	0	0	0	119	118	120	133		220	280
1,4-Dichlorobenzene	16	1	1	100	94	94	94	94	94	94		0	0
2,4,5-Trichlorophenol	16	16	0	0	0	0	119	118	120	133		220	280
2,4,6-Trichlorophenol	16	16	0	0	0	0	49	48.3	50	56.3		91	120
2,4-Dichlorophenol	16	16	0	0	0	0	119	118	120	133		220	280
2,4-Dinitrophenol	16	16	0	0	0	0	591	600	600	663		1100	1400
2,4-Dinitrotoluene	16	16	0	0	0	0	119	118	120	133		220	280
2,6-Dinitrotoluene	16	16	0	0	0	0	119	118	120	133		220	280
2-Chloronaphthalene	16	16	0	0	0	0	119	118	120	133		220	280
2-Chlorophenol	16	16	0	0	0	0	119	118	120	133		220	280
2-Methylnaphthalene	16	16	0	0	0	0	119	118	120	133		220	280
2-Methylphenol (o-Cresol)	16	16	0	0	0	0	119	118	120	133		220	280
2-Nitroaniline	16	16	0	0	0	0	591	600	600	663		1100	1400
2-Nitrophenol	16	16	0	0	0	0	119	118	120	133		220	280
3&4Methylphenol	16	16	0	0	0	0	119	118	120	133		220	280
3,3'-Dichlorobenzidine	16	16	0	0	0	0	230	228	235	260		430	550
3-Nitroaniline	16	16	0	0	0	0	591	600	600	663		1100	1400
4,6-Dinitro-2-methylphenol	16	16	0	0	0	0	591	600	600	663		1100	1400
4-Bromophenyl phenyl ether	16	16	0	0	0	0	119	118	120	133		220	280
4-Chloro-3-methylphenol	16	16	0	0	0	0	119	118	120	133		220	280
4-Chloroaniline	16	16	0	0	0	0	230	228	235	260		430	550
4-Chlorophenyl phenyl ether	16	16	0	0	0	0	119	118	120	133		220	280
4-Nitroaniline	16	16	0	0	0	0	591	600	600	663		1100	1400

Appendix B-3e
Creek Segment F Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

	Number Analyzed	Number Used in Analyses	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Standard Deviation[2]	Minimum Detection Limit	Maximum Detection Limit
4-Nitrophenol	16	16	0	0	0	0	591	600	600	663		1100	1400
Acenaphthene	16	16	0	0	0	0	119	118	120	133		220	280
Acenaphthylene	16	16	0	0	0	0	119	118	120	133		220	280
Anthracene	16	16	0	0	0	0	119	118	120	133		220	280
Benzo(a)anthracene	16	4	4	100	35	92	62.3	61	86	90.8	29.9	0	0
Benzo(a)pyrene	16	16	5	31	49	190	69.3	60	65	108	60.1	120	150
Benzo(b)fluoranthene	16	16	5	31	39	180	111	115	120	180	76.5	220	280
Benzo(g,h,i)perylene	16	15	5	33	49	130	105	115	120	127	33.4	220	250
Benzo(k)fluoranthene	16	15	4	27	44	130	109	115	120	130	46.1	220	240
Bis(2-chloroethoxy)methane	16	16	0	0	0	0	119	118	120	133		220	280
Bis(2-chloroethyl)ether	16	16	0	0	0	0	119	118	120	133		220	280
Bis(2-chloroisopropyl ether)	16	16	0	0	0	0	119	118	120	133		220	280
Bis(2-ethylhexyl)phthalate	16	6	4	67	68	110	90.6	92.3	110	110	19.6	220	220
Butylbenzylphthalate	16	16	0	0	0	0	119	118	120	133		220	280
Carbazole	16	16	0	0	0	0	119	118	120	133		220	280
Chrysene	16	16	5	31	35	140	105	115	120	140	50	220	280
Dibenzo(a,h)anthracene	16	16	0	0	0	0	62.5	60	65	71.3		120	150
Dibenzofuran	16	16	0	0	0	0	119	118	120	133		220	280
Diethyl phthalate	16	16	0	0	0	0	119	118	120	133		220	280
Dimethyl phthalate	16	16	0	0	0	0	119	118	120	133		220	280
di-n-Butylphthalate	16	16	0	0	0	0	119	118	120	133		220	280
di-n-Octylphthalate	16	16	0	0	0	0	119	118	120	133		220	280
Fluoranthene	16	16	5	31	52.5	170	110	115	120	148	50.9	220	280
Fluorene	16	16	0	0	0	0	119	118	120	133		220	280
Hexachlorobenzene	16	16	0	0	0	0	49	48.3	50	56.3		91	120
Hexachlorobutadiene	16	1	1	100	61	61	61	61	61	61		0	0
Hexachlorocyclopentadiene	16	16	0	0	0	0	119	118	120	133		220	280
Hexachloroethane	16	16	0	0	0	0	119	118	120	133		220	280
Indeno(1,2,3-cd)pyrene	16	5	2	40	92	110	106	110	110	110	12.7	220	220
Isophorone	16	16	0	0	0	0	119	118	120	133		220	280
Naphthalene	16	16	0	0	0	0	119	118	120	133		220	280
Nitrobenzene	16	16	0	0	0	0	119	118	120	133		220	280
N-Nitroso-di-N-propylamine	16	16	0	0	0	0	119	118	120	133		220	280
N-nitrosodiphenylamine	16	16	0	0	0	0	119	118	120	133		220	280
Pentachlorophenol	16	16	8	50	1.5	24	8.81	11.3	12	16.5	7.55	22	28
Phenanthrene	16	4	4	100	30	98	59.3	54.5	78.5	94.1	31.7	0	0
Phenol	16	16	0	0	0	0	119	118	120	133		220	280
Pyrene	16	16	2	13	110	160	120	118	120	145	35.4	220	280
Total PAHs[6]	16	16	6	38	132	1400	1560	1530	1560	1930	530	1500	3140
VOCs (ug/kg)													
1,1,1-Trichloroethane	16	16	0	0	0	0	3.43	3.4	3.58	4.13		5.3	9.9
1,1,2,2-Tetrachloroethane	16	16	1	6	10	10	3.88	3.43	3.66	6.21		5.8	9.9
1,1,2-Trichloroethane	16	16	1	6	6.1	6.1	3.64	3.43	3.66	5.24		5.8	9.9
1,1-Dichloroethane	16	16	0	0	0	0	3.43	3.4	3.58	4.13		5.3	9.9
1,1-Dichloroethene	16	16	0	0	0	0	3.16	3.15	3.33	3.8		4.9	9.1
1,2-Dichloroethane	16	1	1	100	2.1	2.1	2.1	2.1	2.1	2.1		0	0
1,2-Dichloroethene (total)	16	16	0	0	0	0	3.43	3.4	3.58	4.13		5.3	9.9
1,2-Dichloropropane	16	16	0	0	0	0	3.43	3.4	3.58	4.13		5.3	9.9
2-Butanone (MEK)	16	8	7	88	7.5	14	10.3	10	10.9	13.8	2.1	27	27
2-Hexanone	16	16	0	0	0	0	17.2	17	18.1	20.5		27	50
4-Methyl-2-pentanone (MIBK)	16	16	0	0	0	0	17.2	17	18.1	20.5		27	50
Acetone	16	15	7	47	29	64	40	34	43.3	62.6	14	58	77
Benzene	16	16	0	0	0	0	3.43	3.4	3.58	4.13		5.3	9.9
Bromodichloromethane	16	1	1	100	1.3	1.3	1.3	1.3	1.3	1.3		0	0
Bromoform	16	2	1	50	3	3	2.95	2.95	2.98	3		5.8	5.8
Bromomethane	16	16	0	0	0	0	6.88	7	7.13	8.13		11	20
Carbon disulfide	16	16	0	0	0	0	3.43	3.4	3.58	4.13		5.3	9.9
Carbon tetrachloride	16	16	0	0	0	0	3.43	3.4	3.58	4.13		5.3	9.9
Chlorobenzene	16	16	3	19	5.2	14	4.38	3.4	3.58	9.95	4.44	5.3	7.3
Chloroform	16	16	0	0	0	0	3.43	3.4	3.58	4.13		5.3	9.9

Appendix B-3e
Creek Segment F Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

	Number Analyzed	Number Used in Analyses	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Standard Deviation[2]	Minimum Detection Limit	Maximum Detection Limit
Chloroethane	16	16	0	0	0	0	6.88	7	7.13	8.13		11	20
Chloromethane	16	16	0	0	0	0	6.88	7	7.13	8.13		11	20
cis-1,3-Dichloropropene	16	16	0	0	0	0	2.75	2.73	2.88	3.31		4.3	7.9
Dibromochloromethane	16	1	1	100	2	2	2	2	2	2		0	0
Ethylbenzene	16	16	0	0	0	0	3.43	3.4	3.58	4.13		5.3	9.9
Methylene chloride	16	15	4	27	1.8	4.3	3.21	3.35	3.5	3.88	1.07	5.8	7.4
Styrene	16	16	0	0	0	0	3.43	3.4	3.58	4.13		5.3	9.9
Tetrachloroethene	16	16	0	0	0	0	3.43	3.4	3.58	4.13		5.3	9.9
Toluene	16	16	8	50	2.3	12	4.73	3.55	5.26	9.3	3.38	5.8	9.9
trans-1,3-Dichloropropene	16	16	0	0	0	0	2.75	2.73	2.88	3.31		4.3	7.9
Trichloroethene	16	16	0	0	0	0	3.43	3.4	3.58	4.13		5.3	9.9
Vinyl chloride	16	16	0	0	0	0	6.88	7	7.13	8.13		11	20
Xylenes (total)	16	15	1	7	4.8	4.8	3.42	3.4	3.6	4.14		5.3	7.7
Inorganics (mg/kg)													
Aluminum	16	16	16	100	5100	12000	8860	9000	10900	12000	2230	0	0
Antimony	16	3	2	67	0.62	0.66	0.627	0.62	0.64	0.656	0.0283	1.2	1.2
Arsenic	16	16	15	94	4.1	19	9.71	9.13	11.3	15.3	3.46	5.8	5.8
Barium	16	16	16	100	160	330	219	200	263	300	53.9	0	0
Beryllium	16	16	13	81	0.38	1.2	0.634	0.655	0.785	0.968	0.203	0.49	0.65
Cadmium	16	16	15	94	0.77	57	20.3	19.8	29.8	50.6	17.3	0.71	0.71
Calcium	16	16	16	100	5450	17000	9800	8500	14000	16300	4030	0	0
Chromium	16	16	16	100	9.3	29	16.8	16	19.5	27.9	5.84	0	0
Cobalt	16	16	16	100	5.6	13	8.84	8.6	9.55	12.8	2.25	0	0
Copper	16	16	16	100	20	505	120	95.5	158	269	118	0	0
Iron	16	16	16	100	11000	41000	19300	18000	21000	29800	7070	0	0
Lead	16	16	16	100	7.5	450	58.1	27.5	38	188	107	0	0
Magnesium	16	16	16	100	3700	8200	5270	5200	5990	7230	1240	0	0
Manganese	16	16	16	100	170	890	335	298	403	635	185	0	0
Mercury	16	16	16	100	0.018	0.82	0.191	0.102	0.2	0.678	0.228	0	0
Molybdenum	16	16	2	13	0.37	2.2	0.584	0.463	0.613	1.08	1.29	0.38	1.4
Nickel	16	16	16	100	15	630	167	128	230	383	150	0	0
Potassium	16	16	16	100	940	2300	1590	1450	2010	2300	471	0	0
Selenium	16	15	1	7	1.8	1.8	0.656	0.6	0.7	1.07		0.61	1.5
Silver	16	16	1	6	0.79	0.79	0.656	0.65	0.7	0.76		1.2	1.5
Sodium	16	16	15	94	96	290	138	120	143	238	50.5	170	170
Thallium	16	16	0	0	0	0	0.694	0.65	0.763	1.04		0.73	3.2
Tin	16	16	1	6	17	17	3.73	3.08	3.41	7.1		1.9	7.6
Vanadium	16	16	16	100	17	34	25.7	26	29.3	31.8	4.88	0	0
Zinc	16	16	16	100	59	15000	2240	1390	1880	5890	3480	0	0
PCBs (ug/kg)													
Monochlorobiphenyl	16	16	1	6	5.6	5.6	2.49	2.28	2.35	3.46		4.3	5.5
Dichlorobiphenyl	16	16	0	0	0	0	2.3	2.28	2.35	2.6		4.3	5.5
Trichlorobiphenyl	16	16	2	13	1	7.1	2.51	2.25	2.35	3.84	4.31	4.3	5.5
Tetrachlorobiphenyl	16	16	2	13	4.95	77	9.18	4.63	4.83	23.4	50.9	8.7	11
Pentachlorobiphenyl	16	16	6	38	2.3	130	13.6	4.73	6.4	42.1	50	8.7	11
Hexachlorobiphenyl	16	16	6	38	3.35	70	9.13	4.73	5.7	23.4	26.3	8.7	11
Heptachlorobiphenyl	16	16	1	6	16	16	7.56	7	7	10.4		13	17
Octachlorobiphenyl	16	1	1	100	6.2	6.2	6.2	6.2	6.2	6.2		0	0
Nonachlorobiphenyl	16	15	2	13	3.3	13	11	11.5	11.8	12.3	6.86	22	24
Decachlorobiphenyl	16	16	4	25	3.2	32	11.9	11.5	12	18.5	13.3	22	28
Total PCBs[3]	16	16	7	44	1	356.9	69.3	50.6	53.6	136	129	5.1	106.8
Dioxins (ug/kg)													
1,2,3,4,6,7,8,9-OCDD	16	16	16	100	0.14	9.2	2.51	0.985	3.13	7.85	3.05	0	0
1,2,3,4,6,7,8-HpCDD	16	16	11	69	0.06	1.5	0.282	0.0775	0.235	1.2	0.501	0.01	0.05
1,2,3,4,7,8-HxCDD	16	16	2	13	0.05	0.18	0.0244	0.01	0.02	0.0825	0.0919	0.01	0.04
1,2,3,6,7,8-HxCDD	16	16	3	19	0.045	0.41	0.0472	0.015	0.0213	0.208	0.189	0.01	0.05
1,2,3,7,8,9-HxCDD	16	16	3	19	0.06	0.55	0.0589	0.015	0.0213	0.243	0.263	0.01	0.05
1,2,3,7,8-PeCDD	16	16	2	13	0.08	0.25	0.0328	0.015	0.0213	0.123	0.12	0.01	0.05
2,3,7,8-TCDD	16	16	0	0	0	0	0.00959	0.01	0.01	0.0188		0.008	0.06
Total HpCDD	16	16	11	69	0.08	2.8	0.516	0.123	0.458	2.2	0.938	0.01	0.05

Appendix B-3e
Creek Segment F Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

	Number Analyzed	Number Used in Analyses	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Standard Deviation[2]	Minimum Detection Limit	Maximum Detection Limit
Total HxCDD	16	16	5	31	0.02	4.2	0.369	0.0175	0.0325	1.88	1.76	0.01	0.04
Total PeCDD	16	16	3	19	0.04	3.6	0.291	0.015	0.025	1.52	1.87	0.01	0.05
Total TCDD	16	16	1	6	30.7	30.7	3.08	1.25	1.35	8.73		2.2	2.8
Furans (ug/kg)													
1,2,3,4,6,7,8,9-OCDF	16	16	10	63	0.1	7.6	1.19	0.145	0.835	5.24	2.56	0.03	0.38
1,2,3,4,6,7,8-HpCDF	16	16	7	44	0.045	0.93	0.191	0.02	0.138	0.863	0.387	0.01	0.04
1,2,3,4,7,8,9-HpCDF	16	16	2	13	0.1	0.27	0.0331	0.01	0.02	0.143	0.12	0.008	0.04
1,2,3,4,7,8-HxCDF	16	16	1	6	0.64	0.64	0.0536	0.01	0.0113	0.224		0.006	0.17
1,2,3,6,7,8-HxCDF	16	16	0	0	0	0	0.0179	0.01	0.01	0.0625		0.006	0.26
1,2,3,7,8,9-HxCDF	16	16	1	6	0.38	0.38	0.0327	0.01	0.0113	0.106		0.006	0.03
1,2,3,7,8-PeCDF	16	16	2	13	0.08	0.3	0.0341	0.0125	0.0163	0.135	0.156	0.01	0.04
2,3,4,6,7,8-HxCDF	16	16	1	6	0.26	0.26	0.0252	0.01	0.0113	0.0763		0.006	0.03
2,3,4,7,8-PeCDF	16	16	2	13	0.1	0.35	0.0384	0.0125	0.0163	0.163	0.177	0.01	0.04
2,3,7,8-TCDF	16	16	3	19	0.045	0.75	0.067	0.01	0.015	0.315	0.376	0.007	0.03
Total HpCDF	16	16	12	75	0.05	3.6	0.641	0.07	0.5	2.7	1.21	0.02	0.04
Total HxCDF	16	16	5	31	0.015	7	0.584	0.01	0.0813	3.03	2.98	0.01	0.41
Total PeCDF	16	16	4	25	0.08	2.9	0.239	0.015	0.035	1.18	1.35	0.01	0.04
Total TCDF	16	16	3	19	0.23	4.2	0.375	0.035	0.0463	1.88	2.09	0.05	0.1
Total TEQ[16]	16	16	16	100	0.000014	0.784	0.101	0.0436	0.0585	0.377	0.198	0.0313	0.132309

Appendix B-3e
Creek Segment F Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

	Normality Test[3]	Normal UCL[1]	Log Normal UCL[1]	Distribution[4]	Selected UCL[5]	Creek Segment Specific EPC[6]
Cyanide (mg/kg)	FALSE	0.670	0.835	LOGNORMAL	0.835	0.835
Pesticides/Herbicides (ug/kg)						
2,4,5-T	FALSE	5.85	5.83	LOGNORMAL	5.83	ND
2,4,5-TP (Silvex)	FALSE	5.85	5.83	LOGNORMAL	5.83	ND
2,4-D	FALSE	8.55	10.7	LOGNORMAL	10.7	10.7
2,4-DB	FALSE	5.85	5.83	LOGNORMAL	5.83	ND
4,4'-DDD	FALSE	3.64	4.49	LOGNORMAL	4.49	ND
4,4'-DDE	TRUE	1.02	1.60	NORMAL	1.02	1.01
4,4'-DDT	TRUE	3.51	6.52	NORMAL	3.51	3.51
Total DDT[7]	TRUE	6.95	9.21	NORMAL	6.95	6.95
Aldrin	NA	NA	NA	NA	NA	0.23
alpha-BHC	FALSE	0.552	0.680	LOGNORMAL	0.68	ND
alpha-Chlordane	FALSE	1.98	2.47	LOGNORMAL	2.47	2.47
beta-BHC	FALSE	0.781	1.05	LOGNORMAL	1.05	1.05
Dalapon	FALSE	45.6	45.5	LOGNORMAL	45.5	ND
delta-BHC	FALSE	0.552	0.680	LOGNORMAL	0.68	ND
Dicamba	TRUE	4.2	6.3	NORMAL	4.17	4.09
Dichlorprop	FALSE	70.4	70.2	LOGNORMAL	70.2	ND
Dieldrin	FALSE	2.32	3.79	LOGNORMAL	3.79	3.79
Dinoseb	FALSE	70.4	70.2	LOGNORMAL	70.2	ND
Endosulfan I	FALSE	1.87	2.30	LOGNORMAL	2.3	ND
Endosulfan II	FALSE	3.64	4.49	LOGNORMAL	4.49	ND
Endosulfan sulfate	FALSE	2.74	3.24	LOGNORMAL	3.24	3.24
Endrin	FALSE	3.64	4.49	LOGNORMAL	4.49	ND
Endrin aldehyde	FALSE	3.64	4.49	LOGNORMAL	4.49	ND
Endrin ketone	FALSE	3.64	4.49	LOGNORMAL	4.49	ND
gamma-BHC (Lindane)	FALSE	1.87	2.30	LOGNORMAL	2.3	ND
gamma-Chlordane	FALSE	1.48	1.99	LOGNORMAL	1.99	1.99
Heptachlor	FALSE	1.92	2.39	LOGNORMAL	2.39	ND
Heptachlor epoxide	FALSE	1.87	2.30	LOGNORMAL	2.3	ND
MCPA	FALSE	1,395	1,391	LOGNORMAL	1390	ND
MCPP	FALSE	1,454	1,545	LOGNORMAL	1550	1550
Methoxychlor	FALSE	18.7	23.0	LOGNORMAL	23	ND
Toxaphene	FALSE	187	230	LOGNORMAL	230	ND
SVOCs (ug/kg)						
1,2,4-Trichlorobenzene	FALSE	119	119	LOGNORMAL	119	ND
1,2-Dichlorobenzene	FALSE	119	119	LOGNORMAL	119	ND
1,3-Dichlorobenzene	FALSE	119	119	LOGNORMAL	119	ND
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	94
2,4,5-Trichlorophenol	FALSE	119	119	LOGNORMAL	119	ND
2,4,6-Trichlorophenol	FALSE	49.1	48.9	LOGNORMAL	48.9	ND
2,4-Dichlorophenol	FALSE	119	119	LOGNORMAL	119	ND
2,4-Dinitrophenol	FALSE	591	589	LOGNORMAL	589	ND
2,4-Dinitrotoluene	FALSE	119	119	LOGNORMAL	119	ND
2,6-Dinitrotoluene	FALSE	119	119	LOGNORMAL	119	ND
2-Chloronaphthalene	FALSE	119	119	LOGNORMAL	119	ND
2-Chlorophenol	FALSE	119	119	LOGNORMAL	119	ND
2-Methylnaphthalene	FALSE	119	119	LOGNORMAL	119	ND
2-Methylphenol (o-Cresol)	FALSE	119	119	LOGNORMAL	119	ND
2-Nitroaniline	FALSE	591	589	LOGNORMAL	589	ND
2-Nitrophenol	FALSE	119	119	LOGNORMAL	119	ND
3&4Methylphenol	FALSE	119	119	LOGNORMAL	119	ND
3,3'-Dichlorobenzidine	FALSE	231	230	LOGNORMAL	230	ND
3-Nitroaniline	FALSE	591	589	LOGNORMAL	589	ND
4,6-Dinitro-2-methylphenol	FALSE	591	589	LOGNORMAL	589	ND
4-Bromophenyl phenyl ether	FALSE	119	119	LOGNORMAL	119	ND
4-Chloro-3-methylphenol	FALSE	119	119	LOGNORMAL	119	ND
4-Chloroaniline	FALSE	231	230	LOGNORMAL	230	ND
4-Chlorophenyl phenyl ether	FALSE	119	119	LOGNORMAL	119	ND
4-Nitroaniline	FALSE	591	589	LOGNORMAL	589	ND

Appendix B-3e
Creek Segment F Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

	Normality Test[3]	Normal UCL[1]	Log Normal UCL[1]	Distribution[4]	Selected UCL[5]	Creek Segment Specific EPC[6]
4-Nitrophenol	FALSE	591	589	LOGNORMAL	589	ND
Acenaphthene	FALSE	119	119	LOGNORMAL	119	ND
Acenaphthylene	FALSE	119	119	LOGNORMAL	119	ND
Anthracene	FALSE	119	119	LOGNORMAL	119	ND
Benzo(a)anthracene	TRUE	63	92	NORMAL	63.3	62.3
Benzo(a)pyrene	FALSE	70	80	LOGNORMAL	79.6	79.6
Benzo(b)fluoranthene	FALSE	112	147	LOGNORMAL	147	147
Benzo(g,h,i)perylene	FALSE	105	123	LOGNORMAL	123	123
Benzo(k)fluoranthene	FALSE	110	129	LOGNORMAL	129	129
Bis(2-chloroethoxy)methane	FALSE	119	119	LOGNORMAL	119	ND
Bis(2-chloroethyl)ether	FALSE	119	119	LOGNORMAL	119	ND
Bis(2-chloroisopropyl ether)	FALSE	119	119	LOGNORMAL	119	ND
Bis(2-ethylhexyl)phthalate	FALSE	91	110	LOGNORMAL	110	90.6
Butylbenzylphthalate	FALSE	119	119	LOGNORMAL	119	ND
Carbazole	FALSE	119	119	LOGNORMAL	119	ND
Chrysene	FALSE	106	137	LOGNORMAL	137	137
Dibenzo(a,h)anthracene	FALSE	62.6	62.4	LOGNORMAL	62.4	ND
Dibenzofuran	FALSE	119	119	LOGNORMAL	119	ND
Diethyl phthalate	FALSE	119	119	LOGNORMAL	119	ND
Dimethyl phthalate	FALSE	119	119	LOGNORMAL	119	ND
di-n-Butylphthalate	FALSE	119	119	LOGNORMAL	119	ND
di-n-Octylphthalate	FALSE	119	119	LOGNORMAL	119	ND
Fluoranthene	FALSE	110	130	LOGNORMAL	130	130
Fluorene	FALSE	119	119	LOGNORMAL	119	ND
Hexachlorobenzene	FALSE	49.1	48.9	LOGNORMAL	48.9	ND
Hexachlorobutadiene	NA	NA	NA	NA	NA	61
Hexachlorocyclopentadiene	FALSE	119	119	LOGNORMAL	119	ND
Hexachloroethane	FALSE	119	119	LOGNORMAL	119	ND
Indeno(1,2,3-cd)pyrene	FALSE	107	106	LOGNORMAL	106	106
Isophorone	FALSE	119	119	LOGNORMAL	119	ND
Naphthalene	FALSE	119	119	LOGNORMAL	119	ND
Nitrobenzene	FALSE	119	119	LOGNORMAL	119	ND
N-Nitroso-di-N-propylamine	FALSE	119	119	LOGNORMAL	119	ND
N-nitrosodiphenylamine	FALSE	119	119	LOGNORMAL	119	ND
Pentachlorophenol	FALSE	8.91	16.7	LOGNORMAL	16.7	16.7
Phenanthrene	TRUE	60	98	NORMAL	60.3	59.3
Phenol	FALSE	119	119	LOGNORMAL	119	ND
Pyrene	FALSE	121	120	LOGNORMAL	120	120
Total PAHs[2]	FALSE	1,559	1,648	LOGNORMAL	1650	1400
VOCs (ug/kg)						
1,1,1-Trichloroethane	FALSE	3.43	3.65	LOGNORMAL	3.65	ND
1,1,2,2-Tetrachloroethane	FALSE	3.91	4.43	LOGNORMAL	4.43	4.43
1,1,2-Trichloroethane	FALSE	3.65	3.97	LOGNORMAL	3.97	3.97
1,1-Dichloroethane	FALSE	3.43	3.65	LOGNORMAL	3.65	ND
1,1-Dichloroethene	FALSE	3.17	3.37	LOGNORMAL	3.37	ND
1,2-Dichloroethane	NA	NA	NA	NA	NA	2.1
1,2-Dichloroethene (total)	FALSE	3.43	3.65	LOGNORMAL	3.65	ND
1,2-Dichloropropane	FALSE	3.43	3.65	LOGNORMAL	3.65	ND
2-Butanone (MEK)	TRUE	10.3	12.1	NORMAL	10.3	10.3
2-Hexanone	FALSE	17.2	18.3	LOGNORMAL	18.3	ND
4-Methyl-2-pentanone (MIBK)	FALSE	17.2	18.3	LOGNORMAL	18.3	ND
Acetone	FALSE	40.2	45.8	LOGNORMAL	45.8	45.8
Benzene	FALSE	3.43	3.65	LOGNORMAL	3.65	ND
Bromodichloromethane	NA	NA	NA	NA	NA	1.3
Bromoform	NA	NA	NA	NA	NA	2.95
Bromomethane	FALSE	6.89	7.33	LOGNORMAL	7.33	ND
Carbon disulfide	FALSE	3.43	3.65	LOGNORMAL	3.65	ND
Carbon tetrachloride	FALSE	3.43	3.65	LOGNORMAL	3.65	ND
Chlorobenzene	FALSE	4.43	5.36	LOGNORMAL	5.36	5.36
Chloroform	FALSE	3.43	3.65	LOGNORMAL	3.65	ND

Appendix B-3e
Creek Segment F Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

	Normality Test[3]	Normal UCL[1]	Log Normal UCL[1]	Distribution[4]	Selected UCL[5]	Creek Segment Specific EPC[6]
Chloroethane	FALSE	6.89	7.33	LOGNORMAL	7.33	ND
Chloromethane	FALSE	6.89	7.33	LOGNORMAL	7.33	ND
cis-1,3-Dichloropropene	FALSE	2.76	2.93	LOGNORMAL	2.93	ND
Dibromochloromethane	NA	NA	NA	NA	NA	2
Ethylbenzene	FALSE	3.43	3.65	LOGNORMAL	3.65	ND
Methylene chloride	TRUE	3.22	3.55	NORMAL	3.22	3.22
Styrene	FALSE	3.43	3.65	LOGNORMAL	3.65	ND
Tetrachloroethene	FALSE	3.43	3.65	LOGNORMAL	3.65	ND
Toluene	FALSE	4.77	5.99	LOGNORMAL	5.99	5.99
trans-1,3-Dichloropropene	FALSE	2.76	2.93	LOGNORMAL	2.93	ND
Trichloroethene	FALSE	3.43	3.65	LOGNORMAL	3.65	ND
Vinyl chloride	FALSE	6.89	7.33	LOGNORMAL	7.33	ND
Xylenes (total)	TRUE	3.43	3.66	NORMAL	3.43	3.43
Inorganics (mg/kg)						
Aluminum	TRUE	8,898	10,119	NORMAL	8900	8900
Antimony	TRUE	0.63	0.63	NORMAL	0.628	0.627
Arsenic	TRUE	9.77	12.5	NORMAL	9.77	9.77
Barium	TRUE	220	245	NORMAL	220	220
Beryllium	TRUE	0.638	0.809	NORMAL	0.638	0.638
Cadmium	TRUE	20.6	57.0	NORMAL	20.6	20.6
Calcium	FALSE	9,867	12,038	LOGNORMAL	12000	12000
Chromium	TRUE	16.9	19.9	NORMAL	16.9	16.9
Cobalt	TRUE	8.87	9.98	NORMAL	8.87	8.87
Copper	FALSE	122	230	LOGNORMAL	230	230
Iron	FALSE	19,453	22,547	LOGNORMAL	22500	22500
Lead	FALSE	59.8	88.1	LOGNORMAL	88.1	88.1
Magnesium	TRUE	5,292	5,866	NORMAL	5290	5290
Manganese	FALSE	338	424	LOGNORMAL	424	424
Mercury	FALSE	0.195	0.419	LOGNORMAL	0.419	0.419
Molybdenum	FALSE	0.591	0.762	LOGNORMAL	0.762	0.762
Nickel	FALSE	170	344	LOGNORMAL	344	344
Potassium	TRUE	1,600	1,845	NORMAL	1600	1600
Selenium	FALSE	0.662	0.81	LOGNORMAL	0.805	0.805
Silver	FALSE	0.657	0.653	LOGNORMAL	0.653	0.653
Sodium	FALSE	139	159	LOGNORMAL	159	159
Thallium	FALSE	0.698	0.814	LOGNORMAL	0.814	ND
Tin	FALSE	3.79	5.05	LOGNORMAL	5.05	5.05
Vanadium	TRUE	25.7	28.2	NORMAL	25.7	25.7
Zinc	FALSE	2,294	5,654	LOGNORMAL	5650	5650
PCBs (ug/kg)						
Monochlorobiphenyl	FALSE	2.51	2.77	LOGNORMAL	2.77	2.77
Dichlorobiphenyl	FALSE	2.31	2.30	LOGNORMAL	2.3	ND
Trichlorobiphenyl	FALSE	2.53	2.99	LOGNORMAL	2.99	2.99
Tetrachlorobiphenyl	FALSE	9.47	10.8	LOGNORMAL	10.8	10.8
Pentachlorobiphenyl	FALSE	14.1	17.5	LOGNORMAL	17.5	17.5
Hexachlorobiphenyl	FALSE	9.39	11.1	LOGNORMAL	11.1	11.1
Heptachlorobiphenyl	FALSE	7.60	8.34	LOGNORMAL	8.34	8.34
Octachlorobiphenyl	NA	NA	NA	NA	NA	6.2
Nonachlorobiphenyl	FALSE	11.0	13.0	LOGNORMAL	13	13
Decachlorobiphenyl	FALSE	12.0	15.2	LOGNORMAL	15.2	15.2
Total PCBs[9]	FALSE	70.5	83.8	LOGNORMAL	83.8	83.8
Dioxins (ug/kg)						
1,2,3,4,6,7,8,9-OCDD	FALSE	2.56	7.13	LOGNORMAL	7.13	7.13
1,2,3,4,6,7,8-HpCDD	FALSE	0.289	1.50	LOGNORMAL	1.5	1.5
1,2,3,4,7,8-HxCDD	FALSE	0.0251	0.0393	LOGNORMAL	0.0393	0.0393
1,2,3,6,7,8-HxCDD	FALSE	0.0488	0.0959	LOGNORMAL	0.0959	0.0959
1,2,3,7,8,9-HxCDD	FALSE	0.0590	0.119	LOGNORMAL	0.119	0.119
1,2,3,7,8-PeCDD	FALSE	0.0338	0.0564	LOGNORMAL	0.0564	0.0564
2,3,7,8-TCDD	FALSE	0.00970	0.0130	LOGNORMAL	0.013	ND
Total HpCDD	FALSE	0.529	2.80	LOGNORMAL	2.8	2.8

Appendix B-3e
Creek Segment F Summary Statistics and Exposure Point Concentrations
Dead Creek
Sauget Area I

	Normality Test[3]	Normal UCL[1]	Log Normal UCL[1]	Distribution[4]	Selected UCL[5]	Creek Segment Specific EPC[6]
Total HxCDD	FALSE	0.386	1.95	LOGNORMAL	1.95	1.95
Total PeCDD	FALSE	0.305	0.804	LOGNORMAL	0.804	0.804
Total TCDD	FALSE	3.20	3.47	LOGNORMAL	3.47	3.47
Furans (ug/kg)						
1,2,3,4,6,7,8,9-OCDF	FALSE	1.23	7.60	LOGNORMAL	7.6	7.6
1,2,3,4,6,7,8-HpCDF	FALSE	0.196	0.930	LOGNORMAL	0.93	0.93
1,2,3,4,7,8,9-HpCDF	FALSE	0.0341	0.0590	LOGNORMAL	0.059	0.059
1,2,3,4,7,8-HxCDF	FALSE	0.0561	0.0860	LOGNORMAL	0.086	0.086
1,2,3,6,7,8-HxCDF	FALSE	0.0184	0.0279	LOGNORMAL	0.0279	ND
1,2,3,7,8,9-HxCDF	FALSE	0.0342	0.0406	LOGNORMAL	0.0406	0.0406
1,2,3,7,8-PeCDF	FALSE	0.0352	0.0546	LOGNORMAL	0.0546	0.0546
2,3,4,6,7,8-HxCDF	FALSE	0.0262	0.0331	LOGNORMAL	0.0331	0.0331
2,3,4,7,8-PeCDF	FALSE	0.0398	0.0631	LOGNORMAL	0.0631	0.0631
2,3,7,8-TCDF	FALSE	0.0699	0.145	LOGNORMAL	0.145	0.145
Total HpCDF	FALSE	0.658	3.60	LOGNORMAL	3.6	3.6
Total HxCDF	FALSE	0.612	4.92	LOGNORMAL	4.92	4.92
Total PeCDF	FALSE	0.250	0.719	LOGNORMAL	0.719	0.719
Total TCDF	FALSE	0.392	0.722	LOGNORMAL	0.722	0.722
Total TEQ[10]	FALSE	0.104	0.156	LOGNORMAL	0.156	0.156

ND = not detected
NA = not available
EPC = Exposure Point Concentration
UCL = 95th Percent Upper Confidence Limit on the mean
Duplicates have been averaged (see text for details).

[1]Average and percentiles calculated assuming 1/2 detection limit for non-detects

[2]Standard deviation calculated for detected concentrations only

[3]Normality Test based on Shapiro-Wilks W Test ($p = 0.05$). If NA, insufficient amount of data (N<3) to conduct test. If FALSE, data does not have a normal distribution. If TRUE, data has a normal underlying distribution.

[4]Data are assumed to be either normally or lognormally distributed. If the data do not have a normal underlying distribution as determined by the Shapiro-Wilks W Test, data are assumed to be lognormal.

[5]Selected UCL determined by the determined distribution of the data (either normally or lognormally distributed).

[6]For compounds with less than 10 samples available for analyses, the EPC is the average concentration. If the selected UCL exceeds the maximum detected concentration, the maximum is used. Otherwise, the selected UCL is used as the EPC.

[7]Total DDT is the sum of 4,4'-DDD, 4,4'-DDE and 4,4'-DDT. For nondetects, half the detection limit is used.

[8]Total PAHs is the sum of all measured carcinogenic and noncarcinogenic PAHs. For nondetects, half the detection is used.

[9]Total PCBs equals the sum of the homologs. For nondetects, half the detection limit is used.

[10]Total TEQ is based on Toxic Equivalency Factors for Humans/Mammals as developed by Van den Berg, et al., 1998. For nondetects, half the detection limit is used.

APPENDIX C

1999 SURFACE WATER, SEDIMENT, AND FORAGE FISH DATA AND SUMMARY STATISTICS

Appe 1a

Summary Statistics for 1999 Creek Segment B Surface Water
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Cyanide, Total (mg/L)	3	0	0			0.005		0.005	0.005	0.005	0.01	0.01
Pesticides/Herbicides (ug/L)												
2,4,5-T	3	0	0			0.25		0.25	0.25	0.25	0.5	0.5
2,4,5-TP (Silvex)	3	0	0			0.25		0.25	0.25	0.25	0.5	0.5
2,4-D	3	0	0			0.25		0.25	0.25	0.25	0.5	0.5
2,4-DB	3	0	0			0.25		0.25	0.25	0.25	0.5	0.5
4,4'-DDD	3	1	33	0.0052	0.0052	0.0351		0.05	0.05	0.05	0.1	0.1
4,4'-DDE	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
4,4'-DDT	3	1	33	0.004	0.004	0.0347		0.05	0.05	0.05	0.1	0.1
Total DDT	3	1	33	0.0092	0.0092	0.12		0.15	0.15	0.15	0.1	0.3
Aldrin	3	1	33	0.0037	0.0037	0.0179		0.025	0.025	0.025	0.05	0.05
alpha-BHC	3	2	67	0.011	0.022	0.0175	0.00778	0.0195	0.0208	0.0218	0.039	0.039
Alpha Chlordane	3	0	0			0.025		0.025	0.025	0.025	0.05	0.05
beta-BHC	3	2	67	0.019	0.02	0.0153	0.000707	0.019	0.0195	0.0199	0.014	0.014
Dalapon	3	0	0			60		60	60	60	120	120
delta-BHC	3	3	100	0.005	0.015	0.00887	0.00537	0.0066	0.0108	0.0142		
Dicamba	3	0	0			0.6		0.6	0.6	0.6	1.2	1.2
Dichloroprop	3	0	0			3		3	3	3	6	6
Dieldrin	3	1	33	0.0035	0.0035	0.0345		0.05	0.05	0.05	0.1	0.1
Dinoseb	3	0	0			3		3	3	3	6	6
Endosulfan I	3	0	0			0.025		0.025	0.025	0.025	0.05	0.05
Endosulfan II	3	1	33	0.0053	0.0053	0.0351		0.05	0.05	0.05	0.1	0.1
Endosulfan sulfate	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
Endrin	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
Endrin aldehyde	3	1	33	0.0025	0.0025	0.0342		0.05	0.05	0.05	0.1	0.1
Endrin ketone	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
gamma-BHC (Lindane)	3	2	67	0.0038	0.04	0.0178	0.0256	0.0095	0.0248	0.037	0.019	0.019
Gamma Chlordane	3	2	67	0.0027	0.0054	0.011	0.00191	0.0054	0.0152	0.023	0.05	0.05
Heptachlor	3	2	67	0.0016	0.0048	0.0105	0.00226	0.0048	0.0149	0.023	0.05	0.05
Heptachlor epoxide	3	2	67	0.0016	0.0077	0.0114	0.00431	0.0077	0.0164	0.0233	0.05	0.05
MCPA	3	0	0			60		60	60	60	120	120
MCPP	3	0	0			60		60	60	60	120	120
Methoxychlor	3	0	0			0.25		0.25	0.25	0.25	0.5	0.5
Toxaphene	3	0	0			2.5		2.5	2.5	2.5	5	5
SVOCs (ug/L)												
1,2,4-Trichlorobenzene	3	0	0			5		5	5	5	10	10
1,2-Dichlorobenzene	3	0	0			5		5	5	5	10	10
1,3-Dichlorobenzene	3	0	0			5		5	5	5	10	10
1,4-Dichlorobenzene	3	0	0			5		5	5	5	10	10
2,4,5-Trichlorophenol	3	0	0			5		5	5	5	10	10
2,4,6-Trichlorophenol	3	0	0			1.05		1.05	1.05	1.05	2.1	2.1
2,4-Dichlorophenol	3	0	0			5		5	5	5	10	10
2,4-Dinitrophenol	3	0	0			7		7	7	7	14	14
2,4-Dinitrotoluene	3	0	0			5		5	5	5	10	10
2,6-Dinitrotoluene	3	0	0			5		5	5	5	10	10
2-Chloronaphthalene	3	0	0			5		5	5	5	10	10
2-Chlorophenol	3	0	0			5		5	5	5	10	10
2-Methylnaphthalene	3	0	0			5		5	5	5	10	10
2-Methylphenol (o-cresol)	3	0	0			5		5	5	5	10	10
2-Nitroaniline	3	0	0			25		25	25	25	50	50
2-Nitrophenol	3	0	0			5		5	5	5	10	10
3-Methylphenol/4-Methylphenol	3	0	0			5		5	5	5	10	10
3,3'-Dichlorobenzidine	3	0	0			10		10	10	10	20	20
3-Nitroaniline	3	0	0			25		25	25	25	50	50
4,6-Dinitro-2-methylphenol	3	0	0			6.5		6.5	6.5	6.5	13	13
4-Bromophenylphenyl ether	3	0	0			0.5		0.5	0.5	0.5	1	1
4-Chloro-3-methylphenol	3	0	0			5		5	5	5	10	10
4-Chloroaniline	3	0	0			10		10	10	10	20	20
4-Chlorophenylphenyl ether	3	0	0			5		5	5	5	10	10
4-Nitroaniline	3	0	0			25		25	25	25	50	50
4-Nitrophenol	3	0	0			25		25	25	25	50	50

Appendix C-1a
Summary Statistics for 1999 Creek Segment B Surface Water
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Acenaphthene	3	0	0			5		5	5	5	10	10
Acenaphthylene	3	0	0			5		5	5	5	10	10
Anthracene	3	0	0			5		5	5	5	10	10
Benzo(a)anthracene	3	0	0			5		5	5	5	10	10
Benzo(a)pyrene	3	0	0			5		5	5	5	10	10
Benzo(b)fluoranthene	3	0	0			5		5	5	5	10	10
Benzo(g,h,i)perylene	3	0	0			5		5	5	5	10	10
Benzo(k)fluoranthene	3	0	0			5		5	5	5	10	10
bis(2-Chloroethoxy)methane	3	0	0			5		5	5	5	10	10
bis(2-Chloroethyl)ether	3	0	0			5		5	5	5	10	10
2,2'-Oxybis(1-Chloropropane)	3	0	0			5		5	5	5	10	10
bis(2-Ethylhexyl)phthalate	3	0	0			0.9		0.9	0.9	0.9	1.8	1.8
Butylbenzylphthalate	3	0	0			5		5	5	5	10	10
Carbazole	3	0	0			5		5	5	5	10	10
Chrysene	3	0	0			5		5	5	5	10	10
Dibenzo(a,h)anthracene	3	0	0			5		5	5	5	10	10
Dibenzofuran	3	0	0			5		5	5	5	10	10
Diethylphthalate	3	0	0			5		5	5	5	10	10
Dimethylphthalate	3	0	0			5		5	5	5	10	10
Di-n-butylphthalate	3	0	0			5		5	5	5	10	10
Di-n-octylphthalate	3	0	0			5		5	5	5	10	10
Fluoranthene	3	0	0			5		5	5	5	10	10
Fluorene	3	0	0			0.5		0.5	0.5	0.5	1	1
Hexachlorobenzene	3	0	0			5		5	5	5	10	10
Hexachlorobutadiene	3	0	0			5		5	5	5	10	10
Hexachlorocyclopentadiene	3	0	0			5		5	5	5	10	10
Hexachloroethane	3	0	0			0.95		0.95	0.95	0.95	1.9	1.9
Indeno(1,2,3-cd)pyrene	3	0	0			5		5	5	5	10	10
Isophorone	3	0	0			5		5	5	5	10	10
Naphthalene	3	0	0			5		5	5	5	10	10
Nitrobenzene	3	0	0			1.75		1.75	1.75	1.75	3.5	3.5
N-Nitroso-di-n-propylamine	3	0	0			5		5	5	5	10	10
N-Nitrosodiphenylamine	3	0	0			2.5		2.5	2.5	2.5	5	5
Pentachlorophenol	3	1	33	1	1	2		2.5	2.5	2.5	5	5
Phenanthrene	3	0	0			5		5	5	5	10	10
Phenol	3	0	0			5		5	5	5	10	10
Pyrene	3	0	0			5		5	5	5	10	10
Total PAHs	3	0	0			80.5		80.5	80.5	80.5	161	161
VOCs (ug/L)												
1,1,1-Trichloroethane	3	0	0			2.5		2.5	2.5	2.5	5	5
1,1,2,2-Tetrachloroethane	3	0	0			2.5		2.5	2.5	2.5	5	5
1,1,2-Trichloroethane	3	0	0			2.5		2.5	2.5	2.5	5	5
1,1-Dichloroethane	3	0	0			2.5		2.5	2.5	2.5	5	5
1,1-Dichloroethene	3	0	0			2.5		2.5	2.5	2.5	5	5
1,2-Dichloroethane	3	0	0			2.5		2.5	2.5	2.5	5	5
Cis/Trans-1,2-Dichloroethene	3	0	0			2.5		2.5	2.5	2.5	5	5
1,2-Dichloropropane	3	0	0			2.5		2.5	2.5	2.5	5	5
2-Butanone (MEK)	3	0	0			12.5		12.5	12.5	12.5	25	25
2-Hexanone	3	0	0			12.5		12.5	12.5	12.5	25	25
4-Methyl-2-pentanone (MIBK)	3	0	0			12.5		12.5	12.5	12.5	25	25
Acetone	3	2	67	14	18	19	2.83	18	21.5	24.3	50	50
Benzene	3	0	0			0.6		0.6	0.6	0.6	1.2	1.2
Bromodichloromethane	3	0	0			2.5		2.5	2.5	2.5	5	5
Bromoform	3	0	0			2.5		2.5	2.5	2.5	5	5
Bromomethane (Methyl bromide)	3	0	0			4.9		4.9	4.9	4.9	9.8	9.8
Carbon disulfide	3	0	0			2.5		2.5	2.5	2.5	5	5
Carbon tetrachloride	3	0	0			2.5		2.5	2.5	2.5	5	5
Chlorobenzene	3	1	33	2.8	2.8	2.6		2.5	2.65	2.77	5	5
Chloroform	3	0	0			2.5		2.5	2.5	2.5	5	5
Chloroethane	3	0	0			5		5	5	5	10	10
Chloromethane	3	0	0			5		5	5	5	10	10

Appx -1a

Summary Statistics for 1999 Creek Segment B Surface Water
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
cis-1,3-Dichloropropene	3	0	0			0 5		0.5	0.5	0.5	1	1
Dibromochloromethane	3	0	0			2.5		2.5	2.5	2.5	5	5
Ethylbenzene	3	0	0			2.5		2.5	2.5	2.5	5	5
Methylene chloride (Dichloromethane)	3	0	0			2.35		2.35	2 35	2.35	4.7	4.7
Styrene	3	0	0			2.5		2.5	2.5	2.5	5	5
Tetrachloroethene	3	0	0			2.5		2.5	2.5	2.5	5	5
Toluene	3	0	0			2.5		2.5	2.5	2.5	5	5
trans-1,3-Dichloropropene	3	0	0			2.5		2.5	2.5	2.5	5	5
Trichloroethene	3	0	0			1.35		1.35	1 35	1.35	2.7	2.7
Vinyl chloride	3	0	0			5		5	5	5	10	10
Xylenes, Total	3	0	0			2.5		2.5	2.5	2.5	5	5
Inorganics (mg/L)												
Aluminum	3	3	100	0 035	0.066	0 0473	0.0184	0.041	0.0535	0.0635		
Antimony	3	1	33	0.007	0.007	0.009		0.01	0.01	0.01	0.02	0 02
Arsenic	3	2	67	0.0052	0.0064	0.00553	0.000849	0.0052	0.0058	0.00628	0.01	0.01
Barium	3	3	100	0.17	0.3	0.233	0.0651	0.23	0.265	0.293		
Beryllium	3	0	0			0.002		0.002	0.002	0.002	0 004	0.004
Cadmium	3	1	33	0.00091	0 00091	0.00197		0.0025	0.0025	0.0025	0.005	0.005
Calcium	3	3	100	51	180	124	66	140	160	176		
Chromium	3	0	0			0 005		0.005	0 005	0.005	0.01	0.01
Cobalt	3	0	0			0.005		0.005	0.005	0.005	0.01	0.01
Copper	3	3	100	0.046	0 13	0.0783	0.0452	0.059	0.0945	0.123		
Iron	3	1	33	0.43	0.43	0 178		0.065	0.248	0.394	0.076	0.13
Lead	3	3	100	0.003	0.0066	0.0046	0.00183	0.0042	0.0054	0.00636		
Magnesium	3	3	100	6	23	15.3	8.62	17	20	22.4		
Manganese	3	3	100	0.0068	0.034	0.0223	0.014	0.026	0.03	0.0332		
Mercury	3	0	0			0.0001		0.0001	0.0001	0.0001	0.0002	0.0002
Molybdenum	3	3	100	0.012	0.032	0.0227	0.0101	0.024	0.028	0.0312		
Nickel	3	3	100	0.0096	0.015	0.0125	0.00273	0.013	0.014	0.0148		
Potassium	3	3	100	4.8	7.7	6.6	1.57	7.3	7.5	7.66		
Selenium	3	0	0			0.005		0.005	0.005	0.005	0.01	0.01
Silver	3	0	0			0.005		0.005	0.005	0.005	0 01	0.01
Sodium	3	3	100	28	54	39.7	13 2	37	45.5	52.3		
Thallium	3	0	0			0.005		0.005	0.005	0.005	0 01	0.01
Vanadium	3	0	0			0.005		0.005	0.005	0.005	0 01	0 01
Zinc	3	3	100	0 045	0 13	0 085	0.0427	0 08	0.105	0.125		
Fluoride												
Hardness as CaCO3	3	3	100	150	550	373	204	420	485	537		
Ortho-Phosphate-P	3	3	100	0.021	0.087	0.0613	0 0354	0.078	0 0815	0.0859		
pH	3	3	100	7.6	8 5	8.03	0 451	8	8.25	8.45		
Suspended Solids	3	0	0			2.5		2.5	2.5	2.5	5	5
Total Dissolved Solids	3	3	100	340	1200	827	441	940	1070	1170		
Total Phosphorus	3	1	33	0.11	0.11	0.07		0 05	0.08	0.104	0.1	0.1
PCBs (ug/L)												
Monochlorobiphenyl	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
Dichlorobiphenyl	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
Trichlorobiphenyl	3	0	0			0 05		0.05	0.05	0.05	0.1	0.1
Tetrachlorobiphenyl												
Pentachlorobiphenyl	3	0	0			0.1		0.1	0 1	0.1	0.2	0.2
Hexachlorobiphenyl	3	0	0			0 1		0.1	0.1	0.1	0.2	0.2
Heptachlorobiphenyl	3	0	0			0.15		0.15	0.15	0 15	0.3	0.3
Octachlorobiphenyl	3	0	0			0.15		0.15	0.15	0.15	0.3	0.3
Nonachlorobiphenyl	3	0	0			0.25		0.25	0.25	0.25	0.5	0.5
Decachlorobiphenyl	3	0	0			0.25		0.25	0.25	0.25	0 5	0.5
Total PCBs	3	0	0			1.25		1.25	1.25	1.25	2.5	2.5
Dioxins (ug/L)												
1,2,3,4,6,7,8,9-OCDD	3	3	100	0.00193	0.00558	0.00391	0.00184	0.00422	0.0049	0.00544		
1,2,3,4,6,7,8-HpCDD	3	3	100	0.000213	0.000637	0.000441	0.000214	0.000473	0.000555	0.000621		
1,2,3,4,7,8-HxCDD	3	0	0			0.00000383		0.00000455	0.00000465	0.00000473	0.0000032	0.0000095
1,2,3,6,7,8-HxCDD	3	2	67	0.0000178	0 0000241	0.0000154	0.00000445	0 0000178	0.000021	0.0000235	0.0000085	0.0000085
1,2,3,7,8,9-HxCDD												

Appendix C-1a
Summary Statistics for 1999 Creek Segment B Surface Water
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
1,2,3,7,8-PeCDD	3	0	0			0.00000355		0.00000425	0.0000045	0.0000047	0.0000033	0.0000095
2,3,7,8-TCDD	3	0	0			0.00000337		0.00000385	0.0000042	0.00000448	0.0000034	0.0000091
Total HpCDD	3	3	100	0.000451	0.00124	0.000878	0.000398	0.000943	0.00109	0.00121		
Total HxCDD	3	3	100	0.0000251	0.00018	0.000104	0.0000775	0.000106	0.000143	0.000173		
Total PeCDD	3	0	0			0.0000142		0.00000475	0.0000192	0.0000308	0.0000085	0.0000673
Total TCDD	3	2	67	0.0000243	0.0000262	0.0000181	0.00000134	0.0000243	0.0000253	0.000026	0.0000077	0.0000077
Furans (ug/L)												
1,2,3,4,6,7,8,9-OCDF	3	3	100	0.000209	0.00174	0.00101	0.000767	0.00107	0.00141	0.00167		
1,2,3,4,6,7,8-HpCDF	3	3	100	0.0000748	0.0004	0.00024	0.000163	0.000245	0.000323	0.000385		
1,2,3,4,7,8,9-HpCDF	3	1	33	0.0000248	0.0000248	0.0000123		0.0000062	0.0000155	0.0000229	0.0000117	0.0000124
1,2,3,4,7,8-HxCDF	3	1	33	0.0000146	0.0000146	0.00000735		0.0000039	0.00000925	0.0000135	0.0000071	0.0000078
1,2,3,6,7,8-HxCDF	3	0	0			0.00000337		0.0000033	0.00000345	0.00000357	0.0000064	0.0000072
1,2,3,7,8,9-HxCDF	3	0	0			0.00000328		0.00000395	0.00000413	0.00000427	0.0000032	0.0000086
1,2,3,7,8-PeCDF	3	0	0			0.00000265		0.0000031	0.00000335	0.00000355	0.0000025	0.0000072
2,3,4,6,7,8-HxCDF	3	0	0			0.00000467		0.00000385	0.00000525	0.00000637	0.000007	0.0000133
2,3,4,7,8-PeCDF	3	0	0			0.00000278		0.00000325	0.00000353	0.00000375	0.0000026	0.0000076
2,3,7,8-TCDF	3	1	33	0.0000115	0.0000115	0.00000655		0.00000435	0.00000793	0.0000108	0.0000076	0.0000087
Total HpCDF	3	3	100	0.00018	0.00119	0.000701	0.000506	0.000734	0.000962	0.00114		
Total HxCDF	3	2	67	0.0000272	0.000095	0.0000732	0.0000479	0.000095	0.0000963	0.0000973	0.000195	0.000195
Total PeCDF	3	1	33	0.0000458	0.0000458	0.0000246		0.000025	0.0000354	0.0000437	0.0000063	0.0000499
Total TCDF	3	1	33	0.0000661	0.0000661	0.0000248		0.00000435	0.0000352	0.0000599	0.0000076	0.0000087
Total TEQ	3	3	100	0.00000309	0.0000182	0.0000212	0.00000759	0.0000236	0.0000237	0.0000238		

[1]Average and percentiles calculated assuming 1/2 detection limit for nondetects
[2]Standard deviation calculated for detected concentrations only

Appe[illegible].b
Summary Statistics for 1999 Cr[illegible] Segment D Surface Water
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Cyanide, Total (mg/L)	3	0	0			0.005		0.005	0.005	0.005	0.01	0.01
Pesticides/Herbicides (ug/L)												
2,4,5-T	3	0	0			0.25		0.25	0.25	0.25	0.5	0.5
2,4,5-TP (Silvex)	3	0	0			0.25		0.25	0.25	0.25	0.5	0.5
2,4-D	3	0	0			0.25		0.25	0.25	0.25	0.5	0.5
2,4-DB	3	0	0			0.25		0.25	0.25	0.25	0.5	0.5
4,4'-DDD	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
4,4'-DDE	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
4,4'-DDT	3	3	100	0.0023	0.0071	0.00447	0.00243	0.004	0.00555	0.00679		
Total DDT	3	3	100	0.0023	0.0071	0.104	0.00243	0.104	0.106	0.107		
Aldrin	3	2	67	0.002	0.0023	0.00977	0.000212	0.0023	0.0137	0.0227	0.05	0.05
alpha-BHC	3	3	100	0.0043	0.0164	0.00893	0.00653	0.0061	0.0113	0.0154		
Alpha Chlordane	3	0	0			0.025		0.025	0.025	0.025	0.05	0.05
beta-BHC	3	3	100	0.01	0.045	0.0275	0.0175	0.0275	0.0363	0.0433		
Dalapon	3	0	0			60		60	60	60	120	120
delta-BHC	3	3	100	0.0037	0.0126	0.00668	0.00508	0.0038	0.00818	0.0117		
Dicamba	3	0	0			0.6		0.6	0.6	0.6	1.2	1.2
Dichloroprop	3	0	0			3		3	3	3	6	6
Dieldrin	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
Dinoseb	3	0	0			22		3	31.5	54.3	6	120
Endosulfan I	3	1	33	0.00051	0.00051	0.0168		0.025	0.025	0.025	0.05	0.05
Endosulfan II	3	1	33	0.0063	0.0063	0.0354		0.05	0.05	0.05	0.1	0.1
Endosulfan sulfate	3	3	100	0.0035	0.017	0.0087	0.00726	0.0056	0.0113	0.0159		
Endrin	3	2	67	0.0021	0.0054	0.0192	0.00233	0.0054	0.0277	0.0455	0.1	0.1
Endrin aldehyde	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
Endrin ketone	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
gamma-BHC (Lindane)	3	3	100	0.01	0.0455	0.0235	0.0192	0.015	0.0302	0.0424		
Gamma Chlordane	3	1	33	0.005	0.005	0.0183		0.025	0.025	0.025	0.05	0.05
Heptachlor	3	3	100	0.0064	0.012	0.00878	0.00289	0.00795	0.00998	0.0116		
Heptachlor epoxide	3	3	100	0.011	0.017	0.014	0.003	0.014	0.0155	0.0167		
MCPA	3	0	0			60		60	60	60	120	120
MCPP	3	0	0			60		60	60	60	120	120
Methoxychlor	3	0	0			0.25		0.25	0.25	0.25	0.5	0.5
Toxaphene	3	0	0			2.5		2.5	2.5	2.5	5	5
SVOCs (ug/L)												
1,2,4-Trichlorobenzene	3	0	0			5		5	5	5	10	10
1,2-Dichlorobenzene	3	0	0			5		5	5	5	10	10
1,3-Dichlorobenzene	3	0	0			5		5	5	5	10	10
1,4-Dichlorobenzene	3	0	0			5		5	5	5	10	10
2,4,5-Trichlorophenol	3	0	0			5		5	5	5	10	10
2,4,6-Trichlorophenol	3	0	0			1.05		1.05	1.05	1.05	2.1	2.1
2,4-Dichlorophenol	3	0	0			5		5	5	5	10	10
2,4-Dinitrophenol	3	0	0			7		7	7	7	14	14
2,4-Dinitrotoluene	3	0	0			5		5	5	5	10	10
2,6-Dinitrotoluene	3	0	0			5		5	5	5	10	10
2-Chloronaphthalene	3	0	0			5		5	5	5	10	10
2-Chlorophenol	3	0	0			5		5	5	5	10	10
2-Methylnaphthalene	3	0	0			5		5	5	5	10	10
2-Methylphenol (o-cresol)	3	0	0			5		5	5	5	10	10
2-Nitroaniline	3	0	0			25		25	25	25	50	50
2-Nitrophenol	3	0	0			5		5	5	5	10	10
3-Methylphenol/4-Methylphenol	3	0	0			5		5	5	5	10	10
3,3'-Dichlorobenzidine	3	0	0			10		10	10	10	20	20
3-Nitroaniline	3	0	0			25		25	25	25	50	50
4,6-Dinitro-2-methylphenol	3	0	0			6.5		6.5	6.5	6.5	13	13
4-Bromophenylphenyl ether	3	0	0			0.5		0.5	0.5	0.5	1	1
4-Chloro-3-methylphenol	3	0	0			5		5	5	5	10	10
4-Chloroaniline	3	0	0			10		10	10	10	20	20
4-Chlorophenylphenyl ether	3	0	0			5		5	5	5	10	10
4-Nitroaniline	3	0	0			25		25	25	25	50	50
4-Nitrophenol	3	0	0			25		25	25	25	50	50

Appendix C-1b
Summary Statistics for 1999 Creek Segment D Surface Water
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Acenaphthene	3	0	0			5		5	5	5	10	10
Acenaphthylene	3	0	0			5		5	5	5	10	10
Anthracene	3	0	0			5		5	5	5	10	10
Benzo(a)anthracene	3	0	0			5		5	5	5	10	10
Benzo(a)pyrene	3	0	0			5		5	5	5	10	10
Benzo(b)fluoranthene	3	0	0			5		5	5	5	10	10
Benzo(g,h,i)perylene	3	0	0			5		5	5	5	10	10
Benzo(k)fluoranthene	3	0	0			5		5	5	5	10	10
bis(2-Chloroethoxy)methane	3	0	0			5		5	5	5	10	10
bis(2-Chloroethyl)ether	3	0	0			5		5	5	5	10	10
2,2'-Oxybis(1-Chloropropane)	3	0	0			5		5	5	5	10	10
bis(2-Ethylhexyl)phthalate	3	0	0			0.9		0.9	0.9	0.9	1.8	1.8
Butylbenzylphthalate	3	0	0			5		5	5	5	10	10
Carbazole	3	0	0			5		5	5	5	10	10
Chrysene	3	0	0			5		5	5	5	10	10
Dibenzo(a,h)anthracene	3	0	0			5		5	5	5	10	10
Dibenzofuran	3	0	0			5		5	5	5	10	10
Diethylphthalate	3	0	0			5		5	5	5	10	10
Dimethylphthalate	3	0	0			5		5	5	5	10	10
Di-n-butylphthalate	3	0	0			5		5	5	5	10	10
Di-n-octylphthalate	3	0	0			5		5	5	5	10	10
Fluoranthene	3	0	0			5		5	5	5	10	10
Fluorene	3	0	0			0.5		0.5	0.5	0.5	1	1
Hexachlorobenzene	3	0	0			5		5	5	5	10	10
Hexachlorobutadiene	3	0	0			5		5	5	5	10	10
Hexachlorocyclopentadiene	3	0	0			5		5	5	5	10	10
Hexachloroethane	3	0	0			0.95		0.95	0.95	0.95	1.9	1.9
Indeno(1,2,3-cd)pyrene	3	0	0			5		5	5	5	10	10
Isophorone	3	0	0			5		5	5	5	10	10
Naphthalene	3	0	0			5		5	5	5	10	10
Nitrobenzene	3	0	0			1.75		1.75	1.75	1.75	3.5	3.5
N-Nitroso-di-n-propylamine	3	0	0			5		5	5	5	10	10
N-Nitrosodiphenylamine	3	0	0			2.5		2.5	2.5	2.5	5	5
Pentachlorophenol	3	0	0			2.5		2.5	2.5	2.5	5	5
Phenanthrene	3	0	0			5		5	5	5	10	10
Phenol	3	0	0			5		5	5	5	10	10
Pyrene	3	0	0			5		5	5	5	10	10
Total PAHs	3	0	0			75.5		75.5	75.5	75.5	151	151
VOCs (ug/L)												
1,1,1-Trichloroethane	3	0	0			2.5		2.5	2.5	2.5	5	5
1,1,2,2-Tetrachloroethane	3	0	0			2.5		2.5	2.5	2.5	5	5
1,1,2-Trichloroethane	3	0	0			2.5		2.5	2.5	2.5	5	5
1,1-Dichloroethane	3	0	0			2.5		2.5	2.5	2.5	5	5
1,1-Dichloroethene	3	0	0			2.5		2.5	2.5	2.5	5	5
1,2-Dichloroethane	3	0	0			2.5		2.5	2.5	2.5	5	5
Cis/Trans-1,2-Dichloroethene	3	0	0			2.5		2.5	2.5	2.5	5	5
1,2-Dichloropropane	3	0	0			2.5		2.5	2.5	2.5	5	5
2-Butanone (MEK)	3	0	0			12.5		12.5	12.5	12.5	25	25
2-Hexanone	3	0	0			12.5		12.5	12.5	12.5	25	25
4-Methyl-2-pentanone (MIBK)	3	0	0			12.5		12.5	12.5	12.5	25	25
Acetone	3	3	100	11	17	13.2	3.33	11.5	14.3	16.5		
Benzene	3	0	0			0.6		0.6	0.6	0.6	1.2	1.2
Bromodichloromethane	3	0	0			2.5		2.5	2.5	2.5	5	5
Bromoform	3	0	0			2.5		2.5	2.5	2.5	5	5
Bromomethane (Methyl bromide)	3	0	0			4.9		4.9	4.9	4.9	9.8	9.8
Carbon disulfide	3	0	0			2.5		2.5	2.5	2.5	5	5
Carbon tetrachloride	3	0	0			2.5		2.5	2.5	2.5	5	5
Chlorobenzene	3	0	0			2.5		2.5	2.5	2.5	5	5
Chloroform	3	0	0			2.5		2.5	2.5	2.5	5	5
Chloroethane	3	0	0			5		5	5	5	10	10
Chloromethane	3	0	0			5		5	5	5	10	10

Appx -1b

Summary Statistics for 1999 Creek Segment D Surface Water
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
cis-1,3-Dichloropropene	3	0	0			0.5		0.5	0.5	0.5	1	1
Dibromochloromethane	3	0	0			2.5		2.5	2.5	2.5	5	5
Ethylbenzene	3	0	0			2.5		2.5	2.5	2.5	5	5
Methylene chloride (Dichloromethane)	3	0	0			2.35		2.35	2.35	2.35	4.7	4.7
Styrene	3	0	0			2.5		2.5	2.5	2.5	5	5
Tetrachloroethene	3	0	0			2.5		2.5	2.5	2.5	5	5
Toluene	3	0	0			2.5		2.5	2.5	2.5	5	5
trans-1,3-Dichloropropene	3	0	0			2.5		2.5	2.5	2.5	5	5
Trichloroethene	3	0	0			1.35		1.35	1.35	1.35	2.7	2.7
Vinyl chloride	3	0	0			5		5	5	5	10	10
Xylenes, Total	3	0	0			2.5		2.5	2.5	2.5	5	5
Inorganics (mg/L)												
Aluminum	3	3	100	0.33	1.4	0.69	0.615	0.34	0.87	1.29		
Antimony	3	0	0			0.01		0.01	0.01	0.01	0.02	0.02
Arsenic	3	1	33	0.005	0.005	0.005		0.005	0.005	0.005	0.01	0.01
Barium	3	3	100	0.16	0.175	0.168	0.00764	0.17	0.173	0.175		
Beryllium	3	0	0			0.002		0.002	0.002	0.002	0.004	0.004
Cadmium	3	0	0			0.0025		0.0025	0.0025	0.0025	0.005	0.005
Calcium	3	3	100	48	50	49.2	1.04	49.5	49.8	50		
Chromium	3	1	33	0.0057	0.0057	0.00523		0.005	0.00535	0.00563	0.01	0.01
Cobalt	3	0	0			0.005		0.005	0.005	0.005	0.01	0.01
Copper	3	3	100	0.015	0.026	0.0188	0.00621	0.0155	0.0208	0.025		
Iron	3	3	100	0.96	1.8	1.29	0.45	1.1	1.45	1.73		
Lead	3	3	100	0.0066	0.016	0.0106	0.00488	0.00905	0.0125	0.0153		
Magnesium	3	3	100	6	6.6	6.38	0.333	6.55	6.58	6.6		
Manganese	3	3	100	0.046	0.082	0.0608	0.0188	0.0545	0.0683	0.0793		
Mercury	3	0	0			0.0001		0.0001	0.0001	0.0001	0.0002	0.0002
Molybdenum	3	3	100	0.0033	0.0052	0.00442	0.000993	0.00475	0.00498	0.00516		
Nickel	3	3	100	0.017	0.022	0.019	0.00265	0.018	0.02	0.0216		
Potassium	3	3	100	5	6.3	5.7	0.656	5.8	6.05	6.25		
Selenium	3	1	33	0.0046	0.0046	0.00487		0.005	0.005	0.005	0.01	0.01
Silver	3	0	0			0.005		0.005	0.005	0.005	0.01	0.01
Sodium	3	3	100	8.1	11	9.23	1.55	8.6	9.8	10.8		
Thallium	3	0	0			0.005		0.005	0.005	0.005	0.01	0.01
Vanadium	3	3	100	0.00415	0.007	0.00515	0.0016	0.0043	0.00565	0.00673		
Zinc	3	3	100	0.05	0.15	0.0838	0.0573	0.0515	0.101	0.14		
Fluoride												
Hardness as CaCO3	3	3	100	140	150	147	5.77	150	150	150		
Ortho-Phosphate-P	3	3	100	0.057	0.075	0.065	0.00917	0.063	0.069	0.0738		
pH	3	3	100	7.6	8	7.83	0.208	7.9	7.95	7.99		
Suspended Solids	3	3	100	26	44	32.5	9.99	27.5	35.8	42.4		
Total Dissolved Solids	3	3	100	200	210	207	5.77	210	210	210		
Total Phosphorus	3	3	100	0.21	0.25	0.232	0.0202	0.235	0.243	0.249		
PCBs (ug/L)												
Monochlorobiphenyl	3	0	0			0.183		0.25	0.25	0.25	0.1	0.5
Dichlorobiphenyl	3	0	0			0.183		0.25	0.25	0.25	0.1	0.5
Trichlorobiphenyl	3	0	0			0.183		0.25	0.25	0.25	0.1	0.5
Tetrachlorobiphenyl												
Pentachlorobiphenyl	3	1	33	0.055	0.055	0.352		0.5	0.5	0.5	1	1
Hexachlorobiphenyl	3	0	0			0.367		0.5	0.5	0.5	0.2	1.
Heptachlorobiphenyl	3	0	0			0.55		0.75	0.75	0.75	0.3	1.5
Octachlorobiphenyl	3	0	0			0.55		0.75	0.75	0.75	0.3	1.5
Nonachlorobiphenyl	3	0	0			0.917		1.25	1.25	1.25	0.5	2.5
Decachlorobiphenyl	3	0	0			0.917		1.25	1.25	1.25	0.5	2.5
Total PCBs	3	1	33	0.055	0.055	4.57		6.25	6.25	6.25	2.3	12.5
Dioxins (ug/L)												
1,2,3,4,6,7,8,9-OCDD	3	3	100	0.00308	0.00402	0.00364	0.000495	0.00383	0.00392	0.004		
1,2,3,4,6,7,8-HpCDD	3	3	100	0.00034	0.000444	0.000401	0.000054	0.000418	0.000431	0.000441		
1,2,3,4,7,8-HxCDD	3	1	33	0.0000118	0.0000118	0.00000637		0.00000395	0.00000788	0.000011	0.0000067	0.0000079
1,2,3,6,7,8-HxCDD	3	3	100	0.0000135	0.0000184	0.0000162	0.00000252	0.0000167	0.0000176	0.0000182		
1,2,3,7,8,9-HxCDD												

Appendix C-1b
Summary Statistics for 1999 Creek Segment D Surface Water
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
1,2,3,7,8-PeCDD	3	0	0			0.00000333		0.0000032	0.00000348	0.0000037	0.0000061	0.0000075
2,3,7,8-TCDD	3	0	0			0.00000312		0.00000295	0.0000032	0.0000034	0.0000059	0.0000069
Total HpCDD	3	3	100	0.000678	0.000858	0.00079	0.0000977	0.000834	0.000846	0.000856		
Total HxCDD	3	3	100	0.0000928	0.000115	0.000102	0.0000116	0.0000982	0.000107	0.000113		
Total PeCDD	3	1	33	0.0000179	0.0000179	0.0000101		0.0000093	0.0000136	0.000017	0.0000061	0.0000186
Total TCDD	3	1	33	0.0000124	0.0000124	0.00000627		0.00000345	0.00000793	0.0000115	0.0000059	0.0000069
Furans (ug/L)												
1,2,3,4,6,7,8,9-OCDF	3	3	100	0.00104	0.00125	0.00116	0.00011	0.0012	0.00123	0.00125		
1,2,3,4,6,7,8-HpCDF	3	3	100	0.0000233	0.000337	0.000228	0.000177	0.000324	0.000331	0.000336		
1,2,3,4,7,8,9-HpCDF	3	2	67	0.000014	0.0000254	0.0000149	0.0000081	0.000014	0.0000197	0.0000243	0.0000109	0.0000109
1,2,3,4,7,8-HxCDF	3	1	33	0.0000077	0.0000077	0.0000058		0.00000635	0.00000703	0.00000757	0.0000067	0.0000127
1,2,3,6,7,8-HxCDF	3	2	67	0.0000064	0.0000153	0.00000827	0.00000629	0.0000064	0.0000109	0.0000144	0.0000062	0.0000062
1,2,3,7,8,9-HxCDF	3	0	0			0.00000333		0.00000335	0.00000353	0.00000367	0.0000059	0.0000074
1,2,3,7,8-PeCDF	3	1	33	0.0000138	0.0000138	0.00000617		0.00000255	0.00000818	0.0000127	0.0000043	0.0000051
2,3,4,6,7,8-HxCDF	3	1	33	0.0000138	0.0000138	0.00000657		0.0000033	0.00000855	0.0000128	0.0000052	0.0000066
2,3,4,7,8-PeCDF	3	1	33	0.0000101	0.0000101	0.00000502		0.0000027	0.0000064	0.00000936	0.0000045	0.0000054
2,3,7,8-TCDF	3	1	33	0.0000053	0.0000053	0.00000367		0.0000029	0.0000041	0.00000506	0.0000056	0.0000058
Total HpCDF	3	3	100	0.000541	0.000903	0.000769	0.000198	0.000862	0.000883	0.000899		
Total HxCDF	3	2	67	0.000128	0.000133	0.000112	0.00000354	0.000128	0.000131	0.000133	0.000148	0.000148
Total PeCDF	3	2	67	0.000016	0.000038	0.0000189	0.0000156	0.000016	0.000027	0.0000358	0.0000053	0.0000053
Total TCDF	3	1	33	0.0000218	0.0000218	0.00000917		0.0000029	0.0000124	0.0000199	0.0000056	0.0000058
Total TEQ	3	3	100	0.00000998	0.0000173	0.0000219	0.0000039	0.0000211	0.0000229	0.0000242		

[1]Average and percentiles calculated assuming 1/2 detection limit for nondetects
[2]Standard deviation calculated for detected concentrations only

Appendix C-1c
Analytical Data for 1999 Creek Segment E Surface Water
Dead Creek
Sauget Area I

	SW-CSE-S3	
Cyanide, Total (mg/L)	0.01	U
Pesticides/Herbicides (ug/L)		
2,4,5-T	0.5	U
2,4,5-TP (Silvex)	0.5	U
2,4-D	0.5	U
2,4-DB	0.5	U
4,4'-DDD	0.1	U
4,4'-DDE	0.1	U
4,4'-DDT	0.1	U
Total DDT	0.1	U
Aldrin	0.05	U
alpha-BHC	0.0035	J
Alpha Chlordane	0.05	U
beta-BHC	0.012	J
Dalapon	120	U
delta-BHC	0.028	
Dicamba	1.2	U
Dichloroprop	6	U
Dieldrin	0.1	U
Dinoseb	6	U
Endosulfan I	0.05	U
Endosulfan II	0.1	U
Endosulfan sulfate	0.1	U
Endrin	0.1	U
Endrin aldehyde	0.1	U
Endrin ketone	0.1	U
gamma-BHC (Lindane)	0.0028	J
Gamma Chlordane	0.05	U
Heptachlor	0.05	U
Heptachlor epoxide	0.05	U
MCPA	120	U
MCPP	120	U
Methoxychlor	0.5	U
Toxaphene	5	U
SVOCs (ug/L)		
1,2,4-Trichlorobenzene	10	U
1,2-Dichlorobenzene	10	U
1,3-Dichlorobenzene	10	U
1,4-Dichlorobenzene	10	U
2,4,5-Trichlorophenol	10	U
2,4,6-Trichlorophenol	2.1	U
2,4-Dichlorophenol	10	U
2,4-Dinitrophenol	14	U
2,4-Dinitrotoluene	10	U
2,6-Dinitrotoluene	10	U
2-Chloronaphthalene	10	U
2-Chlorophenol	10	U
2-Methylnaphthalene	10	U
2-Methylphenol (o-cresol)	10	U

Appendix C-1c
Analytical Data for 1999 Creek Segment E Surface Water
Dead Creek
Sauget Area I

	SW-CSE-S3	
2-Nitroaniline	50	U
2-Nitrophenol	10	U
3-Methylphenol/4-Methylphenol	20	U
3,3'-Dichlorobenzidine	10	U
3-Nitroaniline	50	U
4,6-Dinitro-2-methylphenol	13	U
4-Bromophenylphenyl ether	1	U
4-Chloro-3-methylphenol	10	U
4-Chloroaniline	20	U
4-Chlorophenylphenyl ether	10	U
4-Nitroaniline	50	U
4-Nitrophenol	50	U
Acenaphthene	10	U
Acenaphthylene	10	U
Anthracene	10	U
Benzo(a)anthracene	10	U
Benzo(a)pyrene	10	U
Benzo(b)fluoranthene	10	U
Benzo(g,h,i)perylene	10	U
Benzo(k)fluoranthene	10	U
bis(2-Chloroethoxy)methane	10	U
bis(2-Chloroethyl)ether	10	U
2,2'-Oxybis(1-Chloropropane)	10	U
bis(2-Ethylhexyl)phthalate	1.8	U
Butylbenzylphthalate	10	U
Carbazole	10	U
Chrysene	10	U
Dibenzo(a,h)anthracene	10	U
Dibenzofuran	10	U
Diethylphthalate	10	U
Dimethylphthalate	10	U
Di-n-butylphthalate	10	U
Di-n-octylphthalate	10	U
Fluoranthene	1.2	J
Fluorene	1	U
Hexachlorobenzene	10	U
Hexachlorobutadiene	10	U
Hexachlorocyclopentadiene	10	U
Hexachloroethane	1.9	U
Indeno(1,2,3-cd)pyrene	10	U
Isophorone	10	U
Naphthalene	10	U
Nitrobenzene	3.5	U
N-Nitroso-di-n-propylamine	10	U
N-Nitrosodiphenylamine	5	U
Pentachlorophenol	5	U
Phenanthrene	0.67	J
Phenol	10	U
Pyrene	0.87	J

Appendix C-1c
Analytical Data for 1999 Creek Segment E Surface Water
Dead Creek
Sauget Area I

	SW-CSE-S3	
Total PAHs	2.7	J
VOCs (ug/L)		
1,1,1-Trichloroethane	5	U
1,1,2,2-Tetrachloroethane	5	U
1,1,2-Trichloroethane	5	U
1,1-Dichloroethane	5	U
1,1-Dichloroethene	5	U
1,2-Dichloroethane	5	U
Cis/Trans-1,2-Dichloroethene	5	U
1,2-Dichloropropane	5	U
2-Butanone (MEK)	25	U
2-Hexanone	25	U
4-Methyl-2-pentanone (MIBK)	25	U
Acetone	50	U
Benzene	1.2	U
Bromodichloromethane	5	U
Bromoform	5	U
Bromomethane (Methyl bromide)	9.8	U
Carbon disulfide	5	U
Carbon tetrachloride	5	U
Chlorobenzene	5	U
Chloroform	5	U
Chloroethane	10	U
Chloromethane	10	U
cis-1,3-Dichloropropene	1	U
Dibromochloromethane	5	U
Ethylbenzene	5	U
Methylene chloride (Dichloromethane)	4.7	U
Styrene	5	U
Tetrachloroethene	5	U
Toluene	5	U
trans-1,3-Dichloropropene	5	U
Trichloroethene	2.7	U
Vinyl chloride	10	U
Xylenes, Total	5	U
Inorganics (mg/L)		
Aluminum	0.2	U
Antimony	0.02	U
Arsenic	0.01	U
Barium	0.066	
Beryllium	0.004	U
Cadmium	0.005	U
Calcium	44	J
Chromium	0.01	U
Cobalt	0.01	U
Copper	0.0092	J
Iron	1.2	
Lead	0.005	U
Magnesium	15	

Appendix C-1c
Analytical Data for 1999 Creek Segment E Surface Water
Dead Creek
Sauget Area I

	SW-CSE-S3	
Manganese	0.14	J
Mercury	0.0002	U
Molybdenum	0.01	U
Nickel	0.04	U
Potassium	4.8	
Selenium	0.01	U
Silver	0.01	U
Sodium	23	J
Thallium	0.01	U
Vanadium	0.01	U
Zinc	0.073	
Fluoride	0.75	
Hardness as CaCO3	170	
Ortho-Phosphate-P	0.37	J
pH	7.1	
Suspended Solids	7	
Total Dissolved Solids	250	
Total Phosphorus	0.37	
PCBs (ug/L)		
Monochlorobiphenyl	0.1	U
Dichlorobiphenyl	0.1	U
Trichlorobiphenyl	0.1	U
Tetrachlorobiphenyl	0.2	U
Pentachlorobiphenyl	0.2	U
Hexachlorobiphenyl	0.2	U
Heptachlorobiphenyl	0.3	U
Octachlorobiphenyl	0.3	U
Nonachlorobiphenyl	0.5	U
Decachlorobiphenyl	0.5	U
Total PCBs	0.5	U
Dioxins (ug/L)		
1,2,3,4,6,7,8,9-OCDD	0.0000604	M
1,2,3,4,6,7,8-HpCDD	0.0000119	
1,2,3,4,7,8-HxCDD	0.0000044	U
1,2,3,6,7,8-HxCDD	0.0000041	U
1,2,3,7,8,9-HxCDD	0.0000281	M
1,2,3,7,8-PeCDD	0.0000081	U
2,3,7,8-TCDD	0.0000066	U
Total HpCDD	0.0000119	
Total HxCDD	0.000058	M
Total PeCDD	0.0000081	U
Total TCDD	0.0000066	U
Furans (ug/L)		
1,2,3,4,6,7,8,9-OCDF	0.0000164	
1,2,3,4,6,7,8-HpCDF	0.0000042	U
1,2,3,4,7,8,9-HpCDF	0.0000055	U
1,2,3,4,7,8-HxCDF	0.0000039	U
1,2,3,6,7,8-HxCDF	0.0000037	U
1,2,3,7,8,9-HxCDF	0.0000044	U

Appendix C-1c
Analytical Data for 1999 Creek Segment E Surface Water
Dead Creek
Sauget Area I

	SW-CSE-S3	
1,2,3,7,8-PeCDF	0.0000046	U
2,3,4,6,7,8-HxCDF	0.0000039	U
2,3,4,7,8-PeCDF	0.0000049	U
2,3,7,8-TCDF	0.0000061	U
Total HpCDF	0.0000048	U
Total HxCDF	0.0000039	U
Total PeCDF	0.0000047	U
Total TCDF	0.0000061	U
Total TEQ	1.2064E-07	

[1]The maximum detection limit is shown since none of the applicable compounds were detected.
[2]The value shown represents the sum of the detected concentrations.

Appendix C-1d
Summary Statistics for 1999 Creek Segment F Surface Water
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Cyanide, Total (mg/L)	3	0	0			0.005		0.005	0.005	0.005	0.01	0.01
Pesticides/Herbicides (ug/L)												
2,4,5-T	3	0	0			0.25		0.25	0.25	0.25	0.5	0.5
2,4,5-TP (Silvex)	3	0	0			0.25		0.25	0.25	0.25	0.5	0.5
2,4-D	3	0	0			0.25		0.25	0.25	0.25	0.5	0.5
2,4-DB	3	0	0			0.25		0.25	0.25	0.25	0.5	0.5
4,4'-DDD	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
4,4'-DDE	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
4,4'-DDT	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
Total DDT	3	0	0			0.15		0.15	0.15	0.15	0.3	0.3
Aldrin	3	0	0			0.025		0.025	0.025	0.025	0.05	0.05
alpha-BHC	3	0	0			0.0195		0.0195	0.0195	0.0195	0.039	0.039
Alpha Chlordane	3	0	0			0.025		0.025	0.025	0.025	0.05	0.05
beta-BHC	3	0	0			0.007		0.007	0.007	0.007	0.014	0.014
Dalapon	3	0	0			60		60	60	60	120	120
delta-BHC	3	0	0			0.006		0.006	0.006	0.006	0.012	0.012
Dicamba	3	0	0			0.6		0.6	0.6	0.6	1.2	1.2
Dichloroprop	3	0	0			3		3	3	3	6	6
Dieldrin	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
Dinoseb	3	0	0			3		3	3	3	6	6
Endosulfan I	3	0	0			0.025		0.025	0.025	0.025	0.05	0.05
Endosulfan II	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
Endosulfan sulfate	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
Endrin	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
Endrin aldehyde	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
Endrin ketone	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
gamma-BHC (Lindane)	3	0	0			0.0095		0.0095	0.0095	0.0095	0.019	0.019
Gamma Chlordane	3	0	0			0.025		0.025	0.025	0.025	0.05	0.05
Heptachlor	3	0	0			0.025		0.025	0.025	0.025	0.05	0.05
Heptachlor epoxide	3	0	0			0.025		0.025	0.025	0.025	0.05	0.05
MCPA	3	0	0			60		60	60	60	120	120
MCPP	3	0	0			60		60	60	60	120	120
Methoxychlor	3	0	0			0.25		0.25	0.25	0.25	0.5	0.5
Toxaphene	3	0	0			2.5		2.5	2.5	2.5	5	5
SVOCs (ug/L)												
1,2,4-Trichlorobenzene	3	0	0			5		5	5	5	10	10
1,2-Dichlorobenzene	3	0	0			5		5	5	5	10	10
1,3-Dichlorobenzene	3	0	0			5		5	5	5	10	10
1,4-Dichlorobenzene	3	0	0			5		5	5	5	10	10
2,4,5-Trichlorophenol	3	0	0			5		5	5	5	10	10
2,4,6-Trichlorophenol	3	0	0			1.05		1.05	1.05	1.05	2.1	2.1
2,4-Dichlorophenol	3	0	0			5		5	5	5	10	10
2,4-Dinitrophenol	3	0	0			7		7	7	7	14	14
2,4-Dinitrotoluene	3	0	0			5		5	5	5	10	10
2,6-Dinitrotoluene	3	0	0			5		5	5	5	10	10
2-Chloronaphthalene	3	0	0			5		5	5	5	10	10
2-Chlorophenol	3	0	0			5		5	5	5	10	10
2-Methylnaphthalene	3	0	0			5		5	5	5	10	10
2-Methylphenol (o-cresol)	3	0	0			5		5	5	5	10	10
2-Nitroaniline	3	0	0			25		25	25	25	50	50
2-Nitrophenol	3	0	0			5		5	5	5	10	10
3-Methylphenol/4-Methylphenol	3	0	0			5		5	5	5	10	10
3,3'-Dichlorobenzidine	3	0	0			10		10	10	10	20	20
3-Nitroaniline	3	0	0			25		25	25	25	50	50
4,6-Dinitro-2-methylphenol	3	0	0			6.5		6.5	6.5	6.5	13	13
4-Bromophenylphenyl ether	3	0	0			0.5		0.5	0.5	0.5	1	1
4-Chloro-3-methylphenol	3	0	0			5		5	5	5	10	10
4-Chloroaniline	3	0	0			10		10	10	10	20	20
4-Chlorophenylphenyl ether	3	0	0			5		5	5	5	10	10
4-Nitroaniline	3	0	0			25		25	25	25	50	50
4-Nitrophenol	3	0	0			25		25	25	25	50	50

Appendix d
Summary Statistics for 1999 Creek Segment F Surface Water
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Acenaphthene	3	0	0			5		5	5	5	10	10
Acenaphthylene	3	0	0			5		5	5	5	10	10
Anthracene	3	0	0			5		5	5	5	10	10
Benzo(a)anthracene	3	0	0			5		5	5	5	10	10
Benzo(a)pyrene	3	0	0			5		5	5	5	10	10
Benzo(b)fluoranthene	3	0	0			5		5	5	5	10	10
Benzo(g,h,i)perylene	3	0	0			5		5	5	5	10	10
Benzo(k)fluoranthene	3	0	0			5		5	5	5	10	10
bis(2-Chloroethoxy)methane	3	0	0			5		5	5	5	10	10
bis(2-Chloroethyl)ether	3	0	0			5		5	5	5	10	10
2,2'-Oxybis(1-Chloropropane)	3	0	0			5		5	5	5	10	10
bis(2-Ethylhexyl)phthalate	3	0	0			0.9		0.9	0.9	0.9	1.8	1.8
Butylbenzylphthalate	3	0	0			5		5	5	5	10	10
Carbazole	3	0	0			5		5	5	5	10	10
Chrysene	3	0	0			5		5	5	5	10	10
Dibenzo(a,h)anthracene	3	0	0			5		5	5	5	10	10
Dibenzofuran	3	0	0			5		5	5	5	10	10
Diethylphthalate	3	0	0			5		5	5	5	10	10
Dimethylphthalate	3	0	0			5		5	5	5	10	10
Di-n-butylphthalate	3	0	0			5		5	5	5	10	10
Di-n-octylphthalate	3	0	0			5		5	5	5	10	10
Fluoranthene	3	1	33	0.7	0.7	3.57		5	5	5	10	10
Fluorene	3	0	0			0.5		0.5	0.5	0.5	1	1
Hexachlorobenzene	3	0	0			5		5	5	5	10	10
Hexachlorobutadiene	3	0	0			5		5	5	5	10	10
Hexachlorocyclopentadiene	3	0	0			5		5	5	5	10	10
Hexachloroethane	3	0	0			0.95		0.95	0.95	0.95	1.9	1.9
Indeno(1,2,3-cd)pyrene	3	0	0			5		5	5	5	10	10
Isophorone	3	0	0			5		5	5	5	10	10
Naphthalene	3	0	0			5		5	5	5	10	10
Nitrobenzene	3	0	0			1.75		1.75	1.75	1.75	3.5	3.5
N-Nitroso-di-n-propylamine	3	0	0			5		5	5	5	10	10
N-Nitrosodiphenylamine	3	0	0			2.5		2.5	2.5	2.5	5	5
Pentachlorophenol	3	0	0			2.5		2.5	2.5	2.5	5	5
Phenanthrene	3	1	33	0.7	0.7	3.57		5	5	5	10	10
Phenol												
Pyrene	3	0	0			5		5	5	5	10	10
Total PAHs	3	1	33	1.4	1.4	77.6		80.5	80.5	80.5	141	161
VOCs (ug/L)												
1,1,1-Trichloroethane	3	0	0			2.5		2.5	2.5	2.5	5	5
1,1,2,2-Tetrachloroethane	3	0	0			2.5		2.5	2.5	2.5	5	5
1,1,2-Trichloroethane	3	0	0			2.5		2.5	2.5	2.5	5	5
1,1-Dichloroethane	3	0	0			2.5		2.5	2.5	2.5	5	5
1,1-Dichloroethene	3	0	0			2.5		2.5	2.5	2.5	5	5
1,2-Dichloroethane	3	0	0			2.5		2.5	2.5	2.5	5	5
Cis/Trans-1,2-Dichloroethene	3	0	0			2.5		2.5	2.5	2.5	5	5
1,2-Dichloropropane	3	0	0			2.5		2.5	2.5	2.5	5	5
2-Butanone (MEK)	3	0	0			12.5		12.5	12.5	12.5	25	25
2-Hexanone	3	0	0			12.5		12.5	12.5	12.5	25	25
4-Methyl-2-pentanone (MIBK)	3	0	0			12.5		12.5	12.5	12.5	25	25
Acetone	3	0	0			25		25	25	25	50	50
Benzene	3	1	33	1.7	1.7	0.967		0.6	1.15	1.59	1.2	1.2
Bromodichloromethane	3	0	0			2.5		2.5	2.5	2.5	5	5
Bromoform	3	0	0			2.5		2.5	2.5	2.5	5	5
Bromomethane (Methyl bromide)	3	0	0			4.9		4.9	4.9	4.9	9.8	9.8
Carbon disulfide	3	0	0			2.5		2.5	2.5	2.5	5	5
Carbon tetrachloride	3	0	0			2.5		2.5	2.5	2.5	5	5
Chlorobenzene	3	0	0			2.5		2.5	2.5	2.5	5	5
Chloroform	3	0	0			2.5		2.5	2.5	2.5	5	5
Chloroethane	3	0	0			5		5	5	5	10	10
Chloromethane	3	0	0			5		5	5	5	10	10

Appendix C-1d
Summary Statistics for 1999 Creek Segment F Surface Water
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
cis-1,3-Dichloropropene	3	0	0			0.5		0.5	0.5	0.5	1	1
Dibromochloromethane	3	0	0			2.5		2.5	2.5	2.5	5	5
Ethylbenzene	3	0	0			2.5		2.5	2.5	2.5	5	5
Methylene chloride (Dichloromethane)	3	0	0			2.35		2.35	2.35	2.35	4.7	4.7
Styrene	3	0	0			2.5		2.5	2.5	2.5	5	5
Tetrachloroethene	3	0	0			2.5		2.5	2.5	2.5	5	5
Toluene	3	0	0			2.5		2.5	2.5	2.5	5	5
trans-1,3-Dichloropropene	3	0	0			2.5		2.5	2.5	2.5	5	5
Trichloroethene	3	0	0			1.35		1.35	1.35	1.35	2.7	2.7
Vinyl chloride												
Xylenes, Total	3	0	0			2.5		2.5	2.5	2.5	5	5
Inorganics (mg/L)												
Aluminum	3	3	100	0.039	0.55	0.246	0.269	0.15	0.35	0.51		
Antimony	3	0	0			0.01		0.01	0.01	0.01	0.02	0.02
Arsenic	3	2	67	0.0032	0.0049	0.00437	0.0012	0.0049	0.00495	0.00499	0.01	0.01
Barium	3	3	100	0.12	0.13	0.127	0.00577	0.13	0.13	0.13		
Beryllium	3	0	0			0.002		0.002	0.002	0.002	0.004	0.004
Cadmium	3	0	0			0.0025		0.0025	0.0025	0.0025	0.005	0.005
Calcium	3	3	100	52	53	52.7	0.577	53	53	53		
Chromium	3	0	0			0.005		0.005	0.005	0.005	0.01	0.01
Cobalt	3	0	0			0.005		0.005	0.005	0.005	0.01	0.01
Copper	3	3	100	0.0016	0.012	0.0052	0.00589	0.002	0.007	0.011		
Iron	3	3	100	0.5	1	0.683	0.275	0.55	0.775	0.955		
Lead	3	2	67	0.0022	0.0037	0.0028	0.00106	0.0025	0.0031	0.00358	0.005	0.005
Magnesium	3	3	100	30	33	32	1.73	33	33	33		
Manganese	3	3	100	0.082	0.14	0.107	0.0297	0.1	0.12	0.136		
Mercury	3	0	0			0.0001		0.0001	0.0001	0.0001	0.0002	0.0002
Molybdenum	3	1	33	0.0028	0.0028	0.00427		0.005	0.005	0.005	0.01	0.01
Nickel	3	3	100	0.0069	0.021	0.0136	0.00707	0.013	0.017	0.0202		
Potassium	3	3	100	6.4	6.9	6.6	0.265	6.5	6.7	6.86		
Selenium	3	0	0			0.005		0.005	0.005	0.005	0.01	0.01
Silver	3	0	0			0.005		0.005	0.005	0.005	0.01	0.01
Sodium	3	3	100	21	22	21.3	0.577	21	21.5	21.9		
Thallium	3	0	0			0.005		0.005	0.005	0.005	0.01	0.01
Vanadium												
Zinc	3	3	100	0.0073	0.075	0.0391	0.034	0.035	0.055	0.071		
Fluoride	3	3	100	0.24	0.27	0.253	0.0153	0.25	0.26	0.268		
Hardness as CaCO3	3	3	100	260	270	263	5.77	260	265	269		
Ortho-Phosphate-P	3	3	100	0.083	0.12	0.0923	0.0285	0.094	0.107	0.117		
pH	3	3	100	7.4	8.6	7.87	0.643	7.6	8.1	8.5		
Suspended Solids	3	2	67	8	12	7.5	2.83	8	10	11.6	5	5
Total Dissolved Solids	3	3	100	330	360	347	15.3	350	355	359		
Total Phosphorus	3	3	100	0.13	0.18	0.15	0.0265	0.14	0.16	0.176		
PCBs (ug/L)												
Monochlorobiphenyl	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
Dichlorobiphenyl												
Trichlorobiphenyl	3	0	0			0.05		0.05	0.05	0.05	0.1	0.1
Tetrachlorobiphenyl	3	0	0			0.1		0.1	0.1	0.1	0.2	0.2
Pentachlorobiphenyl	3	0	0			0.1		0.1	0.1	0.1	0.2	0.2
Hexachlorobiphenyl	3	0	0			0.1		0.1	0.1	0.1	0.2	0.2
Heptachlorobiphenyl	3	0	0			0.15		0.15	0.15	0.15	0.3	0.3
Octachlorobiphenyl	3	0	0			0.15		0.15	0.15	0.15	0.3	0.3
Nonachlorobiphenyl	3	0	0			0.25		0.25	0.25	0.25	0.5	0.5
Decachlorobiphenyl	3	0	0			0.25		0.25	0.25	0.25	0.5	0.5
Total PCBs	3	0	0			1.25		1.25	1.25	1.25	2.5	2.5
Dioxins (ug/L)												
1,2,3,4,6,7,8,9-OCDD	3	2	67	0.000573	0.000617	0.000424	0.0000311	0.000573	0.000595	0.000613	0.000166	0.000166
1,2,3,4,6,7,8-HpCDD	3	2	67	0.0000629	0.0000692	0.0000471	0.00000445	0.0000629	0.0000661	0.0000686	0.0000183	0.0000183
1,2,3,4,7,8-HxCDD												
1,2,3,6,7,8-HxCDD	3	0	0			0.00000198		0.00000205	0.00000213	0.00000219	0.0000034	0.0000044
1,2,3,7,8,9-HxCDD	3	0	0			0.00000207		0.00000215	0.00000223	0.00000229	0.0000035	0.0000046

Appe[illegible]-1d
Summary Statistics for 1999 Creek Segment F Surface Water
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
1,2,3,7,8-PeCDD	3	0	0			0.00000313		0.00000335	0.00000355	0.00000371	0.0000046	0.0000075
2,3,7,8-TCDD	3	0	0			0.0000026		0.0000029	0.000003	0.00000308	0.0000036	0.0000062
Total HpCDD	3	2	67	0.000127	0.000128	0.0000913	0.000000707	0.000127	0.000128	0.000128	0.0000378	0.0000378
Total HxCDD	3	1	33	0.0000902	0.0000902	0.0000337		0.00000905	0.0000496	0.0000821	0.0000035	0.0000181
Total PeCDD	3	0	0			0.00000313		0.00000335	0.00000355	0.00000371	0.0000046	0.0000075
Total TCDD	3	0	0			0.0000026		0.0000029	0.000003	0.00000308	0.0000036	0.0000062
Furans (ug/L)												
1,2,3,4,6,7,8,9-OCDF	3	3	100	0.0000817	0.00026	0.000191	0.0000955	0.00023	0.000245	0.000257		
1,2,3,4,6,7,8-HpCDF	3	3	100	0.0000134	0.0000505	0.0000363	0.00002	0.0000451	0.0000478	0.00005		
1,2,3,4,7,8,9-HpCDF	3	1	33	0.000548	0.000548	0.000184		0.0000024	0.000275	0.000493	0.0000041	0.0000048
1,2,3,4,7,8-HxCDF	3	1	33	0.000024	0.000024	0.00000898		0.00000165	0.0000128	0.0000218	0.0000026	0.0000033
1,2,3,6,7,8-HxCDF	3	1	33	0.0000089	0.0000089	0.00000388		0.00000155	0.00000523	0.00000817	0.0000024	0.0000031
1,2,3,7,8,9-HxCDF	3	0	0			0.00000188		0.00000185	0.0000021	0.0000023	0.0000029	0.0000047
1,2,3,7,8-PeCDF	3	0	0			0.0000018		0.00000195	0.00000205	0.00000213	0.0000026	0.0000043
2,3,4,6,7,8-HxCDF	3	0	0			0.00000188		0.00000165	0.00000188	0.00000206	0.0000026	0.0000042
2,3,4,7,8-PeCDF	3	0	0			0.0000019		0.00000205	0.00000215	0.00000223	0.0000028	0.0000045
2,3,7,8-TCDF	3	0	0			0.00000197		0.00000225	0.00000228	0.0000023	0.0000027	0.0000046
Total HpCDF	3	2	67	0.000182	0.0006	0.000283	0.000296	0.000182	0.000391	0.000558	0.000131	0.000131
Total HxCDF	3	2	67	0.0000249	0.000581	0.000204	0.000393	0.0000249	0.000303	0.000525	0.0000125	0.0000125
Total PeCDF	3	0	0			0.00000185		0.000002	0.0000021	0.00000218	0.0000027	0.0000044
Total TCDF	3	0	0			0.00000197		0.00000225	0.00000228	0.0000023	0.0000027	0.0000046
Total TEQ	3	3	100	0.00000121	0.00000891	0.000012	0.00000444	0.0000107	0.0000143	0.0000171		

[1]Average and percentiles calculated assuming 1/2 detection limit for nondetects
[2]Standard deviation calculated for detected concentrations only

Appendix C-2a
Summary Statistics for 1999 Creek Segment B Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Cyanide, Total (mg/kg)	3	0	0			0.667		0.6	0.725	0.825	1.1	1.7
Pesticides/Herbicides (ug/kg)												
2,4,5-T	3	0	0			45.2		55	62.5	68.5	21	140
2,4,5-TP (Silvex)	3	0	0			45.2		55	62.5	68.5	21	140
2,4-D	3	0	0			45.2		55	62.5	68.5	21	140
2,4-DB	3	0	0			45.2		55	62.5	68.5	21	140
4,4'-DDD	3	1	33	150	150	320		325	405	469	650	970
4,4'-DDE	3	0	0			413		430	458	480	650	970
4,4'-DDT	3	0	0			413		430	458	480	650	970
Total DDT	3	1	33	150	150	1150		1010	1230	1410	1720	2910
Aldrin	3	3	100	410	1100	830	369	980	1040	1090		
alpha-BHC	3	0	0			63		65	70	74	98	150
Alpha Chlordane	3	0	0			212		220	235	247	330	500
beta-BHC	3	0	0			63		65	70	74	98	150
Dalapon	3	0	0			350		420	485	537	160	1100
delta-BHC	3	0	0			63		65	70	74	98	150
Dicamba	3	0	0			110		130	153	171	50	350
Dichloroprop	3	0	0			558		650	775	875	250	1800
Dieldrin	3	0	0			413		430	458	480	650	970
Dinoseb	3	0	0			558		650	775	875	250	1800
Endosulfan I	3	0	0			212		220	235	247	330	500
Endosulfan II	3	0	0			413		430	458	480	650	970
Endosulfan sulfate	3	3	100	84	130	104	23.6	98	114	127		
Endrin	3	0	0			413		430	458	480	650	970
Endrin aldehyde	3	1	33	520	520	443		485	503	517	650	970
Endrin ketone	3	0	0			413		430	458	480	650	970
gamma-BHC (Lindane)	3	0	0			212		220	235	247	330	500
Gamma Chlordane	3	1	33	720	720	378		250	485	673	330	500
Heptachlor	3	1	33	500	500	295		220	360	472	330	440
Heptachlor epoxide	3	1	33	0.2	0.2	138		165	208	242	330	500
MCPA	3	0	0			11000		13000	15300	17100	5000	35000
MCPP	3	0	0			11000		13000	15300	17100	5000	35000
Methoxychlor	3	0	0			2120		2200	2350	2470	3300	5000
Toxaphene	3	0	0			21200		22000	23500	24700	33000	50000
SVOCs (ug/kg)												
1,2,4-Trichlorobenzene	3	1	33	770	770	1170		1100	1380	1600	2200	3300
1,2-Dichlorobenzene	3	1	33	370	370	1110		1300	1480	1620	2600	3300
1,3-Dichlorobenzene	3	0	0			1350		1300	1480	1620	2200	3300
1,4-Dichlorobenzene	3	2	67	520	1000	1060	339	1000	1330	1590	3300	3300
2,4,5-Trichlorophenol	3	0	0			1350		1300	1480	1620	2200	3300
2,4,6-Trichlorophenol	3	0	0			1350		1300	1480	1620	2200	3300
2,4-Dichlorophenol	3	0	0			1350		1300	1480	1620	2200	3300
2,4-Dinitrophenol	3	0	0			6670		6500	7250	7850	11000	16000
2,4-Dinitrotoluene	3	0	0			1350		1300	1480	1620	2200	3300
2,6-Dinitrotoluene	3	0	0			1350		1300	1480	1620	2200	3300
2-Chloronaphthalene	3	0	0			1350		1300	1480	1620	2200	3300
2-Chlorophenol	3	0	0			1350		1300	1480	1620	2200	3300
2-Methylnaphthalene	3	0	0			1350		1300	1480	1620	2200	3300
2-Methylphenol (o-cresol)	3	0	0			1350		1300	1480	1620	2200	3300
2-Nitroaniline	3	0	0			6670		6500	7250	7850	11000	16000
2-Nitrophenol	3	0	0			1350		1300	1480	1620	2200	3300
3-Methylphenol/4-Methylphenol	3	0	0			1350		1300	1480	1620	2200	3300
3,3'-Dichlorobenzidine	3	0	0			2580		2500	2830	3090	4200	6300
3-Nitroaniline	3	0	0			6670		6500	7250	7850	11000	16000
4,6-Dinitro-2-methylphenol	3	0	0			6670		6500	7250	7850	11000	16000
4-Bromophenylphenyl ether	3	0	0			1350		1300	1480	1620	2200	3300
4-Chloro-3-methylphenol	3	0	0			1350		1300	1480	1620	2200	3300
4-Chloroaniline	3	1	33	830	830	2030		2100	2630	3050	4200	6300
4-Chlorophenylphenyl ether	3	0	0			1350		1300	1480	1620	2200	3300
4-Nitroaniline	3	0	0			6670		6500	7250	7850	11000	16000
4-Nitrophenol	3	0	0			6670		6500	7250	7850	11000	16000

Appe. -2a
Summary Statistics for 1999 Creek Segment B Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Acenaphthene	3	0	0			1350		1300	1480	1620	2200	3300
Acenaphthylene	3	0	0			1350		1300	1480	1620	2200	3300
Anthracene	3	0	0			1350		1300	1480	1620	2200	3300
Benzo(a)anthracene	3	3	100	680	870	777	95	780	825	861		
Benzo(a)pyrene	3	3	100	730	1200	1020	255	1140	1170	1190		
Benzo(b)fluoranthene	3	3	100	1100	2000	1500	458	1400	1700	1940		
Benzo(g,h,i)perylene	3	3	100	790	1600	1180	406	1160	1380	1580		
Benzo(k)fluoranthene	3	3	100	920	1600	1240	341	1210	1410	1560		
bis(2-Chloroethoxy)methane	3	0	0			1350		1300	1480	1620	2200	3300
bis(2-Chloroethyl)ether	3	0	0			1350		1300	1480	1620	2200	3300
2,2'-Oxybis(1-Chloropropane)	3	0	0			1350		1300	1480	1620	2200	3300
bis(2-Ethylhexyl)phthalate	3	1	33	3000	3000	1980		1650	2330	2870	2600	3300
Butylbenzylphthalate	3	0	0			1350		1300	1480	1620	2200	3300
Carbazole	3	0	0			1350		1300	1480	1620	2200	3300
Chrysene	3	3	100	1100	1800	1400	361	1300	1550	1750		
Dibenzo(a,h)anthracene	3	0	0			717		700	775	835	1200	1700
Dibenzofuran	3	0	0			1350		1300	1480	1620	2200	3300
Diethylphthalate	3	0	0			1350		1300	1480	1620	2200	3300
Dimethylphthalate	3	0	0			1350		1300	1480	1620	2200	3300
Di-n-butylphthalate	3	0	0			1350		1300	1480	1620	2200	3300
Di-n-octylphthalate	3	0	0			1350		1300	1480	1620	2200	3300
Fluoranthene	3	3	100	1800	2000	1900	100	1900	1950	1990		
Fluorene	3	0	0			1350		1300	1480	1620	2200	3300
Hexachlorobenzene	3	0	0			533		500	575	635	900	1300
Hexachlorobutadiene	3	0	0			1350		1300	1480	1620	2200	3300
Hexachlorocyclopentadiene	3	0	0			1350		1300	1480	1620	2200	3300
Hexachloroethane	3	0	0			1350		1300	1480	1620	2200	3300
Indeno(1,2,3-cd)pyrene	3	2	67	1000	1300	1320	212	1300	1480	1620	3300	3300
Isophorone	3	0	0			1350		1300	1480	1620	2200	3300
Naphthalene	3	1	33	380	380	1040		1100	1380	1600	2200	3300
Nitrobenzene	3	0	0			1350		1300	1480	1620	2200	3300
N-Nitroso-di-n-propylamine	3	0	0			1350		1300	1480	1620	2200	3300
N-Nitrosodiphenylamine	3	0	0			1350		1300	1480	1620	2200	3300
Pentachlorophenol	3	3	100	46.5	220	108	97.5	56	138	204		
Phenanthrene	3	3	100	810	930	883	64.3	910	920	928		
Phenol	3	0	0			1350		1300	1480	1620	2200	3300
Pyrene	3	3	100	2000	2400	2200	200	2200	2300	2380		
Total PAHs	3	3	100	10100	15400	21900	2660	22500	22600	22600		
VOCs (ug/kg)												
1,1,1-Trichloroethane	3	0	0			13		10	14.5	18.1	20	38
1,1,2,2-Tetrachloroethane	3	0	0			13		10	14.5	18.1	20	38
1,1,2-Trichloroethane	3	0	0			13		10	14.5	18.1	20	38
1,1-Dichloroethane	3	0	0			13		10	14.5	18.1	20	38
1,1-Dichloroethene	3	0	0			11.8		9	13.3	16.7	18	35
1,2-Dichloroethane	3	0	0			13		10	14.5	18.1	20	38
Cis/Trans-1,2-Dichloroethene	3	0	0			13		10	14.5	18.1	20	38
1,2-Dichloropropane	3	0	0			13		10	14.5	18.1	20	38
2-Butanone (MEK)	3	0	0			64.5		49.5	72.3	90.5	98	190
2-Hexanone	3	1	33	21	21	55.2		49.5	72.3	90.5	99	190
4-Methyl-2-pentanone (MIBK)	3	0	0			64.5		49.5	72.3	90.5	98	190
Acetone	3	0	0			138		125	158	184	200	380
Benzene	3	0	0			13		10	14.5	18.1	20	38
Bromodichloromethane	3	0	0			13		10	14.5	18.1	20	38
Bromoform	3	0	0			13		10	14.5	18.1	20	38
Bromomethane (Methyl bromide)	3	0	0			25.8		20	29	36.2	39	76
Carbon disulfide	3	0	0			13		10	14.5	18.1	20	38
Carbon tetrachloride	3	0	0			13		10	14.5	18.1	20	38
Chlorobenzene	3	3	100	20	51.5	32.5	16.7	26	38.8	49		
Chloroform	3	0	0			13		10	14.5	18.1	20	38
Chloroethane	3	0	0			25.8		20	29	36.2	39	76
Chloromethane	3	0	0			25.8		20	29	36.2	39	76

Appendix C-2a
Summary Statistics for 1999 Creek Segment B Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
cis-1,3-Dichloropropene	3	0	0			10.3		8	11.5	14.3	16	30
Dibromochloromethane	3	0	0			13		10	14.5	18.1	20	38
Ethylbenzene	3	0	0			13		10	14.5	18.1	20	38
Methylene chloride (Dichloromethane)	3	0	0			13		10	14.5	18.1	20	38
Styrene	3	0	0			13		10	14.5	18.1	20	38
Tetrachloroethene	3	0	0			13		10	14.5	18.1	20	38
Toluene	3	1	33	20	20	16.3		19	19.5	19.9	20	38
trans-1,3-Dichloropropene	3	0	0			10.3		8	11.5	14.3	16	30
Trichloroethene	3	0	0			13		10	14.5	18.1	20	38
Vinyl chloride	3	0	0			25.8		20	29	36.2	39	76
Xylenes, Total	3	0	0			13		10	14.5	18.1	20	38
Inorganics (mg/kg)												
Aluminum	3	3	100	6550	12000	8950	2780	8300	10200	11600		
Antimony	3	3	100	6.3	8.9	7.33	1.38	6.8	7.85	8.69		
Arsenic	3	3	100	25	38	32	6.56	33	35.5	37.5		
Barium	3	3	100	750	3300	1920	1290	1700	2500	3140		
Beryllium	3	0	0			0.527		0.5	0.55	0.59	0.96	1.2
Cadmium	3	3	100	15	25	21.7	5.77	25	25	25		
Calcium	3	3	100	87000	180000	122000	50400	100000	140000	172000		
Chromium	3	3	100	41.5	78	65.2	20.5	76	77	77.8		
Cobalt	3	3	100	6.95	12	9.62	2.54	9.9	11	11.8		
Copper	3	3	100	4850	11000	7520	3160	6700	8850	10600		
Iron	3	3	100	13000	29000	22300	8330	25000	27000	28600		
Lead	3	3	100	560	1000	770	221	750	875	975		
Magnesium	3	3	100	10000	20000	13700	5510	11000	15500	19100		
Manganese	3	3	100	210	245	228	17.6	230	238	244		
Mercury	3	3	100	0.76	1.5	1.22	0.401	1.4	1.45	1.49		
Molybdenum	3	3	100	4.3	7	5.37	1.44	4.8	5.9	6.78		
Nickel	3	3	100	77.5	500	319	218	380	440	488		
Potassium	3	3	100	1650	2400	1920	419	1700	2050	2330		
Selenium	3	3	100	2.9	5.1	3.83	1.14	3.5	4.3	4.94		
Silver	3	3	100	6.7	15	10.2	4.3	8.9	12	14.4		
Sodium	3	0	0			145		145	150	154	270	310
Thallium	3	1	33	2.1	2.1	1.45		1.15	1.63	2.01	2.2	2.3
Vanadium	3	3	100	27.5	41	35.2	6.93	37	39	40.6		
Zinc	3	3	100	1800	7900	4830	3050	4800	6350	7590		
PCBs (ug/kg)												
Monochlorobiphenyl	3	0	0			270		250	293	327	450	670
Dichlorobiphenyl	3	2	67	500	640	455	99	500	570	626	450	450
Trichlorobiphenyl	3	3	100	11000	30000	20100	9520	19400	24700	28900		
Tetrachlorobiphenyl	3	3	100	26000	98000	58500	36500	51500	74800	93400		
Pentachlorobiphenyl	3	3	100	19000	66000	35300	26600	20800	43400	61500		
Hexachlorobiphenyl	3	3	100	3900	21000	10800	9000	7600	14300	19700		
Heptachlorobiphenyl	3	3	100	980	5300	2530	2410	1300	3300	4900		
Octachlorobiphenyl	3	1	33	1800	1800	1170		1000	1400	1720	1400	2000
Nonachlorobiphenyl	3	0	0			1370		1250	1480	1660	2300	3400
Decachlorobiphenyl	3	2	67	2300	3400	2280	778	2300	2850	3290	2300	2300
Total PCBs	3	3	100	67700	226000	133000	84400	100000	164000	215000		
Dioxins (ug/kg)												
1,2,3,4,6,7,8,9-OCDD	3	3	100	1230	3420	2340	1090	2360	2890	3310		
1,2,3,4,6,7,8-HpCDD	3	3	100	116	397	259	141	266	331	384		
1,2,3,4,7,8-HxCDD	3	3	100	1.04	2.31	1.64	0.637	1.57	1.94	2.24		
1,2,3,6,7,8-HxCDD	3	3	100	3.92	13.2	8.53	4.63	8.49	10.8	12.7		
1,2,3,7,8,9-HxCDD	3	3	100	3.08	7.54	5.41	2.24	5.6	6.57	7.35		
1,2,3,7,8-PeCDD	3	3	100	0.779	1.97	1.41	0.599	1.48	1.73	1.92		
2,3,7,8-TCDD	3	1	33	0.264	0.264	0.266		0.264	0.289	0.31	0.441	0.63
Total HpCDD	3	3	100	204	722	471	259	488	605	698		
Total HxCDD	3	0	0			25.9		28.7	33.6	37.6	20.62	77.27
Total PeCDD	3	0	0			8.27		10.4	10.6	10.8	7.14	21.77
Total TCDD	3	0	0			12.1		11.6	17.2	21.7	4.07	45.65
Furans (ug/kg)												

Appx -2a

Summary Statistics for 1999 Creek Segment B Sediment

Dead Creek

Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
1,2,3,4,6,7,8,9-OCDF	3	3	100	157	1130	697	494	807	967	1090		
1,2,3,4,6,7,8-HpCDF	3	3	100	33.7	188	118	78	131	159	182		
1,2,3,4,7,8,9-HpCDF	3	3	100	2.96	13.1	8.28	5.11	8.73	10.9	12.7		
1,2,3,4,7,8-HxCDF	3	3	100	2.12	6.41	4.25	2.15	4.22	5.32	6.19		
1,2,3,6,7,8-HxCDF	3	3	100	0.984	2.54	1.74	0.779	1.7	2.12	2.46		
1,2,3,7,8,9-HxCDF	3	3	100	0.0251	0.119	0.0675	0.0476	0.0583	0.0887	0.113		
1,2,3,7,8-PeCDF	3	3	100	0.248	0.842	0.564	0.299	0.603	0.723	0.818		
2,3,4,6,7,8-HxCDF	3	3	100	1.43	3.91	2.57	1.25	2.36	3.14	3.76		
2,3,4,7,8-PeCDF	3	3	100	0.619	1.28	0.911	0.337	0.835	1.06	1.24		
2,3,7,8-TCDF	3	3	100	0.296	0.811	0.632	0.291	0.788	0.8	0.809		
Total HpCDF	3	2	67	137	519	345	270	378	448	505	755.23	755.23
Total HxCDF	3	0	0			74.4		38.2	104	157	29.9	340.44
Total PeCDF	3	0	0			16.1		5.29	22.9	36.9	4.95	80.9
Total TCDF	3	0	0			8.29		5.58	11.5	16.2	3.76	34.8
Total TEQ	3	3	100	4.31	12.3	8.8	4.02	9.58	11	12.2		

[1]Average and percentiles calculated assuming 1/2 detection limit for nondetects

[2]Standard deviation calculated for detected concentrations only

Appendix C-2b
Summary Statistics for 1999 Creek Segment C Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Cyanide, Total (mg/kg)	3	0	0			0.833		0.85	0.9	0.94	1.4	1.9
Pesticides/Herbicides (ug/kg)												
2,4,5-T	3	0	0			38.7		14	52	82.4	24	180
2,4,5-TP (Silvex)	3	0	0			38.7		14	52	82.4	24	180
2,4-D	3	0	0			38.7		14	52	82.4	24	180
2,4-DB	3	0	0			38.7		14	52	82.4	24	180
4,4'-DDD	3	1	33	28	28	118		135	163	185	270	380
4,4'-DDE	3	1	33	51	51	125		135	163	185	270	380
4,4'-DDT	3	0	0			132		135	163	185	140	380
Total DDT	3	1	33	79	79	375		405	488	554	140	1140
Aldrin	3	3	100	25	64	43.7	19.6	42	53	61.8		
alpha-BHC	3	0	0			20		20.5	24.8	28.2	21	58
Alpha Chlordane	3	3	100	37	120	70.3	43.8	54	87	113		
beta-BHC	3	0	0			20		20.5	24.8	28.2	21	58
Dalapon	3	0	0			300		110	405	641	180	1400
delta-BHC	3	1	33	18	18	16.3		18	19.3	20.3	21	41
Dicamba	3	0	0			94.2		34	127	201	57	440
Dichloroprop	3	0	0			470		170	635	1010	280	2200
Dieldrin	3	0	0			132		135	163	185	140	380
Dinoseb	3	0	0			470		170	635	1010	280	2200
Endosulfan I	3	0	0			68.3		70	85	97	70	200
Endosulfan II	3	0	0			132		135	163	185	140	380
Endosulfan sulfate	3	2	67	9	16	71.7	4.95	16	103	173	380	380
Endrin	3	0	0			132		135	163	185	140	380
Endrin aldehyde	3	0	0			132		135	163	185	140	380
Endrin ketone	3	0	0			132		135	163	185	140	380
gamma-BHC (Lindane)	3	0	0			68.3		70	85	97	70	200
Gamma Chlordane	3	3	100	110	250	167	73.7	140	195	239		
Heptachlor	3	2	67	9.1	9.7	17.9	0.424	9.7	22.4	32.5	70	70
Heptachlor epoxide	3	0	0			68.3		70	85	97	70	200
MCPA	3	0	0			9420		3400	12700	20100	5700	44000
MCPP	3	0	0			9420		3400	12700	20100	5700	44000
Methoxychlor	3	0	0			683		700	850	970	700	2000
Toxaphene	3	0	0			6830		7000	8500	9700	7000	20000
SVOCs (ug/kg)												
1,2,4-Trichlorobenzene	3	0	0			1680		1700	1830	1930	2800	3900
1,2-Dichlorobenzene	3	0	0			1680		1700	1830	1930	2800	3900
1,3-Dichlorobenzene	3	0	0			1680		1700	1830	1930	2800	3900
1,4-Dichlorobenzene	3	0	0			1680		1700	1830	1930	2800	3900
2,4,5-Trichlorophenol	3	0	0			1680		1700	1830	1930	2800	3900
2,4,6-Trichlorophenol	3	0	0			1680		1700	1830	1930	2800	3900
2,4-Dichlorophenol	3	0	0			1680		1700	1830	1930	2800	3900
2,4-Dinitrophenol	3	0	0			8500		8500	9250	9850	14000	20000
2,4-Dinitrotoluene	3	0	0			1680		1700	1830	1930	2800	3900
2,6-Dinitrotoluene	3	0	0			1680		1700	1830	1930	2800	3900
2-Chloronaphthalene	3	0	0			1680		1700	1830	1930	2800	3900
2-Chlorophenol	3	0	0			1680		1700	1830	1930	2800	3900
2-Methylnaphthalene	3	0	0			1680		1700	1830	1930	2800	3900
2-Methylphenol (o-cresol)	3	0	0			1680		1700	1830	1930	2800	3900
2-Nitroaniline	3	0	0			8500		8500	9250	9850	14000	20000
2-Nitrophenol	3	0	0			1680		1700	1830	1930	2800	3900
3-Methylphenol/4-Methylphenol	3	0	0			1680		1700	1830	1930	2800	3900
3,3'-Dichlorobenzidine	3	0	0			3280		3300	3550	3750	5500	7600
3-Nitroaniline	3	0	0			8500		8500	9250	9850	14000	20000
4,6-Dinitro-2-methylphenol	3	0	0			8500		8500	9250	9850	14000	20000
4-Bromophenylphenyl ether	3	0	0			1680		1700	1830	1930	2800	3900
4-Chloro-3-methylphenol	3	0	0			1680		1700	1830	1930	2800	3900
4-Chloroaniline	3	0	0			3280		3300	3550	3750	5500	7600

Appendix C-2b
Summary Statistics for 1999 Creek Segment C Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
4-Chlorophenylphenyl ether	3	0	0			1680		1700	1830	1930	2800	3900
4-Nitroaniline	3	0	0			8500		8500	9250	9850	14000	20000
4-Nitrophenol	3	0	0			8500		8500	9250	9850	14000	20000
Acenaphthene	3	0	0			1680		1700	1830	1930	2800	3900
Acenaphthylene	3	0	0			1680		1700	1830	1930	2800	3900
Anthracene	3	0	0			1680		1700	1830	1930	2800	3900
Benzo(a)anthracene	3	2	67	530	890	940	255	890	1150	1350	2800	2800
Benzo(a)pyrene	3	1	33	1400	1400	1020		900	1150	1350	1500	1800
Benzo(b)fluoranthene	3	3	100	600	2000	1090	786	680	1340	1870		
Benzo(g,h,i)perylene	3	1	33	1400	1400	1500		1400	1550	1670	2800	3400
Benzo(k)fluoranthene	3	2	67	390	1200	1100	573	1200	1450	1650	3400	3400
bis(2-Chloroethoxy)methane	3	0	0			1680		1700	1830	1930	2800	3900
bis(2-Chloroethyl)ether	3	0	0			1680		1700	1830	1930	2800	3900
2,2'-Oxybis(1-Chloropropane)	3	0	0			1680		1700	1830	1930	2800	3900
bis(2-Ethylhexyl)phthalate	3	0	0			1680		1700	1830	1930	2800	3900
Butylbenzylphthalate	3	0	0			1680		1700	1830	1930	2800	3900
Carbazole	3	0	0			1680		1700	1830	1930	2800	3900
Chrysene	3	3	100	500	1500	880	541	640	1070	1410		
Dibenzo(a,h)anthracene	3	0	0			900		900	975	1040	1500	2100
Dibenzofuran	3	0	0			1680		1700	1830	1930	2800	3900
Diethylphthalate	3	0	0			1680		1700	1830	1930	2800	3900
Dimethylphthalate	3	0	0			1680		1700	1830	1930	2800	3900
Di-n-butylphthalate	3	0	0			1680		1700	1830	1930	2800	3900
Di-n-octylphthalate	3	0	0			1680		1700	1830	1930	2800	3900
Fluoranthene	3	3	100	780	2200	1260	814	800	1500	2060		
Fluorene	3	0	0			1680		1700	1830	1930	2800	3900
Hexachlorobenzene	3	0	0			700		700	750	790	1200	1600
Hexachlorobutadiene	3	0	0			1680		1700	1830	1930	2800	3900
Hexachlorocyclopentadiene	3	0	0			1680		1700	1830	1930	2800	3900
Hexachloroethane	3	0	0			1680		1700	1830	1930	2800	3900
Indeno(1,2,3-cd)pyrene	3	0	0			1680		1700	1830	1930	2800	3900
Isophorone	3	0	0			1680		1700	1830	1930	2800	3900
Naphthalene	3	0	0			1680		1700	1830	1930	2800	3900
Nitrobenzene	3	0	0			1680		1700	1830	1930	2800	3900
N-Nitroso-di-n-propylamine	3	0	0			1680		1700	1830	1930	2800	3900
N-Nitrosodiphenylamine	3	0	0			1680		1700	1830	1930	2800	3900
Pentachlorophenol	3	3	100	7.4	23	17.8	9.01	23	23	23		
Phenanthrene	3	3	100	320	840	563	262	530	685	809		
Phenol	3	0	0			1680		1700	1830	1930	2800	3900
Pyrene	3	3	100	660	2000	1200	707	940	1470	1890		
Total PAHs	3	3	100	3270	13400	22200	5640	21200	24700	27400		
VOCs (ug/kg)												
1,1,1-Trichloroethane	3	0	0			13		13.5	14	14.4	22	29
1,1,2,2-Tetrachloroethane	3	0	0			13		13.5	14	14.4	22	29
1,1,2-Trichloroethane	3	0	0			13		13.5	14	14.4	22	29
1,1-Dichloroethane	3	0	0			13		13.5	14	14.4	22	29
1,1-Dichloroethene	3	0	0			12		12.5	13	13.4	20	27
1,2-Dichloroethane	3	0	0			13		13.5	14	14.4	22	29
Cis/Trans-1,2-Dichloroethene	3	0	0			13		13.5	14	14.4	22	29
1,2-Dichloropropane	3	0	0			13		13.5	14	14.4	22	29
2-Butanone (MEK)	3	3	100	28	37	32	4.58	31	34	36.4		
2-Hexanone	3	0	0			63.3		65	67.5	69.5	110	140
4-Methyl-2-pentanone (MIBK)	3	0	0			63.3		65	67.5	69.5	110	140
Acetone	3	3	100	96	130	109	18.6	100	115	127		
Benzene	3	0	0			13		13.5	14	14.4	22	29
Bromodichloromethane	3	0	0			13		13.5	14	14.4	22	29
Bromoform	3	0	0			13		13.5	14	14.4	22	29
Bromomethane (Methyl bromide)	3	0	0			26.2		27	28	28.8	45	58

Appendix C-2b
Summary Statistics for 1999 Creek Segment C Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Carbon disulfide	3	0	0			13		13.5	14	14.4	22	29
Carbon tetrachloride	3	0	0			13		13.5	14	14.4	22	29
Chlorobenzene	3	0	0			13		13.5	14	14.4	22	29
Chloroform	3	0	0			13		13.5	14	14.4	22	29
Chloroethane	3	0	0			26.2		27	28	28.8	45	58
Chloromethane	3	0	0			26.2		27	28	28.8	45	58
cis-1,3-Dichloropropene	3	0	0			10.5		11	11.3	11.5	18	23
Dibromochloromethane	3	0	0			13		13.5	14	14.4	22	29
Ethylbenzene	3	0	0			13		13.5	14	14.4	22	29
Methylene chloride (Dichloromethane)	3	0	0			13		13.5	14	14.4	22	29
Styrene	3	0	0			13		13.5	14	14.4	22	29
Tetrachloroethene	3	0	0			13		13.5	14	14.4	22	29
Toluene	3	0	0			13		13.5	14	14.4	22	29
trans-1,3-Dichloropropene	3	0	0			10.5		11	11.3	11.5	18	23
Trichloroethene	3	0	0			13		13.5	14	14.4	22	29
Vinyl chloride	3	0	0			26.2		27	28	28.8	45	58
Xylenes, Total	3	0	0			13		13.5	14	14.4	22	29
Inorganics (mg/kg)												
Aluminum	3	3	100	9700	15000	12200	2660	12000	13500	14700		
Antimony	3	3	100	1.3	2.2	1.77	0.451	1.8	2	2.16		
Arsenic	3	3	100	16	28	20.3	6.66	17	22.5	26.9		
Barium	3	3	100	470	800	650	167	680	740	788		
Beryllium	3	0	0			0.522		0.5	0.55	0.59	0.93	1.2
Cadmium	3	3	100	16	20	18.3	2.08	19	19.5	19.9		
Calcium	3	3	100	23000	47000	32700	12700	28000	37500	45100		
Chromium	3	3	100	47	93	63.3	25.7	50	71.5	88.7		
Cobalt	3	3	100	9.7	17	12.9	3.73	12	14.5	16.5		
Copper	3	3	100	1400	2200	1900	436	2100	2150	2190		
Iron	3	3	100	21000	27000	24000	3000	24000	25500	26700		
Lead	3	3	100	270	480	360	108	330	405	465		
Magnesium	3	3	100	3600	6400	5170	1430	5500	5950	6310		
Manganese	3	3	100	240	330	287	45.1	290	310	326		
Mercury	3	3	100	0.58	0.66	0.627	0.0416	0.64	0.65	0.658		
Molybdenum	3	2	67	2.2	3.4	2.15	0.849	2.2	2.8	3.28	1.7	1.7
Nickel	3	3	100	370	580	500	114	550	565	577		
Potassium	3	3	100	2100	3000	2500	458	2400	2700	2940		
Selenium	3	0	0			3.03		1.4	3.95	5.99	2.4	13
Silver	3	3	100	1.2	1.8	1.53	0.306	1.6	1.7	1.78		
Sodium	3	0	0			160		160	165	169	300	340
Thallium	3	0	0			1.53		1.55	1.65	1.73	2.6	3.5
Vanadium	3	3	100	34	48	39.3	7.57	36	42	46.8		
Zinc	3	3	100	2900	4500	3570	833	3300	3900	4380		
PCBs (ug/kg)												
Monochlorobiphenyl	3	0	0			233		285	335	375	57	770
Dichlorobiphenyl	3	0	0			233		285	335	375	57	770
Trichlorobiphenyl	3	0	0			233		285	335	375	57	770
Tetrachlorobiphenyl	3	0	0			485		600	700	780	110	1600
Pentachlorobiphenyl	3	2	67	2200	2600	1620	283	2200	2400	2560	110	110
Hexachlorobiphenyl	3	3	100	160	2000	960	943	720	1360	1870		
Heptachlorobiphenyl	3	0	0			695		850	1000	1120	170	2300
Octachlorobiphenyl	3	0	0			695		850	1000	1120	170	2300
Nonachlorobiphenyl	3	0	0			1180		1450	1700	1900	290	3900
Decachlorobiphenyl	3	0	0			1180		1450	1700	1900	290	3900
Total PCBs	3	3	100	160	4600	7520	2240	8980	10900	12400		
Dioxins (ug/kg)												
1,2,3,4,6,7,8,9-OCDD	3	3	100	284	881	549	304	484	682	841		
1,2,3,4,6,7,8-HpCDD	3	3	100	31.7	101	62.7	35.3	55.3	78.2	96.5		
1,2,3,4,7,8-HxCDD	3	3	100	0.0916	0.314	0.183	0.116	0.143	0.229	0.297		

Appen. -2b
Summary Statistics for 1999 Creek Segment C Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
1,2,3,6,7,8-HxCDD	3	3	100	0.657	2.79	1.7	1.07	1.64	2.22	2.68		
1,2,3,7,8,9-HxCDD	3	3	100	0.322	1.03	0.646	0.358	0.587	0.809	0.986		
1,2,3,7,8-PeCDD	3	3	100	0.0781	0.219	0.144	0.0709	0.135	0.177	0.211		
2,3,7,8-TCDD	3	0	0			0.016		0.0149	0.0197	0.0235	0.0176	0.0489
Total HpCDD	3	3	100	57.1	187	115	66.4	99.6	143	178		
Total HxCDD	3	0	0			4.99		4.28	6.42	8.13	4.28	17.12
Total PeCDD	3	0	0			1.71		1.98	2.23	2.44	1.34	4.98
Total TCDD	3	0	0			2.59		2.3	3.28	4.07	2.43	8.54
Furans (ug/kg)												
1,2,3,4,6,7,8,9-OCDF	3	3	100	93.8	398	223	157	178	288	376		
1,2,3,4,6,7,8-HpCDF	3	3	100	17.7	62	37.7	22.5	33.4	47.7	59.2		
1,2,3,4,7,8,9-HpCDF	3	3	100	0.663	4.27	2.25	1.84	1.81	3.04	4.02		
1,2,3,4,7,8-HxCDF	3	3	100	0.353	1.36	0.876	0.505	0.915	1.14	1.32		
1,2,3,6,7,8-HxCDF	3	3	100	0.195	0.698	0.407	0.261	0.328	0.513	0.661		
1,2,3,7,8,9-HxCDF	3	3	100	0.0083	0.0466	0.0234	0.0204	0.0153	0.031	0.0435		
1,2,3,7,8-PeCDF	3	2	67	0.0643	0.151	0.0941	0.0613	0.067	0.109	0.143	0.134	0.134
2,3,4,6,7,8-HxCDF	3	3	100	0.25	1.09	0.606	0.434	0.479	0.785	1.03		
2,3,4,7,8-PeCDF	3	3	100	0.097	0.25	0.178	0.077	0.188	0.219	0.244		
2,3,7,8-TCDF	3	3	100	0.109	0.28	0.188	0.0863	0.174	0.227	0.269		
Total HpCDF	3	3	100	65.6	260	149	100	120	190	246		
Total HxCDF	3	1	33	32.1	32.1	14.8		7.91	20	29.7	8.92	15.81
Total PeCDF	3	0	0			1.07		1.13	1.34	1.5	1.1	3.08
Total TCDF	3	0	0			1.16		1.08	1.44	1.72	1.22	3.59
Total TEQ	3	3	100	0.867	2.91	1.82	1.03	1.65	2.29	2.81		

[1]Average and percentiles calculated assuming 1/2 detection limit for nondetects
[2]Standard deviation calculated for detected concentrations only

Appendix C-2c
Summary Statistics for 1999 Creek Segment D Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Cyanide, Total (mg/kg)	3	0	0			1.02		1.1	1.15	1.19	1.5	2.4
Pesticides/Herbicides (ug/kg)												
2,4,5-T	3	0	0			72.3		95	103	109	24	220
2,4,5-TP (Silvex)	3	0	0			72.3		95	103	109	24	220
2,4-D	3	0	0			72.3		95	103	109	24	220
2,4-DB	3	0	0			72.3		95	103	109	24	220
4,4'-DDD	3	0	0			39.7		43	45	46.6	58	94
4,4'-DDE	3	3	100	4.4	20	12.8	7.87	14	17	19.4		
4,4'-DDT	3	0	0			39.7		43	45	46.6	58	94
Total DDT	3	3	100	4.4	20	92.1	7.87	106	107	108		
Aldrin	3	3	100	2.7	11	7.77	4.44	9.6	10.3	10.9		
alpha-BHC	3	0	0			5.97		6.5	6.75	6.95	8.8	14
Alpha Chlordane	3	2	67	14	26	18.3	8.49	15	20.5	24.9	30	30
beta-BHC	3	0	0			5.97		6.5	6.75	6.95	8.8	14
Dalapon	3	0	0			565		750	800	840	190	1700
delta-BHC	3	2	67	1.5	16	8.17	10.3	7	11.5	15.1	14	14
Dicamba	3	1	33	13	13	90.8		29.5	130	210	59	460
Dichloroprop	3	0	0			865		1150	1230	1290	290	2600
Dieldrin	3	0	0			39.7		43	45	46.6	58	94
Dinoseb	3	0	0			865		1150	1230	1290	290	2600
Endosulfan I	3	0	0			20.3		22	23	23.8	30	48
Endosulfan II	3	0	0			39.7		43	45	46.6	58	94
Endosulfan sulfate	3	0	0			39.7		43	45	46.6	58	94
Endrin	3	0	0			39.7		43	45	46.6	58	94
Endrin aldehyde	3	1	33	16	16	35.3		43	45	46.6	86	94
Endrin ketone	3	1	33	5.5	5.5	31.8		43	45	46.6	86	94
gamma-BHC (Lindane)	3	0	0			20.3		22	23	23.8	30	48
Gamma Chlordane	3	3	100	6.7	49	28.2	21.2	29	39	47		
Heptachlor	3	0	0			20.3		22	23	23.8	30	48
Heptachlor epoxide	3	0	0			20.3		22	23	23.8	30	48
MCPA	3	0	0			17500		23000	24800	26200	5900	53000
MCPP	3	0	0			17500		23000	24800	26200	5900	53000
Methoxychlor	3	0	0			203		220	230	238	300	480
Toxaphene	3	0	0			2030		2200	2300	2380	3000	4800
SVOCs (ug/kg)												
1,2,4-Trichlorobenzene	3	0	0			1980		2150	2250	2330	2900	4700
1,2-Dichlorobenzene	3	0	0			1980		2150	2250	2330	2900	4700
1,3-Dichlorobenzene	3	0	0			1980		2150	2250	2330	2900	4700
1,4-Dichlorobenzene	3	0	0			1980		2150	2250	2330	2900	4700
2,4,5-Trichlorophenol	3	0	0			1980		2150	2250	2330	2900	4700
2,4,6-Trichlorophenol	3	0	0			1980		2150	2250	2330	2900	4700
2,4-Dichlorophenol	3	0	0			1980		2150	2250	2330	2900	4700
2,4-Dinitrophenol	3	0	0			10000		11000	11300	11500	15000	23000
2,4-Dinitrotoluene	3	0	0			1980		2150	2250	2330	2900	4700
2,6-Dinitrotoluene	3	0	0			1980		2150	2250	2330	2900	4700
2-Chloronaphthalene	3	0	0			1980		2150	2250	2330	2900	4700
2-Chlorophenol	3	0	0			1980		2150	2250	2330	2900	4700
2-Methylnaphthalene	3	0	0			1980		2150	2250	2330	2900	4700
2-Methylphenol (o-cresol)	3	0	0			1980		2150	2250	2330	2900	4700
2-Nitroaniline	3	0	0			10000		11000	11300	11500	15000	23000
2-Nitrophenol	3	0	0			1980		2150	2250	2330	2900	4700
3-Methylphenol/4-Methylphenol	3	0	0			1980		2150	2250	2330	2900	4700
3,3'-Dichlorobenzidine	3	0	0			3870		4200	4380	4520	5700	9100
3-Nitroaniline	3	0	0			10000		11000	11300	11500	15000	23000
4,6-Dinitro-2-methylphenol	3	0	0			10000		11000	11300	11500	15000	23000
4-Bromophenylphenyl ether	3	0	0			1980		2150	2250	2330	2900	4700
4-Chloro-3-methylphenol	3	0	0			1980		2150	2250	2330	2900	4700
4-Chloroaniline	3	0	0			3870		4200	4380	4520	5700	9100
4-Chlorophenylphenyl ether	3	0	0			1980		2150	2250	2330	2900	4700
4-Nitroaniline	3	0	0			10000		11000	11300	11500	15000	23000
4-Nitrophenol	3	0	0			10000		11000	11300	11500	15000	23000

Appendix 2c
Summary Statistics for 1995 Creek Segment D Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Acenaphthene	3	0	0			1980		2150	2250	2330	2900	4700
Acenaphthylene	3	0	0			1980		2150	2250	2330	2900	4700
Anthracene	3	0	0			1980		2150	2250	2330	2900	4700
Benzo(a)anthracene	3	1	33	420	420	1640		2150	2250	2330	4300	4700
Benzo(a)pyrene	3	1	33	560	560	987		1150	1200	1240	2300	2500
Benzo(b)fluoranthene	3	3	100	780	970	887	97.1	910	940	964		
Benzo(g,h,i)perylene	3	1	33	660	660	1720		2150	2250	2330	4300	4700
Benzo(k)fluoranthene	3	3	100	520	660	597	70.9	610	635	655		
bis(2-Chloroethoxy)methane	3	0	0			1980		2150	2250	2330	2900	4700
bis(2-Chloroethyl)ether	3	0	0			1980		2150	2250	2330	2900	4700
2,2'-Oxybis(1-Chloropropane)	3	0	0			1980		2150	2250	2330	2900	4700
bis(2-Ethylhexyl)phthalate	3	1	33	1200	1200	1900		2150	2250	2330	4300	4700
Butylbenzylphthalate	3	0	0			1980		2150	2250	2330	2900	4700
Carbazole	3	0	0			1980		2150	2250	2330	2900	4700
Chrysene	3	3	100	670	790	733	60.3	740	765	785		
Dibenzo(a,h)anthracene	3	0	0			1070		1150	1200	1240	1600	2500
Dibenzofuran	3	0	0			1980		2150	2250	2330	2900	4700
Diethylphthalate	3	0	0			1980		2150	2250	2330	2900	4700
Dimethylphthalate	3	0	0			1980		2150	2250	2330	2900	4700
Di-n-butylphthalate	3	0	0			1980		2150	2250	2330	2900	4700
Di-n-octylphthalate	3	0	0			1980		2150	2250	2330	2900	4700
Fluoranthene	3	3	100	1000	1200	1130	115	1200	1200	1200		
Fluorene	3	0	0			1980		2150	2250	2330	2900	4700
Hexachlorobenzene	3	0	0			817		900	925	945	1200	1900
Hexachlorobutadiene	3	0	0			1980		2150	2250	2330	2900	4700
Hexachlorocyclopentadiene	3	0	0			1980		2150	2250	2330	2900	4700
Hexachloroethane	3	0	0			1980		2150	2250	2330	2900	4700
Indeno(1,2,3-cd)pyrene	3	0	0			1980		2150	2250	2330	2900	4700
Isophorone	3	0	0			1980		2150	2250	2330	2900	4700
Naphthalene	3	0	0			1980		2150	2250	2330	2900	4700
Nitrobenzene	3	0	0			1980		2150	2250	2330	2900	4700
N-Nitroso-di-n-propylamine	3	0	0			1980		2150	2250	2330	2900	4700
N-Nitrosodiphenylamine	3	0	0			1980		2150	2250	2330	2900	4700
Pentachlorophenol	3	1	33	3.9	3.9	7500		11000	11300	11500	22000	23000
Phenanthrene	3	1	33	410	410	1640		2150	2250	2330	4300	4700
Phenol	3	0	0			1980		2150	2250	2330	2900	4700
Pyrene	3	3	100	950	1100	1010	81.4	970	1040	1090		
Total PAHs	3	3	100	3940	6810	25300	1400	28400	29200	29800		
VOCs (ug/kg)												
1,1,1-Trichloroethane	3	0	0			16.8		20	20.3	20.5	20	41
1,1,2,2-Tetrachloroethane	3	0	0			16.8		20	20.3	20.5	20	41
1,1,2-Trichloroethane	3	0	0			16.8		20	20.3	20.5	20	41
1,1-Dichloroethane	3	0	0			16.8		20	20.3	20.5	20	41
1,1-Dichloroethene	3	0	0			15.7		18.5	18.8	19	19	38
1,2-Dichloroethane	3	0	0			16.8		20	20.3	20.5	20	41
Cis/Trans-1,2-Dichloroethene	3	0	0			16.8		20	20.3	20.5	20	41
1,2-Dichloropropane	3	0	0			16.8		20	20.3	20.5	20	41
2-Butanone (MEK)	3	3	100	30	65	50.3	18.2	56	60.5	64.1		
2-Hexanone	3	0	0			83.3		100	100	100	100	200
4-Methyl-2-pentanone (MIBK)	3	0	0			83.3		100	100	100	100	200
Acetone	3	3	100	84	190	148	56.3	170	180	188		
Benzene	3	0	0			16.8		20	20.3	20.5	20	41
Bromodichloromethane	3	0	0			16.8		20	20.3	20.5	20	41
Bromoform	3	0	0			16.8		20	20.3	20.5	20	41
Bromomethane (Methyl bromide)	3	0	0			33.8		40	40.5	40.9	41	82
Carbon disulfide	3	0	0			16.8		20	20.3	20.5	20	41
Carbon tetrachloride	3	0	0			16.8		20	20.3	20.5	20	41
Chlorobenzene	3	0	0			16.8		20	20.3	20.5	20	41
Chloroform	3	0	0			16.8		20	20.3	20.5	20	41
Chloroethane	3	0	0			33.8		40	40.5	40.9	41	82
Chloromethane	3	0	0			33.8		40	40.5	40.9	41	82

Appendix C-2c
Summary Statistics for 1999 Creek Segment D Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
cis-1,3-Dichloropropene	3	0	0			13.5		16	16.3	16.5	16	33
Dibromochloromethane	3	0	0			16.8		20	20.3	20.5	20	41
Ethylbenzene	3	0	0			16.8		20	20.3	20.5	20	41
Methylene chloride (Dichloromethane)	3	0	0			16.8		20	20.3	20.5	20	41
Styrene	3	0	0			16.8		20	20.3	20.5	20	41
Tetrachloroethene	3	0	0			16.8		20	20.3	20.5	20	41
Toluene	3	0	0			16.8		20	20.3	20.5	20	41
trans-1,3-Dichloropropene	3	0	0			13.5		16	16.3	16.5	16	33
Trichloroethene	3	0	0			16.8		20	20.3	20.5	20	41
Vinyl chloride	3	0	0			33.8		40	40.5	40.9	41	82
Xylenes, Total	3	0	0			16.8		20	20.3	20.5	20	41
Inorganics (mg/kg)												
Aluminum	3	3	100	13000	16000	14000	1730	13000	14500	15700		
Antimony	3	0	0			3.88		4.35	4.35	4.35	5.9	8.7
Arsenic	3	3	100	10	17	14.3	3.79	16	16.5	16.9		
Barium	3	3	100	310	400	363	47.3	380	390	398		
Beryllium	3	0	0			0.583		0.6	0.625	0.645	1	1.3
Cadmium	3	3	100	10	15	12.7	2.52	13	14	14.8		
Calcium	3	3	100	26000	30000	28000	2000	28000	29000	29800		
Chromium	3	3	100	56	67	61	5.57	60	63.5	66.3		
Cobalt	3	3	100	8.8	12	10.9	1.85	12	12	12		
Copper	3	3	100	320	740	597	240	730	735	739		
Iron	3	3	100	19000	25000	22000	3000	22000	23500	24700		
Lead	3	3	100	170	260	220	45.8	230	245	257		
Magnesium	3	3	100	6600	7500	6930	493	6700	7100	7420		
Manganese	3	3	100	250	320	280	36.1	270	295	315		
Mercury	3	3	100	0.35	0.5	0.423	0.0751	0.42	0.46	0.492		
Molybdenum	3	0	0			1.22		1.3	1.4	1.48	1.7	3
Nickel	3	3	100	150	260	223	63.5	260	260	260		
Potassium	3	3	100	2700	3200	2930	252	2900	3050	3170		
Selenium	3	0	0			1.23		1.25	1.35	1.43	2	2.9
Silver	3	0	0			1.92		2.15	2.15	2.15	2.9	4.3
Sodium	3	0	0			113		120	123	125	190	250
Thallium	3	0	0			1.92		2.15	2.15	2.15	2.9	4.3
Vanadium	3	3	100	37	51	44	7	44	47.5	50.3		
Zinc	3	3	100	1800	2700	2330	473	2500	2600	2680		
PCBs (ug/kg)												
Monochlorobiphenyl	3	0	0			40.3		43.5	45.8	47.6	59	98
Dichlorobiphenyl	3	0	0			40.3		43.5	45.8	47.6	59	96
Trichlorobiphenyl	3	0	0			40.3		43.5	45.8	47.6	59	96
Tetrachlorobiphenyl	3	0	0			81.7		90	92.5	94.5	120	190
Pentachlorobiphenyl	3	3	100	430	520	477	45.1	480	500	516		
Hexachlorobiphenyl	3	3	100	97	400	249	152	250	325	385		
Heptachlorobiphenyl	3	0	0			122		130	138	144	180	290
Octachlorobiphenyl	3	0	0			122		130	138	144	180	290
Nonachlorobiphenyl	3	0	0			203		220	230	238	300	480
Decachlorobiphenyl	3	2	67	170	230	183	42.4	170	200	224	300	300
Total PCBs	3	3	100	697	1150	1560	253	1400	1660	1870		
Dioxins (ug/kg)												
1,2,3,4,6,7,8,9-OCDD	3	3	100	91.3	209	161	61.8	183	196	206		
1,2,3,4,6,7,8-HpCDD	3	3	100	10.8	21.5	17.5	5.8	20.1	20.8	21.3		
1,2,3,4,7,8-HxCDD	3	3	100	0.0962	0.107	0.1	0.00607	0.0968	0.102	0.106		
1,2,3,6,7,8-HxCDD	3	3	100	0.396	0.587	0.504	0.0979	0.529	0.558	0.581		
1,2,3,7,8,9-HxCDD	3	3	100	0.318	0.363	0.34	0.0225	0.34	0.352	0.361		
1,2,3,7,8-PeCDD	3	3	100	0.0741	0.0811	0.0779	0.00354	0.0785	0.0798	0.0808		
2,3,7,8-TCDD	3	1	33	0.0134	0.0134	0.00892		0.0069	0.0102	0.0128	0.0129	0.0138
Total HpCDD	3	3	100	19.3	39.3	31.7	10.8	36.4	37.8	39		
Total HxCDD	3	0	0			2.04		2.18	2.22	2.27	3.37	4.57
Total PeCDD	3	0	0			0.687		0.74	0.743	0.745	1.15	1.49
Total TCDD	3	0	0			0.439		0.472	0.488	0.502	0.678	1.01
Furans (ug/kg)												

Appx -2c
Summary Statistics for 1999 Creek Segment D Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
1,2,3,4,6,7,8,9-OCDF	3	3	100	26.6	64	47.3	19	51.3	57.6	62.7		
1,2,3,4,6,7,8-HpCDF	3	3	100	6 14	12.1	9.72	3 16	10.9	11.5	12		
1,2,3,4,7,8,9-HpCDF	3	3	100	0 305	0.538	0 419	0.117	0.414	0.476	0.526		
1,2,3,4,7,8-HxCDF	3	3	100	0.166	0 297	0 236	0.066	0.245	0.271	0.292		
1,2,3,6,7,8-HxCDF	3	3	100	0.118	0.178	0.147	0 03	0 146	0.162	0.175		
1,2,3,7,8,9-HxCDF	3	3	100	0.0074	0.009	0.008	0.000872	0.0076	0.0083	0.00886		
1,2,3,7,8-PeCDF	3	3	100	0.0377	0.0575	0.0507	0.0113	0.0569	0 0572	0.0574		
2,3,4,6,7,8-HxCDF	3	3	100	0.153	0.233	0.189	0.0405	0.182	0.208	0.228		
2,3,4,7,8-PeCDF	3	3	100	0.0461	0 0792	0 0626	0 0166	0.0624	0.0708	0.0775		
2,3,7,8-TCDF	3	3	100	0.064	0.0983	0.0845	0 0181	0.0911	0.0947	0.0976		
Total HpCDF	3	1	33	32.6	32.6	20.5		20.4	26.5	31 4	17.17	40.89
Total HxCDF	3	1	33	4.89	4.89	3.17		2.87	3.88	4.69	3.49	5 73
Total PeCDF	3	0	0			0.421		0.44	0.48	0.512	0.607	1.04
Total TCDF	3	0	0			0 481		0.53	0.573	0.607	0.598	1 23
Total TEQ	3	3	100	0 427	0 666	0.57	0.126	0.616	0.641	0.661		

[1]Average and percentiles calculated assuming 1/2 detection limit for nondetects
[2]Standard deviation calculated for detected concentrations only

Appendix C-2d
Summary Statistics for 1999 Creek Segment E Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Cyanide, Total (mg/kg)	3	0	0			0.8		0.85	0.875	0.895	1.3	1.8
Pesticides/Herbicides (ug/kg)												
2,4,5-T	3	0	0			73.3		70	77.5	83.5	130	170
2,4,5-TP (Silvex)	3	0	0			73.3		70	77.5	83.5	130	170
2,4-D	3	1	33	73	73	69.3		70	71.5	72.7	130	140
2,4-DB	3	1	33	150	150	95		70	110	142	130	140
4,4'-DDD	3	0	0			38		43	51.5	58.3	22	120
4,4'-DDE	3	3	100	3.4	15	7.57	6.45	4.3	9.65	13.9		
4,4'-DDT	3	1	33	9.3	9.3	21.1		11	27	39.8	22	86
Total DDT	3	3	100	3.4	24.3	66.7	11.8	84.3	86.9	88.9		
Aldrin	3	0	0			19.2		22	26	29.2	11	60
alpha-BHC	3	0	0			5.72		6.5	7.75	8.75	3.3	18
Alpha Chlordane	3	3	100	2.5	6.9	4.43	2.25	3.9	5.4	6.6		
beta-BHC	3	0	0			5.72		6.5	7.75	8.75	3.3	18
Dalapon	3	0	0			565		550	800	640	990	1300
delta-BHC	3	1	33	1.3	1.3	3.15		1.65	4.08	6.02	3.3	13
Dicamba	3	0	0			175		170	188	202	300	410
Dichloroprop	3	0	0			883		850	950	1030	1500	2100
Dieldrin	3	3	100	1.7	9.4	5.5	3.85	5.4	7.4	9		
Dinoseb	3	1	33	1700	1700	1170		1050	1380	1640	1500	2100
Endosulfan I	3	0	0			19.2		22	26	29.2	11	60
Endosulfan II	3	2	67	2.3	12	8.43	6.86	11	11.5	11.9	22	22
Endosulfan sulfate	3	1	33	10	10	21.3		11	27	39.8	22	86
Endrin	3	1	33	4.6	4.6	19.5		11	27	39.8	22	86
Endrin aldehyde	3	2	67	3.6	22	12.2	13	11	16.5	20.9	22	22
Endrin ketone	3	2	67	6.8	17	11.6	7.21	11	14	16.4	22	22
gamma-BHC (Lindane)	3	0	0			19.2		22	26	29.2	11	60
Gamma Chlordane	3	3	100	5.1	14	8.33	4.92	5.9	9.95	13.2		
Heptachlor	3	1	33	0.53	0.53	17.5		22	26	29.2	44	60
Heptachlor epoxide	3	1	33	5.2	5.2	10.9		5.5	13.8	20.4	11	44
MCPA	3	0	0			17500		17000	18800	20200	30000	41000
MCPP	3	0	0			17500		17000	18800	20200	30000	41000
Methoxychlor	3	1	33	39	39	105		55	138	204	110	440
Toxaphene	3	0	0			1920		2200	2600	2920	1100	6000
SVOCs (ug/kg)												
1,2,4-Trichlorobenzene	3	0	0			267		280	290	298	440	600
1,2-Dichlorobenzene	3	0	0			267		280	290	298	440	600
1,3-Dichlorobenzene	3	0	0			267		280	290	298	440	600
1,4-Dichlorobenzene	3	0	0			267		280	290	298	440	600
2,4,5-Trichlorophenol	3	0	0			267		280	290	298	440	600
2,4,6-Trichlorophenol	3	0	0			267		280	290	298	440	600
2,4-Dichlorophenol	3	0	0			267		280	290	298	440	600
2,4-Dinitrophenol	3	0	0			1330		1400	1450	1490	2200	3000
2,4-Dinitrotoluene	3	0	0			267		280	290	298	440	600
2,6-Dinitrotoluene	3	0	0			267		280	290	298	440	600
2-Chloronaphthalene	3	0	0			267		280	290	298	440	600
2-Chlorophenol	3	0	0			267		280	290	298	440	600
2-Methylnaphthalene	3	0	0			267		280	290	298	440	600
2-Methylphenol (o-cresol)	3	0	0			267		280	290	298	440	600
2-Nitroaniline	3	0	0			1330		1400	1450	1490	2200	3000
2-Nitrophenol	3	0	0			267		280	290	298	440	600
3-Methylphenol/4-Methylphenol	3	0	0			267		280	290	298	440	600
3,3'-Dichlorobenzidine	3	0	0			527		550	575	595	860	1200
3-Nitroaniline	3	0	0			1330		1400	1450	1490	2200	3000
4,6-Dinitro-2-methylphenol	3	0	0			1330		1400	1450	1490	2200	3000
4-Bromophenylphenyl ether	3	0	0			267		280	290	298	440	600
4-Chloro-3-methylphenol	3	0	0			267		280	290	298	440	600
4-Chloroaniline	3	0	0			527		550	575	595	860	1200
4-Chlorophenylphenyl ether	3	0	0			267		280	290	298	440	600
4-Nitroaniline	3	0	0			1330		1400	1450	1490	2200	3000
4-Nitrophenol	3	0	0			1330		1400	1450	1490	2200	3000

Summary Statistics for 1999 Creek Segment E Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Acenaphthene	3	0	0			267		280	290	298	440	600
Acenaphthylene	3	0	0			267		280	290	298	440	600
Anthracene	3	0	0			267		280	290	298	440	600
Benzo(a)anthracene	3	3	100	100	340	187	133	120	230	318		
Benzo(a)pyrene	3	3	100	150	420	247	150	170	295	395		
Benzo(b)fluoranthene	3	3	100	170	520	317	182	260	390	494		
Benzo(g,h,i)perylene	3	3	100	140	350	220	114	170	260	332		
Benzo(k)fluoranthene	3	2	67	170	600	357	304	300	450	570	600	600
bis(2-Chloroethoxy)methane	3	0	0			267		280	290	298	440	600
bis(2-Chloroethyl)ether	3	0	0			267		280	290	298	440	600
2,2'-Oxybis(1-Chloropropane)	3	0	0			267		280	290	298	440	600
bis(2-Ethylhexyl)phthalate	3	2	67	250	260	270	7.07	260	280	296	600	600
Butylbenzylphthalate	3	0	0			267		280	290	298	440	600
Carbazole	3	0	0			267		280	290	298	440	600
Chrysene	3	3	100	190	660	357	263	220	440	616		
Dibenzo(a,h)anthracene	3	0	0			143		150	155	159	240	320
Dibenzofuran	3	0	0			267		280	290	298	440	600
Diethylphthalate	3	0	0			267		280	290	298	440	600
Dimethylphthalate	3	0	0			267		280	290	298	440	600
Di-n-butylphthalate	3	0	0			267		280	290	298	440	600
Di-n-octylphthalate	3	0	0			267		280	290	298	440	600
Fluoranthene	3	3	100	320	1200	637	489	390	795	1120		
Fluorene	3	0	0			267		280	290	298	440	600
Hexachlorobenzene	3	0	0			110		115	120	124	180	250
Hexachlorobutadiene	3	0	0			267		280	290	298	440	600
Hexachlorocyclopentadiene	3	1	33	560	560	360		300	430	534	440	600
Hexachloroethane	3	0	0			267		280	290	298	440	600
Indeno(1,2,3-cd)pyrene	3	3	100	130	430	237	168	150	290	402		
Isophorone	3	0	0			267		280	290	298	440	600
Naphthalene	3	0	0			267		280	290	298	440	600
Nitrobenzene	3	0	0			267		280	290	298	440	600
N-Nitroso-di-n-propylamine	3	0	0			267		280	290	298	440	600
N-Nitrosodiphenylamine	3	0	0			267		280	290	298	440	600
Pentachlorophenol	3	2	67	3.8	2200	793	1550	175	1190	2000	350	350
Phenanthrene	3	3	100	120	510	253	222	130	320	472		
Phenol	3	0	0			267		280	290	298	440	600
Pyrene	3	3	100	250	1000	520	417	310	655	931		
Total PAHs	3	3	100	1580	6030	5070	2440	3840	5850	7460		
VOCs (ug/kg)												
1,1,1-Trichloroethane	3	0	0			12.3		12.5	13.8	14.8	19	30
1,1,2,2-Tetrachloroethane	3	0	0			12.3		12.5	13.8	14.8	19	30
1,1,2-Trichloroethane	3	0	0			12.3		12.5	13.8	14.8	19	30
1,1-Dichloroethane	3	0	0			12.3		12.5	13.8	14.8	19	30
1,1-Dichloroethene	3	0	0			11.2		11.5	12.5	13.3	17	27
1,2-Dichloroethane	3	0	0			12.3		12.5	13.8	14.8	19	30
Cis/Trans-1,2-Dichloroethene	3	0	0			12.3		12.5	13.8	14.8	19	30
1,2-Dichloropropane	3	0	0			12.3		12.5	13.8	14.8	19	30
2-Butanone (MEK)	3	1	33	520	520	214		75	298	476	94	150
2-Hexanone	3	0	0			62.3		65	70	74	94	150
4-Methyl-2-pentanone (MIBK)	3	0	0			62.3		65	70	74	94	150
Acetone	3	1	33	1200	1200	503		215	708	1100	190	430
Benzene	3	0	0			12.3		12.5	13.8	14.8	19	30
Bromodichloromethane	3	0	0			12.3		12.5	13.8	14.8	19	30
Bromoform	3	0	0			12.3		12.5	13.8	14.8	19	30
Bromomethane (Methyl bromide)	3	0	0			24.7		25	27.5	29.5	38	60
Carbon disulfide	3	0	0			12.3		12.5	13.8	14.8	19	30
Carbon tetrachloride	3	0	0			12.3		12.5	13.8	14.8	19	30
Chlorobenzene	3	0	0			12.3		12.5	13.8	14.8	19	30
Chloroform	3	0	0			12.3		12.5	13.8	14.8	19	30
Chloroethane	3	0	0			24.7		25	27.5	29.5	38	60
Chloromethane	3	0	0			24.7		25	27.5	29.5	38	60

Appendix C-2d
Summary Statistics for 1999 Creek Segment E Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
cis-1,3-Dichloropropene	3	0	0			9.83		10	11	11.8	15	24
Dibromochloromethane	3	0	0			12.3		12.5	13.8	14.8	19	30
Ethylbenzene	3	0	0			12.3		12.5	13.8	14.8	19	30
Methylene chloride (Dichloromethane)	3	0	0			12.3		12.5	13.8	14.8	19	30
Styrene	3	0	0			12.3		12.5	13.8	14.8	19	30
Tetrachloroethene	3	0	0			12.3		12.5	13.8	14.8	19	30
Toluene	3	0	0			12.3		12.5	13.8	14.8	19	30
trans-1,3-Dichloropropene	3	0	0			9.83		10	11	11.8	15	24
Trichloroethene	3	0	0			12.3		12.5	13.8	14.8	19	30
Vinyl chloride	3	0	0			24.7		25	27.5	29.5	38	60
Xylenes, Total	3	0	0			12.3		12.5	13.8	14.8	19	30
Inorganics (mg/kg)												
Aluminum	3	3	100	11000	15000	13000	2000	13000	14000	14800		
Antimony	3	2	67	2	2.7	2.58	0.495	2.7	2.88	3.02	6.1	6.1
Arsenic	3	3	100	9.3	16	12.4	3.37	12	14	15.6		
Barium	3	3	100	190	340	273	76.4	290	315	335		
Beryllium	3	2	67	0.75	0.84	0.68	0.0836	0.75	0.795	0.831	0.9	0.9
Cadmium	3	3	100	7.7	14	10.9	3.15	11	12.5	13.7		
Calcium	3	3	100	26000	80000	49700	27600	43000	61500	76300		
Chromium	3	3	100	31	71	50.3	20	49	60	68.8		
Cobalt	3	3	100	7.4	10	8.87	1.33	9.2	9.6	9.92		
Copper	3	3	100	150	570	357	210	350	460	548		
Iron	3	3	100	17000	24000	20300	3510	20000	22000	23600		
Lead	3	3	100	140	310	213	87.4	190	250	298		
Magnesium	3	3	100	7400	13000	9870	2880	9200	11100	12600		
Manganese	3	3	100	170	320	267	83.9	310	315	319		
Mercury	3	3	100	0.3	0.51	0.37	0.121	0.3	0.405	0.489		
Molybdenum	3	3	100	1.6	3.2	2.47	0.808	2.6	2.9	3.14		
Nickel	3	3	100	51	190	124	69.7	130	160	184		
Potassium	3	3	100	2400	3100	2700	361	2600	2850	3050		
Selenium	3	0	0			1.18		1.3	1.4	1.48	1.5	3
Silver	3	2	67	0.87	1.1	1.09	0.304	1.1	1.3	1.46	3	3
Sodium	3	0	0			122		125	138	148	180	300
Thallium	3	1	33	1.9	1.9	1.57		1.5	1.7	1.86	2.6	3
Vanadium	3	3	100	37	51	42.7	7.37	40	45.5	49.9		
Zinc	3	3	100	980	2300	1690	666	1800	2050	2250		
PCBs (ug/kg)												
Monochlorobiphenyl	3	0	0			18.3		6	24.8	39.8	11	87
Dichlorobiphenyl	3	0	0			18.3		6	24.8	39.8	11	87
Trichlorobiphenyl	3	1	33	9.2	9.2	19.4		9.2	26.4	40.1	11	87
Tetrachlorobiphenyl	3	1	33	60	60	52		60	72.5	82.5	22	170
Pentachlorobiphenyl	3	1	33	650	650	249		85	368	594	22	170
Hexachlorobiphenyl	3	1	33	130	130	75.3		85	108	126	22	170
Heptachlorobiphenyl	3	1	33	49	49	65.2		49	89.5	122	33	260
Octachlorobiphenyl	3	0	0			54.8		18	74	119	33	260
Nonachlorobiphenyl	3	0	0			92.7		30	125	201	56	440
Decachlorobiphenyl	3	1	33	140	140	129		140	180	212	56	440
Total PCBs	3	1	33	1040	1040	774		1090	1090	1100	120	2171
Dioxins (ug/kg)												
1,2,3,4,6,7,8,9-OCDD	3	3	100	30.6	91.5	60.9	30.4	60.7	76.1	88.4		
1,2,3,4,6,7,8-HpCDD	3	3	100	3.26	9.45	6.49	3.1	6.77	8.11	9.18		
1,2,3,4,7,8-HxCDD	3	2	67	0.0574	0.13	0.0863	0.0513	0.0574	0.0937	0.123	0.0232	0.0232
1,2,3,6,7,8-HxCDD	3	3	100	0.113	0.704	0.386	0.304	0.282	0.493	0.662		
1,2,3,7,8,9-HxCDD	3	3	100	0.0825	0.415	0.225	0.171	0.176	0.296	0.391		
1,2,3,7,8-PeCDD	3	3	100	0.0147	0.0696	0.0362	0.0293	0.0244	0.047	0.0651		
2,3,7,8-TCDD	3	2	67	0.004	0.0075	0.0057	0.00247	0.0075	0.00805	0.00849	0.0172	0.0172
Total HpCDD	3	3	100	6.26	17.7	12.3	5.75	12.8	15.3	17.2		
Total HxCDD	3	0	0			1.49		1.19	2	2.64	0.974	5.61
Total PeCDD	3	0	0			0.36		0.262	0.484	0.661	0.223	1.41
Total TCDD	3	0	0			0.375		0.305	0.51	0.674	0.207	1.43
Furans (ug/kg)												

Appx -2d

Summary Statistics for 1999 Creek Segment E Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
1,2,3,4,6,7,8,9-OCDF	3	3	100	9.75	28.7	20 8	9 88	24	26.4	28.2		
1,2,3,4,6,7,8-HpCDF	3	3	100	1.64	5.94	4.24	2.28	5 13	5 54	5 86		
1,2,3,4,7,8,9-HpCDF	3	3	100	0 0956	0.673	0.348	0.295	0.276	0 475	0.633		
1,2,3,4,7,8-HxCDF	3	3	100	0.053	0.364	0.181	0.162	0.127	0.246	0.34		
1,2,3,6,7,8-HxCDF	3	3	100	0.0344	0.222	0.124	0.0941	0.116	0.169	0.211		
1,2,3,7,8,9-HxCDF	3	3	100	0.0045	0.0175	0.0101	0.0067	0.0082	0.0129	0.0166		
1,2,3,7,8-PeCDF	3	3	100	0.0141	0 051	0.0306	0 0187	0.0268	0.0389	0.0486		
2,3,4,6,7,8-HxCDF	3	3	100	0.0447	0.274	0.15	0.116	0 13	0.202	0.26		
2,3,4,7,8-PeCDF	3	3	100	0.0105	0.0658	0.0349	0.0282	0.0283	0.0471	0.0621		
2,3,7,8-TCDF	3	3	100	0.0106	0 0921	0.0495	0.0409	0.0457	0.0689	0.0875		
Total HpCDF	3	2	67	19.4	24.2	15.7	3.42	19.4	21.8	23.7	6.89	6.89
Total HxCDF	3	0	0			2.07		1.58	2.8	3.78	1.21	8.04
Total PeCDF	3	0	0			0.273		0.224	0.354	0.458	0.223	0 967
Total TCDF	3	0	0			0.341		0.301	0.453	0.575	0 232	1.21
Total TEQ	3	3	100	0.113	0 461	0 298	0.175	0.31	0 39	0.454		

[1]Average and percentiles calculated assuming 1/2 detection limit for nondetects
[2]Standard deviation calculated for detected concentrations only

Appendix C-2e
Summary Statistics for 1999 Creek Segment F Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Cyanide, Total (mg/kg)	3	0	0			0.95		0.95	1.13	1.27	1.2	2.6
Pesticides/Herbicides (ug/kg)												
2,4,5-T	3	0	0			63.3		55	87.5	114	30	240
2,4,5-TP (Silvex)	3	0	0			63.3		55	87.5	114	30	240
2,4-D	3	1	33	23	23	66		55	87.5	114	110	240
2,4-DB	3	0	0			63.3		55	87.5	114	30	240
4,4'-DDD	3	1	33	3.8	3.8	11.1		12	14.8	17	24	35
4,4'-DDE	3	3	100	2.5	11	7.2	4.32	8.1	9.55	10.7		
4,4'-DDT	3	1	33	4.5	4.5	11.3		12	14.8	17	24	35
Total DDT	3	3	100	2.5	19.3	29.6	8.55	26.5	34.8	41.4		
Aldrin	3	1	33	4.1	4.1	6.37		6	7.5	8.7	12	18
alpha-BHC	3	0	0			1.88		1.85	2.25	2.57	2.3	5.3
Alpha Chlordane	3	3	100	0.84	5.3	3.58	2.4	4.6	4.95	5.23		
beta-BHC	3	0	0			1.88		1.85	2.25	2.57	2.3	5.3
Dalapon	3	0	0			517		430	715	943	240	2000
delta-BHC	3	1	33	0.34	0.34	1.61		1.85	2.25	2.57	3.7	5.3
Dicamba	3	0	0			151		130	208	270	74	570
Dichloroprop	3	0	0			762		650	1050	1370	370	2900
Dieldrin	3	2	67	0.99	9.3	9.26	5.88	9.3	13.4	16.7	35	35
Dinoseb	3	0	0			762		650	1050	1370	370	2900
Endosulfan I	3	3	100	1.2	5.7	2.97	2.4	2	3.85	5.33		
Endosulfan II	3	3	100	1.8	8.1	5.13	3.17	5.5	6.8	7.84		
Endosulfan sulfate	3	1	33	2.8	2.8	10.8		12	14.8	17	24	35
Endrin	3	2	67	1.7	1.7	6.97	#NUM!	1.7	9.6	15.9	35	35
Endrin aldehyde	3	3	100	3.6	14	8.87	5.2	9	11.5	13.5		
Endrin ketone	3	3	100	3.8	10	7	3.1	7.2	8.6	9.72		
gamma-BHC (Lindane)	3	0	0			6.3		6	7.5	8.7	7.8	18
Gamma Chlordane	3	3	100	2.4	17	8.97	7.41	7.5	12.3	16.1		
Heptachlor	3	1	33	0.93	0.93	4.61		3.9	6.45	8.49	7.8	18
Heptachlor epoxide	3	2	67	0.51	5.4	4.97	3.46	5.4	7.2	8.64	18	18
MCPA	3	0	0			15100		13000	20800	27000	7400	57000
MCPP	3	0	0			15100		13000	20800	27000	7400	57000
Methoxychlor	3	3	100	7.3	24	15.1	8.4	14	19	23		
Toxaphene	3	0	0			630		600	750	870	780	1800
SVOCs (ug/kg)												
1,2,4-Trichlorobenzene	3	0	0			318		310	378	432	400	890
1,2-Dichlorobenzene	3	0	0			318		310	378	432	400	890
1,3-Dichlorobenzene	3	0	0			318		310	378	432	400	890
1,4-Dichlorobenzene	3	0	0			318		310	378	432	400	890
2,4,5-Trichlorophenol	3	0	0			318		310	378	432	400	890
2,4,6-Trichlorophenol	3	0	0			318		310	378	432	400	890
2,4-Dichlorophenol	3	0	0			318		310	378	432	400	890
2,4-Dinitrophenol	3	0	0			1600		1550	1900	2180	2000	4500
2,4-Dinitrotoluene	3	0	0			318		310	378	432	400	890
2,6-Dinitrotoluene	3	0	0			318		310	378	432	400	890
2-Chloronaphthalene	3	0	0			318		310	378	432	400	890
2-Chlorophenol	3	0	0			318		310	378	432	400	890
2-Methylnaphthalene	3	0	0			318		310	378	432	400	890
2-Methylphenol (o-cresol)	3	0	0			318		310	378	432	400	890
2-Nitroaniline	3	0	0			1600		1550	1900	2180	2000	4500
2-Nitrophenol	3	0	0			318		310	378	432	400	890
3-Methylphenol/4-Methylphenol	3	0	0			318		310	378	432	400	890
3,3'-Dichlorobenzidine	3	0	0			612		600	725	825	770	1700
3-Nitroaniline	3	0	0			1600		1550	1900	2180	2000	4500
4,6-Dinitro-2-methylphenol	3	0	0			1600		1550	1900	2180	2000	4500
4-Bromophenylphenyl ether	3	0	0			318		310	378	432	400	890
4-Chloro-3-methylphenol	3	0	0			318		310	378	432	400	890
4-Chloroaniline	3	0	0			612		600	725	825	770	1700
4-Chlorophenylphenyl ether	3	0	0			318		310	378	432	400	890
4-Nitroaniline	3	0	0			1600		1550	1900	2180	2000	4500
4-Nitrophenol	3	0	0			1600		1550	1900	2180	2000	4500

Appx -2e

Summary Statistics for 1999 Creek Segment F Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Acenaphthene	3	0	0			318		310	378	432	400	890
Acenaphthylene	3	0	0			318		310	378	432	400	890
Anthracene	3	0	0			318		310	378	432	400	890
Benzo(a)anthracene	3	0	0			318		310	378	432	400	890
Benzo(a)pyrene	3	0	0			168		165	200	228	210	470
Benzo(b)fluoranthene	3	0	0			318		310	378	432	400	890
Benzo(g,h,i)perylene	3	0	0			318		310	378	432	400	890
Benzo(k)fluoranthene	3	0	0			318		310	378	432	400	890
bis(2-Chloroethoxy)methane	3	0	0			318		310	378	432	400	890
bis(2-Chloroethyl)ether	3	0	0			318		310	378	432	400	890
2,2'-Oxybis(1-Chloropropane)	3	0	0			318		310	378	432	400	890
bis(2-Ethylhexyl)phthalate	3	0	0			318		310	378	432	400	890
Butylbenzylphthalate	3	0	0			318		310	378	432	400	890
Carbazole	3	0	0			318		310	378	432	400	890
Chrysene	3	1	33	74	74	276		310	378	432	620	890
Dibenzo(a,h)anthracene	3	0	0			168		165	200	228	210	470
Dibenzofuran	3	0	0			318		310	378	432	400	890
Diethylphthalate	3	0	0			318		310	378	432	400	890
Dimethylphthalate	3	0	0			318		310	378	432	400	890
Di-n-butylphthalate	3	0	0			318		310	378	432	400	890
Di-n-octylphthalate	3	0	0			318		310	378	432	400	890
Fluoranthene	3	2	67	120	130	232	7.07	130	288	414	890	890
Fluorene	3	0	0			318		310	378	432	400	890
Hexachlorobenzene	3	0	0			132		130	158	180	160	370
Hexachlorobutadiene	3	0	0			318		310	378	432	400	890
Hexachlorocyclopentadiene	3	0	0			318		310	378	432	400	890
Hexachloroethane	3	0	0			318		310	378	432	400	890
Indeno(1,2,3-cd)pyrene	3	0	0			318		310	378	432	400	890
Isophorone	3	0	0			318		310	378	432	400	890
Naphthalene	3	0	0			318		310	378	432	400	890
Nitrobenzene	3	0	0			318		310	378	432	400	890
N-Nitroso-di-n-propylamine	3	0	0			318		310	378	432	400	890
N-Nitrosodiphenylamine	3	0	0			318		310	378	432	400	890
Pentachlorophenol	3	0	0			104		36	141	224	62	490
Phenanthrene	3	0	0			318		310	378	432	400	890
Phenol	3	0	0			318		310	378	432	400	890
Pyrene	3	0	0			318		310	378	432	400	890
Total PAHs	3	2	67	130	194	4660	45.3	4490	5600	6480	5220	13400
VOCs (ug/kg)												
1,1,1-Trichloroethane	3	0	0			14		13	16.8	19.8	17	41
1,1,2,2-Tetrachloroethane	3	0	0			14		13	16.8	19.8	17	41
1,1,2-Trichloroethane	3	0	0			14		13	16.8	19.8	17	41
1,1-Dichloroethane	3	0	0			14		13	16.8	19.8	17	41
1,1-Dichloroethene	3	0	0			13		12	15.5	18.3	16	38
1,2-Dichloroethane	3	0	0			14		13	16.8	19.8	17	41
Cis/Trans-1,2-Dichloroethene	3	0	0			14		13	16.8	19.8	17	41
1,2-Dichloropropane	3	0	0			14		13	16.8	19.8	17	41
2-Butanone (MEK)	3	0	0			69.2		65	82.5	96.5	85	200
2-Hexanone	3	0	0			69.2		65	82.5	96.5	85	200
4-Methyl-2-pentanone (MIBK)	3	0	0			69.2		65	82.5	96.5	85	200
Acetone	3	0	0			145		130	168	198	200	410
Benzene	3	0	0			14		13	16.8	19.8	17	41
Bromodichloromethane	3	0	0			14		13	16.8	19.8	17	41
Bromoform	3	0	0			14		13	16.8	19.8	17	41
Bromomethane (Methyl bromide)	3	0	0			27.8		25.5	33.3	39.5	34	82
Carbon disulfide	3	0	0			14		13	16.8	19.8	17	41
Carbon tetrachloride	3	0	0			14		13	16.8	19.8	17	41
Chlorobenzene	3	0	0			14		13	16.8	19.8	17	41
Chloroform	3	0	0			14		13	16.8	19.8	17	41
Chloroethane	3	0	0			27.8		25.5	33.3	39.5	34	82
Chloromethane	3	0	0			27.8		25.5	33.3	39.5	34	82

Appendix C-2e
Summary Statistics for 1999 Creek Segment F Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
cis-1,3-Dichloropropene	3	0	0			11.2		10	13.3	15.9	14	33
Dibromochloromethane	3	0	0			14		13	16.8	19.8	17	41
Ethylbenzene	3	1	33	11	11	13.3		11	15.8	19.6	17	41
Methylene chloride (Dichloromethane)	3	0	0			14		13	16.8	19.8	17	41
Styrene	3	0	0			14		13	16.8	19.8	17	41
Tetrachloroethene	3	0	0			14		13	16.8	19.8	17	41
Toluene	3	0	0			14		13	16.8	19.8	17	41
trans-1,3-Dichloropropene	3	0	0			11.2		10	13.3	15.9	14	33
Trichloroethene	3	0	0			14		13	16.8	19.8	17	41
Vinyl chloride	3	0	0			27.8		25.5	33.3	39.5	34	82
Xylenes, Total	3	0	0			14		13	16.8	19.8	17	41
Inorganics (mg/kg)												
Aluminum	3	3	100	7800	17000	12900	4690	14000	15500	16700		
Antimony	3	3	100	2.5	4.7	3.27	1.24	2.6	3.65	4.49		
Arsenic	3	3	100	8	19	14	5.57	15	17	18.6		
Barium	3	3	100	150	270	223	64.3	250	260	268		
Beryllium	3	3	100	0.53	0.89	0.757	0.197	0.85	0.87	0.886		
Cadmium	3	3	100	7.4	47	22.8	21.2	14	30.5	43.7		
Calcium	3	3	100	11000	13000	11700	1150	11000	12000	12800		
Chromium	3	3	100	19	38	29	9.54	30	34	37.2		
Cobalt	3	3	100	5.5	13	9.83	3.88	11	12	12.8		
Copper	3	3	100	160	410	270	128	240	325	393		
Iron	3	3	100	14000	26000	20700	6110	22000	24000	25600		
Lead	3	3	100	110	320	180	121	110	215	299		
Magnesium	3	3	100	4100	6800	5400	1350	5300	6050	6650		
Manganese	3	3	100	170	510	303	181	230	370	482		
Mercury	3	3	100	0.3	1.1	0.617	0.425	0.45	0.775	1.04		
Molybdenum	3	3	100	0.7	3.7	1.72	1.71	0.76	2.23	3.41		
Nickel	3	3	100	90	390	220	154	180	285	369		
Potassium	3	3	100	1600	2900	2400	700	2700	2800	2880		
Selenium	3	0	0			1.8		1.85	2.13	2.35	2.3	4.8
Silver	3	0	0			1.8		1.85	2.13	2.35	2.3	4.8
Sodium	3	0	0			132		115	145	169	210	350
Thallium	3	0	0			1.8		1.85	2.13	2.35	2.3	4.8
Vanadium	3	3	100	25	51	39	13.1	41	46	50		
Zinc	3	3	100	950	3700	2080	1440	1600	2650	3490		
PCBs (ug/kg)												
Monochlorobiphenyl	3	0	0			14.1		8.5	19.3	27.9	7.7	60
Dichlorobiphenyl	3	0	0			14.1		8.5	19.3	27.9	7.7	60
Trichlorobiphenyl	3	0	0			14.1		8.5	19.3	27.9	7.7	60
Tetrachlorobiphenyl	3	0	0			28.5		17.5	38.8	55.8	16	120
Pentachlorobiphenyl	3	2	67	61	66	62.3	3.54	61	63.5	65.5	120	120
Hexachlorobiphenyl	3	2	67	17	22	33	3.54	22	41	56.2	120	120
Heptachlorobiphenyl	3	0	0			42.7		26.5	58.3	83.7	23	180
Octachlorobiphenyl	3	0	0			42.7		26.5	58.3	83.7	23	180
Nonachlorobiphenyl	3	0	0			72.8		44	99.5	144	39	310
Decachlorobiphenyl	3	0	0			72.8		44	99.5	144	39	310
Total PCBs	3	2	67	83	83	397	#NUM!	267	514	711	163.1	1520
Dioxins (ug/kg)												
1,2,3,4,6,7,8,9-OCDD	3	3	100	38.7	88.4	58.2	26.6	47.4	67.9	84.3		
1,2,3,4,6,7,8-HpCDD	3	3	100	4.03	9.44	5.97	3.01	4.44	6.94	8.94		
1,2,3,4,7,8-HxCDD	3	3	100	0.0228	0.0688	0.0402	0.0249	0.0291	0.049	0.0648		
1,2,3,6,7,8-HxCDD	3	3	100	0.141	0.32	0.207	0.0986	0.159	0.24	0.304		
1,2,3,7,8,9-HxCDD	3	3	100	0.0667	0.221	0.126	0.0829	0.0911	0.156	0.208		
1,2,3,7,8-PeCDD	3	3	100	0.0145	0.0389	0.0255	0.0124	0.0232	0.0311	0.0373		
2,3,7,8-TCDD	3	3	100	0.0055	0.016	0.00993	0.00544	0.0083	0.0122	0.0152		
Total HpCDD	3	3	100	7.86	17.9	11.4	5.61	8.53	13.2	17		
Total HxCDD	3	1	33	1.37	1.37	1.11		1.37	1.4	1.42	1.08	2.86
Total PeCDD	3	0	0			0.26		0.217	0.302	0.37	0.352	0.773
Total TCDD	3	0	0			0.208		0.152	0.249	0.326	0.25	0.691
Furans (ug/kg)												

Summary Statistics for 1999 Creek Segment F Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
1,2,3,4,6,7,8,9-OCDF	3	3	100	15	32.6	22.3	9 18	19.3	25.9	31.3		
1,2,3,4,6,7,8-HpCDF	3	3	100	2.38	5.08	3.45	1 43	2 9	3 99	4.86		
1,2,3,4,7,8,9-HpCDF	3	3	100	0.157	0.32	0.225	0.0848	0.198	0.259	0 308		
1,2,3,4,7,8-HxCDF	3	3	100	0 0842	0.162	0.111	0.044	0.0874	0.125	0.155		
1,2,3,6,7,8-HxCDF	3	3	100	0.0325	0 0719	0.047	0.0216	0.0367	0.0543	0.0684		
1,2,3,7,8,9-HxCDF	3	3	100	0.0085	0.0223	0.0139	0 00737	0.0109	0.0166	0.0212		
1,2,3,7,8-PeCDF	3	2	67	0.0118	0.0124	0.0136	0.000424	0.0124	0 0145	0.0162	0 0333	0.0333
2,3,4,6,7,8-HxCDF	3	3	100	0.0473	0.0699	0.0625	0.0238	0.0503	0.0701	0.0859		
2,3,4,7,8-PeCDF	3	3	100	0.0147	0.0333	0.022	0.00994	0.0179	0.0256	0.0318		
2,3,7,8-TCDF	3	3	100	0.016	0 0448	0.0304	0.0144	0.0304	0.0376	0.0434		
Total HpCDF	3	3	100	10 7	21.7	14.6	6.09	11.6	16 6	20 6		
Total HxCDF	3	0	0			1.01		0 86	1 15	1.38	1.44	2 88
Total PeCDF	3	0	0			0.221		0.164	0 258	0.333	0 293	0.703
Total TCDF	3	0	0			0.317		0.225	0.365	0.477	0.444	1.01
Total TEQ	3	3	100	0 144	0.331	0.215	0 101	0.17	0.251	0.316		

[1]Average and percentiles calculated assuming 1/2 detection limit for nondetects
[2]Standard deviation calculated for detected concentrations only

Appendix C-2f
Summary Statistics for 1999 Borrow Pit Lake Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Cyanide, Total (mg/kg)	3	0	0			0.717		0.7	0.725	0.745	1.4	1.5
Pesticides/Herbicides (ug/kg)												
2,4,5-T	3	0	0			11.7		11.5	11.8	12	23	24
2,4,5-TP (Silvex)	3	0	0			11.7		11.5	11.8	12	23	24
2,4-D	3	2	67	6.1	11	9.7	3.46	11	11.5	11.9	24	24
2,4-DB	3	0	0			11.7		11.5	11.8	12	23	24
4,4'-DDD	3	0	0			7.68		9	9.25	9.45	9.1	19
4,4'-DDE	3	3	100	1.105	3.2	1.97	1.09	1.6	2.4	3.04		
4,4'-DDT	3	2	67	1.14	1.4	4.01	0.184	1.4	5.45	8.69	19	19
Total DDT	3	3	100	2.245	3.2	13.7	0.504	12	17.1	21.2		
Aldrin	3	0	0			4		4.7	4.83	4.93	4.7	9.9
alpha-BHC	3	0	0			1.18		1.4	1.43	1.45	1.4	2.9
Alpha Chlordane	3	3	100	0.475	3.2	1.63	1.41	1.2	2.2	3		
beta-BHC	3	0	0			1.18		1.4	1.43	1.45	1.4	2.9
Dalapon	3	0	0			91.7		90	92.5	94.5	180	190
delta-BHC	3	0	0			1.18		1.4	1.43	1.45	1.4	2.9
Dicamba	3	0	0			28.2		28	28.5	28.9	55	58
Dichloroprop	3	0	0			140		140	143	145	270	290
Dieldrin	3	2	67	0.255	0.5	3.25	0.173	0.5	4.75	8.15	18	18
Dinoseb	3	0	0			140		140	143	145	270	290
Endosulfan I	3	3	100	0.38	2.8	1.39	1.26	1	1.9	2.62		
Endosulfan II	3	0	0			7.68		9	9.25	9.45	9.1	19
Endosulfan sulfate	3	2	67	0.94	1.4	3.78	0.325	1.4	5.2	8.24	18	18
Endrin	3	0	0			7.68		9	9.25	9.45	9.1	19
Endrin aldehyde	3	3	100	1.2	2.2	1.58	0.539	1.35	1.78	2.12		
Endrin ketone	3	1	33	0.715	0.715	6.41		9	9.25	9.45	18	19
gamma-BHC (Lindane)	3	1	33	0.16	0.16	3.27		4.7	4.83	4.93	9.4	9.9
Gamma Chlordane	3	2	67	0.735	3	2.81	1.6	3	3.85	4.53	9.4	9.4
Heptachlor	2	0	0			4.83		4.83	4.89	4.94	9.4	9.9
Heptachlor epoxide	3	1	33	0.2	0.2	3.28		4.7	4.83	4.93	9.4	9.9
MCPA	3	0	0			2820		2800	2850	2890	5500	5800
MCPP	3	0	0			2820		2800	2850	2890	5500	5800
Methoxychlor	3	0	0			40		47	48.3	49.3	47	99
Toxaphene	3	0	0			400		470	483	493	470	990
SVOCs (ug/kg)												
1,2,4-Trichlorobenzene	3	0	0			240		235	243	249	470	500
1,2-Dichlorobenzene	3	0	0			240		235	243	249	470	500
1,3-Dichlorobenzene	3	0	0			240		235	243	249	470	500
1,4-Dichlorobenzene	3	0	0			240		235	243	249	470	500
2,4,5-Trichlorophenol	3	0	0			240		235	243	249	470	500
2,4,6-Trichlorophenol	3	0	0			240		235	243	249	470	500
2,4-Dichlorophenol	3	0	0			240		235	243	249	470	500
2,4-Dinitrophenol	3	0	0			1180		1150	1200	1240	2300	2500
2,4-Dinitrotoluene	3	0	0			240		235	243	249	470	500
2,6-Dinitrotoluene	3	0	0			240		235	243	249	470	500
2-Chloronaphthalene	3	0	0			240		235	243	249	470	500
2-Chlorophenol	3	0	0			240		235	243	249	470	500
2-Methylnaphthalene	3	0	0			240		235	243	249	470	500
2-Methylphenol (o-cresol)	3	0	0			240		235	243	249	470	500
2-Nitroaniline	3	0	0			1180		1150	1200	1240	2300	2500
2-Nitrophenol	3	0	0			240		235	243	249	470	500
3-Methylphenol/4-Methylphenol	3	0	0			240		235	243	249	470	500
3,3'-Dichlorobenzidine	3	0	0			463		455	468	478	910	960
3-Nitroaniline	3	0	0			1180		1150	1200	1240	2300	2500
4,6-Dinitro-2-methylphenol	3	0	0			1180		1150	1200	1240	2300	2500
4-Bromophenylphenyl ether	3	0	0			240		235	243	249	470	500
4-Chloro-3-methylphenol	3	0	0			240		235	243	249	470	500
4-Chloroaniline	3	0	0			463		455	468	478	910	960
4-Chlorophenylphenyl ether	3	0	0			240		235	243	249	470	500
4-Nitroaniline	3	0	0			1180		1150	1200	1240	2300	2500

Summary Statistics for 1999 Borrow Pit Lake Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
4-Nitrophenol	3	0	0			1180		1150	1200	1240	2300	2500
Acenaphthene	3	0	0			240		235	243	249	470	500
Acenaphthylene	3	0	0			240		235	243	249	470	500
Anthracene	3	0	0			240		235	243	249	470	500
Benzo(a)anthracene	3	0	0			240		235	243	249	470	500
Benzo(a)pyrene	3	0	0			127		125	128	130	250	260
Benzo(b)fluoranthene	3	0	0			240		235	243	249	470	500
Benzo(g,h,i)perylene	3	0	0			240		235	243	249	470	500
Benzo(k)fluoranthene	3	0	0			240		235	243	249	470	500
bis(2-Chloroethoxy)methane	3	0	0			240		235	243	249	470	500
bis(2-Chloroethyl)ether	3	0	0			240		235	243	249	470	500
2,2'-Oxybis(1-Chloropropane)	3	0	0			240		235	243	249	470	500
bis(2-Ethylhexyl)phthalate	3	0	0			240		235	243	249	470	500
Butylbenzylphthalate	3	0	0			240		235	243	249	470	500
Carbazole	3	0	0			240		235	243	249	470	500
Chrysene	3	0	0			240		235	243	249	470	500
Dibenzo(a,h)anthracene	3	0	0			127		125	128	130	250	260
Dibenzofuran	3	0	0			240		235	243	249	470	500
Diethylphthalate	3	0	0			240		235	243	249	470	500
Dimethylphthalate	3	0	0			240		235	243	249	470	500
Di-n-butylphthalate	3	0	0			240		235	243	249	470	500
Di-n-octylphthalate	3	0	0			240		235	243	249	470	500
Fluoranthene	3	0	0			240		235	243	249	470	500
Fluorene	3	0	0			240		235	243	249	470	500
Hexachlorobenzene	3	0	0			96.7		95	97.5	99.5	190	200
Hexachlorobutadiene	3	0	0			240		235	243	249	470	500
Hexachlorocyclopentadiene	3	0	0			240		235	243	249	470	500
Hexachloroethane	3	0	0			240		235	243	249	470	500
Indeno(1,2,3-cd)pyrene	3	0	0			240		235	243	249	470	500
Isophorone	3	0	0			240		235	243	249	470	500
Naphthalene	3	0	0			240		235	243	249	470	500
Nitrobenzene	3	0	0			240		235	243	249	470	500
N-Nitroso-di-n-propylamine	3	0	0			240		235	243	249	470	500
N-Nitrosodiphenylamine	3	0	0			240		235	243	249	470	500
Pentachlorophenol	3	0	0			808		1150	1200	1240	47	2500
Phenanthrene	3	0	0			240		235	243	249	470	500
Phenol	3	0	0			240		235	243	249	470	500
Pyrene	3	0	0			240		235	243	249	470	500
Total PAHs	3	0	0			3850		3780	3890	3990	7550	8020
VOCs (ug/kg)												
1,1,1-Trichloroethane	3	0	0			12.5		12.5	13.5	14.3	21	29
1,1,2,2-Tetrachloroethane	3	0	0			12.5		12.5	13.5	14.3	21	29
1,1,2-Trichloroethane	3	0	0			12.5		12.5	13.5	14.3	21	29
1,1-Dichloroethane	3	0	0			12.5		12.5	13.5	14.3	21	29
1,1-Dichloroethene	3	0	0			11.5		11.5	12.5	13.3	19	27
1,2-Dichloroethane	3	0	0			12.5		12.5	13.5	14.3	21	29
Cis/Trans-1,2-Dichloroethene	3	0	0			12.5		12.5	13.5	14.3	21	29
1,2-Dichloropropane	3	0	0			12.5		12.5	13.5	14.3	21	29
2-Butanone (MEK)	3	0	0			61.7		65	67.5	69.5	100	140
2-Hexanone	3	0	0			61.7		65	67.5	69.5	100	140
4-Methyl-2-pentanone (MIBK)	3	0	0			61.7		65	67.5	69.5	100	140
Acetone	3	0	0			125		125	135	143	210	290
Benzene	3	0	0			12.5		12.5	13.5	14.3	21	29
Bromodichloromethane	3	0	0			12.5		12.5	13.5	14.3	21	29
Bromoform	3	0	0			12.5		12.5	13.5	14.3	21	29
Bromomethane (Methyl bromide)	3	0	0			25.2		25.5	27.3	28.7	42	58
Carbon disulfide	3	0	0			12.5		12.5	13.5	14.3	21	29
Carbon tetrachloride	3	0	0			12.5		12.5	13.5	14.3	21	29
Chlorobenzene	3	0	0			12.5		12.5	13.5	14.3	21	29
Chloroform	3	0	0			12.5		12.5	13.5	14.3	21	29

Appendix C-2f
Summary Statistics for 1999 Borrow Pit Lake Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Chloroethane	3	0	0			25.2		25.5	27.3	28.7	42	58
Chloromethane	3	0	0			25.2		25.5	27.3	28.7	42	58
cis-1,3-Dichloropropene	3	0	0			10		10	10.8	11.4	17	23
Dibromochloromethane	3	0	0			12.5		12.5	13.5	14.3	21	29
Ethylbenzene	3	0	0			12.5		12.5	13.5	14.3	21	29
Methylene chloride (Dichloromethane)	3	0	0			12.5		12.5	13.5	14.3	21	29
Styrene	3	0	0			12.5		12.5	13.5	14.3	21	29
Tetrachloroethene	3	0	0			12.5		12.5	13.5	14.3	21	29
Toluene	3	0	0			12.5		12.5	13.5	14.3	21	29
trans-1,3-Dichloropropene	3	0	0			10		10	10.8	11.4	17	23
Trichloroethene	3	0	0			12.5		12.5	13.5	14.3	21	29
Vinyl chloride	3	0	0			25.2		25.5	27.3	28.7	42	58
Xylenes, Total	3	0	0			12.5		12.5	13.5	14.3	21	29
Inorganics (mg/kg)												
Aluminum	3	3	100	11000	16000	13700	2520	14000	15000	15800		
Antimony	3	2	67	1.5	1.9	2.12	0.283	1.9	2.43	2.85	5.9	5.9
Arsenic	3	3	100	13	17	15.5	2.18	16.5	16.8	17		
Barium	3	3	100	240	420	348	95.4	385	403	417		
Beryllium	3	3	100	0.58	0.82	0.713	0.122	0.74	0.78	0.812		
Cadmium	3	3	100	1.6	2.7	2.08	0.562	1.95	2.33	2.63		
Calcium	3	3	100	11000	16500	14500	3040	16000	16300	16500		
Chromium	3	3	100	18	26	21.7	4.04	21	23.5	25.5		
Cobalt	3	3	100	7.1	10	8.92	1.58	9.65	9.83	9.97		
Copper	3	3	100	36	64	48.5	14.2	45.5	54.8	62.2		
Iron	3	3	100	28000	38000	33800	5200	35500	36800	37800		
Lead	3	3	100	34	58	47.8	12.4	51.5	54.8	57.4		
Magnesium	3	3	100	3600	5600	4670	1010	4800	5200	5520		
Manganese	3	3	100	940	1400	1200	235	1250	1330	1390		
Mercury	3	3	100	0.1005	0.16	0.124	0.032	0.11	0.135	0.155		
Molybdenum	3	3	100	0.37	0.92	0.595	0.288	0.495	0.708	0.878		
Nickel	3	3	100	35	54	47.2	10.6	52.5	53.3	53.9		
Potassium	3	3	100	1500	2200	1950	391	2150	2180	2200		
Selenium	3	0	0			1.37		1.4	1.43	1.45	2.5	2.9
Silver	3	1	33	0.79	0.79	1.15		1.25	1.33	1.39	2.5	2.8
Sodium	3	0	0			91.7		90	103	113	140	230
Thallium	3	0	0			1.37		1.4	1.43	1.45	2.5	2.9
Vanadium	3	3	100	28	40	34.8	6.17	36.5	38.3	39.7		
Zinc	3	3	100	250	370	308	60.1	305	338	364		
PCBs (ug/kg)												
Monochlorobiphenyl	3	0	0			4.68		4.6	4.73	4.83	9.2	9.7
Dichlorobiphenyl	3	0	0			4.68		4.6	4.73	4.83	9.2	9.7
Trichlorobiphenyl	3	0	0			4.68		4.6	4.73	4.83	9.2	9.7
Tetrachlorobiphenyl	3	0	0			9.67		9.5	9.75	9.95	19	20
Pentachlorobiphenyl	3	0	0			9.67		9.5	9.75	9.95	19	20
Hexachlorobiphenyl	3	0	0			9.67		9.5	9.75	9.95	19	20
Heptachlorobiphenyl	3	0	0			14.2		14	14.3	14.5	28	29
Octachlorobiphenyl	3	0	0			14.2		14	14.3	14.5	28	29
Nonachlorobiphenyl	3	0	0			23.5		23	23.8	24.4	46	49
Decachlorobiphenyl	3	0	0			23.5		23	23.8	24.4	46	49
Total PCBs	3	0	0			118		116	119	122	232.6	245.1
Dioxins (ug/kg)												
1,2,3,4,6,7,8,9-OCDD	3	3	100	8.625	17.25	13.8	4.56	15.5	16.4	17.1		
1,2,3,4,6,7,8-HpCDD	3	3	100	0.238	0.443	0.369	0.114	0.425	0.434	0.441		
1,2,3,4,7,8-HxCDD	3	2	67	0.0034	0.0049	0.00345	0.00106	0.0034	0.00415	0.00475	0.0041	0.0041
1,2,3,6,7,8-HxCDD	3	3	100	0.00795	0.0162	0.0124	0.00416	0.013	0.0146	0.0159		
1,2,3,7,8,9-HxCDD	3	3	100	0.00975	0.0173	0.0134	0.00379	0.013	0.0152	0.0169		
1,2,3,7,8-PeCDD	3	3	100	0.0021	0.0035	0.00263	0.000757	0.0023	0.0029	0.00338		
2,3,7,8-TCDD	3	3	100	0.0013	0.0122	0.00537	0.00595	0.0026	0.0074	0.0112		
Total HpCDD	3	3	100	0.541	0.932	0.797	0.222	0.917	0.925	0.931		
Total HxCDD	3	0	0			0.0715		0.0675	0.08	0.09	0.109	0.185

Appe ..2f

Summary Statistics for 1999 Borrow Pit Lake Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Total PeCDD	3	0	0			0.0238		0.023	0.0268	0.0298	0.0356	0.0611
Total TCDD	3	0	0			0.0234		0.0178	0.0263	0.0332	0.0352	0.0698
Furans (ug/kg)												
1,2,3,4,6,7,8,9-OCDF	3	3	100	0.235	0.756	0.55	0.277	0.658	0.707	0.746		
1,2,3,4,6,7,8-HpCDF	3	3	100	0.0548	0.159	0.113	0.0533	0.126	0.143	0.156		
1,2,3,4,7,8,9-HpCDF	3	3	100	0.0053	0.0117	0.0093	0.00349	0.0109	0.0113	0.0116		
1,2,3,4,7,8-HxCDF	3	3	100	0.00505	0.0092	0.00715	0.00208	0.0072	0.0082	0.009		
1,2,3,6,7,8-HxCDF	3	3	100	0.00295	0.0059	0.00432	0.00149	0.0041	0.005	0.00572		
1,2,3,7,8,9-HxCDF	3	3	100	0.00074	0.006	0.00345	0.00263	0.0036	0.0048	0.00576		
1,2,3,7,8-PeCDF	3	2	67	0.002	0.0027	0.00187	0.000495	0.002	0.00235	0.00263	0.0018	0.0018
2,3,4,6,7,8-HxCDF	3	3	100	0.0051	0.0073	0.00627	0.00111	0.0064	0.00685	0.00721		
2,3,4,7,8-PeCDF	3	3	100	0.0029	0.0042	0.00368	0.00069	0.00395	0.00408	0.00418		
2,3,7,8-TCDF	3	3	100	0.0062	0.01015	0.00858	0.0021	0.0094	0.00978	0.0101		
Total HpCDF	3	2	67	0.159	0.599	0.345	0.311	0.277	0.438	0.567	0.553	0.553
Total HxCDF	3	0	0			0.0493		0.053	0.0605	0.0665	0.0539	0.136
Total PeCDF	3	0	0			0.0198		0.0179	0.0217	0.0248	0.0318	0.0512
Total TCDF	3	0	0			0.0401		0.0402	0.045	0.0488	0.0606	0.0996
Total TEQ	3	3	100	0.014377	0.0327328	0.0222	0.00952	0.0194	0.0261	0.0314		

[1]Average and percentiles calculated assuming 1/2 detection limit for nondetects
[2]Standard deviation calculated for detected concentrations only

Appendix C-2g
Summary Statistics for 1999 Reference Area I Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Cyanide, Total (mg/kg)	2	0	0			0.573		0.573	0.636	0.687	0.89	1.4
Pesticides/Herbicides (ug/kg)												
2,4,5-T	2	0	0			9.25		9.25	10.1	10.8	15	22
2,4,5-TP (Silvex)	2	0	0			9.25		9.25	10.1	10.8	15	22
2,4-D	2	1	50	12	12	11.5		11.5	11.8	12	22	22
2,4-DB	2	0	0			9.25		9.25	10.1	10.8	15	22
4,4'-DDD	2	0	0			3.65		3.65	4.03	4.33	5.8	8.8
4,4'-DDE	2	0	0			3.65		3.65	4.03	4.33	5.8	8.8
4,4'-DDT	2	0	0			3.65		3.65	4.03	4.33	5.8	8.8
Total DDT	2	0	0			11		11	12.1	13	17.4	26.4
Aldrin	2	0	0			1.9		1.9	2.1	2.26	3	4.6
alpha-BHC	2	0	0			0.548		0.548	0.599	0.64	0.89	1.3
Alpha Chlordane	2	0	0			1.9		1.9	2.1	2.26	3	4.6
beta-BHC	2	0	0			0.548		0.548	0.599	0.64	0.89	1.3
Dalapon	2	0	0			75		75	82.5	88.5	120	180
delta-BHC	2	0	0			0.548		0.548	0.599	0.64	0.89	1.3
Dicamba	2	0	0			22.3		22.3	24.6	26.5	35	54
Dichloroprop	2	0	0			113		113	124	133	180	270
Dieldrin	2	0	0			3.65		3.65	4.03	4.33	5.8	8.8
Dinoseb	2	0	0			113		113	124	133	180	270
Endosulfan I	2	0	0			1.9		1.9	2.1	2.26	3	4.6
Endosulfan II	2	0	0			3.65		3.65	4.03	4.33	5.8	8.8
Endosulfan sulfate	2	0	0			3.65		3.65	4.03	4.33	5.8	8.8
Endrin	2	0	0			3.65		3.65	4.03	4.33	5.8	8.8
Endrin aldehyde	2	0	0			3.65		3.65	4.03	4.33	5.8	8.8
Endrin ketone	2	0	0			3.65		3.65	4.03	4.33	5.8	8.8
gamma-BHC (Lindane)	2	0	0			1.9		1.9	2.1	2.26	3	4.6
Gamma Chlordane	2	0	0			1.9		1.9	2.1	2.26	3	4.6
Heptachlor	2	0	0			1.9		1.9	2.1	2.26	3	4.6
Heptachlor epoxide	2	0	0			1.9		1.9	2.1	2.26	3	4.6
MCPA	2	0	0			2230		2230	2460	2650	3500	5400
MCPP	2	0	0			2230		2230	2460	2650	3500	5400
Methoxychlor	2	0	0			19		19	21	22.6	30	46
Toxaphene	2	0	0			190		190	210	226	300	460
SVOCs (ug/kg)												
1,2,4-Trichlorobenzene	2	0	0			188		188	206	221	300	450
1,2-Dichlorobenzene	2	0	0			188		188	206	221	300	450
1,3-Dichlorobenzene	2	0	0			188		188	206	221	300	450
1,4-Dichlorobenzene	2	0	0			188		188	206	221	300	450
2,4,5-Trichlorophenol	2	0	0			188		188	206	221	300	450
2,4,6-Trichlorophenol	2	0	0			188		188	206	221	300	450
2,4-Dichlorophenol	2	0	0			188		188	206	221	300	450
2,4-Dinitrophenol	2	0	0			950		950	1050	1130	1500	2300
2,4-Dinitrotoluene	2	0	0			188		188	206	221	300	450
2,6-Dinitrotoluene	2	0	0			188		188	206	221	300	450
2-Chloronaphthalene	2	0	0			188		188	206	221	300	450
2-Chlorophenol	2	0	0			188		188	206	221	300	450
2-Methylnaphthalene	2	0	0			188		188	206	221	300	450
2-Methylphenol (o-cresol)	2	0	0			188		188	206	221	300	450
2-Nitroaniline	2	0	0			950		950	1050	1130	1500	2300
2-Nitrophenol	2	0	0			188		188	206	221	300	450
3-Methylphenol/4-Methylphenol	2	0	0			188		188	206	221	300	450
3,3'-Dichlorobenzidine	2	0	0			368		368	404	433	590	880
3-Nitroaniline	2	0	0			950		950	1050	1130	1500	2300
4,6-Dinitro-2-methylphenol	2	0	0			950		950	1050	1130	1500	2300
4-Bromophenylphenyl ether	2	0	0			188		188	206	221	300	450
4-Chloro-3-methylphenol	2	0	0			188		188	206	221	300	450
4-Chloroaniline	2	0	0			368		368	404	433	590	880
4-Chlorophenylphenyl ether	2	0	0			188		188	206	221	300	450
4-Nitroaniline	2	0	0			950		950	1050	1130	1500	2300
4-Nitrophenol	2	0	0			950		950	1050	1130	1500	2300
Acenaphthene	2	0	0			188		188	206	221	300	450

Summary Statistics for 1999 Reference Area I Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Acenaphthylene	2	0	0			188		188	206	221	300	450
Anthracene	2	0	0			188		188	206	221	300	450
Benzo(a)anthracene	2	0	0			188		188	206	221	300	450
Benzo(a)pyrene	2	0	0			100		100	110	118	160	240
Benzo(b)fluoranthene	2	0	0			188		188	206	221	300	450
Benzo(g,h,i)perylene	2	0	0			188		188	206	221	300	450
Benzo(k)fluoranthene	2	0	0			188		188	206	221	300	450
bis(2-Chloroethoxy)methane	2	0	0			188		188	206	221	300	450
bis(2-Chloroethyl)ether	2	0	0			188		188	206	221	300	450
2,2'-Oxybis(1-Chloropropane)	2	0	0			188		188	206	221	300	450
bis(2-Ethylhexyl)phthalate	2	0	0			188		188	206	221	300	450
Butylbenzylphthalate	2	0	0			188		188	206	221	300	450
Carbazole	2	0	0			188		188	206	221	300	450
Chrysene	2	0	0			188		188	206	221	300	450
Dibenzo(a,h)anthracene	2	0	0			100		100	110	118	160	240
Dibenzofuran	2	0	0			188		188	206	221	300	450
Diethylphthalate	2	0	0			188		188	206	221	300	450
Dimethylphthalate	2	0	0			188		188	206	221	300	450
Di-n-butylphthalate	2	0	0			188		188	206	221	300	450
Di-n-octylphthalate	2	0	0			188		188	206	221	300	450
Fluoranthene	2	0	0			188		188	206	221	300	450
Fluorene	2	0	0			188		188	206	221	300	450
Hexachlorobenzene	2	0	0			77.5		77.5	86.3	93.3	120	190
Hexachlorobutadiene	2	0	0			188		188	206	221	300	450
Hexachlorocyclopentadiene	2	0	0			188		188	206	221	300	450
Hexachloroethane	2	0	0			188		188	206	221	300	450
Indeno(1,2,3-cd)pyrene	2	0	0			188		188	206	221	300	450
Isophorone	2	0	0			188		188	206	221	300	450
Naphthalene	2	0	0			188		188	206	221	300	450
Nitrobenzene	2	0	0			188		188	206	221	300	450
N-Nitroso-di-n-propylamine	2	0	0			188		188	206	221	300	450
N-Nitrosodiphenylamine	2	0	0			188		188	206	221	300	450
Pentachlorophenol	2	1	50	1.9	1.9	576		576	863	1090	2300	2300
Phenanthrene	2	0	0			188		188	206	221	300	450
Phenol	2	0	0			188		188	206	221	300	450
Pyrene	2	0	0			188		188	206	221	300	450
Total PAHs	2	0	0			3010		3010	3310	3550	4820	7230
VOCs (ug/kg)												
1,1,1-Trichloroethane	2	0	0			7.13		7.13	8.31	9.26	9.5	19
1,1,2,2-Tetrachloroethane	2	0	0			7.13		7.13	8.31	9.26	9.5	19
1,1,2-Trichloroethane	2	0	0			7.13		7.13	8.31	9.26	9.5	19
1,1-Dichloroethane	2	0	0			7.13		7.13	8.31	9.26	9.5	19
1,1-Dichloroethene	2	0	0			6.43		6.43	7.46	8.29	8.7	17
1,2-Dichloroethane	2	0	0			7.13		7.13	8.31	9.26	9.5	19
Cis/Trans-1,2-Dichloroethene	2	0	0			7.13		7.13	8.31	9.26	9.5	19
1,2-Dichloropropane	2	0	0			7.13		7.13	8.31	9.26	9.5	19
2-Butanone (MEK)	2	1	50	40	40	31.8		31.8	35.9	39.2	47	47
2-Hexanone	2	0	0			35.3		35.3	41.1	45.8	47	94
4-Methyl-2-pentanone (MIBK)	2	0	0			35.3		35.3	41.1	45.8	47	94
Acetone	2	1	50	160	160	104		104	132	154	95	95
Benzene	2	0	0			7.13		7.13	8.31	9.26	9.5	19
Bromodichloromethane	2	0	0			7.13		7.13	8.31	9.26	9.5	19
Bromoform	2	0	0			7.13		7.13	8.31	9.26	9.5	19
Bromomethane (Methyl bromide)	2	0	0			14.3		14.3	16.6	18.5	19	38
Carbon disulfide	2	0	0			7.13		7.13	8.31	9.26	9.5	19
Carbon tetrachloride	2	0	0			7.13		7.13	8.31	9.26	9.5	19
Chlorobenzene	2	0	0			7.13		7.13	8.31	9.26	9.5	19
Chloroform	2	0	0			7.13		7.13	8.31	9.26	9.5	19
Chloroethane	2	0	0			14.3		14.3	16.6	18.5	19	38
Chloromethane	2	0	0			14.3		14.3	16.6	18.5	19	38
cis-1,3-Dichloropropene	2	0	0			5.65		5.65	6.58	7.32	7.6	15
Dibromochloromethane	2	0	0			7.13		7.13	8.31	9.26	9.5	19

Appendix C-2g
Summary Statistics for 1999 Reference Area I Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Ethylbenzene	2	0	0			7.13		7.13	8.31	9.26	9.5	19
Methylene chloride (Dichloromethane)	2	0	0			7.13		7.13	8.31	9.26	9.5	19
Styrene	2	0	0			7.13		7.13	8.31	9.26	9.5	19
Tetrachloroethene	2	0	0			7.13		7.13	8.31	9.26	9.5	19
Toluene	2	0	0			7.13		7.13	8.31	9.26	9.5	19
trans-1,3-Dichloropropene	2	0	0			5.65		5.65	6.58	7.32	7.6	15
Trichloroethene	2	0	0			7.13		7.13	8.31	9.26	9.5	19
Vinyl chloride	2	0	0			14.3		14.3	16.6	18.5	19	38
Xylenes, Total	2	0	0			7.13		7.13	8.31	9.26	9.5	19
Inorganics (mg/kg)												
Aluminum	2	2	100	12000	15000	13500	2120	13500	14300	14900		
Antimony	2	1	50	1.3	1.3	1.45		1.45	1.53	1.59	3.2	3.2
Arsenic	2	2	100	7	8	7.5	0.707	7.5	7.75	7.95		
Barium	2	2	100	210	230	220	14.1	220	225	229		
Beryllium	2	2	100	0.7	0.8	0.75	0.0707	0.75	0.775	0.795		
Cadmium	2	2	100	0.34	0.38	0.36	0.0283	0.36	0.37	0.378		
Calcium	2	2	100	12000	18000	15000	4240	15000	16500	17700		
Chromium	2	2	100	17	21	19	2.83	19	20	20.8		
Cobalt	2	2	100	7.1	9.8	8.45	1.91	8.45	9.13	9.67		
Copper	2	2	100	17	20	18.5	2.12	18.5	19.3	19.9		
Iron	2	2	100	19000	22000	20500	2120	20500	21300	21900		
Lead	2	2	100	22	23	22.5	0.707	22.5	22.8	23		
Magnesium	2	2	100	5000	6500	5750	1060	5750	6130	6430		
Manganese	2	2	100	720	770	745	35.4	745	758	768		
Mercury	2	2	100	0.042	0.063	0.0525	0.0148	0.0525	0.0578	0.062		
Molybdenum	2	2	100	0.37	0.49	0.43	0.0849	0.43	0.46	0.484		
Nickel	2	2	100	19	23	21	2.83	21	22	22.8		
Potassium	2	2	100	1900	2300	2100	283	2100	2200	2280		
Selenium	2	0	0			1.08		1.08	1.16	1.23	1.8	2.5
Silver	2	0	0			1.08		1.08	1.16	1.23	1.8	2.5
Sodium	2	0	0			82.5		82.5	86.3	89.3	150	180
Thallium	2	0	0			1.08		1.08	1.16	1.23	1.8	2.5
Vanadium	2	2	100	30	36	33	4.24	33	34.5	35.7		
Zinc	2	2	100	82	95	88.5	9.19	88.5	91.8	94.4		
PCBs (ug/kg)												
Monochlorobiphenyl	2	0	0			3.7		3.7	4.08	4.38	5.9	8.9
Dichlorobiphenyl	2	0	0			3.7		3.7	4.08	4.38	5.9	8.9
Trichlorobiphenyl	2	0	0			3.7		3.7	4.08	4.38	5.9	8.9
Tetrachlorobiphenyl	2	0	0			7.5		7.5	8.25	8.85	12	18
Pentachlorobiphenyl	2	0	0			7.5		7.5	8.25	8.85	12	18
Hexachlorobiphenyl	2	0	0			7.5		7.5	8.25	8.85	12	18
Heptachlorobiphenyl	2	0	0			11.3		11.3	12.4	13.3	18	27
Octachlorobiphenyl	2	0	0			11.3		11.3	12.4	13.3	18	27
Nonachlorobiphenyl	2	0	0			18.8		18.8	20.6	22.1	30	45
Decachlorobiphenyl	2	0	0			18.8		18.8	20.6	22.1	30	45
Total PCBs	2	0	0			93.6		93.6	103	110	149.7	224.7
Dioxins (ug/kg)												
1,2,3,4,6,7,8,9-OCDD	2	2	100	3.47	4.95	4.21	1.05	4.21	4.58	4.88		
1,2,3,4,6,7,8-HpCDD	2	2	100	0.155	0.162	0.159	0.00495	0.159	0.16	0.162		
1,2,3,4,7,8-HxCDD	2	2	100	0.0011	0.0018	0.00145	0.000495	0.00145	0.00163	0.00177		
1,2,3,6,7,8-HxCDD	2	2	100	0.0044	0.0046	0.0045	0.000141	0.0045	0.00455	0.00459		
1,2,3,7,8,9-HxCDD	2	2	100	0.0034	0.0048	0.0041	0.00099	0.0041	0.00445	0.00473		
1,2,3,7,8-PeCDD	2	0	0			*0.000655*		*0.000655*	*0.000753*	*0.000831*	*0.00092*	*0.0017*
2,3,7,8-TCDD	2	2	100	0.00064	0.0035	0.00207	0.00202	0.00207	0.00279	0.00336		
Total HpCDD	2	2	100	0.324	0.347	0.336	0.0163	0.336	0.341	0.346		
Total HxCDD	2	0	0			0.0242		0.0242	0.0247	0.0251	0.0462	0.0504
Total PeCDD	2	0	0			0.0182		0.0182	0.0186	0.019	0.0345	0.0381
Total TCDD	2	0	0			0.0148		0.0148	0.0148	0.0148	0.0294	0.0296
Furans (ug/kg)												
1,2,3,4,6,7,8,9-OCDF	2	2	100	0.128	0.136	0.132	0.00566	0.132	0.134	0.136		
1,2,3,4,6,7,8-HpCDF	2	2	100	0.0254	0.0307	0.0281	0.00375	0.0281	0.0294	0.0304		
1,2,3,4,7,8,9-HpCDF	2	1	50	0.003	0.003	0.00193		0.00193	0.00246	0.00289	0.0017	0.0017

App[illegible]-2g
Summary Statistics for 1999 Reference Area I Sediment
Dead Creek
Sauget Area I

	Number Analyzed	Number Detected	Detection Frequency	Minimum Detected	Maximum Detected	Average Concentration[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
1,2,3,4,7,8-HxCDF	2	1	50	0.0029	0.0029	0.00193		0.00193	0.00241	0.0028	0.0019	0.0019
1,2,3,6,7,8-HxCDF	2	0	0			0.000483		0.000483	0.000506	0.000541	0.00075	0.0011
1,2,3,7,8,9-HxCDF	2	0	0			0.000055		0.000055	0.0000775	0.0000955	0.00002	0.0002
1,2,3,7,8-PeCDF	2	0	0			0.000255		0.000255	0.000333	0.000395	0.0002	0.00082
2,3,4,6,7,8-HxCDF	2	1	50	0.0018	0.0018	0.00118		0.00118	0.00149	0.00174	0.0011	0.0011
2,3,4,7,8-PeCDF	2	0	0			0.00051		0.00051	0.00053	0.000546	0.00094	0.0011
2,3,7,8-TCDF	2	2	100	0.0013	0.0014	0.00135	0.0000707	0.00135	0.00138	0.0014		
Total HpCDF	2	1	50	0.113	0.113	0.0845		0.0845	0.0988	0.11	0.112	0.112
Total HxCDF	2	2	100	0.0231	0.0252	0.0242	0.00148	0.0242	0.0247	0.0251		
Total PeCDF	2	0	0			0.00423		0.00423	0.00504	0.00569	0.0052	0.0117
Total TCDF	2	1	50	0.0145	0.0145	0.0109		0.0109	0.0127	0.0141	0.0147	0.0147
Total TEQ	2	2	100	0.00482	0.0067	0.00681	0.00134	0.00681	0.00721	0.00753		

[1]Average and percentiles calculated assuming 1/2 detection limit for nondetects
[2]Standard deviation calculated for detected concentrations only

Appendix C-3a
Summary Statistics for 1999 Site Forage Fish
Dead Creek
Sauget Area I

	Number Detected	Number Analyzed	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Cyanide, Total (mg/kg)	0	5	0			5					10	10
Pesticides/Herbicides (ug/kg)												
2,4,5-T	0	4	0			6.25					10	20
2,4,5-TP (Silvex)	0	4	0			6.25					10	20
2,4-D	0	4	0			6.25					10	20
2,4-DB	2	4	50	6.5	10	7.88	2.47	8.25	10	10	10	20
4,4'-DDD	0	4	0			8.25					13	20
4,4'-DDE	3	4	75	4.1	10	7.43	3.18	7.8	9.33	9.87	13	13
4,4'-DDT	0	4	0			8.25					13	20
Total DDT	3	4	75	4.1	10	23.9	3.18	24.3	29.3	29.9	26	40
Aldrin	0	4	0			4.2					6.8	10
alpha-BHC	0	4	0			4.2					6.8	10
Alpha Chlordane	0	4	0			4.2					6.8	10
beta-BHC	0	4	0			4.2					6.8	10
Dalapon	0	4	0			1250					2000	4000
delta-BHC	0	4	0			4.2					6.8	10
Dicamba	1	4	25	2.6	2.6	10.7		10	12.5	18.5	20	40
Dichloroprop	1	4	25	6.7	6.7	51.7		50	62.5	92.5	100	200
Dieldrin	0	4	0			8.25					13	20
Dinoseb	0	4	0			62.5					100	200
Endosulfan I	0	4	0			4.2					6.8	10
Endosulfan II	0	4	0			8.25					13	20
Endosulfan sulfate	0	4	0			8.25					13	20
Endrin	0	4	0			8.25					13	20
Endrin aldehyde	0	4	0			8.25					13	20
Endrin ketone	0	4	0			8.25					13	20
gamma-BHC (Lindane)	0	4	0			4.2					6.8	10
Gamma Chlordane	0	4	0			4.2					6.8	10
Heptachlor	0	4	0			4.2					6.8	10
Heptachlor epoxide	0	4	0			4.2					6.8	10
MCPA	2	4	50	3100	3300	2350	141	2550	3150	3270	2000	4000
MCPP	0	4	0			1250					2000	4000
Methoxychlor	0	4	0			42					68	100
Toxaphene	0	4	0			420					680	1000
SVOCs (ug/kg)												
1,2,4-Trichlorobenzene	0	5	0			136					170	340
1,2-Dichlorobenzene	0	5	0			136					170	340
1,3-Dichlorobenzene	0	5	0			136					170	340
1,4-Dichlorobenzene	0	5	0			136					170	340
2,4,5-Trichlorophenol	0	5	0			336					420	840
2,4,6-Trichlorophenol	0	5	0			136					170	340
2,4-Dichlorophenol	0	5	0			136					170	340
2,4-Dimethylphenol	0	5	0			136					170	340
2,4-Dinitrophenol	0	5	0			336					420	840
2,4-Dinitrotoluene	0	5	0			136					170	340
2,6-Dinitrotoluene	0	5	0			136					170	340
2-Chloronaphthalene	0	5	0			136					170	340
2-Chlorophenol	0	5	0			136					170	340
2-Methylnaphthalene	0	5	0			136					170	340
2-Methylphenol (o-cresol)	0	5	0			136					170	340
2-Nitroaniline	0	5	0			336					420	840
2-Nitrophenol	0	5	0			136					170	340

App C-3a
Summary Statistics for 1999 Site Forage Fish
Dead Creek
Sauget Area I

	Number Detected	Number Analyzed	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
3,3'-Dichlorobenzidine	0	5	0			136					170	340
3&4-Methylphenol (m&p-cresol)	0	5	0			136					170	340
3-Nitroaniline	0	5	0			336					420	840
4,6-Dinitro-2-methylphenol	0	5	0			336					420	840
4-Bromophenylphenyl ether	0	5	0			136					170	340
4-Chloro-3-methylphenol	0	5	0			136					170	340
4-Chloroaniline	0	5	0			136					170	340
4-Chlorophenylphenyl ether	0	5	0			136					170	340
4-Nitroaniline	0	5	0			336					420	840
4-Nitrophenol	0	5	0			336					420	840
Acenaphthene	0	5	0			136					170	340
Acenaphthylene	0	5	0			136					170	340
Anthracene	0	5	0			136					170	340
Benzo(a)anthracene	0	5	0			136					170	340
Benzo(a)pyrene	0	5	0			136					170	340
Benzo(b)fluoranthene	0	5	0			136					170	340
Benzo(g,h,i)perylene	0	5	0			136					170	340
Benzo(k)fluoranthene	0	5	0			136					170	340
bis(2-Chloroethoxy)methane	0	5	0			136					170	340
bis(2-Chloroethyl)ether	0	5	0			136					170	340
2,2'-Oxybis(1-chloropropane)	0	5	0			136					170	340
bis(2-Ethylhexyl)phthalate	3	5	60	130	230	170	52.9	170	170	218	340	340
Butylbenzylphthalate	0	5	0			136					170	340
Carbazole	0	5	0			136					170	340
Chrysene	0	5	0			136					170	340
Dibenzo(a,h)anthracene	2	5	40	22	48	99	18.4	85	170	170	170	340
Dibenzofuran	0	5	0			136					170	340
Diethylphthalate	5	5	100	19	93	41.4	30	36	37	81.8		
Dimethylphthalate	0	5	0			136					170	340
Di-n-butylphthalate	0	5	0			136					170	340
Di-n-octylphthalate	0	5	0			136					170	340
Fluoranthene	0	5	0			136					170	340
Fluorene	0	5	0			136					170	340
Hexachlorobenzene	0	5	0			136					170	340
Hexachlorobutadiene	0	5	0			136					170	340
Hexachlorocyclopentadiene	0	5	0			136					170	340
Hexachloroethane	0	5	0			136					170	340
Indeno(1,2,3-cd)pyrene	1	5	20	54	54	113		85	170	170	170	340
Isophorone	0	5	0			136					170	340
Naphthalene	0	5	0			136					170	340
Nitrobenzene	0	5	0			136					170	340
n-Nitrosodi-n-propylamine	0	5	0			136					170	340
N-Nitrosodiphenylamine/Diphenylamine	0	5	0			136					170	340
Pentachlorophenol	3	5	60	1	5.8	170	2.5	5.8	420	420	840	840
Phenanthrene	0	5	0			136					170	340
Phenol	0	5	0			136					170	340
Pyrene	0	5	0			136					170	340
Total PAHs	2	5	40	22	102	2120	56.6	2480	2720	2720	2550	5440
VOCs (ug/kg)												
1,1,1-Trichloroethane	0	0										
1,1,2,2-Tetrachloroethane	0	0										
1,1,2-Trichloroethane	0	0										

Appendix C-3a
Summary Statistics for 1999 Site Forage Fish
Dead Creek
Sauget Area I

	Number Detected	Number Analyzed	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
1,1-Dichloroethane	0	0										
1,1-Dichloroethene	0	0										
1,2-Dichloroethane	0	0										
Cis/Trans-1,2-Dichloroethene	0	0										
1,2-Dichloropropane	0	0										
2-Hexanone	0	0										
4-Methyl-2-pentanone (MIBK)	0	0										
Acetone	0	0										
Benzene	0	0										
Bromodichloromethane	0	0										
Bromoform	0	0										
Bromomethane (Methyl bromide)	0	0										
Carbon disulfide	0	0										
Carbon tetrachloride	0	0										
Chlorobenzene	0	0										
Chloroform	0	0										
Chloroethane	0	0										
Chloromethane	0	0										
cis-1,3-Dichloropropene	0	0										
Dibromochloromethane	0	0										
Ethylbenzene	0	0										
Methylene chloride (Dichloromethane)	0	0										
Styrene	0	0										
Tetrachloroethene	0	0										
Toluene	0	0										
trans-1,3-Dichloropropene	0	0										
Trichloroethene	0	0										
Vinyl chloride	0	0										
Xylenes, Total	0	0										
Inorganics (mg/kg)												
Aluminum	5	5	100	9.8	52	30.4	17.2	24	44	50.4		
Antimony	0	5	0			0.094					0.18	0.2
Arsenic	0	5	0			1.8					1	5
Barium	0	0										
Beryllium	0	5	0			0.473					0.91	1
Cadmium	0	5	0			0.235					0.45	0.5
Calcium	0	0										
Chromium	5	5	100	0.26	0.4	0.33	0.0557	0.32	0.37	0.394		
Cobalt	0	0										
Copper	5	5	100	0.5	9	2.7	3.56	1.5	1.7	7.54		
Iron	0	0										
Lead	3	5	60	0.48	1.1	0.529	0.331	0.48	0.59	0.998	0.45	0.5
Magnesium	0	0										
Manganese	0	0										
Mercury	3	5	60	0.018	0.6	0.154	0.327	0.05	0.052	0.49	0.095	0.1
Molybdenum	0	0										
Nickel	0	5	0			4.73					9.1	10
Potassium	0	0										
Selenium	3	5	60	0.46	0.54	0.406	0.0436	0.46	0.53	0.538	0.5	0.5
Silver	0	5	0			0.05					0.1	0.1
Sodium	0	0										
Thallium	0	0										

Appe .-3a

Summary Statistics for 1999 Site Forage Fish
Dead Creek
Sauget Area I

	Number Detected	Number Analyzed	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Vanadium	0	0										
Zinc	5	5	100	24	53	37.6	11.7	33	46	51.6		
% Lipids	5	5	100	1.1	1.8	1.46	0.27	1.5	1.6	1.76		
pH	0	0										
PCBs (ug/kg)												
Monochlorobiphenyl	0	5	0			8					10	20
Dichlorobiphenyl	0	5	0			8					10	20
Trichlorobiphenyl	2	5	40	13	600	128	415	10	13	483	10	20
Tetrachlorobiphenyl	2	5	40	240	3200	698	2090	20	240	2610	20	40
Pentachlorobiphenyl	3	5	60	8.7	2100	532	1090	20	510	1780	40	40
Hexachlorobiphenyl	4	5	80	19	1000	288	462	22	380	876	40	40
Heptachlorobiphenyl	2	5	40	44	460	116	294	30	44	377	30	60
Octachlorobiphenyl	1	5	20	130	130	44		30	30	110	30	60
Nonachlorobiphenyl	0	5	0			40					50	100
Decachlorobiphenyl	0	5	0			40					50	100
Total PCBs	4	5	80	19	7490	1900	3580	250	1260	6340	150	500
Dioxins (ug/kg)												
1,2,3,4,6,7,8,9-OCDD	5	5	100	0.0089	1.68	0.391	0.726	0.0269	0.213	1.39		
1,2,3,4,6,7,8-HpCDD	5	5	100	0.0012	0.211	0.0486	0.0915	0.0018	0.0274	0.174		
1,2,3,4,7,8-HxCDD	2	5	40	0.0012	0.0053	0.00142	0.0029	0.0003	0.0012	0.00448	0.0002	0.0006
1,2,3,6,7,8-HxCDD	3	5	60	0.0006	0.0323	0.00813	0.0167	0.0006	0.0073	0.0273	0.0004	0.0005
1,2,3,7,8,9-HxCDD	2	5	40	0.0018	0.0103	0.00255	0.00601	0.0003	0.0018	0.0086	0.0002	0.0006
1,2,3,7,8-PeCDD	2	5	40	0.0035	0.021	0.00503	0.0124	0.0003	0.0035	0.0175	0.0002	0.0006
2,3,7,8-TCDD	3	5	60	0.00072	0.0188	0.00443	0.01	0.00072	0.0022	0.0155	0.0004	0.0005
Total HpCDD	5	5	100	0.0012	0.371	0.0856	0.161	0.0028	0.0503	0.307		
Total HxCDD	3	5	60	0.0006	0.0942	0.0231	0.0494	0.0006	0.0202	0.0794	0.0004	0.0006
Total PeCDD	2	5	40	0.0137	0.161	0.0351	0.104	0.0003	0.0137	0.132	0.0002	0.0006
Total TCDD	3	5	60	0.00072	0.0828	0.0184	0.0454	0.00072	0.0081	0.0679	0.0004	0.0005
Furans (ug/kg)												
1,2,3,4,6,7,8,9-OCDF	4	5	80	0.0013	0.57	0.125	0.277	0.0044	0.0481	0.466	0.0011	0.0011
1,2,3,4,6,7,8-HpCDF	3	5	60	0.001	0.0994	0.0233	0.0531	0.001	0.0154	0.0826	0.0004	0.0005
1,2,3,4,7,8,9-HpCDF	3	5	60	0.00058	0.0073	0.00195	0.00374	0.00058	0.0011	0.00606	0.0006	0.0009
1,2,3,4,7,8-HxCDF	4	5	80	0.00041	0.0096	0.00276	0.00427	0.00077	0.0028	0.00824	0.0004	0.0004
1,2,3,6,7,8-HxCDF	2	5	40	0.001	0.0041	0.00109	0.00219	0.00015	0.001	0.00348	0.0001	0.0003
1,2,3,7,8,9-HxCDF	0	5	0			0.00016					0.0002	0.0005
1,2,3,7,8-PeCDF	1	5	20	0.0052	0.0052	0.00115		0.00015	0.0002	0.0042	0.0001	0.0004
2,3,4,6,7,8-HxCDF	2	5	40	0.0013	0.006	0.00154	0.00332	0.0002	0.0013	0.00506	0.0001	0.0004
2,3,4,7,8-PeCDF	3	5	60	0.00046	0.0127	0.00322	0.00654	0.00046	0.0026	0.0107	0.0003	0.0004
2,3,7,8-TCDF	5	5	100	0.0046	0.113	0.0324	0.0464	0.0078	0.0313	0.0967		
Total HpCDF	5	5	100	0.0018	0.447	0.106	0.193	0.0067	0.0712	0.372		
Total HxCDF	5	5	100	0.0072	0.328	0.0964	0.139	0.0136	0.126	0.288		
Total PeCDF	5	5	100	0.0085	0.261	0.0866	0.111	0.0189	0.134	0.236		
Total TCDF	5	5	100	0.0141	0.381	0.122	0.16	0.025	0.173	0.339		
Total TEQ	5	5	100	0.000481	0.067872	0.0169	0.0291	0.00204	0.0122	0.0567	0.00002	0.00166411

[1]Average and percentiles calculated assuming 1/2 detection limit for nondetects
[2]Standard deviation calculated for detected concentrations only

Appendix C-3b
Summary Statistics for 1999 Reference Forage Fish
Dead Creek
Sauget Area I

	Number Detected	Number Analyzed	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Cyanide, Total (mg/kg)	0	4	0			5					10	10
Pesticides/Herbicides (ug/kg)												
2,4,5-T	0	4	0			5					10	10
2,4,5-TP (Silvex)	0	4	0			5					10	10
2,4-D	0	4	0			5					10	10
2,4-DB	1	4	25	10	10	6.25		5	6.25	9.25	10	10
4,4'-DDD	0	3	0			8.83					13	20
4,4'-DDE	2	3	67	1.3	3.5	4.93	1.56	3.5	6.75	9.35	20	20
4,4'-DDT	0	3	0			8.83					13	20
Total DDT	2	3	67	1.3	3.5	22.6	1.56	21.3	25.7	29.1	26	60
Aldrin	0	3	0			4.47					6.8	10
alpha-BHC	0	3	0			4.47					6.8	10
Alpha Chlordane	0	3	0			4.47					6.8	10
beta-BHC	0	3	0			4.47					6.8	10
Dalapon	0	4	0			1000					2000	2000
delta-BHC	0	3	0			4.47					6.8	10
Dicamba	0	4	0			10					20	20
Dichloroprop	1	4	25	5.1	5.1	38.8		50	50	50	100	100
Dieldrin	2	3	67	1.6	4.7	5.43	2.19	4.7	7.35	9.47	20	20
Dinoseb	0	4	0			50					100	100
Endosulfan I	0	3	0			4.47					6.8	10
Endosulfan II	0	3	0			8.83					13	20
Endosulfan sulfate	0	3	0			8.83					13	20
Endrin	0	3	0			8.83					13	20
Endrin aldehyde	0	3	0			8.83					13	20
Endrin ketone	0	3	0			8.83					13	20
gamma-BHC (Lindane)	0	3	0			4.47					6.8	10
Gamma Chlordane	1	3	33	1.2	1.2	3.2		3.4	4.2	4.84	6.8	10
Heptachlor	0	3	0			4.47					6.8	10
Heptachlor epoxide	0	3	0			4.47					6.8	10
MCPA	1	4	25	2400	2400	1350		1000	1350	2190	2000	2000
MCPP	0	4	0			1000					2000	2000
Methoxychlor	0	3	0			44.7					68	100
Toxaphene	0	3	0			447					680	1000
SVOCs (ug/kg)												
1,2,4-Trichlorobenzene	0	4	0			106					170	340
1,2-Dichlorobenzene	0	4	0			106					170	340
1,3-Dichlorobenzene	0	4	0			106					170	340
1,4-Dichlorobenzene	0	4	0			106					170	340
2,4,5-Trichlorophenol	0	4	0			263					420	840
2,4,6-Trichlorophenol	0	4	0			106					170	340
2,4-Dichlorophenol	0	4	0			106					170	340
2,4-Dimethylphenol	0	4	0			106					170	340
2,4-Dinitrophenol	0	4	0			263					420	840
2,4-Dinitrotoluene	0	4	0			106					170	340
2,6-Dinitrotoluene	0	4	0			106					170	340
2-Chloronaphthalene	0	4	0			106					170	340
2-Chlorophenol	0	4	0			106					170	340
2-Methylnaphthalene	0	4	0			106					170	340
2-Methylphenol (o-cresol)	0	4	0			106					170	340
2-Nitroaniline	0	4	0			263					420	840
2-Nitrophenol	0	4	0			106					170	340

Appe .-3b

Summary Statistics for 1999 Reference Forage Fish
Dead Creek
Sauget Area I

	Number Detected	Number Analyzed	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
3,3'-Dichlorobenzidine	0	4	0			106					170	340
3&4-Methylphenol (m&p-cresol)	0	4	0			106					170	340
3-Nitroaniline	0	4	0			263					420	840
4,6-Dinitro-2-methylphenol	0	4	0			263					420	840
4-Bromophenylphenyl ether	0	4	0			106					170	340
4-Chloro-3-methylphenol	0	4	0			106					170	340
4-Chloroaniline	0	4	0			106					170	340
4-Chlorophenylphenyl ether	0	4	0			106					170	340
4-Nitroaniline	0	4	0			263					420	840
4-Nitrophenol	0	4	0			263					420	840
Acenaphthene	0	4	0			106					170	340
Acenaphthylene	0	4	0			106					170	340
Anthracene	0	4	0			106					170	340
Benzo(a)anthracene	0	4	0			106					170	340
Benzo(a)pyrene	0	4	0			106					170	340
Benzo(b)fluoranthene	0	4	0			106					170	340
Benzo(g,h,i)perylene	0	4	0			106					170	340
Benzo(k)fluoranthene	0	4	0			106					170	340
bis(2-Chloroethoxy)methane	0	4	0			106					170	340
bis(2-Chloroethyl)ether	0	4	0			106					170	340
2,2'-Oxybis(1-chloropropane)	0	4	0			106					170	340
bis(2-Ethylhexyl)phthalate	4	4	100	99	280	172	77.5	155	198	264		
Butylbenzylphthalate	0	4	0			106					170	340
Carbazole	0	3	0			113					170	340
Chrysene	0	4	0			106					170	340
Dibenzo(a,h)anthracene	0	4	0			106					170	340
Dibenzofuran	0	4	0			106					170	340
Diethylphthalate	3	4	75	18	37	61.3	10.4	28.5	70.3	150	340	340
Dimethylphthalate	0	4	0			106					170	340
Di-n-butylphthalate	0	4	0			106					170	340
Di-n-octylphthalate	0	4	0			106					170	340
Fluoranthene	0	4	0			106					170	340
Fluorene	0	4	0			106					170	340
Hexachlorobenzene	0	4	0			106					170	340
Hexachlorobutadiene	0	4	0			106					170	340
Hexachlorocyclopentadiene	0	4	0			106					170	340
Hexachloroethane	0	4	0			106					170	340
Indeno(1,2,3-cd)pyrene	0	4	0			106					170	340
Isophorone	0	4	0			106					170	340
Naphthalene	0	4	0			106					170	340
Nitrobenzene	0	4	0			106					170	340
n-Nitrosodi-n-propylamine	0	4	0			106					170	340
N-Nitrosodiphenylamine/Diphenylamine	0	4	0			106					170	340
Pentachlorophenol	2	4	50	1.5	2.2	106	0.495	106	210	210	420	420
Phenanthrene	0	4	0			106					170	340
Phenol	0	4	0			106					170	340
Pyrene	0	4	0			106					170	340
Total PAHs	0	4	0			1810					2890	5780
VOCs (ug/kg)												
1,1,1-Trichloroethane	0	0										
1,1,2,2-Tetrachloroethane	0	0										
1,1,2-Trichloroethane	0	0										

Appendix C-3b
Summary Statistics for 1999 Reference Forage Fish
Dead Creek
Sauget Area I

	Number Detected	Number Analyzed	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
1,1-Dichloroethane	0	0										
1,1-Dichloroethene	0	0										
1,2-Dichloroethane	0	0										
Cis/Trans-1,2-Dichloroethene	0	0										
1,2-Dichloropropane	0	0										
2-Hexanone	0	0										
4-Methyl-2-pentanone (MIBK)	0	0										
Acetone	0	0										
Benzene	0	0										
Bromodichloromethane	0	0										
Bromoform	0	0										
Bromomethane (Methyl bromide)	0	0										
Carbon disulfide	0	0										
Carbon tetrachloride	0	0										
Chlorobenzene	0	0										
Chloroform	0	0										
Chloroethane	0	0										
Chloromethane	0	0										
cis-1,3-Dichloropropene	0	0										
Dibromochloromethane	0	0										
Ethylbenzene	0	0										
Methylene chloride (Dichloromethane)	0	0										
Styrene	0	0										
Tetrachloroethene	0	0										
Toluene	0	0										
trans-1,3-Dichloropropene	0	0										
Trichloroethene	0	0										
Vinyl chloride	0	0										
Xylenes, Total	0	0										
Inorganics (mg/kg)												
Aluminum	4	4	100	8.3	100	50.3	46.6	46.5	85	97		
Antimony	0	4	0			0.0925					0.18	0.2
Arsenic	0	4	0			1.35					1.8	5
Barium	0	0										
Beryllium	0	4	0			0.466					0.91	1
Cadmium	0	4	0			0.231					0.45	0.5
Calcium	0	0										
Chromium	4	4	100	0.24	1.7	0.713	0.666	0.455	0.778	1.52		
Cobalt	0	0										
Copper	4	4	100	0.42	0.75	0.54	0.149	0.495	0.593	0.719		
Iron	0	0										
Lead	1	4	25	0.37	0.37	0.268		0.238	0.28	0.352	0.45	0.5
Magnesium	0	0										
Manganese	0	0										
Mercury	4	4	100	0.046	0.064	0.0528	0.0078	0.0505	0.0543	0.0621		
Molybdenum	0	0										
Nickel	0	4	0			4.66					9.1	10
Potassium	0	0										
Selenium	2	4	50	0.56	0.65	0.421	0.0636	0.405	0.583	0.637	0.45	0.5
Silver	0	4	0			0.0489					0.091	0.1
Sodium	0	0										
Thallium	0	0										

Appe -3b

Summary Statistics for 1999 Reference Forage Fish
Dead Creek
Sauget Area I

	Number Detected	Number Analyzed	Detection Frequency	Minimum Detected	Maximum Detected	Average[1]	Standard Deviation[2]	50th Percentile[1]	75th Percentile[1]	95th Percentile[1]	Minimum Detection Limit	Maximum Detection Limit
Vanadium	0	0										
Zinc	4	4	100	17	33	25.5	6.61	26	28.5	32.1		
% Lipids	4	4	100	1	2.6	1.6	0.735	1.4	1.93	2.47		
pH	0	0										
PCBs (ug/kg)												
Monochlorobiphenyl	0	4	0			8.75					10	20
Dichlorobiphenyl	0	4	0			8.75					10	20
Trichlorobiphenyl	0	4	0			8.75					10	20
Tetrachlorobiphenyl	0	4	0			17.5					20	40
Pentachlorobiphenyl	0	4	0			17.5					20	40
Hexachlorobiphenyl	0	4	0			17.5					20	40
Heptachlorobiphenyl	0	4	0			26.3					30	60
Octachlorobiphenyl	0	4	0			26.3					30	60
Nonachlorobiphenyl	0	4	0			43.8					50	100
Decachlorobiphenyl	0	4	0			43.8					50	100
Total PCBs	0	4	0			219					250	500
Dioxins (ug/kg)												
1,2,3,4,6,7,8,9-OCDD	4	4	100	0.0223	0.068	0.0416	0.0225	0.038	0.0565	0.0657		
1,2,3,4,6,7,8-HpCDD	4	4	100	0.0018	0.0047	0.00325	0.00142	0.00325	0.00433	0.00463		
1,2,3,4,7,8-HxCDD	0	4	0			0.0002					0.0003	0.0005
1,2,3,6,7,8-HxCDD	4	4	100	0.00044	0.00067	0.000588	0.000106	0.00062	0.000663	0.000669		
1,2,3,7,8,9-HxCDD	0	4	0			0.000213					0.0003	0.0005
1,2,3,7,8-PeCDD	1	4	25	0.00095	0.00095	0.000375		0.0002	0.000425	0.000845	0.0003	0.0005
2,3,7,8-TCDD	3	4	75	0.00046	0.00086	0.000513	0.000225	0.00047	0.000575	0.000803	0.0005	0.0005
Total HpCDD	4	4	100	0.0023	0.0074	0.0049	0.00283	0.00495	0.00733	0.00739		
Total HxCDD	4	4	100	0.00058	0.0016	0.000878	0.000483	0.000665	0.000903	0.00146		
Total PeCDD	1	4	25	0.00095	0.00095	0.000375		0.0002	0.000425	0.000845	0.0003	0.0005
Total TCDD	3	4	75	0.00048	0.0012	0.0007	0.00036	0.000675	0.000953	0.00115	0.0005	0.0005
Furans (ug/kg)												
1,2,3,4,6,7,8,9-OCDF	3	4	75	0.0014	0.018	0.00533	0.00953	0.0015	0.0057	0.0155	0.0006	0.0006
1,2,3,4,6,7,8-HpCDF	1	4	25	0.0016	0.0016	0.000513		0.000175	0.00055	0.00139	0.0002	0.0004
1,2,3,4,7,8,9-HpCDF	0	4	0			0.000275					0.0003	0.0007
1,2,3,4,7,8-HxCDF	3	4	75	0.00023	0.00057	0.000338	0.00017	0.000315	0.000443	0.000545	0.0003	0.0003
1,2,3,6,7,8-HxCDF	0	4	0			0.000125					0.0002	0.0003
1,2,3,7,8,9-HxCDF	0	4	0			0.000163					0.0002	0.0004
1,2,3,7,8-PeCDF	0	4	0			0.00015					0.0002	0.0004
2,3,4,6,7,8-HxCDF	0	4	0			0.000138					0.0002	0.0004
2,3,4,7,8-PeCDF	0	4	0			0.000163					0.0002	0.0004
2,3,7,8-TCDF	3	4	75	0.00095	0.003	0.00138	0.0011	0.00113	0.00173	0.00275	0.0005	0.0005
Total HpCDF	2	4	50	0.0015	0.0067	0.00218	0.00368	0.0009	0.0028	0.00592	0.0004	0.0006
Total HxCDF	4	4	100	0.0017	0.0073	0.00378	0.00244	0.00305	0.00423	0.00669		
Total PeCDF	4	4	100	0.0062	0.012	0.00933	0.00242	0.00955	0.0106	0.0117		
Total TCDF	4	4	100	0.0107	0.0182	0.0134	0.00329	0.0124	0.014	0.0174		
Total TEQ	4	4	100	9.25E-05	0.0021331	0.00134	0.000858	0.00107	0.00145	0.00217	0.000437	0.001511

[1]Average and percentiles calculated assuming 1/2 detection limit for nondetects
[2]Standard deviation calculated for detected concentrations only

APPENDIX D

CALCULATION OF SITE-SPECIFIC BSAFs AND SEDIMENT-FISH TISSUE RELATIONSHIPS

Appendix D-1
Site Specific BSAFs and Sediment-Tissue Relationships

Site-Specific BAFs and BSAFs

Site-specific biota accumulation factors (BAFs) and site-specific biota to sediment accumulation factors (BSAFs) were calculated for forage fish and are presented in this appendix. A BAF is a ratio of the concentration of a compound in an organism to the concentration measured in sediment. BSAFs define the same relationship between the organism and sediment but take into account the fraction of lipid in the organism and fraction of organic carbon in the sediment. Table D-2 shows both the BAF and BSAF for each compound for each forage fish sample.

The final ratio presented and used in the risk assessment differs for nonpolar organic compounds and polar organics/metals. The final ratios are calculated as follows:

Nonpolar organic compounds:

$$\frac{Conc_{organism} / f_{lipid}}{Conc_{sed} / f_{oc}}$$

All other compounds (herbicides and metals):

$$\frac{Conc_{organism}}{Conc_{sed}}$$

where:

$Conc_{organism}$	=Concentration of compound in forage fish (wet weight)
f_{lipid}	=Fraction of lipid in forage fish (wet weight)
$Conc_{sed}$	=Concentration of compound in sediment (dry weight)
f_{oc}	=Fraction of organic carbon in sediment (dry weight)

BSAFs were calculated for each forage fish sample using an average sediment concentration from the area sampled (e.g., Creek Section B). These relationships were calculated if the compound was detected in both sediment and forage fish tissue. They were also calculated for compounds that were detected in forage fish tissue but not sediment (since detection in fish tissue indicated that uptake was occurring, and therefore, the compound must be present in sediment at a concentration below the detection limit). If the compound was not detected in sediment, one half the detection limit was used to calculate the site-specific BSAF.

Sediment-Fish Tissue Relationships

For certain compounds (aluminum, copper, mercury, zinc, PCBs, dioxin TEQs), the relationship between sediment concentrations and fish concentrations were evaluated by plotting the data and looking for trends. If a trend was apparent, the linear regression was evaluated using Statistica software; this evaluation is presented in Appendix D-3. Of the listed compounds, aluminum and mercury did not have a strong or statistically significant relationship between sediment concentration and forage fish tissue concentration.

Appendix D-2
Calculated Bioaccumulation Factors for Forage Fish based on Sediment Data from 1999 2000
Dead Creek
Sauget Area I

Compounds	F.F. BP COMP 1 BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration	F.F. BP COMP 2 BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration
1,1,1-Trichloroethane	NA	NA	0		NA	NA	0	
1,1,2,2-Tetrachloroethane	NA	NA	0		NA	NA	0	
1,1,2-Trichloroethane	NA	NA	0		NA	NA	0	
1,1-Dichloroethane	NA	NA	0		NA	NA	0	
1,1-Dichloroethene	NA	NA	0		NA	NA	0	
1,2,3,4,6,7,8,9-OCDD	0.000645	0.00208	100	17.25	0.00195	0.00523	100	17.25
1,2,3,4,6,7,8,9-OCDF	0.008	0.0258	100	0.756	ND	ND	100	0.756
1,2,3,4,6,7,8-HpCDD	0.00325	0.0105	100	0.443	0.00488	0.0131	100	0.443
1,2,3,4,6,7,8-HpCDF	0.00885	0.0285	100	0.159	ND	ND	100	0.159
1,2,3,4,7,8,9-HpCDF	0.0624	0.201	100	0.0117	ND	ND	100	0.0117
1,2,3,4,7,8-HxCDD	ND	ND	67	0.0049	ND	ND	67	0.0049
1,2,3,4,7,8-HxCDF	0.108	0.347	100	0.0092	ND	ND	100	0.0092
1,2,3,6,7,8-HxCDD	0.0484	0.156	100	0.0162	ND	ND	100	0.0162
1,2,3,6,7,8-HxCDF	ND	ND	100	0.0059	ND	ND	100	0.0059
1,2,3,7,8,9-HxCDD	ND	ND	100	0.0173	ND	ND	100	0.0173
1,2,3,7,8,9-HxCDF	ND	ND	100	0.006	ND	ND	100	0.006
1,2,3,7,8-PeCDD	ND	ND	100	0.0035	ND	ND	100	0.0035
1,2,3,7,8-PeCDF	ND	ND	67	0.0027	ND	ND	67	0.0027
1,2,4-Trichlorobenzene	ND	ND	0		ND	ND	0	
1,2-Dichlorobenzene	ND	ND	0		ND	ND	0	
1,2-Dichloroethane	NA	NA	0		NA	NA	0	
1,2-Dichloropropane	NA	NA	0		NA	NA	0	
1,3-Dichlorobenzene	ND	ND	0		ND	ND	0	
1,4-Dichlorobenzene	ND	ND	0		ND	ND	0	
2,2'-Oxybis(1-chloropropane) bis(	ND	ND	0		ND	ND	0	
2,3,4,6,7,8-HxCDF	ND	ND	100	0.0073	ND	ND	100	0.0073
2,3,4,7,8-PeCDF	0.125	0.403	100	0.0042	ND	ND	100	0.0042
2,3,7,8-TCDD	0.134	0.432	100	0.0122	ND	ND	100	0.0122
2,3,7,8-TCDF	0.909	2.93	100	0.01015	0.536	1.44	100	0.01015
2,4,5-T	ND	ND	0		ND	ND	0	
2,4,5-TP (Silvex)	ND	ND	0		ND	ND	0	
2,4,5-Trichlorophenol	ND	ND	0		ND	ND	0	
2,4,6-Trichlorophenol	ND	ND	0		ND	ND	0	
2,4-D	ND	ND	67	11	ND	ND	67	11
2,4-DB	0.855	2.75	0		0.556	1.49	0	
2,4-Dichlorophenol	ND	ND	0		ND	ND	0	
2,4-Dimethylphenol	ND	ND	0		ND	ND	0	
2,4-Dinitrophenol	ND	ND	0		ND	ND	0	
2,4-Dinitrotoluene	ND	ND	0		ND	ND	0	
2,6-Dinitrotoluene	ND	ND	0		ND	ND	0	
2-Chloronaphthalene	ND	ND	0		ND	ND	0	
2-Chlorophenol	ND	ND	0		ND	ND	0	
2-Hexanone	NA	NA	0		NA	NA	0	
2-Methylnaphthalene	ND	ND	0		ND	ND	0	
2-Methylphenol (o-cresol)	ND	ND	0		ND	ND	0	
2-Nitroaniline	ND	ND	0		ND	ND	0	
2-Nitrophenol	ND	ND	0		ND	ND	0	
3,3'-Dichlorobenzidine	ND	ND	0		ND	ND	0	
3&4-Methylphenol (m&p-cresol)	ND	ND	0		ND	ND	0	
3-Nitroaniline	ND	ND	0		ND	ND	0	
4,4'-DDD	ND	ND	0		ND	ND	0	
4,4'-DDE	2.08	6.7	100	3.2	4.62	12.4	100	3.2
4,4'-DDT	ND	ND	67	1.4	ND	ND	67	1.4
4,6-Dinitro-2-methylphenol	ND	ND	0		ND	ND	0	
4-Bromophenylphenyl ether	ND	ND	0		ND	ND	0	
4-Chloro-3-methylphenol	ND	ND	0		ND	ND	0	
4-Chloroaniline	ND	ND	0		ND	ND	0	
4-Chlorophenylphenyl ether	ND	ND	0		ND	ND	0	
4-Methyl-2-pentanone (MIBK)	NA	NA	0		NA	NA	0	
4-Nitroaniline	ND	ND	0		ND	ND	0	
4-Nitrophenol	ND	ND	0		ND	ND	0	
Acenaphthene	ND	ND	0		ND	ND	0	
Acenaphthylene	ND	ND	0		ND	ND	0	
Acetone	NA	NA	0		NA	NA	0	
Aldrin	ND	ND	0		ND	ND	0	
Alpha Chlordane	ND	ND	100	3.2	ND	ND	100	3.2
alpha-BHC	ND	ND	0		ND	ND	0	
Aluminum	0.00175	0.00564	100	16000	0.0038	0.0102	100	16000
Anthracene	ND	ND	0		ND	ND	0	
Antimony	ND	ND	67	1.9	ND	ND	67	1.9
Arsenic	ND	ND	100	17	ND	ND	100	17
Barium	NA	NA	100	420	NA	NA	100	420
Benzene	NA	NA	0		NA	NA	0	
Benzo(a)anthracene	ND	ND	0		ND	ND	0	
Benzo(a)pyrene	ND	ND	0		ND	ND	0	
Benzo(b)fluoranthene	ND	ND	0		ND	ND	0	
Benzo(g,h,i)perylene	ND	ND	0		ND	ND	0	
Benzo(k)fluoranthene	ND	ND	0		ND	ND	0	
Beryllium	ND	ND	100	0.82	ND	ND	100	0.82
beta-BHC	ND	ND	0		ND	ND	0	
bis(2-Chloroethoxy)methane	ND	ND	0		ND	ND	0	
bis(2-Chloroethyl)ether	ND	ND	0		ND	ND	0	
bis(2-Ethylhexyl)phthalate	0.625	2.01	0		0.958	2.57	0	
Bromodichloromethane	NA	NA	0		NA	NA	0	
Bromoform	NA	NA	0		NA	NA	0	

Appendix D-2
Calculated Bioaccumulation Factors for Forage Fish based on Sediment Data from 1999 2000
Dead Creek
Sauget Area I

Compounds	F.F. BP COMP 1 BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration	F.F. BP COMP 2 BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration
Bromomethane (Methyl bromide)	NA	NA	0		NA	NA	0	
Butylbenzylphthalate	ND	ND	0		ND	ND	0	
Cadmium	ND	ND	100	2.7	ND	ND	100	2.7
Calcium	NA	NA	100	16500	NA	NA	100	16500
Carbazole	ND	ND	0		ND	ND	0	
Carbon disulfide	NA	NA	0		NA	NA	0	
Carbon tetrachloride	NA	NA	0		NA	NA	0	
Chlorobenzene	NA	NA	0		NA	NA	0	
Chloroethane	NA	NA	0		NA	NA	0	
Chloroform	NA	NA	0		NA	NA	0	
Chloromethane	NA	NA	0		NA	NA	0	
Chromium	0.0147	0.0475	100	26	0.0138	0.0371	100	26
Chrysene	ND	ND	0		ND	ND	0	
Cis/Trans-1,2-Dichloroethene	NA	NA	0		NA	NA	0	
cis-1,3-Dichloropropene	NA	NA	0		NA	NA	0	
Cobalt	NA	NA	100	10	NA	NA	100	10
Copper	0.0103	0.0332	100	64	0.0161	0.0432	100	64
Cyanide, Total	ND	ND	0		ND	ND	0	
Dalapon	ND	ND	0		ND	ND	0	
Decachlorobiphenyl	ND	ND	0		ND	ND	0	
delta-BHC	ND	ND	0		ND	ND	0	
Dibenzo(a,h)anthracene	ND	ND	0		0.378	1.01	0	
Dibenzofuran	ND	ND	0		ND	ND	0	
Dibromochloromethane	NA	NA	0		NA	NA	0	
Dicamba	0.0922	0.297	0		ND	ND	0	
Dichlorobiphenyl	ND	ND	0		ND	ND	0	
Dichloroprop	0.0479	0.154	0		ND	ND	0	
Dieldrin	ND	ND	67	0.5	ND	ND	67	0.5
Diethylphthalate	0.0792	0.255	0		0.154	0.414	0	
Dimethylphthalate	ND	ND	0		ND	ND	0	
Di-n-butylphthalate	ND	ND	0		ND	ND	0	
Di-n-octylphthalate	ND	ND	0		ND	ND	0	
Dinoseb	ND	ND	0		ND	ND	0	
Endosulfan I	ND	ND	100	2.8	ND	ND	100	2.8
Endosulfan II	ND	ND	0		ND	ND	0	
Endosulfan sulfate	ND	ND	67	1.4	ND	ND	67	1.4
Endrin	ND	ND	0		ND	ND	0	
Endrin aldehyde	ND	ND	100	2.2	ND	ND	100	2.2
Endrin ketone	ND	ND	33	0.715	ND	ND	33	0.715
Ethylbenzene	NA	NA	0		NA	NA	0	
Fluoranthene	ND	ND	0		ND	ND	0	
Fluorene	ND	ND	0		ND	ND	0	
Gamma Chlordane	ND	ND	67	3	ND	ND	67	3
gamma-BHC (Lindane)	ND	ND	33	0.16	ND	ND	33	0.16
Heptachlor	ND	ND	0		ND	ND	0	
Heptachlor epoxide	ND	ND	33	0.2	ND	ND	33	0.2
Heptachlorobiphenyl	ND	ND	0		ND	ND	0	
Hexachlorobenzene	ND	ND	0		ND	ND	0	
Hexachlorobiphenyl	2.28	7.33	0		1.96	5.27	0	
Hexachlorobutadiene	ND	ND	0		ND	ND	0	
Hexachlorocyclopentadiene	ND	ND	0		ND	ND	0	
Hexachloroethane	ND	ND	0		ND	ND	0	
Indeno(1,2,3-cd)pyrene	ND	ND	0		0.225	0.604	0	
Iron	NA	NA	100	38000	NA	NA	100	38000
Isophorone	ND	ND	0		ND	ND	0	
Lead	ND	ND	100	58	ND	ND	100	58
Magnesium	NA	NA	100	5600	NA	NA	100	5600
Manganese	NA	NA	100	1400	NA	NA	100	1400
MCPA_(4-chloro-2-methylphenoxy	1.1	3.54	0		1.17	3.14	0	
MCPP_2-(4-chloro-2-methylphenc	ND	ND	0		ND	ND	0	
Mercury	0.419	1.35	100	0.16	4.84	13	100	0.16
Methoxychlor	ND	ND	0		ND	ND	0	
Methylene chloride (Dichlorometha	NA	NA	0		NA	NA	0	
Molybdenum	NA	NA	100	0.92	NA	NA	100	0.92
Monochlorobiphenyl	ND	ND	0		ND	ND	0	
Naphthalene	ND	ND	0		ND	ND	0	
Nickel	ND	ND	100	54	ND	ND	100	54
Nitrobenzene	ND	ND	0		ND	ND	0	
n-Nitrosodi-n-propylamine	ND	ND	0		ND	ND	0	
N-Nitrosodiphenylamine/Diphenyla	ND	ND	0		ND	ND	0	
Nonachlorobiphenyl	ND	ND	0		ND	ND	0	
Octachlorobiphenyl	ND	ND	0		ND	ND	0	
Pentachlorobiphenyl	0.9	2.9	0		ND	ND	0	
Pentachlorophenol	0.00272	0.00877	0		0.00124	0.00332	0	
pH	NA	NA	100	7.06	NA	NA	100	7.06
Phenanthrene	ND	ND	0		ND	ND	0	
Phenol	ND	ND	0		ND	ND	0	
Potassium	NA	NA	100	2200	NA	NA	100	2200
Pyrene	ND	ND	0		ND	ND	0	
Selenium	0.394	1.27	0		ND	ND	0	
Silver	ND	ND	33	0.79	ND	ND	33	0.79
Sodium	NA	NA	0		NA	NA	0	
Styrene	NA	NA	0		NA	NA	0	
Tetrachlorobiphenyl	ND	ND	0		ND	ND	0	
Tetrachloroethene	NA	NA	0		NA	NA	0	

Appendix D-2
Calculated Bioaccumulation Factors for Forage Fish based on Sediment Data from 1999 2000
Dead Creek
Sauget Area I

Compounds	F.F. BP COMP 1 BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration	F.F. BP COMP 2 BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration
Thallium	NA	NA	0		NA	NA	0	
Toluene	NA	NA	0		NA	NA	0	
Total HpCDD	0.00151	0.00485	100	0.932	0.00351	0.00943	100	0.932
Total HpCDF	0.0194	0.0625	67	0.599	0.0058	0.0156	67	0.599
Total HxCDD	0.00839	0.027	0		ND	ND	0	
Total HxCDF	0.276	0.888	0		0.146	0.392	0	
Total PeCDD	ND	ND	0		ND	ND	0	
Total PeCDF	0.955	3.07	0		0.535	1.44	0	
Total TCDD	0.0308	0.0991	0		ND	ND	0	
Total TCDF	0.623	2.01	0		0.352	0.944	0	
Toxaphene	ND	ND	0		ND	ND	0	
trans-1,3-Dichloropropene	NA	NA	0		NA	NA	0	
Trichlorobiphenyl	ND	ND	0		ND	ND	0	
Trichloroethene	NA	NA	0		NA	NA	0	
Vanadium	NA	NA	100	40	NA	NA	100	40
Vinyl chloride	NA	NA	0		NA	NA	0	
Xylenes, Total	NA	NA	0		NA	NA	0	
Zinc	0.0779	0.251	100	370	0.107	0.288	100	370

Appendix D-2
Calculated Bioaccumulation Factors for Forage Fish based on Sediment Data from 1999 2000
Dead Creek
Sauget Area I

Compounds	F.F. BP COMP 3 BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration	F.F. CS B COMP 1 BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration
1,1,1-Trichloroethane	NA	NA	0		NA	NA	0	
1,1,2,2-Tetrachloroethane	NA	NA	0		NA	NA	0	
1,1,2-Trichloroethane	NA	NA	0		NA	NA	0	
1,1-Dichloroethane	NA	NA	0		NA	NA	0	
1,1-Dichloroethene	NA	NA	0		NA	NA	0	
1,2,3,4,6,7,8,9-OCDD	0.00172	0.00521	100	17.25	0.000718	0.00527	100	3420
1,2,3,4,6,7,8,9-OCDF	0.00236	0.00714	100	0.756	0.000818	0.006	100	1130
1,2,3,4,6,7,8-HpCDD	0.00434	0.0131	100	0.443	0.000815	0.00598	100	397
1,2,3,4,6,7,8-HpCDF	ND	ND	100	0.159	0.000842	0.00618	100	188
1,2,3,4,7,8,9-HpCDF	ND	ND	100	0.0117	0.000882	0.00647	100	13.1
1,2,3,4,7,8-HxCDD	ND	ND	67	0.0049	0.00323	0.0237	100	2.31
1,2,3,4,7,8-HxCDF	0.0573	0.173	100	0.0092	0.00226	0.0166	100	6.41
1,2,3,6,7,8-HxCDD	ND	ND	100	0.0162	0.00379	0.0278	100	13.2
1,2,3,6,7,8-HxCDF	ND	ND	100	0.0059	0.00236	0.0173	100	2.54
1,2,3,7,8,9-HxCDD	ND	ND	100	0.0173	0.0019	0.014	100	7.54
1,2,3,7,8,9-HxCDF	ND	ND	100	0.006	ND	ND	100	0.119
1,2,3,7,8-PeCDD	ND	ND	100	0.0035	0.0149	0.109	100	1.97
1,2,3,7,8-PeCDF	ND	ND	67	0.0027	0.00922	0.0676	100	0.842
1,2,4-Trichlorobenzene	ND	ND	0		ND	ND	33	770
1,2-Dichlorobenzene	ND	ND	0		ND	ND	33	370
1,2-Dichloroethane	NA	NA	0		NA	NA	0	
1,2-Dichloropropane	NA	NA	0		NA	NA	0	
1,3-Dichlorobenzene	ND	ND	0		ND	ND	0	
1,4-Dichlorobenzene	ND	ND	0		ND	ND	67	1000
2,2'-Oxybis(1-chloropropane)_bis(	ND	ND	0		ND	ND	0	
2,3,4,6,7,8-HxCDF	ND	ND	100	0.0073	0.00233	0.0171	100	3.91
2,3,4,7,8-PeCDF	ND	ND	100	0.0042	0.0139	0.102	100	1.28
2,3,7,8-TCDD	ND	ND	100	0.0122	0.0707	0.519	33	0.264
2,3,7,8-TCDF	0.606	1.83	100	0.01015	0.179	1.31	100	0.811
2,4,5-T	ND	ND	0		NA	NA	0	
2,4,5-TP (Silvex)	ND	ND	0		NA	NA	0	
2,4,5-Trichlorophenol	ND	ND	0		ND	ND	0	
2,4,6-Trichlorophenol	ND	ND	0		ND	ND	0	
2,4-D	ND	ND	67	11	NA	NA	0	
2,4-DB	ND	ND	0		NA	NA	0	
2,4-Dichlorophenol	ND	ND	0		ND	ND	0	
2,4-Dimethylphenol	ND	ND	0		ND	ND	0	
2,4-Dinitrophenol	ND	ND	0		ND	ND	0	
2,4-Dinitrotoluene	ND	ND	0		ND	ND	0	
2,6-Dinitrotoluene	ND	ND	0		ND	ND	0	
2-Chloronaphthalene	ND	ND	0		ND	ND	0	
2-Chlorophenol	ND	ND	0		ND	ND	0	
2-Hexanone	NA	NA	0		NA	NA	33	21
2-Methylnaphthalene	ND	ND	0		ND	ND	0	
2-Methylphenol (o-cresol)	ND	ND	0		ND	ND	0	
2-Nitroaniline	ND	ND	0		ND	ND	0	
2-Nitrophenol	ND	ND	0		ND	ND	0	
3,3'-Dichlorobenzidine	ND	ND	0		ND	ND	0	
3&4-Methylphenol (m&p-cresol)	ND	ND	0		ND	ND	0	
3-Nitroaniline	ND	ND	0		ND	ND	0	
4,4'-DDD	ND	ND	0		NA	NA	33	150
4,4'-DDE	5.08	15.3	100	3.2	NA	NA	0	
4,4'-DDT	ND	ND	67	1.4	NA	NA	0	
4,6-Dinitro-2-methylphenol	ND	ND	0		ND	ND	0	
4-Bromophenylphenyl ether	ND	ND	0		ND	ND	0	
4-Chloro-3-methylphenol	ND	ND	0		ND	ND	0	
4-Chloroaniline	ND	ND	0		ND	ND	33	830
4-Chlorophenylphenyl ether	ND	ND	0		ND	ND	0	
4-Methyl-2-pentanone (MIBK)	NA	NA	0		NA	NA	0	
4-Nitroaniline	ND	ND	0		ND	ND	0	
4-Nitrophenol	ND	ND	0		ND	ND	0	
Acenaphthene	ND	ND	0		ND	ND	0	
Acenaphthylene	ND	ND	0		ND	ND	0	
Acetone	NA	NA	0		NA	NA	0	
Aldrin	ND	ND	0		NA	NA	100	1100
Alpha Chlordane	ND	ND	100	3.2	NA	NA	0	
alpha-BHC	ND	ND	0		NA	NA	0	
Aluminum	0.00321	0.0097	100	16000	0.00109	0.00803	100	12000
Anthracene	ND	ND	0		ND	ND	0	
Antimony	ND	ND	67	1.9	ND	ND	100	8.9
Arsenic	ND	ND	100	17	ND	ND	100	38
Barium	NA	NA	100	420	NA	NA	100	3300
Benzene	NA	NA	0		NA	NA	0	
Benzo(a)anthracene	ND	ND	0		ND	ND	100	870
Benzo(a)pyrene	ND	ND	0		ND	ND	100	1200
Benzo(b)fluoranthene	ND	ND	0		ND	ND	100	2000
Benzo(g,h,i)perylene	ND	ND	0		ND	ND	100	1600
Benzo(k)fluoranthene	ND	ND	0		ND	ND	100	1600
Beryllium	ND	ND	100	0.82	ND	ND	0	
beta-BHC	ND	ND	0		NA	NA	0	
bis(2-Chloroethoxy)methane	ND	ND	0		ND	ND	0	
bis(2-Chloroethyl)ether	ND	ND	0		ND	ND	0	
bis(2-Ethylhexyl)phthalate	ND	ND	0		ND	ND	33	3000
Bromodichloromethane	NA	NA	0		NA	NA	0	
Bromoform	NA	NA	0		NA	NA	0	

Appendix D-2
Calculated Bioaccumulation Factors for Forage Fish based on Sediment Data from 1999 2000
Dead Creek
Sauget Area I

Compounds	F.F. BP COMP 3 BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration	F.F. CS B COMP 1 BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration
Bromomethane (Methyl bromide)	NA	NA	0		NA	NA	0	
Butylbenzylphthalate	ND	ND	0		ND	ND	0	
Cadmium	ND	ND	100	2.7	ND	ND	100	25
Calcium	NA	NA	100	16500	NA	NA	100	180000
Carbazole	ND	ND	0		ND	ND	0	
Carbon disulfide	NA	NA	0		NA	NA	0	
Carbon tetrachloride	NA	NA	0		NA	NA	0	
Chlorobenzene	NA	NA	0		NA	NA	100	51.5
Chloroethane	NA	NA	0		NA	NA	0	
Chloroform	NA	NA	0		NA	NA	0	
Chloromethane	NA	NA	0		NA	NA	0	
Chromium	0.012	0.0362	100	26	0.00613	0.045	100	78
Chrysene	ND	ND	0		ND	ND	100	1800
Cis/Trans-1,2-Dichloroethene	NA	NA	0		NA	NA	0	
cis-1,3-Dichloropropene	NA	NA	0		NA	NA	0	
Cobalt	NA	NA	100	10	NA	NA	100	12
Copper	0.0351	0.106	100	64	0.0012	0.00878	100	11000
Cyanide, Total	ND	ND	0		ND	ND	0	
Dalapon	ND	ND	0		NA	NA	0	
Decachlorobiphenyl	ND	ND	0		ND	ND	67	3400
delta-BHC	ND	ND	0		NA	NA	0	
Dibenzo(a,h)anthracene	ND	ND	0		ND	ND	0	
Dibenzofuran	ND	ND	0		ND	ND	0	
Dibromochloromethane	NA	NA	0		NA	NA	0	
Dicamba	ND	ND	0		NA	NA	0	
Dichlorobiphenyl	ND	ND	0		ND	ND	67	640
Dichloroprop	ND	ND	0		NA	NA	0	
Dieldrin	ND	ND	67	0.5	NA	NA	0	
Diethylphthalate	0.15	0.453	0		0.0689	0.505	0	
Dimethylphthalate	ND	ND	0		ND	ND	0	
Di-n-butylphthalate	ND	ND	0		ND	ND	0	
Di-n-octylphthalate	ND	ND	0		ND	ND	0	
Dinoseb	ND	ND	0		NA	NA	0	
Endosulfan I	ND	ND	100	2.8	NA	NA	0	
Endosulfan II	ND	ND	0		NA	NA	0	
Endosulfan sulfate	ND	ND	67	1.4	NA	NA	100	130
Endrin	ND	ND	0		NA	NA	0	
Endrin aldehyde	ND	ND	100	2.2	NA	NA	33	520
Endrin ketone	ND	ND	33	0.715	NA	NA	0	
Ethylbenzene	NA	NA	0		NA	NA	0	
Fluoranthene	ND	ND	0		ND	ND	100	2000
Fluorene	ND	ND	0		ND	ND	0	
Gamma Chlordane	ND	ND	67	3	NA	NA	33	720
gamma-BHC (Lindane)	ND	ND	33	0.16	NA	NA	0	
Heptachlor	ND	ND	0		NA	NA	33	500
Heptachlor epoxide	ND	ND	33	0.2	NA	NA	33	0.2
Heptachlorobiphenyl	ND	ND	0		0.182	1.33	100	5300
Hexachlorobenzene	ND	ND	0		ND	ND	0	
Hexachlorobiphenyl	ND	ND	0		0.0926	0.679	100	21000
Hexachlorobutadiene	ND	ND	0		ND	ND	0	
Hexachlorocyclopentadiene	ND	ND	0		ND	ND	0	
Hexachloroethane	ND	ND	0		ND	ND	0	
Indeno(1,2,3-cd)pyrene	ND	ND	0		ND	ND	67	1300
Iron	NA	NA	100	38000	NA	NA	100	29000
Isophorone	ND	ND	0		ND	ND	0	
Lead	0.0123	0.0373	100	58	0.00143	0.0105	100	1000
Magnesium	NA	NA	100	5600	NA	NA	100	20000
Manganese	NA	NA	100	1400	NA	NA	100	245
MCPA_(4-chloro-2-methylphenoxy	ND	ND	0		NA	NA	0	
MCPP_2-(4-chloro-2-methylphenc	ND	ND	0		NA	NA	0	
Mercury	ND	ND	100	0.16	ND	ND	100	1.5
Methoxychlor	ND	ND	0		NA	NA	0	
Methylene chloride (Dichlorometha	NA	NA	0		NA	NA	0	
Molybdenum	NA	NA	100	0.92	NA	NA	100	7
Monochlorobiphenyl	ND	ND	0		ND	ND	0	
Naphthalene	ND	ND	0		ND	ND	33	380
Nickel	ND	ND	100	54	ND	ND	100	500
Nitrobenzene	ND	ND	0		ND	ND	0	
n-Nitrosodi-n-propylamine	ND	ND	0		ND	ND	0	
N-Nitrosodiphenylamine/Diphenyla	ND	ND	0		ND	ND	0	
Nonachlorobiphenyl	ND	ND	0		ND	ND	0	
Octachlorobiphenyl	ND	ND	0		0.111	0.815	33	1800
Pentachlorobiphenyl	ND	ND	0		0.0595	0.436	100	66000
Pentachlorophenol	ND	ND	0		ND	ND	100	220
pH	NA	NA	100	7.06	NA	NA	100	6.72
Phenanthrene	ND	ND	0		ND	ND	100	930
Phenol	ND	ND	0		ND	ND	0	
Potassium	NA	NA	100	2200	NA	NA	100	2400
Pyrene	ND	ND	0		ND	ND	100	2400
Selenium	0.387	1.17	0		ND	ND	100	5.1
Silver	ND	ND	33	0.79	ND	ND	100	15
Sodium	NA	NA	0		NA	NA	0	
Styrene	NA	NA	0		NA	NA	0	
Tetrachlorobiphenyl	ND	ND	0		0.0547	0.401	100	98000
Tetrachloroethene	NA	NA	0		NA	NA	0	

Appendix D-2
Calculated Bioaccumulation Factors for Forage Fish based on Sediment Data from 1999 2000
Dead Creek
Sauget Area I

	F.F. BP COMP 3				F.F. CS B COMP 1			
Compounds	BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration	BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration
Thallium	NA	NA	0		NA	NA	33	2.1
Toluene	NA	NA	0		NA	NA	33	20
Total HpCDD	0.00326	0.00985	100	0.932	0.000788	0.00578	100	722
Total HpCDF	0.00522	0.0158	67	0.599	0.0013	0.00951	67	519
Total HxCDD	ND	ND	0		0.00364	0.0267	0	
Total HxCDF	0.148	0.447	0		0.00441	0.0323	0	
Total PeCDD	ND	ND	0		0.0195	0.143	0	
Total PeCDF	0.429	1.3	0		0 0162	0.119	0	
Total TCDD	ND	ND	0		0.00684	0.0502	0	
Total TCDF	0.359	1.08	0		0.046	0.337	0	
Toxaphene	ND	ND	0		NA	NA	0	
trans-1,3-Dichloropropene	NA	NA	0		NA	NA	0	
Trichlorobiphenyl	ND	ND	0		0.0299	0.219	100	30000
Trichloroethene	NA	NA	0		NA	NA	0	
Vanadium	NA	NA	100	40	NA	NA	100	41
Vinyl chloride	NA	NA	0		NA	NA	0	
Xylenes, Total	NA	NA	0		NA	NA	0	
Zinc	0.104	0 314	100	370	0.00952	0.0699	100	7900

Appendix D-2
Calculated Bioaccumulation Factors for Forage Fish based on Sediment Data from 1999 2000
Dead Creek
Sauget Area I

Compounds	F.F. CS-D COMP 1 BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration	F.F. REF 1 COMP 1 BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration
1,1,1-Trichloroethane	NA	NA	0		NA	NA	0	
1,1,2,2-Tetrachloroethane	NA	NA	0		NA	NA	0	
1,1,2-Trichloroethane	NA	NA	0		NA	NA	0	
1,1-Dichloroethane	NA	NA	0		NA	NA	0	
1,1-Dichloroethene	NA	NA	0		NA	NA	0	
1,2,3,4,6,7,8,9-OCDD	0.00132	0.006	100	209	0.0053	0.00357	100	4.95
1,2,3,4,6,7,8,9-OCDF	0.00102	0.00462	100	64	0.0121	0.00816	100	0.136
1,2,3,4,6,7,8-HpCDD	0.00157	0.00711	100	21.5	0.0113	0.00762	100	0.162
1,2,3,4,6,7,8-HpCDF	0.00158	0.00719	100	12.1	ND	ND	100	0.0307
1,2,3,4,7,8,9-HpCDF	0.00263	0.0119	100	0.538	ND	ND	50	0.003
1,2,3,4,7,8-HxCDD	0.012	0.0545	100	0.107	ND	ND	100	0.0018
1,2,3,4,7,8-HxCDF	0.0119	0.0538	100	0.297	0.207	0.139	50	0.0029
1,2,3,6,7,8-HxCDD	0.0145	0.0657	100	0.587	0.129	0.0868	100	0.0046
1,2,3,6,7,8-HxCDF	0.0068	0.0309	100	0.178	ND	ND	0	
1,2,3,7,8,9-HxCDD	0.00529	0.024	100	0.363	ND	ND	100	0.0048
1,2,3,7,8,9-HxCDF	ND	ND	100	0.009	ND	ND	0	
1,2,3,7,8-PeCDD	0.0449	0.204	100	0.0811	ND	ND	0	
1,2,3,7,8-PeCDF	ND	ND	100	0.0575	ND	ND	0	
1,2,4-Trichlorobenzene	ND	ND	0		ND	ND	0	
1,2-Dichlorobenzene	ND	ND	0		ND	ND	0	
1,2-Dichloroethane	NA	NA	0		NA	NA	0	
1,2-Dichloropropane	NA	NA	0		NA	NA	0	
1,3-Dichlorobenzene	ND	ND	0		ND	ND	0	
1,4-Dichlorobenzene	ND	ND	0		ND	ND	0	
2,2'-Oxybis(1-chloropropane) bis(	ND	ND	0		ND	ND	0	
2,3,4,6,7,8-HxCDF	0.00688	0.0312	100	0.233	ND	ND	50	0.0018
2,3,4,7,8-PeCDF	0.0415	0.188	100	0.0792	ND	ND	0	
2,3,7,8-TCDD	0.247	1.12	33	0.0134	0.222	0.15	100	0.0035
2,3,7,8-TCDF	0.37	1.68	100	0.0983	2.22	1.5	100	0.0014
2,4,5-T	ND	ND	0		ND	ND	0	
2,4,5-TP (Silvex)	ND	ND	0		ND	ND	0	
2,4,5-Trichlorophenol	ND	ND	0		ND	ND	0	
2,4,6-Trichlorophenol	ND	ND	0		ND	ND	0	
2,4-D	ND	ND	0		ND	ND	50	12
2,4-DB	ND	ND	0		1.08	0.728	0	
2,4-Dichlorophenol	ND	ND	0		ND	ND	0	
2,4-Dimethylphenol	ND	ND	0		ND	ND	0	
2,4-Dinitrophenol	ND	ND	0		ND	ND	0	
2,4-Dinitrotoluene	ND	ND	0		ND	ND	0	
2,6-Dinitrotoluene	ND	ND	100	65	ND	ND	50	40
2-Chloronaphthalene	ND	ND	0		ND	ND	0	
2-Chlorophenol	ND	ND	0		ND	ND	0	
2-Hexanone	NA	NA	0		NA	NA	0	
2-Methylnaphthalene	ND	ND	0		ND	ND	0	
2-Methylphenol (o-cresol)	ND	ND	0		ND	ND	0	
2-Nitroaniline	ND	ND	0		ND	ND	0	
2-Nitrophenol	ND	ND	0		ND	ND	0	
3,3'-Dichlorobenzidine	ND	ND	0		ND	ND	0	
3&4-Methylphenol (m&p-cresol)	ND	ND	0		ND	ND	0	
3-Nitroaniline	ND	ND	0		ND	ND	0	
4,4'-DDD	ND	ND	0		ND	ND	0	
4,4'-DDE	ND	ND	100	20	0.959	0.645	0	
4,4'-DDT	ND	ND	0		ND	ND	0	
4,6-Dinitro-2-methylphenol	ND	ND	0		ND	ND	0	
4-Bromophenylphenyl ether	ND	ND	0		ND	ND	0	
4-Chloro-3-methylphenol	ND	ND	0		ND	ND	0	
4-Chloroaniline	ND	ND	0		ND	ND	0	
4-Chlorophenylphenyl ether	ND	ND	0		ND	ND	0	
4-Methyl-2-pentanone (MIBK)	NA	NA	0		NA	NA	0	
4-Nitroaniline	ND	ND	0		ND	ND	0	
4-Nitrophenol	ND	ND	0		ND	ND	0	
Acenaphthene	ND	ND	0		ND	ND	0	
Acenaphthylene	ND	ND	0		ND	ND	0	
Acetone	NA	NA	100	190	NA	NA	50	160
Aldrin	ND	ND	100	11	ND	ND	0	
Alpha Chlordane	ND	ND	67	26	ND	ND	0	
alpha-BHC	ND	ND	0		ND	ND	0	
Aluminum	0.00157	0.00713	100	16000	0.000963	0.000648	100	15000
Anthracene	ND	ND	0		ND	ND	0	
Antimony	ND	ND	0		ND	ND	50	1.3
Arsenic	ND	ND	100	17	ND	ND	100	8
Barium	NA	NA	100	400	NA	NA	100	230
Benzene	NA	NA	0		NA	NA	0	
Benzo(a)anthracene	ND	ND	33	420	ND	ND	0	
Benzo(a)pyrene	ND	ND	33	560	ND	ND	0	
Benzo(b)fluoranthene	ND	ND	100	970	ND	ND	0	
Benzo(g,h,i)perylene	ND	ND	33	660	ND	ND	0	
Benzo(k)fluoranthene	ND	ND	100	660	ND	ND	0	
Beryllium	ND	ND	0		ND	ND	100	0.8
beta-BHC	ND	ND	0		ND	ND	0	
bis(2-Chloroethoxy)methane	ND	ND	0		ND	ND	0	
bis(2-Chloroethyl)ether	ND	ND	0		ND	ND	0	
bis(2-Ethylhexyl)phthalate	0.0684	0.311	33	1200	0.904	0.609	0	
Bromodichloromethane	NA	NA	0		NA	NA	0	
Bromoform	NA	NA	0		NA	NA	0	

Appendix D-2
Calculated Bioaccumulation Factors for Forage Fish based on Sediment Data from 1999 2000
Dead Creek
Sauget Area I

	F.F. CS-D COMP 1				F.F. REF 1 COMP 1			
Compounds	BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration	BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration
Bromomethane (Methyl bromide)	NA	NA	0		NA	NA	0	
Butylbenzylphthalate	ND	ND	0		ND	ND	0	
Cadmium	ND	ND	100	15	ND	ND	100	0.38
Calcium	NA	NA	100	30000	NA	NA	100	18000
Carbazole	ND	ND	0		ND	ND	0	
Carbon disulfide	NA	NA	0		NA	NA	0	
Carbon tetrachloride	NA	NA	0		NA	NA	0	
Chlorobenzene	NA	NA	0		NA	NA	0	
Chloroethane	NA	NA	0		NA	NA	0	
Chloroform	NA	NA	0		NA	NA	0	
Chloromethane	NA	NA	0		NA	NA	0	
Chromium	0.00607	0.0275	100	67	0 0126	0.0085	100	21
Chrysene	ND	ND	100	790	ND	ND	0	
Cis/Trans-1,2-Dichloroethene	NA	NA	0		NA	NA	0	
cis-1,3-Dichloropropene	NA	NA	0		NA	NA	0	
Cobalt	NA	NA	100	12	NA	NA	100	9.8
Copper	0.00251	0.0114	100	740	0.0243	0.0164	100	20
Cyanide, Total	ND	ND	0		ND	ND	0	
Dalapon	ND	ND	0		ND	ND	0	
Decachlorobiphenyl	ND	ND	67	230	ND	ND	0	
delta-BHC	ND	ND	67	16	ND	ND	0	
Dibenzo(a,h)anthracene	0.0206	0.0933	0		ND	ND	0	
Dibenzofuran	ND	ND	0		ND	ND	0	
Dibromochloromethane	NA	NA	0		NA	NA	0	
Dicamba	ND	ND	33	13	ND	ND	0	
Dichlorobiphenyl	ND	ND	0		ND	ND	0	
Dichloroprop	ND	ND	0		0 0451	0 0304	0	
Dieldrin	ND	ND	0		1.29	0.867	0	
Diethylphthalate	0.0111	0 0504	0		0.0957	0.0644	0	
Dimethylphthalate	ND	ND	0		ND	ND	0	
Di-n-butylphthalate	ND	ND	0		ND	ND	0	
Di-n-octylphthalate	ND	ND	0		ND	ND	0	
Dinoseb	ND	ND	0		ND	ND	0	
Endosulfan I	ND	ND	0		ND	ND	0	
Endosulfan II	ND	ND	0		ND	ND	0	
Endosulfan sulfate	ND	ND	0		ND	ND	0	
Endrin	ND	ND	0		ND	ND	0	
Endrin aldehyde	ND	ND	33	16	ND	ND	0	
Endrin ketone	ND	ND	33	5.5	ND	ND	0	
Ethylbenzene	NA	NA	0		NA	NA	0	
Fluoranthene	ND	ND	100	1200	ND	ND	0	
Fluorene	ND	ND	0		ND	ND	0	
Gamma Chlordane	ND	ND	100	49	ND	ND	0	
gamma-BHC (Lindane)	ND	ND	0		ND	ND	0	
Heptachlor	ND	ND	0		ND	ND	0	
Heptachlor epoxide	ND	ND	0		ND	ND	0	
Heptachlorobiphenyl	0.361	1.64	0		ND	ND	0	
Hexachlorobenzene	ND	ND	0		ND	ND	0	
Hexachlorobiphenyl	1.53	6.93	100	400	ND	ND	0	
Hexachlorobutadiene	ND	ND	0		ND	ND	0	
Hexachlorocyclopentadiene	ND	ND	0		ND	ND	0	
Hexachloroethane	ND	ND	0		ND	ND	0	
Indeno(1,2,3-cd)pyrene	ND	ND	0		ND	ND	0	
Iron	NA	NA	100	25000	NA	NA	100	22000
Isophorone	ND	ND	0		ND	ND	0	
Lead	0.00218	0 0099	100	260	ND	ND	100	23
Magnesium	NA	NA	100	7500	NA	NA	100	6500
Manganese	NA	NA	100	320	NA	NA	100	770
MCPA_(4-chloro-2-methylphenoxy	ND	ND	0		1.08	0.724	0	
MCPP_2-(4-chloro-2-methylphenc	ND	ND	0		ND	ND	0	
Mercury	0.0426	0.193	100	0.5	0.952	0.641	100	0.063
Methoxychlor	ND	ND	0		ND	ND	0	
Methylene chloride (Dichlorometha	NA	NA	0		NA	NA	0	
Molybdenum	NA	NA	0		NA	NA	100	0 49
Monochlorobiphenyl	ND	ND	0		ND	ND	0	
Naphthalene	ND	ND	0		ND	ND	0	
Nickel	ND	ND	100	260	ND	ND	100	23
Nitrobenzene	ND	ND	0		ND	ND	0	
n-Nitrosodi-n-propylamine	ND	ND	0		ND	ND	0	
N-Nitrosodiphenylamine/Diphenyl	ND	ND	0		ND	ND	0	
Nonachlorobiphenyl	ND	ND	0		ND	ND	0	
Octachlorobiphenyl	ND	ND	0		ND	ND	0	
Pentachlorobiphenyl	1.07	4.85	100	520	ND	ND	0	
Pentachlorophenol	0.000773	0.00351	33	3.9	0.00382	0.00257	50	1.9
pH	NA	NA	100	6.84	NA	NA	100	7 31
Phenanthrene	ND	ND	33	410	ND	ND	0	
Phenol	ND	ND	0		ND	ND	0	
Potassium	NA	NA	100	3200	NA	NA	100	2300
Pyrene	ND	ND	100	1100	ND	ND	0	
Selenium	0.374	1.7	0		ND	ND	0	
Silver	ND	ND	0		ND	ND	0	
Sodium	NA	NA	0		NA	NA	0	
Styrene	NA	NA	0		NA	NA	0	
Tetrachlorobiphenyl	2.94	13.3	0		ND	ND	0	
Tetrachloroethene	NA	NA	0		NA	NA	0	

Appendix D-2

Calculated Bioaccumulation Factors for Forage Fish based on Sediment Data from 1999 2000

Dead Creek

Sauget Area I

Compounds	F.F. CS-D COMP 1 BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration	F.F. REF 1 COMP 1 BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration
Thallium	NA	NA	0		NA	NA	0	
Toluene	NA	NA	0		NA	NA	0	
Total HpCDD	0.00159	0.0072	100	39.3	0.00774	0.00521	100	0.347
Total HpCDF	0.00347	0.0158	33	32.6	0.0178	0.0119	50	0.113
Total HxCDD	0.0099	0.0449	0		0.024	0.0161	0	
Total HxCDF	0.0397	0.18	33	4.89	0.302	0.203	100	0 0252
Total PeCDD	0.0199	0.0905	0		ND	ND	0	
Total PeCDF	0.318	1.44	0		2 84	1.91	0	
Total TCDD	0.0185	0.0837	0		0.0588	0.0396	0	
Total TCDF	0.36	1.63	0		1.67	1.12	50	0.0145
Toxaphene	ND	ND	0		ND	ND	0	
trans-1,3-Dichloropropene	NA	NA	0		NA	NA	0	
Trichlorobiphenyl	0.323	1.46	0		ND	ND	0	
Trichloroethene	NA	NA	0		NA	NA	0	
Vanadium	NA	NA	100	51	NA	NA	100	36
Vinyl chloride	NA	NA	0		NA	NA	0	
Xylenes, Total	NA	NA	0		NA	NA	0	
Zinc	0 0227	0.103	100	2700	0.192	0.129	100	95

Appendix D-2
Calculated Bioaccumulation Factors for Forage Fish based on Sediment Data from 1999 2000
Dead Creek
Sauget Area I

	F.F. REF 2 COMP 1				F.F. REF 2 COMP 2			
Compounds	BAF	BSAFn	Detection Frequency In Sediment	Maximum Sediment Concentration	BAF	BSAFn	Detection Frequency In Sediment	Maximum Sediment Concentration
1,1,1-Trichloroethane	NA	NA	0		NA	NA	0	
1,1,2,2-Tetrachloroethane	NA	NA	0		NA	NA	0	
1,1,2-Trichloroethane	NA	NA	0		NA	NA	0	
1,1-Dichloroethane	NA	NA	0		NA	NA	0	
1,1-Dichloroethene	NA	NA	0		NA	NA	0	
1,2,3,4,6,7,8,9-OCDD	0.00839	0.0138	100	8.57	0.00372	0.00557	100	8.57
1,2,3,4,6,7,8,9-OCDF	0.297	0.489	100	0.107	0.0231	0.0346	100	0.107
1,2,3,4,6,7,8-HpCDD	0.0351	0.0579	100	0.14	0.0172	0.0257	100	0.14
1,2,3,4,6,7,8-HpCDF	0.0936	0.154	100	0.0283	ND	ND	100	0.0283
1,2,3,4,7,8,9-HpCDF	ND	ND	0		ND	ND	0	
1,2,3,4,7,8-HxCDD	ND	ND	50	0.0021	ND	ND	50	0.0021
1,2,3,4,7,8-HxCDF	0.329	0.544	50	0.003	ND	ND	50	0.003
1,2,3,6,7,8-HxCDD	0.181	0.298	100	0.004	0.184	0.275	100	0.004
1,2,3,6,7,8-HxCDF	ND	ND	50	0.0013	ND	ND	50	0.0013
1,2,3,7,8,9-HxCDD	ND	ND	100	0.00505	ND	ND	100	0.00505
1,2,3,7,8,9-HxCDF	ND	ND	0		ND	ND	0	
1,2,3,7,8-PeCDD	0.688	1.14	100	0.00145	ND	ND	100	0.00145
1,2,3,7,8-PeCDF	ND	ND	50	0.0011	ND	ND	50	0.0011
1,2,4-Trichlorobenzene	ND	ND	0		ND	ND	0	
1,2-Dichlorobenzene	ND	ND	0		ND	ND	0	
1,2-Dichloroethane	NA	NA	0		NA	NA	0	
1,2-Dichloropropane	NA	NA	0		NA	NA	0	
1,3-Dichlorobenzene	ND	ND	0		ND	ND	0	
1,4-Dichlorobenzene	ND	ND	0		ND	ND	0	
2,2'-Oxybis(1-chloropropane)_bis(	ND	ND	0		ND	ND	0	
2,3,4,6,7,8-HxCDF	ND	ND	50	0.0016	ND	ND	50	0.0016
2,3,4,7,8-PeCDF	ND	ND	50	0.0013	ND	ND	50	0.0013
2,3,7,8-TCDD	3.82	6.31	0		ND	ND	0	
2,3,7,8-TCDF	1.2	1.99	100	0.0014	ND	ND	100	0.0014
2,4,5-T	ND	ND	0		ND	ND	0	
2,4,5-TP (Silvex)	ND	ND	0		ND	ND	0	
2,4,5-Trichlorophenol	ND	ND	0		ND	ND	0	
2,4,6-Trichlorophenol	ND	ND	0		ND	ND	0	
2,4-D	ND	ND	0		ND	ND	0	
2,4-DB	ND	ND	0		ND	ND	0	
2,4-Dichlorophenol	ND	ND	0		ND	ND	0	
2,4-Dimethylphenol	ND	ND	0		ND	ND	0	
2,4-Dinitrophenol	ND	ND	0		ND	ND	0	
2,4-Dinitrotoluene	ND	ND	0		ND	ND	0	
2,6-Dinitrotoluene	ND	ND	100	14	ND	ND	100	14
2-Chloronaphthalene	ND	ND	0		ND	ND	0	
2-Chlorophenol	ND	ND	0		ND	ND	0	
2-Hexanone	NA	NA	0		NA	NA	0	
2-Methylnaphthalene	ND	ND	0		ND	ND	0	
2-Methylphenol (o-cresol)	ND	ND	0		ND	ND	0	
2-Nitroaniline	ND	ND	0		ND	ND	0	
2-Nitrophenol	ND	ND	0		ND	ND	0	
3,3'-Dichlorobenzidine	ND	ND	0		ND	ND	0	
3&4-Methylphenol (m&p-cresol)	ND	ND	0		ND	ND	0	
3-Nitroaniline	ND	ND	0		ND	ND	0	
4,4'-DDD	ND	ND	0		ND	ND	0	
4,4'-DDE	ND	ND	0		0.371	0.557	0	
4,4'-DDT	ND	ND	0		ND	ND	0	
4,6-Dinitro-2-methylphenol	ND	ND	0		ND	ND	0	
4-Bromophenylphenyl ether	ND	ND	0		ND	ND	0	
4-Chloro-3-methylphenol	ND	ND	0		ND	ND	0	
4-Chloroaniline	ND	ND	0		ND	ND	0	
4-Chlorophenylphenyl ether	ND	ND	0		ND	ND	0	
4-Methyl-2-pentanone (MIBK)	NA	NA	0		NA	NA	0	
4-Nitroaniline	ND	ND	0		ND	ND	0	
4-Nitrophenol	ND	ND	0		ND	ND	0	
Acenaphthene	ND	ND	0		ND	ND	0	
Acenaphthylene	ND	ND	0		ND	ND	0	
Acetone	NA	NA	100	52	NA	NA	100	52
Aldrin	ND	ND	0		ND	ND	0	
Alpha Chlordane	ND	ND	0		ND	ND	0	
alpha-BHC	ND	ND	0		ND	ND	0	
Aluminum	0.00516	0.00852	100	19000	0.00645	0.00968	100	19000
Anthracene	ND	ND	0		ND	ND	0	
Antimony	ND	ND	100	4	ND	ND	100	4
Arsenic	ND	ND	100	7	ND	ND	100	7
Barium	NA	NA	100	220	NA	NA	100	220
Benzene	NA	NA	0		NA	NA	0	
Benzo(a)anthracene	ND	ND	0		ND	ND	0	
Benzo(a)pyrene	ND	ND	0		ND	ND	0	
Benzo(b)fluoranthene	ND	ND	0		ND	ND	0	
Benzo(g,h,i)perylene	ND	ND	0		ND	ND	0	
Benzo(k)fluoranthene	ND	ND	0		ND	ND	0	
Beryllium	ND	ND	100	1	ND	ND	100	1
beta-BHC	ND	ND	0		ND	ND	0	
bis(2-Chloroethoxy)methane	ND	ND	0		ND	ND	0	
bis(2-Chloroethyl)ether	ND	ND	0		ND	ND	0	
bis(2-Ethylhexyl)phthalate	1.56	2.57	0		0.55	0.825	0	
Bromodichloromethane	NA	NA	0		NA	NA	0	
Bromoform	NA	NA	0		NA	NA	0	

Appendix D-2
Calculated Bioaccumulation Factors for Forage Fish based on Sediment Data from 1999 2000
Dead Creek
Sauget Area I

	F.F. REF 2 COMP 1				F.F. REF 2 COMP 2			
Compounds	BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration	BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration
Bromomethane (Methyl bromide)	NA	NA	0		NA	NA	0	
Butylbenzylphthalate	ND	ND	0		ND	ND	0	
Cadmium	ND	ND	100	0.65	ND	ND	100	0.65
Calcium	NA	NA	100	12000	NA	NA	100	12000
Carbazole	ND	ND	0		ND	ND	0	
Carbon disulfide	NA	NA	0		NA	NA	0	
Carbon tetrachloride	NA	NA	0		NA	NA	0	
Chlorobenzene	NA	NA	0		NA	NA	0	
Chloroethane	NA	NA	0		NA	NA	0	
Chloroform	NA	NA	0		NA	NA	0	
Chloromethane	NA	NA	0		NA	NA	0	
Chromium	0.021	0.0348	100	25	0.0224	0 0336	100	25
Chrysene	ND	ND	0		ND	ND	0	
Cis/Trans-1,2-Dichloroethene	NA	NA	0		NA	NA	0	
cis-1,3-Dichloropropene	NA	NA	0		NA	NA	0	
Cobalt	NA	NA	100	10	NA	NA	100	10
Copper	0.0215	0.0355	100	23	0.0385	0 0577	100	23
Cyanide, Total	ND	ND	0		ND	ND	0	
Dalapon	ND	ND	0		ND	ND	0	
Decachlorobiphenyl	ND	ND	0		ND	ND	0	
delta-BHC	ND	ND	0		ND	ND	0	
Dibenzo(a,h)anthracene	ND	ND	0		ND	ND	0	
Dibenzofuran	ND	ND	0		ND	ND	0	
Dibromochloromethane	NA	NA	0		NA	NA	0	
Dicamba	ND	ND	0		ND	ND	0	
Dichlorobiphenyl	ND	ND	0		ND	ND	0	
Dichloroprop	ND	ND	0		ND	ND	0	
Dieldrin	ND	ND	0		0.457	0.686	0	
Diethylphthalate	0.111	0.183	0		ND	ND	0	
Dimethylphthalate	ND	ND	0		ND	ND	0	
Di-n-butylphthalate	ND	ND	0		ND	ND	0	
Di-n-octylphthalate	ND	ND	0		ND	ND	0	
Dinoseb	ND	ND	0		ND	ND	0	
Endosulfan I	ND	ND	0		ND	ND	0	
Endosulfan II	ND	ND	0		ND	ND	0	
Endosulfan sulfate	ND	ND	0		ND	ND	0	
Endrin	ND	ND	0		ND	ND	0	
Endrin aldehyde	ND	ND	0		ND	ND	0	
Endrin ketone	ND	ND	0		ND	ND	0	
Ethylbenzene	NA	NA	0		NA	NA	0	
Fluoranthene	ND	ND	0		ND	ND	0	
Fluorene	ND	ND	0		ND	ND	0	
Gamma Chlordane	ND	ND	0		0.667	1	0	
gamma-BHC (Lindane)	ND	ND	0		ND	ND	0	
Heptachlor	ND	ND	0		ND	ND	0	
Heptachlor epoxide	ND	ND	0		ND	ND	0	
Heptachlorobiphenyl	ND	ND	0		ND	ND	0	
Hexachlorobenzene	ND	ND	0		ND	ND	0	
Hexachlorobiphenyl	ND	ND	0		ND	ND	0	
Hexachlorobutadiene	ND	ND	0		ND	ND	0	
Hexachlorocyclopentadiene	ND	ND	0		ND	ND	0	
Hexachloroethane	ND	ND	0		ND	ND	0	
Indeno(1,2,3-cd)pyrene	ND	ND	0		ND	ND	0	
Iron	NA	NA	100	24000	NA	NA	100	24000
Isophorone	ND	ND	0		ND	ND	0	
Lead	ND	ND	100	26	0 0174	0.0261	100	26
Magnesium	NA	NA	100	5800	NA	NA	100	5800
Manganese	NA	NA	100	770	NA	NA	100	770
MCPA_(4-chloro-2-methylphenoxy	ND	ND	0		ND	ND	0	
MCPP_2-(4-chloro-2-methylphenc	ND	ND	0		ND	ND	0	
Mercury	1.17	1.93	100	0.047	1.47	2 21	100	0 047
Methoxychlor	ND	ND	0		ND	ND	0	
Methylene chloride (Dichlorometha	NA	NA	0		NA	NA	0	
Molybdenum	NA	NA	100	0.53	NA	NA	100	0.53
Monochlorobiphenyl	ND	ND	0		ND	ND	0	
Naphthalene	ND	ND	0		ND	ND	0	
Nickel	ND	ND	100	26	ND	ND	100	26
Nitrobenzene	ND	ND	0		ND	ND	0	
n-Nitrosodi-n-propylamine	ND	ND	0		ND	ND	0	
N-Nitrosodiphenylamine/Diphenyla	ND	ND	0		ND	ND	0	
Nonachlorobiphenyl	ND	ND	0		ND	ND	0	
Octachlorobiphenyl	ND	ND	0		ND	ND	0	
Pentachlorobiphenyl	ND	ND	0		ND	ND	0	
Pentachlorophenol	ND	ND	0		0.00327	0.0049	0	
pH	NA	NA	100	7.24	NA	NA	100	7.24
Phenanthrene	ND	ND	0		ND	ND	0	
Phenol	ND	ND	0		ND	ND	0	
Potassium	NA	NA	100	2600	NA	NA	100	2600
Pyrene	ND	ND	0		ND	ND	0	
Selenium	0.574	0.948	0		0.667	1	0	
Silver	ND	ND	0		ND	ND	0	
Sodium	NA	NA	0		NA	NA	0	
Styrene	NA	NA	0		NA	NA	0	
Tetrachlorobiphenyl	ND	ND	0		ND	ND	0	
Tetrachloroethene	NA	NA	0		NA	NA	0	

Appendix D-2
Calculated Bioaccumulation Factors for Forage Fish based on Sediment Data from 1999 2000
Dead Creek
Sauget Area I

	F.F. REF 2 COMP 1				F.F. REF 2 COMP 2			
Compounds	BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration	BAF	BSAFn	Detection Frequency in Sediment	Maximum Sediment Concentration
Thallium	NA	NA	0		NA	NA	0	
Toluene	NA	NA	0		NA	NA	0	
Total HpCDD	0.0239	0 0394	100	0.342	0.00742	0.0111	100	0.342
Total HpCDF	0.22	0 362	50	0.0139	ND	ND	50	0.0139
Total HxCDD	0.0201	0.0332	50	0 0444	0.0204	0.0306	50	0.0444
Total HxCDF	0.36	0.595	50	0.00615	0.327	0.49	50	0.00615
Total PeCDD	0.0556	0.0917	50	0.0217	ND	ND	50	0.0217
Total PeCDF	2.59	4.27	0		2.9	4.35	0	
Total TCDD	0.14	0.232	0		ND	ND	0	
Total TCDF	1.36	2.25	50	0.0078	1.61	2.41	50	0.0078
Toxaphene	ND	ND	0		ND	ND	0	
trans-1,3-Dichloropropene	NA	NA	0		NA	NA	0	
Trichlorobiphenyl	ND	ND	0		ND	ND	0	
Trichloroethene	NA	NA	0		NA	NA	0	
Vanadium	NA	NA	100	44	NA	NA	100	44
Vinyl chloride	NA	NA	0		NA	NA	0	
Xylenes, Total	NA	NA	0		NA	NA	0	
Zinc	0.426	0.703	100	96	0.348	0.523	100	96

Appendix D-2
Calculated Bioaccumulation Factors for Forage Fish based on Sediment Data from 1999 2000
Dead Creek
Sauget Area I

Compounds	BAF	BSAFn	F.F. REF 2 COMP 3 Detection Frequency in Sediment	Maximum Sediment Concentration
1,1,1-Trichloroethane	NA	NA	0	
1,1,2,2-Tetrachloroethane	NA	NA	0	
1,1,2-Trichloroethane	NA	NA	0	
1,1-Dichloroethane	NA	NA	0	
1,1-Dichloroethene	NA	NA	0	
1,2,3,4,6,7,8,9-OCDD	0.0108	0.0105	100	8.57
1,2,3,4,6,7,8,9-OCDF	ND	ND	100	0.107
1,2,3,4,6,7,8-HpCDD	0.0313	0.0304	100	0.14
1,2,3,4,6,7,8-HpCDF	ND	ND	100	0.0283
1,2,3,4,7,8,9-HpCDF	ND	ND	0	
1,2,3,4,7,8-HxCDD	ND	ND	50	0.0021
1,2,3,4,7,8-HxCDF	0.133	0.129	50	0.003
1,2,3,6,7,8-HxCDD	0.121	0.117	100	0.004
1,2,3,6,7,8-HxCDF	ND	ND	50	0.0013
1,2,3,7,8,9-HxCDD	ND	ND	100	0.00505
1,2,3,7,8,9-HxCDF	ND	ND	0	
1,2,3,7,8-PeCDD	ND	ND	100	0.00145
1,2,3,7,8-PeCDF	ND	ND	50	0.0011
1,2,4-Trichlorobenzene	ND	ND	0	
1,2-Dichlorobenzene	ND	ND	0	
1,2-Dichloroethane	NA	NA	0	
1,2-Dichloropropane	NA	NA	0	
1,3-Dichlorobenzene	ND	ND	0	
1,4-Dichlorobenzene	ND	ND	0	
2,2'-Oxybis(1-chloropropane)_bis(	ND	ND	0	
2,3,4,6,7,8-HxCDF	ND	ND	50	0.0016
2,3,4,7,8-PeCDF	ND	ND	50	0.0013
2,3,7,8-TCDD	2.13	2.07	0	
2,3,7,8-TCDF	0.88	0.854	100	0.0014
2,4,5-T	ND	ND	0	
2,4,5-TP (Silvex)	ND	ND	0	
2,4,5-Trichlorophenol	ND	ND	0	
2,4,6-Trichlorophenol	ND	ND	0	
2,4-D	ND	ND	0	
2,4-DB	ND	ND	0	
2,4-Dichlorophenol	ND	ND	0	
2,4-Dimethylphenol	ND	ND	0	
2,4-Dinitrophenol	ND	ND	0	
2,4-Dinitrotoluene	ND	ND	0	
2,6-Dinitrotoluene	ND	ND	100	14
2-Chloronaphthalene	ND	ND	0	
2-Chlorophenol	ND	ND	0	
2-Hexanone	NA	NA	0	
2-Methylnaphthalene	ND	ND	0	
2-Methylphenol (o-cresol)	ND	ND	0	
2-Nitroaniline	ND	ND	0	
2-Nitrophenol	ND	ND	0	
3,3'-Dichlorobenzidine	ND	ND	0	
3&4-Methylphenol (m&p-cresol)	ND	ND	0	
3-Nitroaniline	ND	ND	0	
4,4'-DDD	NA	NA	0	
4,4'-DDE	NA	NA	0	
4,4'-DDT	NA	NA	0	
4,6-Dinitro-2-methylphenol	ND	ND	0	
4-Bromophenylphenyl ether	ND	ND	0	
4-Chloro-3-methylphenol	ND	ND	0	
4-Chloroaniline	ND	ND	0	
4-Chlorophenylphenyl ether	ND	ND	0	
4-Methyl-2-pentanone (MIBK)	NA	NA	0	
4-Nitroaniline	ND	ND	0	
4-Nitrophenol	ND	ND	0	
Acenaphthene	ND	ND	0	
Acenaphthylene	ND	ND	0	
Acetone	NA	NA	100	52
Aldrin	NA	NA	0	
Alpha Chlordane	NA	NA	0	
alpha-BHC	NA	NA	0	
Aluminum	0.000535	0.00052	100	19000
Anthracene	ND	ND	0	
Antimony	ND	ND	100	4
Arsenic	ND	ND	100	7
Barium	NA	NA	100	220
Benzene	NA	NA	0	
Benzo(a)anthracene	ND	ND	0	
Benzo(a)pyrene	ND	ND	0	
Benzo(b)fluoranthene	ND	ND	0	
Benzo(g,h,i)perylene	ND	ND	0	
Benzo(k)fluoranthene	ND	ND	0	
Beryllium	ND	ND	100	1
beta-BHC	NA	NA	0	
bis(2-Chloroethoxy)methane	ND	ND	0	
bis(2-Chloroethyl)ether	ND	ND	0	
bis(2-Ethylhexyl)phthalate	0.778	0.755	0	
Bromodichloromethane	NA	NA	0	
Bromoform	NA	NA	0	

Appendix D-2
Calculated Bioaccumulation Factors for Forage Fish based on Sediment Data from 1999 2000
Dead Creek
Sauget Area I

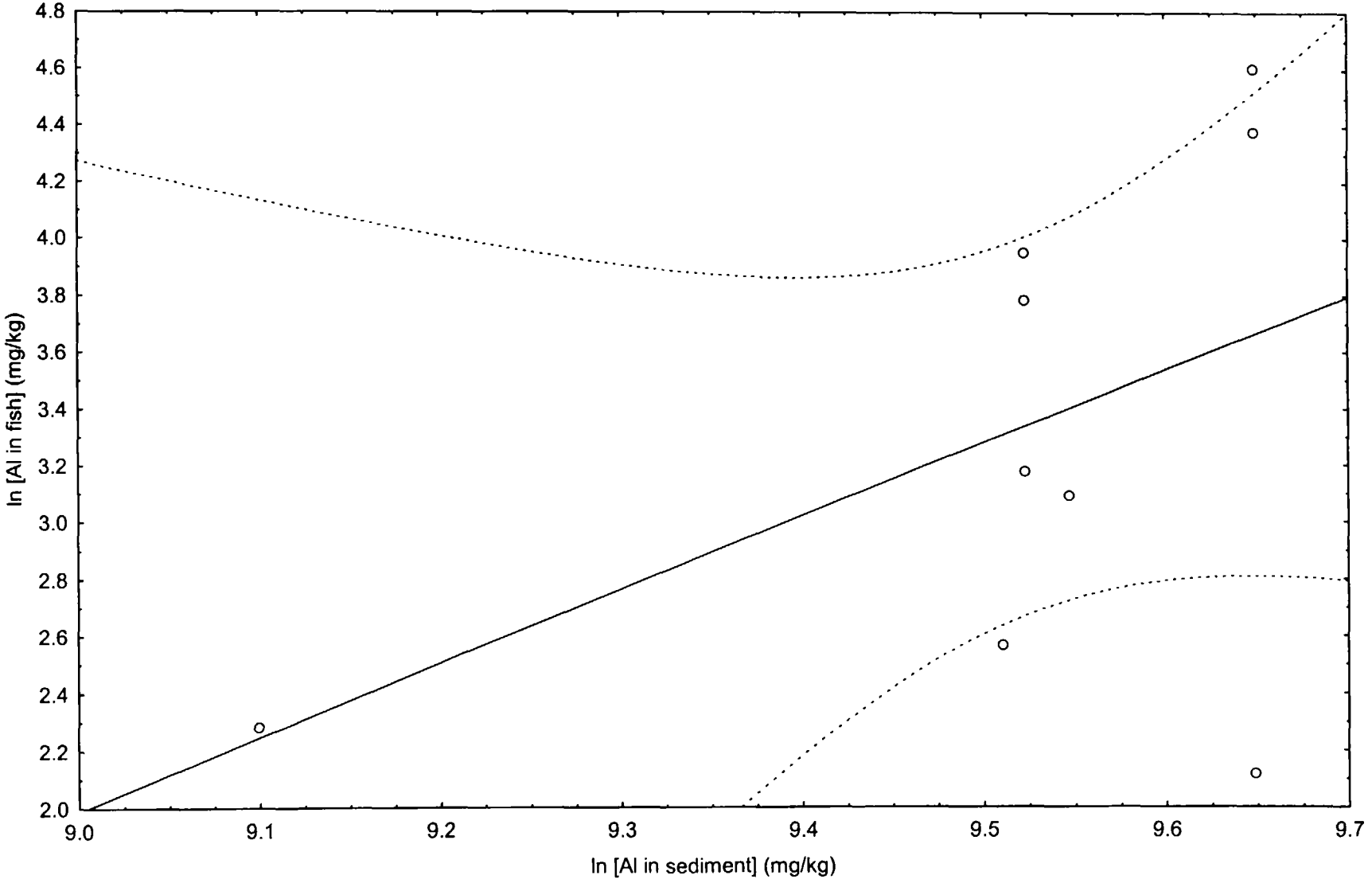
Compounds	BAF	BSAFn	F.F. REF 2 COMP 3 Detection Frequency in Sediment	Maximum Sediment Concentration
Bromomethane (Methyl bromide)	NA	NA	0	
Butylbenzylphthalate	ND	ND	0	
Cadmium	ND	ND	100	0.65
Calcium	NA	NA	100	12000
Carbazole	NA	NA	0	
Carbon disulfide	NA	NA	0	
Carbon tetrachloride	NA	NA	0	
Chlorobenzene	NA	NA	0	
Chloroethane	NA	NA	0	
Chloroform	NA	NA	0	
Chloromethane	NA	NA	0	
Chromium	0.081	0.0786	100	25
Chrysene	ND	ND	0	
Cis/Trans-1,2-Dichloroethene	NA	NA	0	
cis-1,3-Dichloropropene	NA	NA	0	
Cobalt	NA	NA	100	10
Copper	0.0277	0.0269	100	23
Cyanide, Total	ND	ND	0	
Dalapon	ND	ND	0	
Decachlorobiphenyl	ND	ND	0	
delta-BHC	NA	NA	0	
Dibenzo(a,h)anthracene	ND	ND	0	
Dibenzofuran	ND	ND	0	
Dibromochloromethane	NA	NA	0	
Dicamba	ND	ND	0	
Dichlorobiphenyl	ND	ND	0	
Dichloroprop	ND	ND	0	
Dieldrin	NA	NA	0	
Diethylphthalate	0.206	0.2	0	
Dimethylphthalate	ND	ND	0	
Di-n-butylphthalate	ND	ND	0	
Di-n-octylphthalate	ND	ND	0	
Dinoseb	ND	ND	0	
Endosulfan I	NA	NA	0	
Endosulfan II	NA	NA	0	
Endosulfan sulfate	NA	NA	0	
Endrin	NA	NA	0	
Endrin aldehyde	NA	NA	0	
Endrin ketone	NA	NA	0	
Ethylbenzene	NA	NA	0	
Fluoranthene	ND	ND	0	
Fluorene	ND	ND	0	
Gamma Chlordane	NA	NA	0	
gamma-BHC (Lindane)	NA	NA	0	
Heptachlor	NA	NA	0	
Heptachlor epoxide	NA	NA	0	
Heptachlorobiphenyl	ND	ND	0	
Hexachlorobenzene	ND	ND	0	
Hexachlorobiphenyl	ND	ND	0	
Hexachlorobutadiene	ND	ND	0	
Hexachlorocyclopentadiene	ND	ND	0	
Hexachloroethane	ND	ND	0	
Indeno(1,2,3-cd)pyrene	ND	ND	0	
Iron	NA	NA	100	24000
Isophorone	ND	ND	0	
Lead	ND	ND	100	26
Magnesium	NA	NA	100	5800
Manganese	NA	NA	100	770
MCPA_(4-chloro-2-methylphenoxy	ND	ND	0	
MCPP_2-(4-chloro-2-methylphenc	ND	ND	0	
Mercury	1.06	1.03	100	0.047
Methoxychlor	NA	NA	0	
Methylene chloride (Dichlorometha	NA	NA	0	
Molybdenum	NA	NA	100	0.53
Monochlorobiphenyl	ND	ND	0	
Naphthalene	ND	ND	0	
Nickel	ND	ND	100	26
Nitrobenzene	ND	ND	0	
n-Nitrosodi-n-propylamine	ND	ND	0	
N-Nitrosodiphenylamine/Diphenyla	ND	ND	0	
Nonachlorobiphenyl	ND	ND	0	
Octachlorobiphenyl	ND	ND	0	
Pentachlorobiphenyl	ND	ND	0	
Pentachlorophenol	ND	ND	0	
pH	NA	NA	100	7.24
Phenanthrene	ND	ND	0	
Phenol	ND	ND	0	
Potassium	NA	NA	100	2600
Pyrene	ND	ND	0	
Selenium	ND	ND	0	
Silver	ND	ND	0	
Sodium	NA	NA	0	
Styrene	NA	NA	0	
Tetrachlorobiphenyl	ND	ND	0	
Tetrachloroethene	NA	NA	0	

Appendix D-2
Calculated Bioaccumulation Factors for Forage Fish based on Sediment Data from 1999 2000
Dead Creek
Sauget Area I

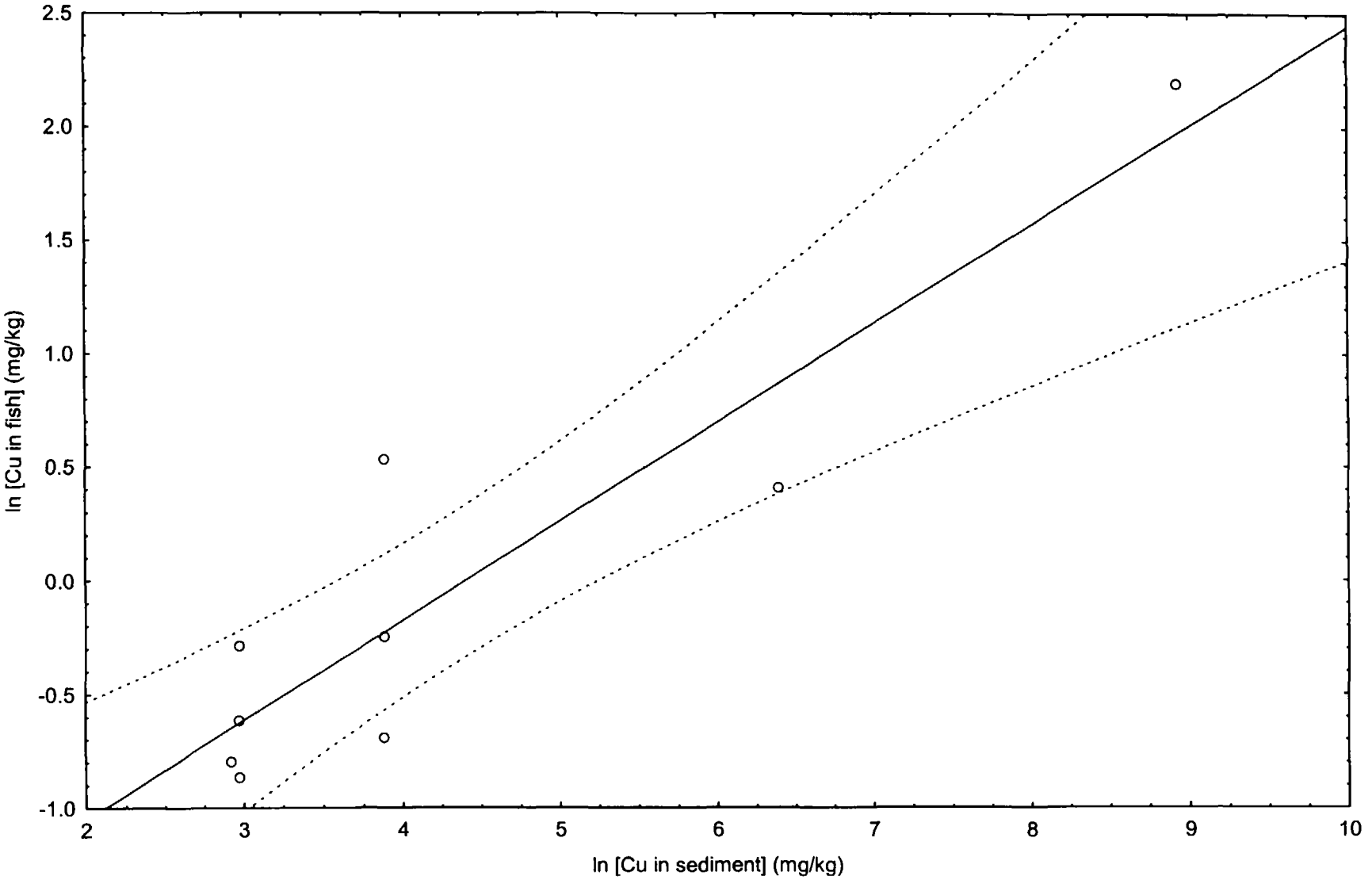
Compounds	F.F. REF 2 COMP 3 BAF	BSAFn	Detection Frequency In Sediment	Maximum Sediment Concentration
Thallium	NA	NA	0	
Toluene	NA	NA	0	
Total HpCDD	0.0235	0.0229	100	0.342
Total HpCDF	ND	ND	50	0.0139
Total HxCDD	0.0488	0.0473	50	0.0444
Total HxCDF	0.191	0.186	50	0.00615
Total PeCDD	ND	ND	50	0.0217
Total PeCDF	1.78	1.73	0	
Total TCDD	0.0561	0.0545	0	
Total TCDF	1.55	1.51	50	0.0078
Toxaphene	NA	NA	0	
trans-1,3-Dichloropropene	NA	NA	0	
Trichlorobiphenyl	ND	ND	0	
Trichloroethene	NA	NA	0	
Vanadium	NA	NA	100	44
Vinyl chlonde	NA	NA	0	
Xylenes, Total	NA	NA	0	
Zinc	0.323	0.313	100	96

BAF = Bioaccumulation Factor
BSAFn = Biota-Sediment Accumulation Factor (lipid and organic carbon normalized)
BAF and BSAFn are not calculated if compound was not detected or analyzed in forage fish
BAF and BSAFn calculated assuming 1/2 detection limit for nondetects in sediment If all samples nondetect, BAF and BSAFn solely based on detection limits.
Units: organics=ug/kg, inorganics=mg/kg

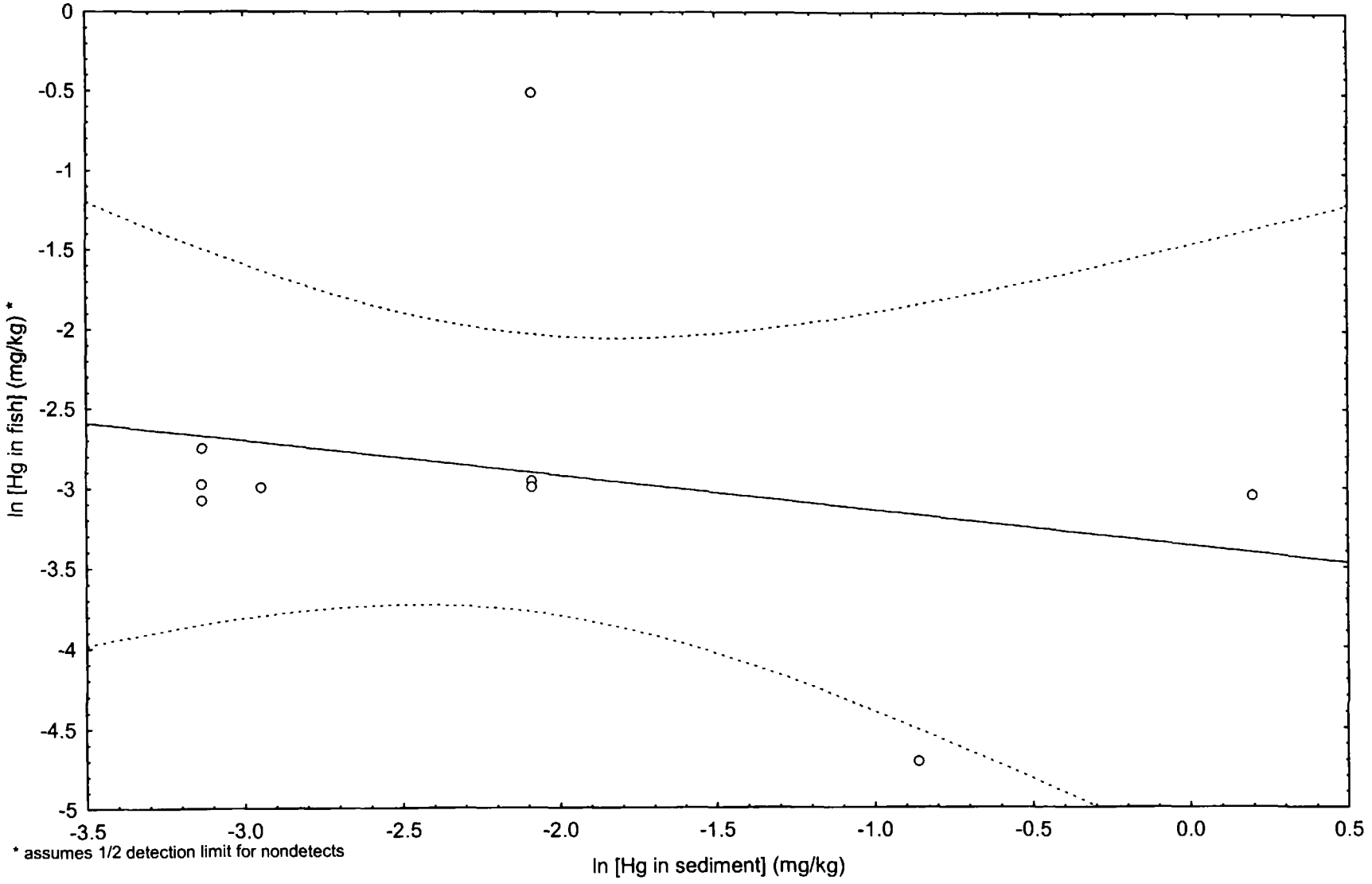
Appendix D-3a
Concentration of Aluminum in Forage Fish and Sediment
Al in fish = -21.2593+2.583*x
r = 0.4808, p = 0.1901



Appendix D-3b
Concentration of Copper in Forage Fish and Sediment
Cu in fish = -1.9259+0.4371*x
r = 0.9146, p = 0.0006

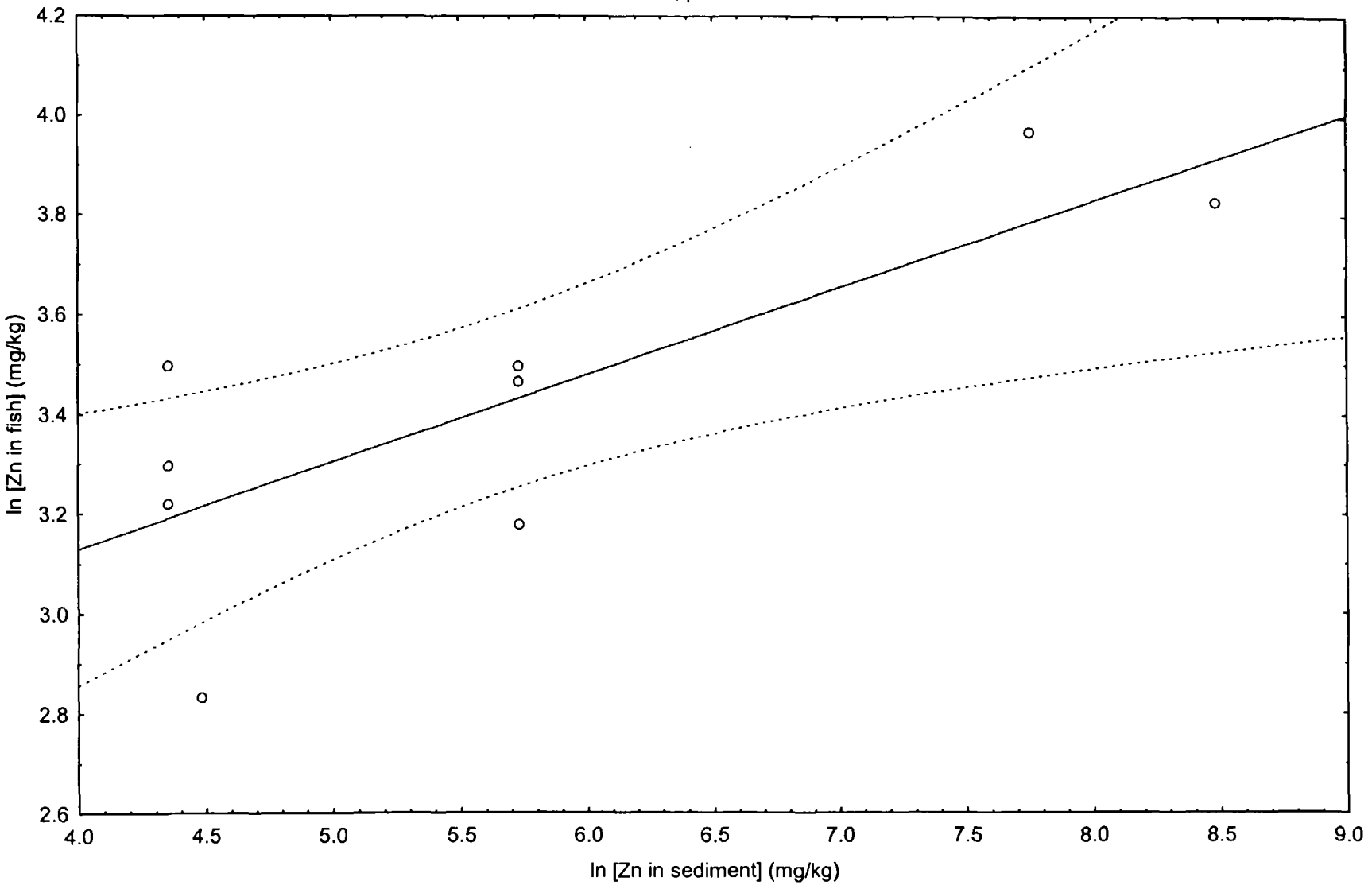


Appendix D-3c
Concentration of Mercury in Forage Fish and Sediment
Hg in fish (half dl) = -3.3624-0.22*x
r = -0.2391, p = 0.5355

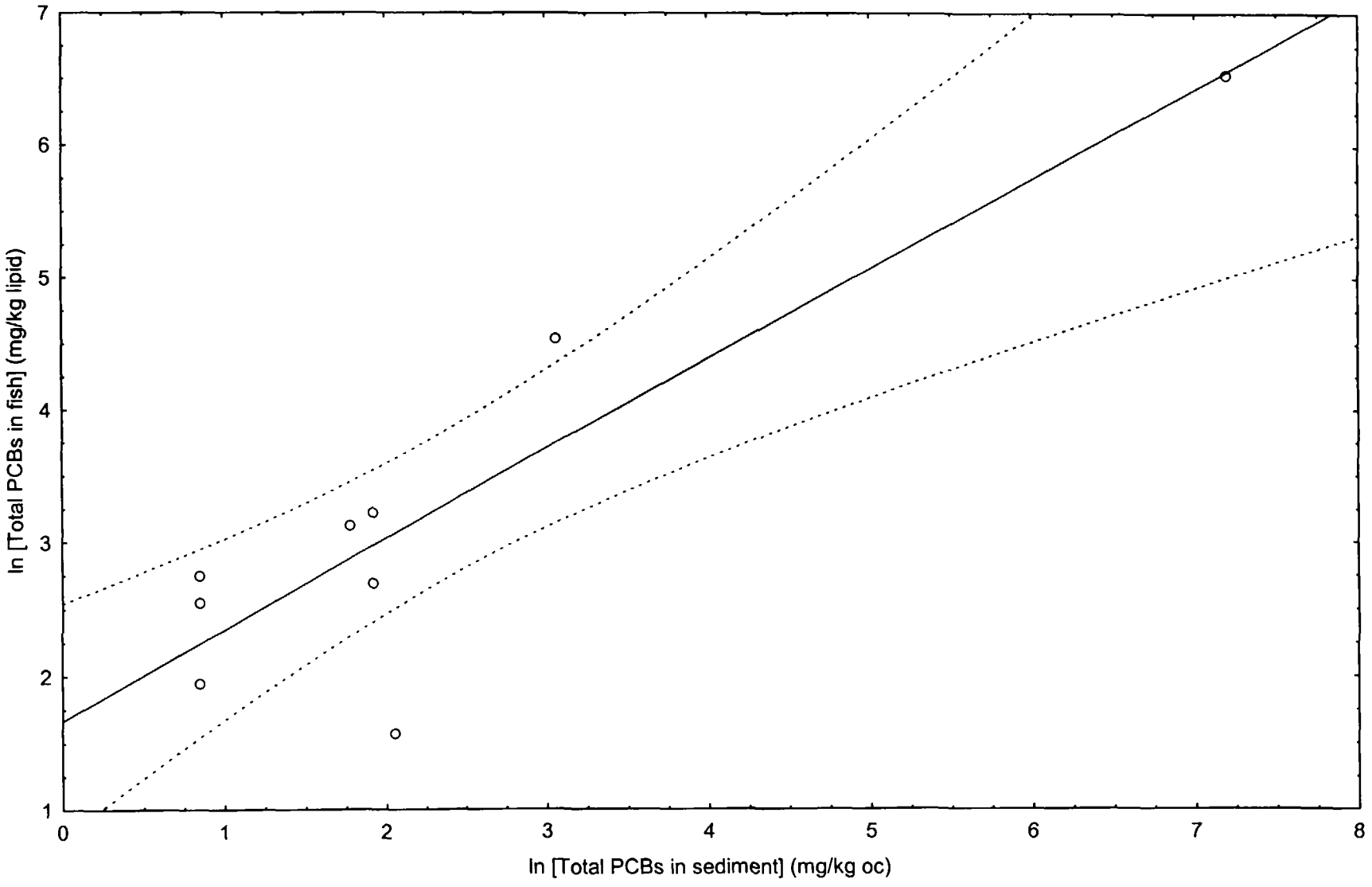


* assumes 1/2 detection limit for nondetects

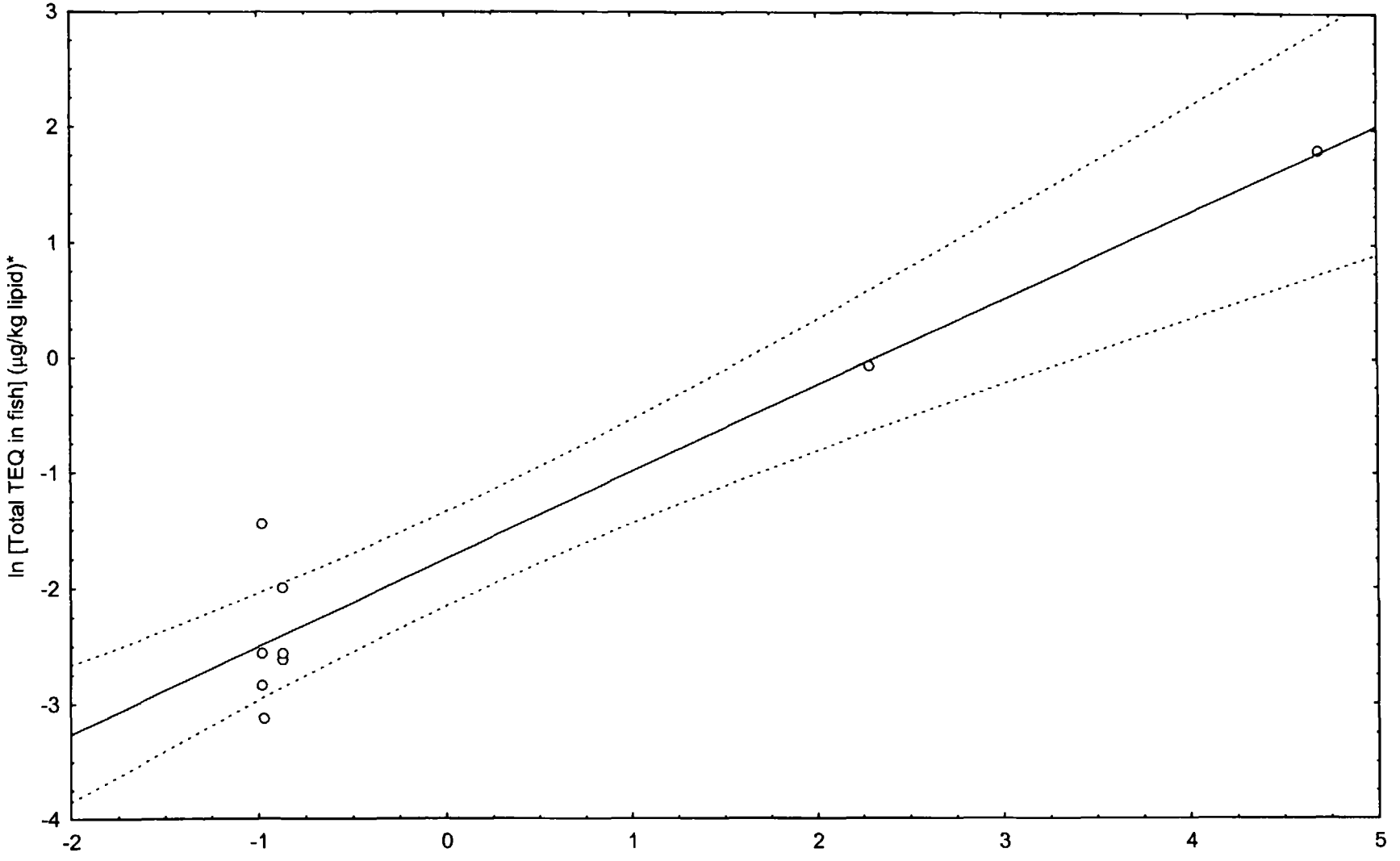
Appendix D-3d
Concentration of Zinc in Forage Fish and Sediment
Zn in fish = 2.4275+0.1754*x
r = 0.7853, p = 0.0122



Appendix D-3e
Concentration of Total PCBs in Forage Fish and Sediment
ln [Fish] (normalized) = 1.6666+0.6806*x
r = 0.8980, p = 0.0010



Appendix D-3f
Concentration of Total TEQ in Forage Fish and Sediment
ln [Fish] (normalized) = -1.748+0.7556*x
r = 0.9543, p = 0.00006



*Assumed 1/2 detection limit for nondetects

APPENDIX E

FOOD CHAIN MODELING

Appendix E-1
Food Chain Model Overview

The following food chain models and assumptions are used to estimate exposure of wildlife species to chemicals via the food chain. The models apply to select species that may use the aquatic environments of Dead Creek of Sauget Area I. The wildlife species for which food chain models were applied are described in Table E-1. This appendix describes the food chain models used in this assessment, presents the exposure parameters, and presents toxicity reference values for wildlife (Tables E-2a and E-2b). The last section of this appendix is the results of the food chain modeling.

Table E-1. Wildlife species used to assess ecological risks

Species	Feeding Guild	Primary Habitat	Use in ERA
Great Blue Heron	Eats fish and other small animals	Aquatic	Evaluate exposure to chemicals in aquatic food webs
River Otter	Eats fish, other small animals and some invertebrates	Aquatic	Evaluate exposures to chemicals in fish and invertebrates

Model Structure

The general form of the wildlife exposure model is:

Exposure Dose (oral) = { [$Conc_{food}$ * $Ingest_{food}$] + [RAF * $Conc_{sed}$ * $Sediment_{diet}$ * $Ingest_{food}$] + [$Conc_{water}$*$Ingest_{water}$]} * $f_{migration}$ x*$f_{foraging\ area}$

Where:

Exposure Dose (oral) = dose of a chemical in ug/g-day

$Conc_{food}$ = the estimated concentration of the chemical (ug/g) in the food (forage fish); this is the average concentration in the relevant exposure zone, an area determined by the size and locations of foraging areas. The average is the appropriate statistic because ecological receptors integrate exposure over their foraging areas. We will use the upper 95% upper confidence limit (UCL) on the mean as a conservative estimate of the central tendency of the data. In Creek Sections C and D, not enough data are available to calculate an UCL, so an average is used.

$Ingest_{food}$ = amount of food ingested per day normalized to body weight (g/g-day) and usually expressed in terms of wet weight of food/live body weight.

RAF – relative availability factor for chemicals in sediment via incidental ingestion of sediment.

$Conc_{sediment}$ = concentration ug/g in the relevant exposure zone; this is estimated as either an average or maximum concentration in the exposure zone. The average is a more appropriate statistic because ecological receptors integrate exposure over their foraging areas. We will use the upper 95% upper confidence limit (UCL) on the mean as a conservative estimate of the central tendency of the data. In Creek Sections C and D, not enough data are available to calculate an UCL, so an average is used.

$Sediment_{diet}$ = fraction of sediment in the diet; the product of this number and $Ingest_{food}$ yields an estimate of the amount of sediment that is incidentally ingested during foraging, grooming, etc.

$Conc_{water}$ = concentration mg/L in the relevant exposure zone. Water exposure has not been evaluated in this assessment because: there are no post-remediation water data available; and the water exposure route typically comprises a negligible percentage of a species exposure. For example in the 2001 Ecological Risk Assessment, the contribution to risk from constituents in surface water was negligible.

$Ingest_{water}$ = drinking water ingestion rate in L/kg/day; the $ingest_{water}$ x $conc_{water}$ yields an estimate of the amount of water that is ingested as drinking water. The drinking water component is in addition to other water sources. USEPA (1993) states that "under some

conditions, some species can meet their water requirements with only the water contained in the diet and metabolic water production".

$F_{migration}$ = the number of months the time the species spends in the area over 12 months; for a species that doesn't migrate, this value is 1.

$F_{foraging\ area}$ = the ratio of the area of the site to the species foraging area. If this value is greater than 1, it can be assumed to be equal to 1 or, if sufficient data are available, the site can be subdivided into smaller foraging areas. The estimated areas of the Dead Creek Sections are: B, 1.1 hectares; C, 0.8 hectares; D, 0.4 hectares; E, 1.2 hectares; and F, 0.3 hectares.

Incidental Sediment Ingestion Rate Estimation

The wildlife sediment ingestion values applied in the food chain models are from Beyer et al. (1994) and are a percentage of the dry mass of food ingested per day.

For the receptors at Dead Creek, the food ingestion rate is given as grams of wet food/gram of body weight/day, and these food ingestion rates are applied in the model.

To estimate a sediment ingestion rate, we assumed a moisture content of fish of about 80% (percent solids of 20%). The 80% moisture for fish is based on average values for largemouth bass of 79.1% and brown bullhead of 81.3% reported for Indiana wild fish (Purdue, 2001). These values are used to convert the receptor's food ingestion rate from wet weight to dry weight, and then calculate a soil ingestion rate from the proportion estimated by Beyer et al (1994). For example, a river otter that eats a diet of 100% fish at a rate of 0.1 g wet food/g body weight/day, will have a dry food consumption rate of:

0.1 g wet food/g body weight/day x 0.2 g dry food/g wet food = 0.02 g dry food/g body weight/day

If the otter ingests 2% of the dry mass of its diet as sediment, the resulting sediment ingestion weight is:

0.02 g dry food/g body weight/day x 0.02 g sediment/g dry food ingested = 0.0004 g dry sediment/g body weight/day

This can be used directly with the dry weight concentration of sediment to calculate an exposure dose.

Model Application

The potential for chronic exposure to individuals is considered by calculating an average or central tendency concentration for food and sediments at spatial scales defined by the foraging areas of the species. For example, exposure concentrations for a species with a foraging area of 10 ha would be determined by averaging the food and sediments concentrations within this spatial scale. A species with a foraging area of 0.1 ha would have an averaging area that is 100 times less. As a simplifying assumption, the health of an individual is assumed to be reflective of the health of a subpopulation.

Model Parameters for Wildlife Species

Great Blue Heron Model

Food Habits: 100% of various fish species. This is a simplifying assumption because herons eat other animals as well. In marsh environments, the great blue heron is an opportunistic feeder; they prefer fish, but they will also eat amphibians, reptiles, crustaceans, insects, birds, and mammals. The diet varies but may include up to 100% fish. A Nova Scotia study found 6% forage fish (Atlantic silverside and mummichog), 52.6% eels, and 41.4% other fish in the diet of great blue heron (USEPA, 1993). However, fish are their main diet.

Food Ingestion Rate: 0.18 g/g-day. This is the estimate of food consumption calculated using Kushlan's equation for wading birds as reported in USEPA (1993).

Incidental sediment ingestion: Because blue herons feed primarily on fish, estimated sediment consumption is presumed to be negligible.

Foraging Area: Great blue heron tend to forage near nesting sites (USEPA, 1993).
No wading bird colonies were located within the study area. However, the Illinois Natural Heritage Inventory has documented two 1000-2000 nest mixed-species colonies in East St. Louis. The closer of these two colonies is approximately one mile east of Sauget Area I near the Alton & Southern rail yards in Alorton. The second site is over two miles to the north at Audubon Avenue and 26th Street.

A study in Minnesota measured the distance between nesting and foraging grounds to range from 0 to 2.7 miles. A Carolina study found the same distance to be 4 to 5 miles. The maximum distance great blue heron will fly between foraging areas is 9 to 13 miles (USEPA, 1993). The size of the feeding territory in a freshwater area in Oregon was 0.6 to 8.4 hectares (USEPA, 1993). It appears that the feeding territories of great blue heron are variable. Some colonies may feed in one particular area while others will feed anywhere prey is available within a radius of at least several miles. This assessment uses the reported 0.6 to 8.4 hectares feeding area. Note that this is conservative in that a more realistic feeding area, based on the nearest nesting sites, results in an area with a radius of up to 2 miles.

Migration history: Great blue herons arrive in Illinois near St. Louis in mid-February and stay through October (INHS, 2000).

River Otter Model

Food Habits: The diet of the river otter consists primarily of aquatic animals, e.g. fish (93 to 100% of diet), although they may consume small numbers of crustaceans, aquatic insects, young mammals and turtles. A relative of the otter, the mink, has similar feeding habits but will eat more mammals (e.g., muskrat and meadow voles) and birds. Otters have also been observed to consume waterfowl in the northerly latitudes. (USEPA, 1993). For the model, the diet of river otter is assumed to consist of 100% fish.

Food Ingestion Rate: Food intake has been reported to range between 700 to 900g of food daily in captivity (Harris, 1968). The average body size of river otter is reported to range from about 8 to 9 kg for males and from about 7 to 8 kg for females. For the purpose of the model, we assumed an ingestion rate of 800 g/day (the middle of the range) and a body weight of 8 kg (again the middle of the range). This yields an ingestion rate of 0.1 g/g-day wet weight for the otter.

Incidental sediment ingestion: The river otter is expected to feed primarily on fish and incidental sediment ingestion is expected to be negligible. Consistent with the expectation that incidental sediment ingestion rate is low, we used a sediment ingestion rate of 2% of the diet. The incidental sediment ingestion rate is 0.0004 g/g-day dry weight assuming that sediment ingestion is 2% of food ingestion based on a 100% fish diet.

Foraging Area: This varies by habitat type. On long shorelines, it can encompass kilometers, or it can measure in hectares in marshes or small stream areas. These areas generally contain smaller areas of concentrated activity (USEPA 1993). The otter dens in banks, in hollow logs, or similar burrow-like places. Home range varies depending on habitat and sex. A range of 400 to 1,900 hectares has been reported for Missouri marshes and streams (USEPA, 1993).

References

Andrle, R.F. and J.R. Carroll (Editors). 1988. The Atlas of Breeding Birds in New York State. Cornell University Press. Ithaca, New York. 551 pp.

Bellrose, F. C. (1976) Ducks, geese, and swans of North America. Harrisburg, PA: The Stackpole Co.; pp. 229-243.

Bent, A.C., 1963. Life Histories of North American Marsh Birds, Dover Publications, Inc., New York.

Beyer, W.N., E.E. Connor, and S. Gerould. 1994. Estimates of soil ingestion by wildlife. J. Wildl. Manage. 58: 375-382.

Bull, John and Farrand, John Jr. 1977. The Audubon Society Field Guide to North American Birds eastern region. New York: Alfred A. Knopf. 784pp.

Calder, W. A.; Braun, E. J. (1983) Scaling of osmotic regulation in mammals and birds. Am. J. Physiol. 244: R601-R606.

Chapman J.A. and G.A. Feldhamer (ed.) Wild Mammals of North America, Biology, Management, Economics. 1990. Baltimore: Johns Hopkins University Press.

Chew, R. M. (1951) The water exchanges of some small mammals. Ecol. Monogr. 21: 215-225.

Clench, M. H.; Leberman, R. C. (1978) Weights of 151 species of Pennsylvania birds analyzed by month, age, and sex. Bull. Carnegie Mus. Nat. Hist.

Cohen, R.R. 1984. Behavioral Determinants of Nest Site Tenacity and Mate Fidelity Patterns in Tree Swallows (*Tachycineta bicolor*). *J. Colo.-Wyo. Acad. Sci.* 16:16.

Cummins, K.W. and J.C. Wuycheck (1971) Caloric Equivalents for Investigations in Ecological Energetics. Internationale Vereinigung fur Theoretische und Angevandte Limnologie, Mitteilung no. 18.

Dunning, J.B. Jr. 1993. CRC Handbook of Avian Body Masses. CRC Press. Ann Arbor, Michigan. 371 pp.

Dwyer, T. J.; Krapu, G. L.; Janke, D. M. (1979) Use of prairie pothole habitat by breeding mallards. J. Wildl. Manage. 43: 526-531.

Ernst, C. H. (1968) Kidney efficiencies of three Pennsylvania mice. Trans. Kentucky Acad. Sci. 29: 21-24.

Hamilton, W. J., Jr. (1941) The foods of small forest mammals in eastern United States. J. Mammal. 22: 250-263.

Harris, C. J. (1968) Otters: a study of the recent Lutrinae. London, U.K.: Weidenfield & Nicolson.

Kirby, R. E.; Riechmann, J. H.; Cowardin, L. M. (1985) Home range and habitat use of forest-dwelling mallards in Minnesota. Wilson Bull. 97: 215-219.

Lauhachinda, V. (1978) Life history of the river otter in Alabama with emphasis on food habitats [Ph.D. dissertation]. Auburn, AL: University of Alabama.

MacArthur, R. A. (1978) Winter movements and home range of the muskrat. Can. Field-Nat. 92: 345-349.

McCarty, J.P. and D.W. Winkler (1999). Foraging ecology and diet selectivity of tree swallows feeding nestlings. *The Condor*. 101: 246-254.

Nagy, Kenneth A., 1987. "Field Metabolic Rate and Food Requirement Scaling in Mammals and Birds". Ecological Monographs, 57(2), 1987, pp 111-128.

Nelson, A. L.; Martin, A. C. (1953) Gamebird weights. J. Wildl. Manage. 17: 36-42.

Ognev, S. I. (1950) Mammals of the U.S.S.R. and adjacent countries. Translated from Russian by; Israel Program for Scientific Translations (1964), Jerusalem; 626pp.

Palmer, R.S., ed., 1962. *Handbook of North American Birds, Volume 1, Loons through Flamingos*, Yale University Press, New Haven.

Purdue, 2001. http://www.purdue.edu/extention/foodsafety/angling Indiana/Nutritional Content of Fish/nutrition.html

Quinney, T. E. (1982) Growth, diet, and mortality of nestling great blue herons. Wilson Bull. 94: 571-577.

Robertson, R.J., B.J. Stutchbury and R.R. Cohen. 1992. Tree Swallow, *Tachycineta bicolor*. In. the Birds of North America. No. 11 (A. Poole, P. Stettenheim, and F. Gill Eds.). Philadelphia: The Academy of Natural Sciences; Washington, D.C. The American Ornithologists Union.

Sather, J. H. (1958) Biology of the Great Plains muskrat in Nebraska. Wildl. Monogr. 2. 35pp.

Svihla, A.; Svihla, R. D. (1931) The Louisiana muskrat. J. Mammal. 12: 12 –28.

Thayer, G.W., W.E. Schaaf, J.W. Angelovic, and M.W. La Croix (1973) Caloric measurements of some estuarine organisms, Fishery Bulletin, US. Department of Commerce; Vol. 71, No. 1, pp. 289-296.

Tyler, A.V. (1973), Caloric values of some North Atlantic invertebrates, Marine Biology 19, 256-261.

US Environmental Protection Agency . (1993). Wildlife Exposure Factors Handbook Volume I. Washington D.C: Office of Research and Development; EPA Report no. EPA/600/R-93/187a.

US Environmental Protection Agency. (2000). Child-Specific Exposure Factors Handbook, External Review Draft. Office of Research and Development, NCEA-W-09853.

Willner, G. R.; Feldhamer, G. A.; Zucker, E. E.; et al. (1980) *Ondatra zibethicus*. Mammalian species. No. 141. Amer. Soc. Mammal.; 8pp.

Appendix E-2a
Toxicological Endpoints for Birds
Dead Creek
Sauget Area I

Compound	CHRONIC							
	Chemical Form	Test Species	Exposure Route	Exposure Duration (Days)	Effect	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Source
Metals								
Aluminum, Total	$Al_2(SO_4)_3$	Ringed Dove	Incorporation into Food	116	Reproduction	109.7	NA	Sample et al., 1996
Antimony, Total						NA	NA	
Arsenic, Total	Sodium Arsenite	Mallard Duck	Incorporation into Food	128	Mortality	5.14	12.84	Sample et al., 1996
Barium, Total	Barium Hydroxide	1 day old Chick	Incorporation into Food	4 weeks; subchronic to chronic factor of 0.1 applied to data by authors	Mortality	20.8	41.7	Sample et al., 1996
Beryllium, Total						NA	NA	Sample et al., 1997
Cadmium, Total	Cadmium Chloride	Mallard Duck	Incorporation into Food	90	Reproduction	1.45	20.03	Sample et al., 1996
Chromium, Total	Trivalent	Black Duck	Incorporation into Food	290	Reproduction	1	5	Sample et al., 1996
Cobalt, Total	not reported	Pekin ducklings	Incorporated into food	28 days	Mortality and myopathy	15	30	Van Vleet, 1982.
Copper, Total	Copper Oxide	1 day old Chick	Incorporation into Food	70	Growth, Mortality	47.0	61.7	Sample et al., 1996
Cyanide, Total						NA	NA	
Iron, Total						NA	NA	
Lead, Total	Acetate	Japanese Quail	Incorporation into Food	84	Reproduction	1.13	11.3	Sample et al., 1996
Manganese	Mn_3O_4	Japanese Quail	Incorporation into Food	75	Growth, Behavior	977	NA	Sample et al., 1996
Mercury, Total	Mercuric Chloride	Japanese Quail	Incorporation into Food	365	Reproduction	0.45	0.9	Sample et al., 1996
Methyl mercury	Methyl Mercury Dicyandiamide	Mallard Duck	Incorporation into Food	3 generations	Reproduction	0.0064 [a]	0.064	Sample et al., 1996
Molybdenum	Sodium Molybdate	Chicken	Incorporation into Food	21 days through reproduction	Reproduction	3.5 [a]	35.3	Sample et al., 1996
Nickel, Total	Nickel Sulfate	Mallard Duckling	Incorporation into Food	90	Mortality, Growth, Behavior	77.4	107	Sample et al., 1996
Selenium, Total	Selenomethionine	Mallard Duck	Incorporation into Food	78	Reproduction	0.4	0.8	Sample et al., 1996
Silver, Total						NA	NA	
Thallium, Total						NA	NA	
Tin	Bis Tributyltin Oxide	Japanese Quail	Incorporated into food	42 days through reproduction	Reproduction	6.8	16.9	Sample et al., 1996
Vanadium, Total	Vanadyl Sulfate	Mallard Duck	Incorporation into Food	84	Longevity, Mortality	11.4	NA	Sample et al., 1996
Zinc, Total	Zinc Sulfate	White Leghorn Hen	Incorporation into Food	308	Reproduction	14.5	131	Sample et al., 1996
Volatiles								
Acetone						NA	NA	
Chloroform						NA	NA	
Chloromethane						NA	NA	
2-Butanone (MEK)						NA	NA	
Methyl chloride						NA	NA	
cis-1,2-Dichloroethene						NA	NA	
Benzene						NA	NA	
Toluene						NA	NA	
Chlorobenzene						NA	NA	
Vinyl chloride						NA	NA	
p/m-Xylene						NA	NA	
Xylene (total)						NA	NA	
Semivolatiles								
Phenol						NA	NA	
1,3-Dichlorobenzene						NA	NA	
1,4-Dichlorobenzene						NA	NA	
1,2-Dichlorobenzene						NA	NA	
1,2-Dichloroethane	NA	Chicken	Oral in diet	730	Reproduction	17.2	34.4	Sample et al., 1996
2-Methylphenol						NA	NA	
3/4-Methylphenol						NA	NA	
Nitrobenzene						NA	NA	

Appendix E-2a
Toxicological Endpoints for Birds
Dead Creek
Sauget Area I

	CHRONIC							
Compound	Chemical Form	Test Species	Exposure Route	Exposure Duration (Days)	Effect	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Source
2,4-Dichlorophenol						NA	NA	
1,2,4-Trichlorobenzene						NA	NA	
4-Chloroaniline						NA	NA	
2,4,5-Trichlorophenol						NA	NA	
n-Nitrosodiphenylamine						NA	NA	
Pentachlorophenol						NA	NA	
bis(2-Ethylhexyl)phthalate	Bis(2-ethylhexyl)phthalate	Ringed Dove	Incorporation into Food	28 during critical life stage = chronic	Reproduction	1.1	NA	Sample et al., 1996
o-Cresol								
Hexachlorobutadiene			Incorporation into food	90	Mortality and reporduction	6	NA	Schwetz et al., 1974.
Naphthalene						NA	NA	
Acenaphthylene						NA	NA	
Acenaphthene						NA	NA	
Fluorene						NA	NA	
Phenanthrene						NA	NA	
Anthracene						NA	NA	
Fluoranthene						NA	NA	
Pyrene						NA	NA	
Benzo[a]anthracene						NA	NA	
Chrysene						NA	NA	
Benzo[b]fluoranthene						NA	NA	
Benzo[k]fluoranthene						NA	NA	
Benzo[a]pyrene						NA	NA	
Indeno[1,2,3-cd]pyrene						NA	NA	
Dibenz[a,h]anthracene						NA	NA	
Benzo[g,h,i]perylene						NA	NA	
2-Methylnaphthalene						NA	NA	
Total PAHs	Mix of PAHs	Mallard Duck	Oral	203	Increased Liver Weight	40 [a]	400	Eisler, 1987
Carbazole						NA	NA	
Aniline						NA	NA	
Pesticides								
a-Chlordane	Chlordane	Red-winged Blackbird	Incorporation into Food	84	Mortality	2.14	10.7	Sample et al., 1996
p,p'-DDE						NA	NA	
Total DDT	NA	Brown Pelican	Incorporation into Food	5 years	Reproduction	0.0028	0.028	Sample et al., 1996.
Aldrin						NA	NA	
alpha-Chlordane	Chlordane	Red-winged Blackbird	Incorporation into Food	84	Mortality	2.14	10.7	Sample et al., 1996
BHC	mixed isomers	Japanese Quail	Oral in diet	90	Reproduction	0.56	2.25	Sample et al., 1996
delta-BHC	BHC - mixed isomers	Japanese Quail	Incorporation into Food	90	Reproduction	0.56	2.25	Sample et al., 1996
Dieldrin	Dieldrin	Barn Owl	Incorporation into Food	730	Reproduction	0.077	NA	Sample et al., 1996
Endosulfan I	Endosulfan	Gray Partridge	Incorporation into Food	stage = chronic	Reproduction	10	NA	Sample et al., 1996
Endosulfan II	Endosulfan	Gray Partridge	Incorporation into Food	stage = chronic	Reproduction	10	NA	Sample et al., 1996
Endosulfan sulfate	Endosulfan	Gray Partridge	Incorporation into Food	stage = chronic	Reproduction	10	NA	Sample et al., 1996
Endrin aldehyde	Endrin	Screech Owl	Incorporation into Food	> 83	Reproduction	0.01 [d]	0.1	Sample et al., 1996
Endrin ketone	Endrin	Screech Owl	Incorporation into Food	> 83	Reproduction	0.01 [d]	0.1	Sample et al., 1996
gamma-Chlordane	Chlordane	Red-winged Blackbird	Incorporation into Food	84	Mortality	2.14	10.7	Sample et al., 1996
gamma-BHC (Lindane)	NA	Mallard Duck	Oral intubation	56	Reproduction	2 [d]	20	Sample et al., 1996
Heptachlor						NA	NA	
Heptachlor epoxide						NA	NA	
Methoxychlor						NA	NA	
Herbicides								
2,4-D						NA	NA	
Dicamba						NA	NA	
Dichloroprop						NA	NA	
MCPA						NA	NA	
MCPP						NA	NA	

Appendix E-2a
Toxicological Endpoints for Birds
Dead Creek
Sauget Area I

Compound	CHRONIC							
	Chemical Form	Test Species	Exposure Route	Exposure Duration (Days)	Effect	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Source
PCBs								
Aroclor-1248						NA	NA	
Arocor-1254	Aroclor 1254	Ringed-necked Pheasant	Incorporation into Food	119	Reproduction	0.18 [a]	1.8	Sample et al., 1996
Total PCB	Aroclor 1242	Mallard Duck	Incorporation into Food	84	Decreased wieght gain in hens, eggshell thinning	4.1 [a]	41	Haseltine and Prouty, 1980
2,3,7,8-tetrachlorodibenzofuran (TCDF)	NA	1-day chicks	Oral in diet	21	Mortality, weight gain	1E-06	0.00001	Sample et al., 1996
2,3,7,8-tetrachlorodibenzodioxin (TCDD)	NA	Ring-necked Pheasant	Weekly intraperitoneal injection	70	Reproduction Fertility, Embryo Mortalitiy	1.4E-05	0.00014	Sample et al., 1996
TEQ	2,3,7,8-TCDD	Ring-necked Pheasant	Intraperitoneal	70		0.014 [a]	0.14	Nosek et al., 1992

NA = Not Available
TEF = Toxicity equivalency factor
[a] NOAEL value was derived by applying an Acute to Chronic Ratio of 10 to the LOAEL value.

Sources:

Eisler, R. 1987. Polycyclic aromatic hydrocarbon hazards to fish, wildlife, and invertebrates: A synoptic review. US Dept. of the Interior. US Fish and Wildlife Service. Patuxent Wildlife Research Center, MD

Haseltine, S.D. and R.M. Prouty, 1980. Aroclor 1242 and reproductive success of adult mallards (*Anas platyrhynchos*). Environmental Research. 23: 29-34.

Nosek, J.A., J.R. Sullivan, S.S. Hurley, S.R. Craven, and R.E. Peterson. 1992. Toxicity and reproductive effects of 2,3,7,8-tetrachlorodibenzo-*p*-dioxin in ring-necked pheasant hens. Journal of Toxicology and Environmental Health. 35: 187-198.

Sample, B.E., D.M. Opresko, and G.W. Suter II. 1996. Toxicological Benchmarks for Wildlife: 1996 Revision. Risk Assessment Program. Health Sciences Reasearch Division. Oak Ridge, TN. ES/ER/TM-86/R3.

Schwetz, B.A., J.M. Norris, R.J. Kociba, P.A. Keeler, R.F. Cornier, and P.J. Gehring, 1974. Reprodcution sutdy in Japanese quail fed hexachlorobutadienen for 90 days. Toxicology and Applied Pharmacology, 30, 255-265.

Van Vleet, J.F., 1982. Amounts of twelve elements required to induce selenium-vitamin E deficiency in ducklings. Am. J. Vet. Res., Vol. 43, No. 5, pp. 851-857.

Appendix E-2b
Toxicological Endpoints for Mammals
Dead Creek
Sauget Area I

Compound	CHRONIC									Otter		
	Test Species											
	Exposure Route	Effect Endpoint	Exposure Duration	Chemical Form	Test Species	Body Weight[a] (kg)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Reference	Body Weight (kg)	Final NOAEL (mg/kg/d)	Final LOAEL (mg/kg/d)
Metals												
Aluminum, Total	Oral-water	Reproduction	3 generations	Aluminum Chloride	Mouse	0.03	1.93	19.3	Sample et al., 1996	8	0.478	4.78
Antimony, Total	Oral-water	Longevity	lifetime (>1yr)	Antimony Potassium Tartrate	Mouse	0.03	0.125	1.25	Sample et al., 1996	8	0.031	0.31
Arsenic, Total	Oral-diet	Growth	730	Arsenite	Rat	0.35	2.5	NA	Byron et al. 1967	8	1.143	NA
Barium, Total	Oral-gavage	Mortality	10	Barium Chloride	Rat	0.435	13.8 [d]	19.8	Sample et al., 1996	8	6.664	9.56
Beryllium, Total	Oral intubation	Longevity, weight loss	lifetime (>1yr)	Beryllium Sulfate	Rat	0.35	0.66	NA	Sample et al., 1996	8	0.302	NA
Cadmium, Total	Oral-gavage	Reproduction	42	Cadmium Chloride	Rat	0.303	1	10	Sample et al., 1996	8	0.441	4.41
Chromium, Total	Oral-diet	Reprod/Longevity	730	Trivalent Chromium	Rat	0.35	2737	NA	Sample et al., 1996	8	1252	NA
Cobalt, Total							NA	NA		8	NA	NA
Copper, Total	Oral-diet	Reproduction	357	Copper Sulfate	Mink	1	11.7	15.14	Sample et al., 1996	8	6.957	9.00
Cyanide, Total	Oral-diet	Reproduction	Gestation and lactation	Potassium Cyanide	Rat	0.273	68.7	NA	Sample et al., 1996	8	29.527	NA
Iron, Total							NA	NA		8	NA	NA
Lead, Total	Oral-diet	Reproduction	3 generations	Lead Acetate	Rat	0.35	8	80	Sample et al., 1996	8	3.659	36.59
Manganese, Total	Oral-diet	Reproduction	224 days	Manganese Oxide	Rat	0.35	88	284	Sample et al., 1996	8	40.246	129.89
Mercury, Total	Oral-diet	Reproduction	168	Mercuric Chloride	Mink	1	1	NA	Sample et al., 1996	8	0.595	NA
Methyl mercury	Oral-diet	Reproduction	3 generations	Methyl Mercury Chloride	Rat	0.35	0.032	0.16	Sample et al., 1996	8	0.015	0.07
Molybdenum, Total	Oral - water	Reproduction	3 generations	Molybdate	Mouse	0.03	0.26 [b]	2.6	Sample et al., 1996	8	0.064	0.64
Nickel, Total	Oral-diet	Reproduction	3 generations	Nickel Sulfate Hexahydrate	Rat	0.35	40	80	Sample et al., 1996	8	18.294	36.59
Selenium, Total	Oral-water	Reproduction	1yr, 2 generations	Potassium Selenate	Rat	0.35	0.2	0.33	Sample et al., 1996	8	0.091	0.15
Silver, Total	Oral-water	Body Weight	259	NA	Rat	0.35	22 [b]	222.2	ATSDR	8	10.062	101.62
Strontium (stable), Total	Oral-water	Body Weight & bone changes	3 years	Strontium Chloride	Rat	0.35	263	NA	Sample et al., 1996	8	120.282	NA
Thallium, Total	Oral-water	Reproduction	60	Thallium Sulfate	Rat	0.365	0.0074	0.074	Sample et al., 1996	8	0.003	0.03
Vanadium, Total	Oral-intubation	Reproduction	>60	Sodium Metavanadate	Rat	0.26	0.21	2.1	Sample et al., 1996	8	0.089	0.89
Zinc, Total	Oral-diet	Reproduction	16 of gestation	Zinc Oxide	Rat	0.35	160	320	Sample et al., 1996	8	73.175	146.35
Volatiles												
Acetone	Oral intubation	Liver and kidney damage	90 days	NA	Rat	0.35	10	50	Sample et al., 1996	8	4.573	22.87
Chloroform	Oral intubation	Liver, kidney, gonad condition	13 weeks	NA	Rat	0.35	15	41	Sample et al., 1996	8	6.860	18.75
Chloromethane							NA	NA		8	NA	NA
Bromodichloromethane	Oral - gavage	Kidney effects	102 weeks	NA	Mouse	0.03	NA	17.9	IRIS, 2002	8	NA	4.43
Bromoform	Oral - gavage	Liver lesions	13 weeks	NA	Rat	0.35	17.9	35.7	IRIS, 2002	8	8.186	16.33
2-Butanone (MEK)	Oral-water	Reproduction	2 generations	NA	Rat	0.35	1771	4571	Sample et al., 1996	8	809.959	2090.53
Methyl chloride	Oral-water	Liver Histology	2 years	NA	Rat	0.35	5.85	50	Sample et al., 1996	8	2.675	22.87
cis-1,2-Dichloroethene	Oral-gavage	Body Weight	90 - applied ACR	NA	Rat	0.35	3.2	29	ATSDR	8	1.464	13.26
Benzene	Oral-gavage	Reproduction	Days 6-12 of gestation	NA	Mouse	0.03	26.36	263.6	Sample et al., 1996	8	6.523	65.23
Ethyl benzene	Oral - gavage	Liver and kidney histology	182 days	NA	Rat	0.35	97.1	291	IRIS, 2002	8	44.408	133.09
Toluene	Oral-gavage	Reproduction	7 of gestation	NA	Mouse	0.03	26	260	Sample et al., 1996	8	6.434	64.34
Carbon Disulfide	Inhalation	Fetal toxicity	34 weeks + length of pregnancy	NA	Rat	0.35	5	NA	IRIS, 2002	8	2.287	NA
Chlorobenzene	Oral-gavage	Mortality	515	NA	Mouse	0.03	86 [c]	NA	ATSDR	8	21.282	NA
Styrene	Oral - diet	Red blood cell and liver effects	560 days	NA	Dog	10	200	400	IRIS, 2002	8	211.474	422.95
1,1,2,2-Tetrachloroethane	Oral-gavage	Kidney and liver effects	103 weeks	1,1,2,2-tetrachloroethane	Rat	0.35	NA	89.3	IRIS, 2002	8	NA	40.84
1,1,2-Trichloroethane	Oral - diet	Blood chemistry	90 days	1,1,2-trichloroethane	Mouse	0.03	4	44	IRIS, 2002	8	0.965	10.89
vinyl chloride	Oral-diet	Longevity, Mortality	Lifetime (144 days)	NA	Rat	0.35	0.17	1.7	Sample et al., 1996	8	0.078	0.78

Appendix E-2b
Toxicological Endpoints for Mammals
Dead Creek
Sauget Area I

Compound	CHRONIC											
	Test Species									Otter		
	Exposure Route	Effect Endpoint	Exposure Duration	Chemical Form	Test Species	Body Weight[a] (kg)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Reference	Body Weight (kg)	Final NOAEL (mg/kg/d)	Final LOAEL (mg/kg/d)
p/m-Xylene	Oral-gavage	Reproduction	Days 6-15 of gestation	Xylene (mixed isomers)	Mouse	0.03	2.1	2.6	Sample et al., 1996	8	0.520	0.64
Xylene (total)	Oral-gavage	Reproduction	Days 6-15 of gestation	Xylene (mixed isomers)	Mouse	0.03	2.1	2.6	Sample et al., 1997	8	0.520	0.64
Semivolatiles												
Phenol	Oral-gavage	Fetal body weight	Days 6-15 gestation	Phenol	Rat	0.03	60	120		8	14.848	29.70
1,3-Dichlorobenzene							NA	NA		8	NA	NA
1,4-Dichlorobenzene	Oral-gavage	Mortality - 52%	515	NA	Rat	0.35	21 b	210 c	ATSDR	8	9.604	96.04
1,2-Dichlorobenzene	Oral-gavage	Mortality	515	NA	Rat	0.35	86 c	NA	IRIS	8	39.332	NA
1,2-Dichloroethane	Oral-water	Reproduction	2 generations	NA	Mouse	0.035	50	NA	Sample et al., 1996	8	12.859	NA
2-Methylphenol	Oral-diet	Reproduction	168	o-cresol	Mink	1	220	NA	Sample et al., 1996	8	130.813	NA
3/4-Methylphenol	Oral-gavage	Mortality	16-20wk, 5-7d/wk, 1x/d	p-cresol	Rat	0.35	175	450	ATSDR	8	80.035	205.81
Nitrobenzene	Inhalation	Kindney and Liver Lesions	90 days	Nitrobenzene	Mouse	0.035	NA	4.6	IRIS, 2002	8	NA	1.18
2,4-Dichlorophenol							NA	NA		8	NA	NA
1,2,4-Trichlorobenzene	Oral-water	Adrenal weight	multigenerational	NA	Rat	0.35	14.8	53.6	IRIS	8	6.769	24.51
4-Chloroaniline	Oral-gavage	Growth, Mortality	515	NA	Rat	0.35	10 c	NA	NTP, 1989	8	4.573	NA
2,4,5-Trichlorophenol	Oral	Behavior, Mortality, etc	98	NA	Rat	0.35	100	300	IRIS	8	45.735	137.20
n-Nitrosodiphenylamine	Oral-diet	Mortality -30%	700	NA	Rat	0.35	20 b	200	ATSDR	8	9.147	91.47
Pentachlorophenol	Oral-diet	Body Weight	181	NA	Rat	0.35	4	13	ATSDR	8	1.829	5.95
bis(2-Ethylhexyl)phthalate	Oral-diet	Reproduction	28	NA	Mouse	0.03	18.3	183	Sample et al., 1996	8	4.529	45.29
o-Cresol	Oral-diet	Reproduction	6 months	NA	Mink	1	219.2	NA	Sample et al., 1996	8	130.337	NA
Naphthalene	Oral-gavage	Body Weight	65-applied ACR	NA	Rat	0.35	7.1 c	14 c	IRIS	8	3.247	6.40
Acenaphthylene							NA	NA		8	NA	NA
Acenaphthene	Oral-gavage	Reproduction	91	NA	Mouse	0.03	350	700	ATSDR	8	86.612	173.22
Fluorene	Oral-gavage	Reproduction	91	NA	Mouse	0.03	500	NA	ATSDR	8	123.731	NA
Phenanthrene							NA	NA		8	NA	NA
Anthracene	Oral-gavage	Mortality, Body Weight	90-applied ACR	NA	Mouse	0.03	100	NA	IRIS	8	24.746	NA
Fluoranthene	Oral-gavage	Reproduction	91	NA	Mouse	0.03	500	NA	ATSDR	8	123.731	NA
Pyrene	Oral-gavage	Kidney effects	91-applied ACR	NA	Mouse	0.03	7.5	13	IRIS	8	1.856	3.22
Benzo[a]anthracene							NA	NA		8	NA	NA
Chrysene							NA	NA		8	NA	NA
Benzo[b]fluoranthene							NA	NA		8	NA	NA
Benzo[k]fluoranthene							NA	NA		8	NA	NA
Benzo[a]pyrene	Oral-intubation	Reproduction	10 of gestation	NA	Mouse	0.03	1	10	Sample et al., 1996	8	0.247	2.47
Indeno[1,2,3-cd]pyrene							NA	NA		8	NA	NA
Dibenz[a,h]anthracene							NA	NA		8	NA	NA
Benzo[g,h,i]perylene							NA	NA		8	NA	NA
2-Methylnaphthalene							NA	NA		8	NA	NA
Total PAH							NA	NA		8	NA	NA
Carbazole							NA	NA		8	NA	NA
Aniline							NA	NA		8	NA	NA
Pesticides												
a-Chlordane	Oral-diet	Reproduction	6 generations	Chlordane	Mouse	0.03	4.6	9.2	Sample et al., 1996	8	1.138	2.28
p,p'-DDE	Oral-diet	Reproduction	730	DDT	Rat	0.35	0.8	4	Sample et al., 1996	8	0.366	1.83
Total DDT	Oral-diet	Reproduction	730	DDT	Rat	0.35	0.8	4	Sample et al., 1996	8	0.366	1.83
Aldrin	Oral - diet	Reproduction	3 generations	NA	Rat	0.35	0.2	1	Sample et al., 1996	8	0.091	0.46
delta-BHC	Oral-diet	Reproduction	331 days	BHC mixed isomers	Mink	1	0.014 b	0.14	Sample et al., 1996	8	0.008	0.08
Dieldrin	Oral-diet	Reproduction	3 generations	NA	Rat	0.35	0.02 b	0.2	Sample et al., 1996	8	0.009	0.09
Endosulfan I	Oral intubation	Reproduction/blood chemistry	30 days	Endosulfan	Rat	0.35	0.15 c	NA	Sample et al., 1996	8	0.069	NA

Appendix E-2b
Toxicological Endpoints for Mammals
Dead Creek
Sauget Area I

Compound	CHRONIC									Otter		
	Test Species											
	Exposure Route	Effect Endpoint	Exposure Duration	Chemical Form	Test Species	Body Weight[a] (kg)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Reference	Body Weight (kg)	Final NOAEL (mg/kg/d)	Final LOAEL (mg/kg/d)
Endosulfan II	Oral intubation	Reproduction/blood chemistry	30 days	Endosulfan	Rat	0.35	0.15 c	NA	Sample et al., 1996	8	0.069	NA
Endosulfan sulfate	Oral intubation	Reproduction/blood chemistry	30 days	Endosulfan	Rat	0.35	0.15 c	NA	Sample et al., 1996	8	0.069	NA
Endrin aldehyde	Oral - diet	Reproduction	120 days	Endrin	Mouse	0.03	0.092 b	0.92	Sample et al., 1996	8	0.023	0.23
Endrin ketone	Oral - diet	Reproduction	120 days	Endrin	Mouse	0.03	0.092 b	0.92	Sample et al., 1996	8	0.023	0.23
gamma-Chlordane	Oral-diet	Reproduction	6 generations	Chlordane	Mouse	0.03	4.6	9.2	Sample et al., 1996	8	1.138	2.28
gamma-BHC (Lindane)	Oral-diet	Reproduction	3 generations	Lindane	Rat	0.35	8	NA	Sample et al., 1996	8	3.659	NA
Heptachlor	Oral-diet	Reproduction	181 days	Heptachlor	Mink	1	0.1 b	1	Sample et al., 1996	8	0.059	0.59
Heptachlor epoxide	Oral-diet	Reproduction	181 days	Heptachlor	Mink	1	0.1 b	1	Sample et al., 1996	8	0.059	0.59
Methoxychlor	Oral-diet	Reproduction	11 month	Methoxychlor	Rat	0.35	4	8	Sample et al., 1996	8	1.829	3.66
Herbicides												
2,4,5-T	Oral diet	Reduced neonatal survival	2 years/3 generations	2,4,5-T	Rat	0.35	3	10	IRIS,2002	8	1.372	4.57
2,4,5-TP	Oral diet	Fetotoxicity		2,4,5-TP	Rat	0.35	25	50	IRIS,2002	8	11.434	22.87
2-4,D	Oral-diet	Blood, kidney, and liver toxicity	90 days	2,4-D	Rat	0.35	1	5	IRIS, 2000	8	0.457	2.29
2,4-DB	Oral diet	Mortality	90 days	2,4-DB	Dog	10	8	25	IRIS, 2002	8	8.459	26.43
Dalapon	Oral- diet	Kidney toxicity	2 years	Dalapon - Na salt	Rat	0.35	8.45	28.17	IRIS, 2002	8	3.865	12.88
Dicamba	Oral-diet	Reproduction	13 days - gestation	Dicamba	Rabbit	1.2	0.3	1	IRIS, 2000	8	0.187	0.62
Dichloroprop							NA	NA		8	NA	NA
MCPA	Oral - diet	Reproduction	2 generations	MCPA	Rat	0.35	7.5	22.5	IRIS, 2000	8	3.430	10.29
MCPP	Oral-diet	Renal effects	90 days	MCPP	Rat	0.35	3	9	IRIS, 2000	8	1.372	4.12
PCBs												
Aroclor-1248	Oral-diet	Reproduction	392	Arochlor 1248	Rhesus monkey	5	0.01	0.1	Sample et al., 1996	8	0.009	0.09
Aroclor-1254	Oral-diet	Reproduction	126	Arochlor 1254	Mink	1	0.14	0.69	Sample et al., 1996	8	0.083	0.41
Total PCB	Oral-diet	Decreased Litter Size	Multigenerational	Arochlor 1254	Rat	0.35	0.32	1.5	Linder et al. 1974	8	0.146	0.69
2,3,7,8-tetrachlorodibenzofuran (TCDF)										8	0.000	0.00
2,3,7,8-tetrachlorodibenzodioxin (TCDD)	Oral-diet	Pup Weight, Litter Size	3 generations	2,3,7,8-TCDD	Rat	0.35	0.001 b	0.01	Murray et al., 1979	8	0.000	0.00
TEQ	Oral-diet	Pup Weight, Litter Size	3 generations	2,3,7,8-TCDD	Rat	0.35	0.001 b	0.01	Murray et al., 1979	8	0.000	0.00

[a]If the test species' body weight was not identified in the study than the following values were used: Rat = 0.35kg, Mouse = 0.03kg, Mink = 1.0kg
[b]Calculated from LOAEL
[c]Calculated based on five days per week exposure ((concentration*5)/7)
[d]Borzelleca et al., 1988

NA = Not Available/Not Applicable
NOAEL = No Observed Adverse Effect Level
LOAEL = Lowest Observed Adverse Effect Level

References:

Agency of Toxic Substances and Disease Registry (ATSDR). Toxicological Profiles.
Byron, W.R., G.W. Bierbower, J.B. Brouwer, and W.H. Hansen. 1967. Pathologic changes in rats and dogs from two-year feeding of sodium arsenite or sodium arsenate. Toxicology and Applied Pharmacology. 10:132-147.
Borzelleca, J.F., L.W. Condie Jr., and J.L. Egle Jr. 1988. Short-term toxicity (one to ten-day) gavage of barium chloride in male and female rats. Jounal of the American Collage of Toxicology. 7(5):675-685.
Integrated Risk Information System (IRIS). Substance Files. U.S. Environmental Protection Agency.
Linder, R.E., T.B. Gaines and R.D. Kimbrough. 1974. The Effect of Polychlorinated Biphenyls on rat Reproduction. Food and Cosmetic Toxicology. 12:
Murray, F.J., F.A. Smith, and K.D. Nitschke. 1979. Three-Generation Reproduction Study of Rats Given 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) in the Diet. Toxicology and Applied Pharmacology. 50:
Sample, B.E., D.M. Opresko, G.W. Suter II. Toxicological Benchmarks for Wildlife: 1996 Revision. U.S. Department of Energy, Office of Environmental Management. ES/ER/TM-86/R3.

Appendix C-2a
Toxicological Endpoints for Birds
Dead Creek
Sauget Area I

Compound	CHRONIC							
	Chemical Form	Test Species	Exposure Route	Exposure Duration (Days)	Effect	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Source
Metals								
Aluminum, Total	$Al_2(SO_4)_3$	Ringed Dove	Incorporation into Food	116	Reproduction	109.7	NA	Sample et al., 1996
Antimony, Total						NA	NA	
Arsenic, Total	Sodium Arsenite	Mallard Duck	Incorporation into Food	128	Mortality	5.14	12.84	Sample et al., 1996
Barium, Total	Barium Hydroxide	1 day old Chick	Incorporation into Food	4 weeks; subchronic to chronic factor of 0.1 applied to data by authors	Mortality	20.8	41.7	Sample et al., 1996
Beryllium, Total						NA	NA	Sample et al., 1997
Cadmium, Total	Cadmium Chloride	Mallard Duck	Incorporation into Food	90	Reproduction	1.45	20.03	Sample et al., 1996
Chromium, Total	Trivalent	Black Duck	Incorporation into Food	290	Reproduction	1	5	Sample et al., 1996
Cobalt, Total	not reported	Pekin ducklings	Incorporated into food	28 days	Mortality and myopathy	15	30	Van Vleet, 1982.
Copper, Total	Copper Oxide	1 day old Chick	Incorporation into Food	70	Growth, Mortality	47.0	61.7	Sample et al., 1996
Cyanide, Total						NA	NA	
Iron, Total						NA	NA	
Lead, Total	Acetate	Japanese Quail	Incorporation into Food	84	Reproduction	1.13	11.3	Sample et al., 1996
Manganese	Mn_3O_4	Japanese Quail	Incorporation into Food	75	Growth, Behavior	977	NA	Sample et al., 1996
Mercury, Total	Mercuric Chloride	Japanese Quail	Incorporation into Food	365	Reproduction	0.45	0.9	Sample et al., 1996
Methyl mercury	Methyl Mercury Dicyandiamide	Mallard Duck	Incorporation into Food	3 generations	Reproduction	0.0064 [a]	0.064	Sample et al., 1996
Molybdenum	Sodium Molybdate	Chicken	Incorporation into Food	21 days through reproduction	Reproduction	3.5 [a]	35.3	Sample et al., 1996
Nickel, Total	Nickel Sulfate	Mallard Duckling	Incorporation into Food	90	Mortality, Growth, Behavior	77.4	107	Sample et al., 1996
Selenium, Total	Selenomethionine	Mallard Duck	Incorporation into Food	78	Reproduction	0.4	0.8	Sample et al., 1996
Silver, Total						NA	NA	
Thallium, Total						NA	NA	
Tin	Bis Tributyltin Oxide	Japanese Quail	Incorporated into food	42 days through reproduction	Reproduction	6.8	16.9	Sample et al., 1996
Vanadium, Total	Vanadyl Sulfate	Mallard Duck	Incorporation into Food	84	Longevity, Mortality	11.4	NA	Sample et al., 1996
Zinc, Total	Zinc Sulfate	White Leghorn Hen	Incorporation into Food	308	Reproduction	14.5	131	Sample et al., 1996
Volatiles								
Acetone						NA	NA	Check ECOTOX
Chloroform						NA	NA	Check ECOTOX
Chloromethane						NA	NA	
2-Butanone (MEK)						NA	NA	
Methyl chloride						NA	NA	Check ECOTOX
cis-1,2-Dichloroethene						NA	NA	
Benzene						NA	NA	Check ECOTOX
Toluene						NA	NA	
Chlorobenzene						NA	NA	
Vinyl chloride						NA	NA	Check ECOTOX
p/m-Xylene						NA	NA	
Xylene (total)						NA	NA	
Semivolatiles								
Phenol						NA	NA	
1,3-Dichlorobenzene						NA	NA	
1,4-Dichlorobenzene						NA	NA	
1,2-Dichlorobenzene						NA	NA	
1,2-Dichloroethane	NA	Chicken	Oral in diet	730	Reproduction	17.2	34.4	Sample et al., 1996
2-Methylphenol						NA	NA	
3/4-Methylphenol						NA	NA	
Nitrobenzene						NA	NA	

Appendix E-2a
Toxicological Endpoints for Birds
Dead Creek
Sauget Area I

	CHRONIC							
Compound	**Chemical Form**	**Test Species**	**Exposure Route**	**Exposure Duration (Days)**	**Effect**	**NOAEL (mg/kg/d)**	**LOAEL (mg/kg/d)**	**Source**
2,4-Dichlorophenol						NA	NA	
1,2,4-Trichlorobenzene						NA	NA	
4-Chloroaniline						NA	NA	
2,4,5-Trichlorophenol						NA	NA	
n-Nitrosodiphenylamine						NA	NA	
Pentachlorophenol						NA	NA	
bis(2-Ethylhexyl)phthalate	Bis(2-ethylhexyl)phthalate	Ringed Dove	Incorporation into Food	28 during critical life stage = chronic	Reproduction	1.1	NA	Sample et al., 1996
o-Cresol					Not in Sample, check ECOTOX			
Hexachlorobutadiene			Incorporation into food	90	Mortality and reporduction	6	NA	Schwetz et al., 1974.
Naphthalene						NA	NA	
Acenaphthylene						NA	NA	
Acenaphthene						NA	NA	
Fluorene						NA	NA	
Phenanthrene						NA	NA	
Anthracene						NA	NA	
Fluoranthene						NA	NA	
Pyrene						NA	NA	
Benzo[a]anthracene						NA	NA	
Chrysene						NA	NA	
Benzo[b]fluoranthene						NA	NA	
Benzo[k]fluoranthene						NA	NA	
Benzo[a]pyrene						NA	NA	
Indeno[1,2,3-cd]pyrene						NA	NA	
Dibenz[a,h]anthracene						NA	NA	
Benzo[g,h,i]perylene						NA	NA	
2-Methylnaphthalene						NA	NA	
Total PAHs	Mix of PAHs	Mallard Duck	Oral	203	Increased Liver Weight	40 [a]	400	Eisler, 1987
Carbazole						NA	NA	
Aniline						NA	NA	
Pesticides								
a-Chlordane	Chlordane	Red-winged Blackbird	Incorporation into Food	84	Mortality	2.14	10.7	Sample et al., 1996
p,p'-DDE						NA	NA	
Total DDT	*NA*	*Brown Pelican*	*Incorporation into Food*	*5 years*	*Reproduction*	*0.0028*	*0.028*	*Sample et al., 1996.*
Aldrin						NA	NA	
alpha-Chlordane	Chlordane	Red-winged Blackbird	Incorporation into Food	84	Mortality	2.14	10.7	Sample et al., 1996
BHC	mixed isomers	Japanese Quail	Oral in diet	90	Reproduction	0.56	2.25	Sample et al., 1996
delta-BHC	BHC - mixed isomers	Japanese Quail	Incorporation into Food	90	Reproduction	0.56	2.25	Sample et al., 1996
Dieldrin	Dieldrin	Barn Owl	Incorporation into Food	730	Reproduction	0.077	NA	Sample et al., 1996
Endosulfan I	Endosulfan	Gray Partridge	Incorporation into Food	stage = chronic	Reproduction	10	NA	Sample et al., 1996
Endosulfan II	Endosulfan	Gray Partridge	Incorporation into Food	stage = chronic	Reproduction	10	NA	Sample et al., 1996
Endosulfan sulfate	Endosulfan	Gray Partridge	Incorporation into Food	stage = chronic	Reproduction	10	NA	Sample et al., 1996
Endrin aldehyde	Endrin	Screech Owl	Incorporation into Food	> 83	Reproduction	0.01 [a]	0.1	Sample et al., 1996
Endrin ketone	Endrin	Screech Owl	Incorporation into Food	> 83	Reproduction	0.01 [a]	0.1	Sample et al., 1996
gamma-Chlordane	*Chlordane*	*Red-winged Blackbird*	*Incorporation into Food*	84	*Mortality*	2.14	*10.7*	*Sample et al., 1996*
gamma-BHC (Lindane)	NA	Mallard Duck	Oral intubation	56	Reproduction	2 [a]	20	Sample et al., 1996
Heptachlor						NA	NA	
Heptachlor epoxide						NA	NA	
Methoxychlor						NA	NA	
Herbicides								
2,4-D						NA	NA	
Dicamba						NA	NA	
Dichloroprop						NA	NA	
MCPA						NA	NA	
MCPP						NA	NA	
PCBs								

Appendix C-2a
Toxicological Endpoints for Birds
Dead Creek
Sauget Area I

	CHRONIC							
Compound	Chemical Form	Test Species	Exposure Route	Exposure Duration (Days)	Effect	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Source
Aroclor-1248						NA	NA	
Arocor-1254	Aroclor 1254	Ringed-necked Pheasant	Incorporation into Food	119	Reproduction	0.18 [a]	1.8	Sample et al., 1996
Total PCB	Aroclor 1242	Mallard Duck	Incorporation into Food	84	Decreased wieght gain in hens, eggshell thinning	4.1 [a]	41	Haseltine and Prouty, 1980
2,3,7,8-tetrachlorodibenzofuran (TCDF)	NA	1-day chicks	Oral in diet	21	Mortality, weight gain	1E-06	0.00001	Sample et al., 1996
2,3,7,8-tetrachlorodibenzodioxin (TCDD)	NA	Ring-necked Pheasant	Weekly intraperitoneal injection	70	Reproduction	1.4E-05	0.00014	Sample et al., 1996
TEQ	2,3,7,8-TCDD	Ring-necked Pheasant	Intraperitoneal	70	Fertility, Embryo Mortalitiy	0.014 [a]	0.14	Nosek et al., 1992

NA = Not Available
TEF = Toxicity equivalency factor
[a] NOAEL value was derived by applying an Acute to Chronic Ratio of 10 to the LOAEL value.

Sources:

Eisler, R. 1987. Polycyclic aromatic hydrocarbon hazards to fish, wildlife, and invertebrates: A synoptic review. US Dept. of the Interior. US Fish and Wildlife Service. Patuxent Wildlife Research Center, MD

Haseltine, S.D. and R.M. Prouty, 1980. Aroclor 1242 and reproductive success of adult mallards (*Anas platyrhynchos*). Environmental Research. 23: 29-34.

Nosek, J.A., J.R. Sullivan, S.S. Hurley, S.R. Craven, and R.E. Peterson. 1992. Toxicity and reproductive effects of 2,3,7,8-tetrachlorodibenzo-*p*-dioxin in ring-necked pheasant hens. Journal of Toxicology and Environmental Health. 35: 187-198.

Sample, B.E., D.M. Opresko, and G.W. Suter II. 1996. Toxicological Benchmarks for Wildlife: 1996 Revision. Risk Assessment Program. Health Sciences Reasearch Division. Oak Ridge, TN. ES/ER/TM-86/R3.

Schwetz, B.A., J.M. Norris, R.J. Kociba, P.A. Keeler, R.F. Cornier, and P.J. Gehring, 1974. Reprodcution sutdy in Japanese quail fed hexachlorobutadienen for 90 days, Toxicology and Applied Pharmacology, 30, 255-265.

Van Vleet, J.F., 1982. Amounts of twelve elements required to induce selenium-vitamin E deficiency in ducklings. Am. J. Vet. Res., Vol. 43, No. 5, pp. 851-857.

Appendix E-2b
Toxicological Endpoints for Mammals
Dead Creek
Sauget Area 1

	CHRONIC											
	Test Species									Otter		
Compound	Exposure Route	Effect Endpoint	Exposure Duration	Chemical Form	Test Species	Body Weight[a] (kg)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Reference	Body Weight (kg)	Final NOAEL (mg/kg/d)	Final LOAEL (mg/kg/d)
Metals												
Aluminum, Total	Oral-water	Reproduction	3 generations	Aluminum Chloride	Mouse	0.03	1.93	19.3	Sample et al., 1996	8	0.478	4.78
Antimony, Total	Oral-water	Longevity	lifetime (>1yr)	Antimony Potassium Tartrate	Mouse	0.03	0.125	1.25	Sample et al., 1996	8	0.031	0.31
Arsenic, Total	Oral-diet	Growth	730	Arsenite	Rat	0.35	2.5	NA	Byron et al. 1967	8	1.143	NA
Barium, Total	Oral-gavage	Mortality	10	Barium Chloride	Rat	0.435	13.8 [d]	19.8	Sample et al., 1996	8	6.664	9.56
Beryllium, Total	Oral intubation	Longevity, weight loss	lifetime (>1yr)	Beryllium Sulfate	Rat	0.35	0.66	NA	Sample et al., 1996	8	0.302	NA
Cadmium, Total	Oral-gavage	Reproduction	42	Cadmium Chloride	Rat	0.303	1	10	Sample et al., 1996	8	0.441	4.41
Chromium, Total	Oral-diet	Reprod/Longevity	730	Trivalent Chromium	Rat	0.35	2737	NA	Sample et al., 1996	8	1252	NA
Cobalt, Total							NA	NA		8	NA	NA
Copper, Total	Oral-diet	Reproduction	357	Copper Sulfate	Mink	1	11.7	15.14	Sample et al., 1996	8	6.957	9.00
Cyanide, Total	Oral-diet	Reproduction	Gestation and lactation	Potassium Cyanide	Rat	0.273	68.7	NA	Sample et al., 1996	8	29.527	NA
Iron, Total							NA	NA		8	NA	NA
Lead, Total	Oral-diet	Reproduction	3 generations	Lead Acetate	Rat	0.35	8	80	Sample et al., 1996	8	3.659	36.59
Manganese, Total	Oral-diet	Reproduction	224 days	Manganese Oxide	Rat	0.35	88	284	Sample et al., 1996	8	40.246	129.89
Mercury, Total	Oral-diet	Reproduction	168	Mercuric Chloride	Mink	1	1	NA	Sample et al., 1996	8	0.595	NA
Methyl mercury	Oral-diet	Reproduction	3 generations	Methyl Mercury Chloride	Rat	0.35	0.032	0.16	Sample et al., 1996	8	0.015	0.07
Molybdenum, Total	Oral - water	Reproduction	3 generations	Molybdate	Mouse	0.03	0.26 [b]	2.6	Sample et al., 1996	8	0.064	0.64
Nickel, Total	Oral-diet	Reproduction	3 generations	Nickel Sulfate Hexahydrate	Rat	0.35	40	80	Sample et al., 1996	8	18.294	36.59
Selenium, Total	Oral-water	Reproduction	1yr, 2 generations	Potassium Selenate	Rat	0.35	0.2	0.33	Sample et al., 1996	8	0.091	0.15
Silver, Total	Oral-water	Body Weight	259	NA	Rat	0.35	22 [b]	222.2	ATSDR	8	10.062	101.62
Strontium (stable), Total	Oral-water	Body Weight & bone changes	3 years	Strontium Chloride	Rat	0.35	263	NA	Sample et al., 1996	8	120.282	NA
Thallium, Total	Oral-water	Reproduction	60	Thallium Sulfate	Rat	0.365	0.0074	0.074	Sample et al., 1996	8	0.003	0.03
Vanadium, Total	Oral-intubation	Reproduction	>60	Sodium Metavanadate	Rat	0.26	0.21	2.1	Sample et al., 1996	8	0.089	0.89
Zinc, Total	Oral-diet	Reproduction	16 of gestation	Zinc Oxide	Rat	0.35	160	320	Sample et al., 1996	8	73.175	146.35
Volatiles												
Acetone	Oral intubation	Liver and kidney damage	90 days	NA	Rat	0.35	10	50	Sample et al., 1996	8	4.573	22.87
Chloroform	Oral intubation	Liver, kidney, gonad condition	13 weeks	NA	Rat	0.35	15	41	Sample et al., 1996	8	6.860	18.75
Chloromethane							NA	NA		8	NA	NA
Bromodichloromethane	Oral - gavage	Kidney effects	102 weeks	NA	Mouse	0.03	NA	17.9	IRIS, 2002	8	NA	4.43
Bromoform	Oral - gavage	Liver lesions	13 weeks	NA	Rat	0.35	17.9	35.7	IRIS, 2002	8	8.186	16.33
2-Butanone (MEK)	Oral-water	Reproduction	2 generations	NA	Rat	0.35	1771	4571	Sample et al., 1996	8	809.959	2090.53
Methyl chloride	Oral-water	Liver Histology	2 years	NA	Rat	0.35	5.85	50	Sample et al., 1996	8	2.675	22.87
cis-1,2-Dichloroethene	Oral-gavage	Body Weight	90 - applied ACR	NA	Rat	0.35	3.2	29	ATSDR	8	1.464	13.26
Benzene	Oral-gavage	Reproduction	Days 6-12 of gestation	NA	Mouse	0.03	26.36	263.6	Sample et al., 1996	8	6.523	65.23
Ethyl benzene	Oral - gavage	Liver and kidney histology	182 days	NA	Rat	0.35	97.1	291	IRIS, 2002	8	44.408	133.09
Toluene	Oral-gavage	Reproduction	7 of gestation	NA	Mouse	0.03	26	260	Sample et al., 1996	8	6.434	64.34
Carbon Disulfide	Inhalation	Fetal toxicity	34 weeks + length of pregnancy	NA	Rat	0.35	5	NA	IRIS, 2002	8	2.287	NA
Chlorobenzene	Oral-gavage	Mortality	515	NA	Mouse	0.03	86 [c]	NA	ATSDR	8	21.282	NA
Styrene	Oral - diet	Red blood cell and liver effects	560 days	NA	Dog	10	200	400	IRIS, 2002	8	211.474	422.95
1,1,2,2-Tetrachloroethane	Oral-gavage	Kidney and liver effects	103 weeks	1,1,2,2-tetrachloroethane	Rat	0.35	NA	89.3	IRIS, 2002	8	NA	40.84
1,1,2-Trichloroethane	Oral - diet	Blood chemistry	90 days	1,1,2-trichloroethane	Mouse	0.03	4	44	IRIS, 2002	8	0.965	10.89
vinyl chloride	Oral-diet	Longevity, Mortality	Lifetime (144 days)	NA	Rat	0.35	0.17	1.7	Sample et al., 1996	8	0.078	0.78

Appen 2b
Toxicological Endpoints for Mammals
Dead Creek
Sauget Area I

Compound	CHRONIC Test Species									Otter		
	Exposure Route	Effect Endpoint	Exposure Duration	Chemical Form	Test Species	Body Weight[a] (kg)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Reference	Body Weight (kg)	Final NOAEL (mg/kg/d)	Final LOAEL (mg/kg/d)
p/m-Xylene	Oral-gavage	Reproduction	Days 6-15 of gestation	Xylene (mixed isomers)	Mouse	0.03	2.1	2.6	Sample et al., 1996	8	0.520	0.64
Xylene (total)	Oral-gavage	Reproduction	Days 6-15 of gestation	Xylene (mixed isomers)	Mouse	0.03	2.1	2.6	Sample et al., 1997	8	0.520	0.64
Semivolatiles												
Phenol	Oral-gavage	Fetal body weight	Days 6-15 gestation	Phenol	Rat	0.03	60	120		8	14.848	29.70
1,3-Dichlorobenzene							NA	NA		8	NA	NA
1,4-Dichlorobenzene	Oral-gavage	Mortality - 52%	515	NA	Rat	0.35	21 b	210 c	ATSDR	8	9.604	96.04
1,2-Dichlorobenzene	Oral-gavage	Mortality	515	NA	Rat	0.35	86 c	NA	IRIS	8	39.332	NA
1,2-Dichloroethane	Oral-water	Reproduction	2 generations	NA	Mouse	0.035	50	NA	Sample et al., 1996	8	12.859	NA
2-Methylphenol	Oral-diet	Reproduction	168	o-cresol	Mink	1	220	NA	Sample et al., 1996	8	130.813	NA
3/4-Methylphenol	Oral-gavage	Mortality	16-20wk, 5-7d/wk, 1x/d	p-cresol	Rat	0.35	175	450	ATSDR	8	80.035	205.81
Nitrobenzene	Inhalation	Kindney and Liver Lesions	90 days	Nitrobenzene	Mouse	0.035	NA	4.6	IRIS, 2002	8	NA	1.18
2,4-Dichlorophenol							NA	NA		8	NA	NA
1,2,4-Trichlorobenzene	Oral-water	Adrenal weight	multigenerational	NA	Rat	0.35	14.8	53.6	IRIS	8	6.769	24.51
4-Chloroaniline	Oral-gavage	Growth, Mortality	515	NA	Rat	0.35	10 c	NA	NTP, 1989	8	4.573	NA
2,4,5-Trichlorophenol	Oral	Behavior, Mortality, etc	98	NA	Rat	0.35	100	300	IRIS	8	45.735	137.20
n-Nitrosodiphenylamine	Oral-diet	Mortality ~30%	700	NA	Rat	0.35	20 b	200	ATSDR	8	9.147	91.47
Pentachlorophenol	Oral-diet	Body Weight	181	NA	Rat	0.35	4	13	ATSDR	8	1.829	5.95
bis(2-Ethylhexyl)phthalate	Oral-diet	Reproduction	28	NA	Mouse	0.03	18.3	183	Sample et al., 1996	8	4.529	45.29
o-Cresol	Oral-diet	Reproduction	6 months	NA	Mink	1	219.2	NA	Sample et al., 1996	8	130.337	NA
Naphthalene	Oral-gavage	Body Weight	65-applied ACR	NA	Rat	0.35	7.1 c	14 c	IRIS	8	3.247	6.40
Acenaphthylene							NA	NA		8	NA	NA
Acenaphthene	Oral-gavage	Reproduction	91	NA	Mouse	0.03	350	700	ATSDR	8	86.612	173.22
Fluorene	Oral-gavage	Reproduction	91	NA	Mouse	0.03	500	NA	ATSDR	8	123.731	NA
Phenanthrene							NA	NA		8	NA	NA
Anthracene	Oral-gavage	Mortality, Body Weight	90-applied ACR	NA	Mouse	0.03	100	NA	IRIS	8	24.746	NA
Fluoranthene	Oral-gavage	Reproduction	91	NA	Mouse	0.03	500	NA	ATSDR	8	123.731	NA
Pyrene	Oral-gavage	Kidney effects	91-applied ACR	NA	Mouse	0.03	7.5	13	IRIS	8	1.856	3.22
Benzo[a]anthracene							NA	NA		8	NA	NA
Chrysene							NA	NA		8	NA	NA
Benzo[b]fluoranthene							NA	NA		8	NA	NA
Benzo[k]fluoranthene							NA	NA		8	NA	NA
Benzo[a]pyrene	Oral-intubation	Reproduction	10 of gestation	NA	Mouse	0.03	1	10	Sample et al., 1996	8	0.247	2.47
Indeno[1,2,3-cd]pyrene							NA	NA		8	NA	NA
Dibenz[a,h]anthracene							NA	NA		8	NA	NA
Benzo[g,h,i]perylene							NA	NA		8	NA	NA
2-Methylnaphthalene							NA	NA		8	NA	NA
Total PAH							NA	NA		8	NA	NA
Carbazole							NA	NA		8	NA	NA
Aniline							NA	NA		8	NA	NA
Pesticides												
a-Chlordane	Oral-diet	Reproduction	6 generations	Chlordane	Mouse	0.03	4.6	9.2	Sample et al., 1996	8	1.138	2.28
p,p'-DDE	Oral-diet	Reproduction	730	DDT	Rat	0.35	0.8	4	Sample et al., 1996	8	0.366	1.83
Total DDT	Oral-diet	Reproduction	730	DDT	Rat	0.35	0.8	4	Sample et al., 1996	8	0.366	1.83
Aldrin	Oral - diet	Reproduction	3 generations	NA	Rat	0.35	0.2	1	Sample et al., 1996	8	0.091	0.46
delta-BHC	Oral-diet	Reproduction	331 days	BHC mixed isomers	Mink	1	0.014 b	0.14	Sample et al., 1996	8	0.008	0.08
Dieldrin	Oral-diet	Reproduction	3 generations	NA	Rat	0.35	0.02 b	0.2	Sample et al., 1996	8	0.009	0.09
Endosulfan I	Oral intubation	Reproduction/blood chemistry	30 days	Endosulfan	Rat	0.35	0.15 c	NA	Sample et al., 1996	8	0.069	NA

Appendix E-2b
Toxicological Endpoints for Mammals
Dead Creek
Sauget Area I

Compound	CHRONIC									Otter		
	Test Species											
	Exposure Route	Effect Endpoint	Exposure Duration	Chemical Form	Test Species	Body Weight[a] (kg)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Reference	Body Weight (kg)	Final NOAEL (mg/kg/d)	Final LOAEL (mg/kg/d)
Endosulfan II	Oral intubation	Reproduction/blood chemistry	30 days	Endosulfan	Rat	0.35	0.15 [c]	NA	Sample et al., 1996	8	0.069	NA
Endosulfan sulfate	Oral intubation	Reproduction/blood chemistry	30 days	Endosulfan	Rat	0.35	0.15 [c]	NA	Sample et al., 1996	8	0.069	NA
Endrin aldehyde	Oral - diet	Reproduction	120 days	Endrin	Mouse	0.03	0.092 [b]	0.92	Sample et al., 1996	8	0.023	0.23
Endrin ketone	Oral - diet	Reproduction	120 days	Endrin	Mouse	0.03	0.092 [b]	0.92	Sample et al., 1996	8	0.023	0.23
gamma-Chlordane	Oral-diet	Reproduction	6 generations	Chlordane	Mouse	0.03	4.6	9.2	Sample et al., 1996	8	1.138	2.28
gamma-BHC (Lindane)	Oral-diet	Reproduction	3 generations	Lindane	Rat	0.35	8	NA	Sample et al., 1996	8	3.659	NA
Heptachlor	Oral-diet	Reproduction	181 days	Heptachlor	Mink	1	0.1 [b]	1	Sample et al., 1996	8	0.059	0.59
Heptachlor epoxide	Oral-diet	Reproduction	181 days	Heptachlor	Mink	1	0.1 [b]	1	Sample et al., 1996	8	0.059	0.59
Methoxychlor	Oral-diet	Reproduction	11 month	Methoxychlor	Rat	0.35	4	8	Sample et al., 1996	8	1.829	3.66
Herbicides												
2,4,5-T	Oral diet	Reduced neonatal survival	2 years/3 generations	2,4,5-T	Rat	0.35	3	10	IRIS,2002	8	1.372	4.57
2,4,5-TP	Oral diet	Fetotoxicity		2,4,5-TP	Rat	0.35	25	50	IRIS,2002	8	11.434	22.87
2-4,D	Oral-diet	Blood, kidney, and liver toxicity	90 days	2,4-D	Rat	0.35	1	5	IRIS, 2000	8	0.457	2.29
2,4-DB	Oral diet	Mortality	90 days	2,4-DB	Dog	10	8	25	IRIS, 2002	8	8.459	26.43
Dalapon	Oral- diet	Kidney toxicity	2 years	Dalapon - Na salt	Rat	0.35	8.45	28.17	IRIS, 2002	8	3.865	12.88
Dicamba	Oral-diet	Reproduction	13 days - gestation	Dicamba	Rabbit	1.2	0.3	1	IRIS, 2000	8	0.187	0.62
Dichloroprop							NA	NA		8	NA	NA
MCPA	Oral - diet	Reproduction	2 generations	MCPA	Rat	0.35	7.5	22.5	IRIS, 2000	8	3.430	10.29
MCPP	Oral-diet	Renal effects	90 days	MCPP	Rat	0.35	3	9	IRIS, 2000	8	1.372	4.12
PCBs												
Aroclor-1248	Oral-diet	Reproduction	392	Arochlor 1248	Rhesus monkey	5	0.01	0.1	Sample et al., 1996	8	0.009	0.09
Aroclor-1254	Oral-diet	Reproduction	126	Arochlor 1254	Mink	1	0.14	0.69	Sample et al., 1996	8	0.083	0.41
Total PCB	Oral-diet	Decreased Litter Size	Multigenerational	Arochlor 1254	Rat	0.35	0.32	1.5	Linder et al. 1974	8	0.146	0.69
2,3,7,8-tetrachlorodibenzofuran (TCDF)										8	0.000	0.00
2,3,7,8-tetrachlorodibenzodioxin (TCDD)	Oral-diet	Pup Weight, Litter Size	3 generations	2,3,7,8-TCDD	Rat	0.35	0.001 [b]	0.01	Murray et al., 1979	8	0.000	0.00
TEQ	Oral-diet	Pup Weight, Litter Size	3 generations	2,3,7,8-TCDD	Rat	0.35	0.001 [b]	0.01	Murray et al., 1979	8	0.000	0.00

[a]If the test species' body weight was not identified in the study than the following values were used: Rat = 0.35kg, Mouse = 0.03kg, Mink = 1.0kg
[b]Calculated from LOAEL
[c]Calculated based on five days per week exposure ((concentration*5)/7)
[d]Borzelleca et al., 1988

NA = Not Available/Not Applicable
NOAEL = No Observed Adverse Effect Level
LOAEL = Lowest Observed Adverse Effect Level

References:

Agency of Toxic Substances and Disease Registry (ATSDR). Toxicological Profiles.
Byron, W.R., G.W. Bierbower, J.B. Brouwer, and W.H. Hansen. 1967. Pathologic changes in rats and dogs from two-year feeding of sodium arsenite or sodium arsenate. Toxicology and Applied Pharmacology. 10:132-147.
Borzelleca, J.F., L.W. Condie Jr., and J.L. Egle Jr. 1988. Short-term toxicity (one to ten-day) gavage of barium chloride in male and female rats. Jounal of the American Colloge of Toxicology. 7(5):675-685.
Integrated Risk Information System (IRIS). Substance Files. U.S. Environmental Protection Agency.
Linder, R.E., T.B. Gaines and R.D. Kimbrough. 1974. The Effect of Polychlorinated Biphenyls on rat Reproduction. Food and Cosmetic Toxicology. 12:
Murray, F.J., F.A. Smith, and K.D. Nitschke. 1979. Three-Generation Reproduction Study of Rats Given 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) in the Diet. Toxicology and Applied Pharmacology. 50:
Sample, B.E., D.M. Opresko, G.W. Suter II. Toxicological Benchmarks for Wildlife: 1996 Revision. U.S. Department of Energy, Office of Environmental Management. ES/ER/TM-86/R3.

Appendix C-3a
Food Chain Model For
Great Blue Heron Ingesting Fish
Creek Segment B
Dead Creek
Sauget Area I

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Time and Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Ratio of Time in Area	Exposure Dose mg/kg/day	Food		Sediment	Sediment
									Total Conc in Food mg/kg wet	Ingestion Rate kg/kg/day	Sediment Concentration mg/kg dry	BSAF
Cyanide	NB	NB	NA	NA		1	0.75			0.18	0.40	
Herbicides and Pesticides												
2,3,5-T	NB	NB	NA	NA		1	0.75			0.18	0.014	
2,4,5-TP (Silvex)	NB	NB	NA	NA		1	0.75			0.18	0.0018	
2,4-D	NB	NB	NA	NA		1	0.75			0.18	0.0084	
2,4-DB	NB	NB	NA	NA	8.84E-04	1	0.75	1.18E-03	0.0065487	0.18	0.0079	0.83
4,4'-DDD	NB	NB	NA	NA		1	0.75			0.18	0.0105	
4,4'-DDE	NB	NB	NA	NA	3.81E-03	1	0.75	5.08E-03	0.02822571	0.18	0.0037	7.12
4,4'-DDT	NB	NB	NA	NA		1	0.75			0.18	0.0286	
Total DDT	1.E+00	1.E-01	0.0028	0.028	3.81E-03	1	0.75	5.08E-03	0.02822571	0.18	0.0432	
Aldrin	NB	NB	NA	NA		1	0.75			0.18	0.00036	
Alpha-BHC	BSAF NA	BSAF NA	0.56	2.25		1	0.75			0.18	0.0007	
Alpha Chlordane	ND	ND	2.14	10.7		1	0.75			0.18	ND	
beta-BHC	BSAF NA	BSAF NA	0.56	2.25		1	0.75			0.18	0.0015	
Dalapon	NB	NB	NA	NA		1	0.75			0.18	0.040	
delta-BHC	BSAF NA	BSAF NA	0.56	2.25		1	0.75			0.18	0.00056	
Dicamba	NB	NB	NA	NA	3.56E-05	1	0.75	4.75E-05	0.00026369	0.18	0.0029	0.0922
Dichloroprop	NB	NB	NA	NA	4.14E-05	1	0.75	5.52E-05	0.0003069	0.18	0.0086	0.0465
Dieldrin	1.E-02	NB	0.077	NA	8.49E-04	1	0.75	1.13E-03	0.00628538	0.18	0.0076	0.777
Dinoseb	NB	NB	NA	NA		1	0.75			0.18	ND	
Endosulfan I	ND	NB	10	NA		1	0.75			0.18	ND	
Endosulfan II	BSAF NA	NB	10	NA		1	0.75			0.18	0.0028	
Endosulfan sulfate	BSAF NA	NB	10	NA		1	0.75			0.18	0.0031	
Endrin	ND	ND	0.01	0.1		1	0.75			0.18	ND	
Endrin aldehyde	ND	ND	0.01	0.1		1	0.75			0.18	ND	
Endrin ketone	BSAF NA	BSAF NA	0.01	0.1		1	0.75			0.18	0.0010	
gamma-BHC (Lindane)	BSAF NA	BSAF NA	2.0	20		1	0.75			0.18	0.0013	
Gamma Chlordane	3.E-05	5.E-06	2.14	10.7	5.64E-05	1	0.75	7.52E-05	0.00041786	0.18	0.00039	1
Heptachlor	NB	NB	NA	NA		1	0.75			0.18	0.0012	
Heptachlor epoxide	NB	NB	NA	NA		1	0.75			0.18	0.011	
MCPA	NB	NB	NA	NA		1	0.75			0.18	ND	1.12
MCPP	NB	NB	NA	NA		1	0.75			0.18	1.7	
Methoxychlor	NB	NB	NA	NA		1	0.75			0.18	0.0017	
Toxaphene	NB	NB	NA	NA		1	0.75			0.18	ND	
SVOCs												
1,2,4-Trichlorobenzene	NB	NB	NA	NA		1	0.75			0.18	0.49	
1,2-Dichlorobenzene	NB	NB	NA	NA		1	0.75			0.18	0.46	
1,3-Dichlorobenzene	NB	NB	NA	NA		1	0.75			0.18	0.10	
1,4-Dichlorobenzene	NB	NB	NA	NA		1	0.75			0.18	0.24	
2,4,5-Trichlorophenol	NB	NB	NA	NA		1	0.75			0.18	0.12	
2,4,6-Trichlorophenol	NB	NB	NA	NA		1	0.75			0.18	0.10	
2,4-Dichlorophenol	NB	NB	NA	NA		1	0.75			0.18	0.20	
2,4-Dinitrophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4-Dinitrotoluene	NB	NB	NA	NA		1	0.75			0.18	ND	
2,6-Dinitrotoluene	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Chloronaphthalene	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Chlorophenol	NB	NB	NA	NA		1	0.75			0.18	0.13	
2-Methylnaphthalene	NB	NB	NA	NA		1	0.75			0.18	0.24	
2-Methylphenol (o-cresol)	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Nitroanaline	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Nitrophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
3- & 4-Methylphenol	NB	NB	NA	NA		1	0.75			0.18	0.15	
3,3'-Dichlorobenzidine	NB	NB	NA	NA		1	0.75			0.18	ND	
3-Nitroanaline	NB	NB	NA	NA		1	0.75			0.18	ND	
4,6-Dinitro-2-methylphenol	NB	NB	NA	NA		1	0.75			0.18	ND	
4-Bromophenyl phenyl ether	NB	NB	NA	NA		1	0.75			0.18	ND	
4-Chloro-3-methylphenol	NB	NB	NA	NA		1	0.75			0.18	ND	
4-Chloroanaline	NB	NB	NA	NA		1	0.75			0.18	0.45	

Appendix E-3a
Food Chain Model For
Great Blue Heron Ingesting Fish
Creek Segment B
Dead Creek
Sauget Area I

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Time and Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Ratio of Time in Area	Food: Exposure Dose mg/kg/day	Food: Total Conc in Food mg/kg wet	Food: Ingestion Rate kg/kg/day	Sediment: Sediment Concentration mg/kg dry	Sediment: BSAF
4-Chlorophenyl phenyl ether	NB	NB	NA	NA		1	0.75			0.18	ND	
4-Nitroanaline	NB	NB	NA	NA		1	0.75			0.18	0.74	
4-Nitrophenol	NB	NB	NA	NA		1	0.75			0.18	0.44	
Acenapthene	NB	NB	NA	NA		1	0.75			0.18	0.137	
Acenaphthylene	NB	NB	NA	NA		1	0.75			0.18	0.124	
Anthracene	NB	NB	NA	NA		1	0.75			0.18	0.152	
Benzo(a)anthracene	NB	NB	NA	NA		1	0.75			0.18	0.169	
Benzo(a)pyrene	NB	NB	NA	NA		1	0.75			0.18	0.106	
Benzo(b)fluoranthene	NB	NB	NA	NA		1	0.75			0.18	0.16	
Benzo(g,h,I,)perylene	NB	NB	NA	NA		1	0.75			0.18	0.145	
Benzo(k)fluoranthene	NB	NB	NA	NA		1	0.75			0.18	0.156	
Bis(2-chloroethoxy)methane	NB	NB	NA	NA		1	0.75			0.18	ND	
Bis(2-chloroethyl)ether	NB	NB	NA	NA		1	0.75			0.18	ND	
Bis(2-chloroisopropyl)ether	NB	NB	NA	NA		1	0.75			0.18	ND	
bis(2-ethylhexyl)phthalate	5.E-02	NB	1.1	NA	5.57E-02	1	0.75	7.43E-02	0.41252143	0.18	0.28	1.38
Butylbenzylphthalate	NB	NB	NA	NA		1	0.75			0.18	0.16	
Carbazole	NB	NB	NA	NA		1	0.75			0.18	0.133	
Chrysene	NB	NB	NA	NA		1	0.75			0.18	0.17	
Dibenzo(a,h)anthracene	NB	NB	NA	NA	6.09E-03	1	0.75	8.12E-03	0.045126	0.18	0.0763	0.552
Dibenzofuran	NB	NB	NA	NA		1	0.75			0.18	0.147	
Diethylphthalate	NB	NB	NA	NA		1	0.75			0.18	ND	0.266
Dimethylphthalate	NB	NB	NA	NA		1	0.75			0.18	ND	
Di-n-butylphthalate	BSAF NA	BSAF NA	0.1	1.1		1	0.75			0.18	0.12	
Di-n-octylphthalate	NB	NB	NA	NA		1	0.75			0.18	ND	
Fluoranthene	NB	NB	NA	NA		1	0.75			0.18	0.207	
Fluorene	NB	NB	NA	NA		1	0.75			0.18	0.161	
Hexachlorobenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
Hexachlorobutadiene	ND	NB	6.0	NA		1	0.75			0.18	ND	
Hexachlorocyclopentadiene	NB	NB	NA	NA		1	0.75			0.18	ND	
Hexachloroethane	NB	NB	NA	NA		1	0.75			0.18	ND	
Indeno(1,2,3-c,d)pyrene	NB	NB	NA	NA	1.27E-02	1	0.75	1.69E-02	0.09383571	0.18	0.145	0.604
Isophorone	NB	NB	NA	NA		1	0.75			0.18	ND	
Naphthalene	NB	NB	NA	NA		1	0.75			0.18	0.199	
Nitrobenzene	NB	NB	NA	NA		1	0.75			0.18	0.13	
N-Nitroso-di-N-propylamine	NB	NB	NA	NA		1	0.75			0.18	ND	
N-Nitrosodiphenylamine	NB	NB	NA	NA		1	0.75			0.18	0.14	
Pentachlorophenol	NB	NB	NA	NA	8.63E-05	1	0.75	1.15E-04	0.00063956	0.18	0.27	0.00236
Phenanthrene	NB	NB	NA	NA		1	0.75			0.18	0.215	
Phenol	NB	NB	NA	NA		1	0.75			0.18	0.16	
Pyrene	NB	NB	NA	NA		1	0.75			0.18	0.217	
Total PAHs	5.E-04	5.E-05	40.0	400	1.88E-02	1	0.75	2.50E-02	0.13896171	0.18	2.77	
VOCs												
1,1,1-Trichloroethane	NB	NB	NA	NA		1	0.75			0.18	0.0044	
1,1,2,2-Tetrachloroethane	NB	NB	NA	NA		1	0.75			0.18	ND	
1,1,2-Trichloroethane	NB	NB	NA	NA		1	0.75			0.18	ND	
1,1-Dichloroethane	NB	NB	NA	NA		1	0.75			0.18	ND	
1,1-Dichlorothene	NB	NB	NA	NA		1	0.75			0.18	ND	
1,2-Dichloroethane	ND	ND	17.2	34.4		1	0.75			0.18	ND	
1,2-Dichloroethene(total)	NB	NB	NA	NA		1	0.75			0.18	0.0040	
1,2-Dichloropropane	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Butanone(MEK)	NB	NB	NA	NA		1	0.75			0.18	0.036	
2-Hexanone	NB	NB	NA	NA		1	0.75			0.18	0.021	
4-Methyl-2-pentanone (MIBK)	NB	NB	NA	NA		1	0.75			0.18	0.021	
Acetone	NB	NB	NA	NA		1	0.75			0.18	0.16	
Benzene	NB	NB	NA	NA		1	0.75			0.18	0.0071	
Bromodichloromethane	NB	NB	NA	NA		1	0.75			0.18	ND	
Bromoform	NB	NB	NA	NA		1	0.75			0.18	ND	
Bromomethane	NB	NB	NA	NA		1	0.75			0.18	ND	

Appendix C-3a
Food Chain Model For
Great Blue Heron Ingesting Fish
Creek Segment B
Dead Creek
Sauget Area I

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Time and Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Ratio of Time in Area	Exposure Dose mg/kg/day	Food: Total Conc in Food mg/kg wet	Food: Ingestion Rate kg/kg/day	Sediment: Sediment Concentration mg/kg dry	Sediment: BSAF
Carbon disulfide	NB	NB	NA	NA		1	0.75			0.18	0.013	
Carbon tetrachloride	NB	NB	NA	NA		1	0.75			0.18	ND	
Chlorobenzene	NB	NB	NA	NA		1	0.75			0.18	1.1	
Chloroform	NB	NB	NA	NA		1	0.75			0.18	0.0027	
Chloroethane	NB	NB	NA	NA		1	0.75			0.18	ND	
Chloromethane	NB	NB	NA	NA		1	0.75			0.18	ND	
cis-1,3-Dichloropropene	NB	NB	NA	NA		1	0.75			0.18	ND	
Dibromochloromethane	NB	NB	NA	NA		1	0.75			0.18	ND	
Ethylbenzene	NB	NB	NA	NA		1	0.75			0.18	0.029	
Methylene chloride	NB	NB	NA	NA		1	0.75			0.18	0.0024	
Styrene	NB	NB	NA	NA		1	0.75			0.18	0.0025	
Tetrachloroethene	NB	NB	NA	NA		1	0.75			0.18	0.005	
Toluene	NB	NB	NA	NA		1	0.75			0.18	0.011	
trans-1,3-Dichloropropene	NB	NB	NA	NA		1	0.75			0.18	ND	
Trichloroethene	NB	NB	NA	NA		1	0.75			0.18	0.0047	
Vinyl chloride	NB	NB	NA	NA		1	0.75			0.18	ND	
Xylenes (total)	NB	NB	NA	NA		1	0.75			0.18	0.12	
Inorganics												
Aluminum, Total	1.E-02	NB	109.7	NA	1.44E+00	1	0.75	1.92E+00	10.6806712	0.18	9390	$\ln[Al_{fish}] = -21.2593 + 2.583 \ln[Al]_{sed}$
Antimony	NB	NB	NA	NA		1	0.75			0.18	1.6	
Arsenic, Total	BSAF NA	BSAF NA	5.1	12.84		1	0.75			0.18	11	
Barium, Total	BSAF NA	BSAF NA	20.8	41.7		1	0.75			0.18	322	
Beryllium	NB	NB	NA	NA		1	0.75			0.18	0.54	
Cadmium, Total	BSAF NA	BSAF NA	1.45	20		1	0.75			0.18	20	
Calcium	NB	NB	NA	NA		1	0.75			0.18	8160	
Chromium, Total	2.E-01	4.E-02	1.00	5.00	2.02E-01	1	0.75	2.70E-01	1.4961	0.18	71	0.0211
Cobalt	BSAF NA	BSAF NA	15.0	30		1	0.75			0.18	8.6	
Copper, Total	8.E-03	6.E-03	47.0	61.7	3.84E-01	1	0.75	5.13E-01	2.84753679	0.18	898	$\ln[Cu]_{fish} = -1.9259 + 0.4371 \ln[Cu]_{sed}$
Iron	NB	NB	NA	NA		1	0.75			0.18	13800	
Lead, Total	1.E-01	1.E-02	1.13	11.3	1.12E-01	1	0.75	1.49E-01	0.828835	0.18	100	0.00833
Magnesium	NB	NB	NA	NA		1	0.75			0.18	5980	
Manganese	BSAF NA	NB	977	NA		1	0.75			0.18	197	
Mercury	BSAF NA	BSAF NA	0.0064	0.064		1	0.75			0.18	0.19	
Molybdenum	BSAF NA	BSAF NA	3.50	35.3		1	0.75			0.18	0.94	
Nickel, Total	BSAF NA	BSAF NA	77.40	107		1	0.75			0.18	385	
Potassium	NB	NB	NA	NA		1	0.75			0.18	1760	
Selenium	1.E-01	6.E-02	0.50	1	5.76E-02	1	0.75	7.68E-02	0.426789	0.18	0.89	0.479
Silver	NB	NB	NA	NA		1	0.75			0.18	0.79	
Sodium	NB	NB	NA	NA		1	0.75			0.18	219	
Thallium	NB	NB	NA	NA		1	0.75			0.18	0.67	
Tin	BSAF NA	BSAF NA	6.80	16.9		1	0.75			0.18	7.84	
Vanadium	BSAF NA	NB	11.40	NA		1	0.75			0.18	25	
Zinc, Total	5.E-01	5.E-02	14.5	131	6.89E+00	1	0.75	9.19E+00	51.0576229	0.18	5340	$\ln[Zn]_{fish} = 2.4275 + 0.1754 \ln[Zn]_{sed}$
PCBs												
Monochlorobiphenyl	NB	NB	NA	NA		1	0.75			0.18	0	
Dichlorobiphenyl	NB	NB	NA	NA		1	0.75			0.18	0	
Trichlorobiphenyl	NB	NB	NA	NA	2.54E-02	1	0.75	3.39E-02	0.1881	0.18	0	0.84
Tetrachlorobiphenyl	NB	NB	NA	NA	9.91E-01	1	0.75	1.32E+00	7.33928571	0.18	1	6.85
Pentachlorobiphenyl	NB	NB	NA	NA	3.40E-01	1	0.75	4.53E-01	2.516425	0.18	1	2.73
Hexachlorobiphenyl	NB	NB	NA	NA	6.91E-02	1	0.75	9.21E-02	0.51185357	0.18	0	5.05
Heptachlorobiphenyl	NB	NB	NA	NA	1.16E-02	1	0.75	1.55E-02	0.0860475	0.18	0	1.49
Octachlorobiphenyl	NB	NB	NA	NA	3.47E-03	1	0.75	4.62E-03	0.0256725	0.18	0	0.815
Nonachlorobiphenyl	NB	NB	NA	NA		1	0.75			0.18	0	
Decachlorobiphenyl	NB	NB	NA	NA		1	0.75			0.18	0	
Total PCBs	1.E+00	1.E-01	0.2	1.8	2.56E-01	1	0.75	3.41E-01	1.8945751	0.18	1.48	$\ln[PCB_{fish}/\%lipids] = 1.6666 + 0.6806 \ln[PCB_{sed}/\%OC]$
Dioxins												
1,2,3,4,6,7,8,9-OCDD	NB	NB	NA	NA	1.38E-04	1	0.75	1.84E-04	0.00102214	0.18	0.15	0.00636

Appendix E-3a
Food Chain Model For
Great Blue Heron Ingesting Fish
Creek Segment B
Dead Creek
Sauget Area I

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Time and Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Ratio of Time in Area	Exposure Dose mg/kg/day	Food: Total Conc. in Food mg/kg wet	Food: Ingestion Rate kg/kg/day	Sediment Concentration mg/kg dry	Sediment: BSAF
1,2,3,4,6,7,8-HpCDD	NB	NB	NA	NA	3.60E-05	1	0.75	4.80E-05	0.00026868	0.18	0.01	0.019
1,2,3,4,7,8-HxCDD	NB	NB	NA	NA	2.34E-07	1	0.75	3.12E-07	1.7344E-06	0.18	0.00	0.0391
1,2,3,6,7,8-HxCDD	NB	NB	NA	NA	7.46E-06	1	0.75	9.95E-06	5.5283E-05	0.18	0.00	0.147
1,2,3,7,8,9-HxCDD	NB	NB	NA	NA	2.70E-07	1	0.75	3.60E-07	1.9991E-06	0.18	0.00	0.019
1,2,3,7,8-PeCDD	NB	NB	NA	NA	4.65E-06	1	0.75	6.20E-06	3.4433E-05	0.18	0.00	0.484
2,3,7,8-TCDD	NB	NB	NA	NA		1	0.75			0.18	ND	1.77
Total HpCDD	NB	NB	NA	NA	1.66E-04	1	0.75	2.22E-04	0.00123149	0.18	0.09	0.0129
Total HxCDD	NB	NB	NA	NA	3.26E-05	1	0.75	4.35E-05	0.00024156	0.18	0.01	0.0323
Total PeCDD	NB	NB	NA	NA	1.45E-05	1	0.75	1.93E-05	0.00010727	0.18	0.00	0.108
Total TCDD	NB	NB	NA	NA	3.87E-05	1	0.75	5.16E-05	0.00028659	0.18	0.00	0.0932
Furans												
1,2,3,4,6,7,8,9-OCDF	NB	NB	NA	NA	6.30E-04	1	0.75	8.40E-04	0.00466779	0.18	0.05	0.0822
1,2,3,4,6,7,8-HpCDF	NB	NB	NA	NA	5.40E-05	1	0.75	7.20E-05	0.00040005	0.18	0.01	0.049
1,2,3,4,7,8,9-HpCDF	NB	NB	NA	NA	1.43E-06	1	0.75	1.90E-06	1.0573E-05	0.18	0.00	0.0731
1,2,3,4,7,8-HxCDF	NB	NB	NA	NA	3.33E-06	1	0.75	4.44E-06	2.4643E-05	0.18	0.00	0.2
1,2,3,6,7,8-HxCDF	NB	NB	NA	NA	1.44E-07	1	0.75	1.92E-07	1.069E-06	0.18	0.00	0.0241
1,2,3,7,8,9-HxCDF	NB	NB	NA	NA		1	0.75			0.18	ND	
1,2,3,7,8-PeCDF	NB	NB	NA	NA	3.65E-07	1	0.75	4.86E-07	2.7016E-06	0.18	0.00	0.0676
2,3,4,6,7,8-HxCDF	NB	NB	NA	NA	7.14E-08	1	0.75	9.52E-08	5.2894E-07	0.18	0.00	0.0242
2,3,4,7,8-PeCDF	NB	NB	NA	NA	1.03E-06	1	0.75	1.38E-06	7.6478E-06	0.18	0.00	0.231
2,3,7,8-TCDF	NB	NB	NA	NA	7.90E-06	1	0.75	1.05E-05	5.8486E-05	0.18	0.00	1.69
Total HpCDF	NB	NB	NA	NA	8.58E-04	1	0.75	1.14E-03	0.00634354	0.18	0.08	0.0704
Total HxCDF	NB	NB	NA	NA	1.11E-03	1	0.75	1.48E-03	0.00820264	0.18	0.02	0.379
Total PeCDF	NB	NB	NA	NA	1.44E-04	1	0.75	1.92E-04	0.00106742	0.18	0.00	2.18
Total TCDF	NB	NB	NA	NA	4.88E-05	1	0.75	6.51E-05	0.00036154	0.18	0.00	1.48
Dioxin - TEQ	2.E-01	2 E-02	0.000014	0.00014	3.38E-06	1	0.75	4.51E-06	2.5051E-05	0.18	0.00028	$\ln[\text{Total TEQ}_{fish}/\%\text{lipids}] = -1.748 + 0.7556 \ln[\text{Total TEQ}_{sed}/\%\text{OC}]$

Notes:
NA = Not available/applicable
NB = Benchmark not available
ND = Not detected
BSAF NA = Biota-Sediment Accumulation Factor not available
Half the detection limit is used for compounds that were not detected.
*Exposure in sediment (creek bottom soil) only
The lowest arsenic benchmarks are used (i.e. benchmarks for copper acetoarsentate rather than sodium arsenite).
For lead, the lead acetate benchmarks are used rather than metallic lead.
The lowest selenium benchmarks are used (i e. benchmarks for selinomethionine rather than sodium selenite)

Food Chain Model Components:
Hazard Index Estimate = [Food Dose]/Toxicological Benchmark

Food Dose = Sediment Concentration x Site Specific BSAF

Average Fraction Organic Carbon in Segment B Sediments	*0.014*
Average Fraction Lipid in Forage Fish	*0.015*

Appendix E-3b
Food Chain Model For
Great Blue Heron Ingesting Fish
Creek Segment C
Dead Creek
Sauget Area I

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Time and Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Ratio of Time in Area	Exposure Dose mg/kg/day	Food Total Conc. in Food mg/kg wet	Food Ingestion Rate kg/kg/day	Sediment Concentration mg/kg dry	Sediment BSAF
Cyanide	NB	NB	NA	NA		1	0.75			0.18	ND	
Herbicides and Pesticides												
2,3,5-T	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4,5-TP (Silvex)	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4-D	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4-DB	NB	NB	NA	NA		1	0.75			0.18	ND	0.83
4,4'-DDD	NB	NB	NA	NA		1	0.75			0.18	ND	
4,4'-DDE	NB	NB	NA	NA		1	0.75			0.18	ND	7.12
4,4'-DDT	NB	NB	NA	NA		1	0.75			0.18	ND	
Total DDT	ND	ND	0.0028	0.028		1	0.75			0.18	ND	
Aldrin	NB	NB	NA	NA		1	0.75			0.18	ND	
Alpha-BHC	ND	ND	0.56	2.25		1	0.75			0.18	ND	
Alpha Chlordane	BSAF NA	BSAF NA	2.14	10.7		1	0.75			0.18	0.00092	
beta-BHC	ND	ND	0.56	2.25		1	0.75			0.18	ND	
Dalapon	NB	NB	NA	NA		1	0.75			0.18	ND	
delta-BHC	BSAF NA	BSAF NA	0.56	2.25		1	0.75			0.18	0.00067	
Dicamba	NB	NB	NA	NA	8.22E-05	1	0.75	1.10E-04	0.00060852	0.18	0.0066	0.0922
Dichloroprop	NB	NB	NA	NA	3.89E-05	1	0.75	5.19E-05	0.0002883	0.18	0.0062	0.0465
Dieldrin	5.E-03	NB	0.077	NA	3.94E-04	1	0.75	5.26E-04	0.00291988	0.18	0.0048	0.777
Dinoseb	NB	NB	NA	NA		1	0.75			0.18	ND	
Endosulfan I	ND	NB	10	NA		1	0.75			0.18	ND	
Endosulfan II	ND	NB	10	NA		1	0.75			0.18	ND	
Endosulfan sulfate	BSAF NA	NB	10	NA		1	0.75			0.18	0.0042	
Endrin	ND	ND	0.01	0.1		1	0.75			0.18	ND	
Endrin aldehyde	ND	ND	0.01	0.1		1	0.75			0.18	ND	
Endrin ketone	BSAF NA	BSAF NA	0.01	0.1		1	0.75			0.18	0.0057	
gamma-BHC (Lindane)	ND	ND	2.0	20		1	0.75			0.18	ND	
Gamma Chlordane	5.E-05	1.E-05	2.14	10.7	1.17E-04	1	0.75	1.56E-04	0.00086842	0.18	0.00110	1
Heptachlor	NB	NB	NA	NA		1	0.75			0.18	ND	
Heptachlor epoxide	NB	NB	NA	NA		1	0.75			0.18	ND	
MCPA	NB	NB	NA	NA		1	0.75			0.18	ND	1.12
MCPP	NB	NB	NA	NA		1	0.75			0.18	ND	
Methoxychlor	NB	NB	NA	NA		1	0.75			0.18	0.0042	
Toxaphene	NB	NB	NA	NA		1	0.75			0.18	ND	
SVOCs												
1,2,4-Trichlorobenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
1,2-Dichlorobenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
1,3-Dichlorobenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
1,4-Dichlorobenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4,5-Trichlorophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4,6-Trichlorophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4-Dichlorophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4-Dinitrophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4-Dinitrotoluene	NB	NB	NA	NA		1	0.75			0.18	ND	
2,6-Dinitrotoluene	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Chloronaphthalene	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Chlorophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Methylnaphthalene	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Methylphenol (o-cresol)	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Nitroanaline	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Nitrophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
3- & 4-Methylphenol	NB	NB	NA	NA		1	0.75			0.18	ND	
3,3'-Dichlorobenzidine	NB	NB	NA	NA		1	0.75			0.18	ND	
3-Nitroanaline	NB	NB	NA	NA		1	0.75			0.18	ND	
4,6-Dinitro-2-methylphenol	NB	NB	NA	NA		1	0.75			0.18	ND	
4-Bromophenyl phenyl ether	NB	NB	NA	NA		1	0.75			0.18	ND	
4-Chloro-3-methylphenol	NB	NB	NA	NA		1	0.75			0.18	ND	

Appendix E-3b
Food Chain Model For
Great Blue Heron Ingesting Fish
Creek Segment C
Dead Creek
Sauget Area I

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Time and Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Ratio of Time in Area	Exposure Dose mg/kg/day	Food			Sediment	
									Total Conc. in Food mg/kg wet	Ingestion Rate kg/kg/day	Sediment Concentration mg/kg dry	BSAF	
4-Chloroanaline	NB	NB	NA	NA		1	0.75			0.18	ND		
4-Chlorophenyl phenyl ether	NB	NB	NA	NA		1	0.75			0.18	ND		
4-Nitroanaline	NB	NB	NA	NA		1	0.75			0.18	ND		
4-Nitrophenol	NB	NB	NA	NA		1	0.75			0.18	ND		
Acenapthene	NB	NB	NA	NA		1	0.75			0.18	ND		
Acenaphthylene	NB	NB	NA	NA		1	0.75			0.18	ND		
Anthracene	NB	NB	NA	NA		1	0.75			0.18	ND		
Benzo(a)anthracene	NB	NB	NA	NA		1	0.75			0.18	ND		
Benzo(a)pyrene	NB	NB	NA	NA		1	0.75			0.18	ND		
Benzo(b)fluoranthene	NB	NB	NA	NA		1	0.75			0.18	ND		
Benzo(g,h,i,)perylene	NB	NB	NA	NA		1	0.75			0.18	0.065		
Benzo(k)fluoranthene	NB	NB	NA	NA		1	0.75			0.18	ND		
Bis(2-chloroethoxy)methane	NB	NB	NA	NA		1	0.75			0.18	ND		
Bis(2-chloroethyl)ether	NB	NB	NA	NA		1	0.75			0.18	ND		
Bis(2-chloroisopropyl)ether	NB	NB	NA	NA		1	0.75			0.18	ND		
bis(2-ethylhexyl)phthalate	ND	NB	1.1	NA		1	0.75			0.18	ND	1.38	
Butylbenzylphthalate	NB	NB	NA	NA		1	0.75			0.18	ND		
Carbazole	NB	NB	NA	NA		1	0.75			0.18	ND		
Chrysene	NB	NB	NA	NA		1	0.75			0.18	ND		
Dibenzo(a,h)anthracene	NB	NB	NA	NA		1	0.75			0.18	ND	0.552	
Dibenzofuran	NB	NB	NA	NA		1	0.75			0.18	ND		
Diethylphthalate	NB	NB	NA	NA		1	0.75			0.18	ND	0.266	
Dimethylphthalate	NB	NB	NA	NA		1	0.75			0.18	ND		
Di-n-butylphthalate	ND	ND	0.1	1.1		1	0.75			0.18	ND		
Di-n-octylphthalate	NB	NB	NA	NA		1	0.75			0.18	ND		
Fluoranthene	NB	NB	NA	NA		1	0.75			0.18	ND		
Fluorene	NB	NB	NA	NA		1	0.75			0.18	ND		
Hexachlorobenzene	NB	NB	NA	NA		1	0.75			0.18	ND		
Hexachlorobutadiene	ND	NB	6.0	NA		1	0.75			0.18	ND		
Hexachlorocyclopentadiene	NB	NB	NA	NA		1	0.75			0.18	ND		
Hexachloroethane	NB	NB	NA	NA		1	0.75			0.18	ND		
Indeno(1,2,3-c,d)pyrene	NB	NB	NA	NA		1	0.75			0.18	ND	0.604	
Isophorone	NB	NB	NA	NA		1	0.75			0.18	ND		
Naphthalene	NB	NB	NA	NA		1	0.75			0.18	ND		
Nitrobenzene	NB	NB	NA	NA		1	0.75			0.18	ND		
N-Nitroso-di-N-propylamine	NB	NB	NA	NA		1	0.75			0.18	ND		
N-Nitrosodiphenylamine	NB	NB	NA	NA		1	0.75			0.18	ND		
Pentachlorophenol	NB	NB	NA	NA	1.93E-06	1	0.75	2.57E-06	1.4302E-05	0.18	0.01	0.00236	
Phenanthrene	NB	NB	NA	NA		1	0.75			0.18	0.025		
Phenol	NB	NB	NA	NA		1	0.75			0.18	ND		
Pyrene	NB	NB	NA	NA		1	0.75			0.18	ND		
Total PAHs	ND	ND	40.0	400		1	0.75			0.18	1.76		
VOCs													
1,1,1-Trichloroethane	NB	NB	NA	NA		1	0.75			0.18	ND		
1,1,2,2-Tetrachloroethane	NB	NB	NA	NA		1	0.75			0.18	ND		
1,1,2-Trichloroethane	NB	NB	NA	NA		1	0.75			0.18	ND		
1,1-Dichloroethane	NB	NB	NA	NA		1	0.75			0.18	ND		
1,1-Dichlorothene	NB	NB	NA	NA		1	0.75			0.18	ND		
1,2-Dichloroethane	ND	ND	17.2	34.4		1	0.75			0.18	ND		
1,2-Dichloroethene(total)	NB	NB	NA	NA		1	0.75			0.18	ND		
1,2-Dichloropropane	NB	NB	NA	NA		1	0.75			0.18	ND		
2-Butanone(MEK)	NB	NB	NA	NA		1	0.75			0.18	0.008		
2-Hexanone	NB	NB	NA	NA		1	0.75			0.18	ND		
4-Methyl-2-pentanone (MIBK)	NB	NB	NA	NA		1	0.75			0.18	ND		
Acetone	NB	NB	NA	NA		1	0.75			0.18	0.03		
Benzene	NB	NB	NA	NA		1	0.75			0.18	0.0030		
Bromodichloromethane	NB	NB	NA	NA		1	0.75			0.18	ND		

Appendix E-3b
Food Chain Model For
Great Blue Heron Ingesting Fish
Creek Segment C
Dead Creek
Sauget Area I

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Time and Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Ratio of Time in Area	Exposure Dose mg/kg/day	Food Total Conc. in Food mg/kg wet	Food Ingestion Rate kg/kg/day	Sediment Concentration mg/kg dry	Sediment BSAF
Bromoform	NB	NB	NA	NA		1	0.75			0.18	ND	
Bromomethane	NB	NB	NA	NA		1	0.75			0.18	ND	
Carbon disulfide	NB	NB	NA	NA		1	0.75			0.18	ND	
Carbon tetrachloride	NB	NB	NA	NA		1	0.75			0.18	ND	
Chlorobenzene	NB	NB	NA	NA		1	0.75			0.18	0.1	
Chloroform	NB	NB	NA	NA		1	0.75			0.18	ND	
Chloroethane	NB	NB	NA	NA		1	0.75			0.18	ND	
Chloromethane	NB	NB	NA	NA		1	0.75			0.18	ND	
cis-1,3-Dichloropropene	NB	NB	NA	NA		1	0.75			0.18	ND	
Dibromochloromethane	NB	NB	NA	NA		1	0.75			0.18	ND	
Ethylbenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
Methylene chloride	NB	NB	NA	NA		1	0.75			0.18	0.0034	
Styrene	NB	NB	NA	NA		1	0.75			0.18	0.0027	
Tetrachloroethene	NB	NB	NA	NA		1	0.75			0.18	ND	
Toluene	NB	NB	NA	NA		1	0.75			0.18	0.004	
trans-1,3-Dichloropropene	NB	NB	NA	NA		1	0.75			0.18	ND	
Trichloroethene	NB	NB	NA	NA		1	0.75			0.18	ND	
Vinyl chloride	NB	NB	NA	NA		1	0.75			0.18	ND	
Xylenes (total)	NB	NB	NA	NA		1	0.75			0.18	0.00	
Inorganics												
Aluminum, Total	2.E-02	NB	109.7	NA	2.07E+00	1	0.75	2.76E+00	15.3298139	0.18	10800	$\ln[Al_{fish}] = -21.2593 + 2.583 \ln[Al_{sed}]$
Antimony	NB	NB	NA	NA		1	0.75			0.18	0.8	
Arsenic, Total	BSAF NA	BSAF NA	5.1	12.84		1	0.75			0.18	10	
Barium, Total	BSAF NA	BSAF NA	20.8	41.7		1	0.75			0.18	249	
Beryllium	NB	NB	NA	NA		1	0.75			0.18	0.83	
Cadmium, Total	BSAF NA	BSAF NA	1.45	20		1	0.75			0.18	13	
Calcium	NB	NB	NA	NA		1	0.75			0.18	7810	
Chromium, Total	1.E-01	2.E-02	1.00	5.00	1.03E-01	1	0.75	1.37E-01	0.76171	0.18	36	0.0211
Cobalt	BSAF NA	BSAF NA	15.0	30		1	0.75			0.18	9.4	
Copper, Total	3.E-03	2.E-03	47.0	61.7	1.53E-01	1	0.75	2.04E-01	1.13279515	0.18	109	$\ln[Cu]_{fish} = -1.9259+0.4371 \ln[Cu]_{sed}$
Iron	NB	NB	NA	NA		1	0.75			0.18	17600	
Lead, Total	4.E-02	4.E-03	1.13	11.3	4.86E-02	1	0.75	6.48E-02	0.359856	0.18	43	0.00833
Magnesium	NB	NB	NA	NA		1	0.75			0.18	4430	
Manganese	BSAF NA	NB	977	NA		1	0.75			0.18	189	
Mercury	BSAF NA	BSAF NA	0.0064	0.064		1	0.75			0.18	0.10	
Molybdenum	ND	ND	3.50	35.3		1	0.75			0.18	ND	
Nickel, Total	BSAF NA	BSAF NA	77.40	107		1	0.75			0.18	263	
Potassium	NB	NB	NA	NA		1	0.75			0.18	1870	
Selenium	ND	ND	0.50	1		1	0.75			0.18	ND	0.479
Silver	NB	NB	NA	NA		1	0.75			0.18	ND	
Sodium	NB	NB	NA	NA		1	0.75			0.18	124	
Thallium	NB	NB	NA	NA		1	0.75			0.18	ND	
Tin	BSAF NA	BSAF NA	6.80	16.9		1	0.75			0.18	3.91	
Vanadium	BSAF NA	NB	11.40	NA		1	0.75			0.18	31	
Zinc, Total	4.E-01	4.E-02	14.5	131	5.87E+00	1	0.75	7.83E+00	43.4915044	0.18	2140	$\ln[Zn]_{fish} = 2.4275 + 0.1754 \ln[Zn]_{sed}$
PCBs												
Monochlorobiphenyl	NB	NB	NA	NA		1	0.75			0.18	0	
Dichlorobiphenyl	NB	NB	NA	NA		1	0.75			0.18	0	
Trichlorobiphenyl	NB	NB	NA	NA	2.43E-04	1	0.75	3.23E-04	0.00179716	0.18	0	0.84
Tetrachlorobiphenyl	NB	NB	NA	NA	5.67E-03	1	0.75	7.56E-03	0.04201934	0.18	0	6.85
Pentachlorobiphenyl	NB	NB	NA	NA	3.40E-03	1	0.75	4.54E-03	0.02521658	0.18	0	2.73
Hexachlorobiphenyl	NB	NB	NA	NA	5.29E-03	1	0.75	7.05E-03	0.03919066	0.18	0	5.05
Heptachlorobiphenyl	NB	NB	NA	NA	1.30E-03	1	0.75	1.73E-03	0.00962226	0.18	0	1.49
Octachlorobiphenyl	NB	NB	NA	NA	6.85E-04	1	0.75	9.14E-04	0.00507659	0.18	0	0.815
Nonachlorobiphenyl	NB	NB	NA	NA		1	0.75			0.18	0	
Decachlorobiphenyl	NB	NB	NA	NA		1	0.75			0.18	0	

Appendix E-3b
Food Chain Model For
Great Blue Heron Ingesting Fish
Creek Segment C
Dead Creek
Sauget Area I

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Time and Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Ratio of Time in Area	Exposure Dose mg/kg/day	Food Total Conc. in Food mg/kg wet	Food Ingestion Rate kg/kg/day	Sediment Concentration mg/kg dry	Sediment BSAF
Total PCBs	1.E-01	1.E-02	0.2	1.8	2.58E-02	1	0.75	3.44E-02	0.19102378	0.18	0.07	$\ln[PCBf_{lw}/\%lipids] = 1.6666 + 0.6806 \ln[PCB_{sw}/\%OC]$
Dioxins												
1,2,3,4,6,7,8,9-OCDD	NB	NB	NA	NA	2.99E-06	1	0.75	3.99E-06	2.2143E-05	0.18	0.00	0.00636
1,2,3,4,6,7,8-HpCDD	NB	NB	NA	NA	6.70E-07	1	0.75	8.94E-07	4.965E-06	0.18	0.00	0.019
1,2,3,4,7,8-HxCDD	NB	NB	NA	NA		1	0.75			0.18	ND	0.0391
1,2,3,6,7,8-HxCDD	NB	NB	NA	NA	2.69E-07	1	0.75	3.59E-07	1.9961E-06	0.18	0.00	0.147
1,2,3,7,8,9-HxCDD	NB	NB	NA	NA	2.03E-08	1	0.75	2.70E-08	0.00000015	0.18	0.00	0.019
1,2,3,7,8-PeCDD	NB	NB	NA	NA		1	0.75			0.18	ND	0.484
2,3,7,8-TCDD	NB	NB	NA	NA		1	0.75			0.18	ND	1.77
Total HpCDD	NB	NB	NA	NA	9.65E-07	1	0.75	1.29E-06	7.1493E-06	0.18	0.00	0.0129
Total HxCDD	NB	NB	NA	NA	6.61E-07	1	0.75	8.81E-07	4.896E-06	0.18	0.00	0.0323
Total PeCDD	NB	NB	NA	NA	1.50E-06	1	0.75	2.00E-06	1.1084E-05	0.18	0.00	0.108
Total TCDD	NB	NB	NA	NA		1	0.75			0.18	ND	0.0932
Furans												
1,2,3,4,6,7,8,9-OCDF	NB	NB	NA	NA	1.28E-05	1	0.75	1.71E-05	9.4746E-05	0.18	0.00	0.0822
1,2,3,4,6,7,8-HpCDF	NB	NB	NA	NA	1.28E-06	1	0.75	1.71E-06	9.5163E-06	0.18	0.00	0.049
1,2,3,4,7,8,9-HpCDF	NB	NB	NA	NA	8.65E-08	1	0.75	1.15E-07	6.4059E-07	0.18	0.00	0.0731
1,2,3,4,7,8-HxCDF	NB	NB	NA	NA	2.00E-07	1	0.75	2.67E-07	1.4826E-06	0.18	0.00	0.2
1,2,3,6,7,8-HxCDF	NB	NB	NA	NA	1.10E-08	1	0.75	1.47E-08	8.1433E-08	0.18	0.00	0.0241
1,2,3,7,8,9-HxCDF	NB	NB	NA	NA		1	0.75			0.18	ND	
1,2,3,7,8-PeCDF	NB	NB	NA	NA		1	0.75			0.18	ND	0.0676
2,3,4,6,7,8-HxCDF	NB	NB	NA	NA	1.52E-08	1	0.75	2.03E-08	1.1253E-07	0.18	0.00	0.0242
2,3,4,7,8-PeCDF	NB	NB	NA	NA		1	0.75			0.18	ND	0.231
2,3,7,8-TCDF	NB	NB	NA	NA	1.47E-06	1	0.75	1.96E-06	1.0901E-05	0.18	0.00	1.69
Total HpCDF	NB	NB	NA	NA	6.49E-06	1	0.75	8.65E-06	4.8076E-05	0.18	0.00	0.0704
Total HxCDF	NB	NB	NA	NA	4.93E-05	1	0.75	6.57E-05	0.00036504	0.18	0.00	0.379
Total PeCDF	NB	NB	NA	NA	7.27E-05	1	0.75	9.70E-05	0.00053869	0.18	0.00	2.18
Total TCDF	NB	NB	NA	NA	8.58E-06	1	0.75	1.14E-05	6.3562E-05	0.18	0.00	1.48
Dioxin - TEQ	4.E-02	4.E-03	0.000014	0.00014	5.07E-07	1	0.75	6.76E-07	3.7532E-06	0.18	0.00003	$\ln[\text{Total TEQ}_{lw}/\%lipids] = -1.748 + 0.7556 \ln[\text{Total TEQ}_{sw}/\%OC]$

Notes:
NA = Not available/applicable
NB = Benchmark not available
ND = Not detected
BSAF NA = Biota-Sediment Accumulation Factor not available
Half the detection limit is used for compounds that were not detected.
*Exposure in sediment (creek bottom soil) only
The lowest arsenic benchmarks are used (i.e. benchmarks for copper acetoarsentate rather than sodium arsenite).
For lead, the lead acetate benchmarks are used rather than metallic lead.
The lowest selenium benchmarks are used (i.e. benchmarks for selinomethionine rather than sodium selenite).

Food Chain Model Components:
Hazard Index Estimate = [Food Dose]/Toxicological Benchmark

Food Dose = Sediment Concentration x Site Specific BSAF

Average Fraction Organic Carbon in Segment C Sediments *0.019*
Average Fraction Lipid in Forage Fish *0.015*

Appendix E-3c
Food Chain Model For
Great Blue Heron Ingesting Fish
***Creek Segment* D**
Dead Creek
Sauget Area I

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Time and Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Ratio of Time in Area	Exposure Dose mg/kg/day	Food			Sediment
									Total Conc. in Food mg/kg wet	Ingestion Rate kg/kg/day	Sediment Concentration mg/kg dry	BSAF
Cyanide	NB	NB	NA	NA		1	0.75			0.18	ND	
Herbicides and Pesticides												
2,3,5-T	NB	NB	NA	NA		1	0.75			0.18	0.0054	
2,4,5-TP (Silvex)	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4-D	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4-DB	NB	NB	NA	NA		1	0.75			0.18	ND	0.83
4,4'-DDD	NB	NB	NA	NA		1	0.75			0.18	0.0014	
4,4'-DDE	NB	NB	NA	NA		1	0.75			0.18	ND	7.12
4,4'-DDT	NB	NB	NA	NA		1	0.75			0.18	0.0562	
Total DDT	ND	ND	0.0028	0.028		1	0.75			0.18	0.0746	
Aldrin	NB	NB	NA	NA		1	0.75			0.18	0.00503	
Alpha-BHC	ND	ND	0.56	2.25		1	0.75			0.18	ND	
Alpha Chlordane	BSAF NA	BSAF NA	2.14	10.7		1	0.75			0.18	0.00678	
beta-BHC	ND	ND	0.56	2.25		1	0.75			0.18	ND	
Dalapon	NB	NB	NA	NA		1	0.75			0.18	0.0475	
delta-BHC	BSAF NA	BSAF NA	0.56	2.25		1	0.75			0.18	0.000824	
Dicamba	NB	NB	NA	NA	2.24E-05	1	0.75	2.99E-05	0.00016596	0.18	0.0018	0.0922
Dichloroprop	NB	NB	NA	NA	1.32E-04	1	0.75	1.76E-04	0.0009765	0.18	0.021	0.0465
Dieldrin	1.E-01	NB	0.077	NA	1.11E-02	1	0.75	1.48E-02	0.0822325	0.18	0.127	0.777
Dinoseb	NB	NB	NA	NA		1	0.75			0.18	ND	
Endosulfan I	ND	NB	10	NA		1	0.75			0.18	ND	
Endosulfan II	ND	NB	10	NA		1	0.75			0.18	ND	
Endosulfan sulfate	BSAF NA	NB	10	NA		1	0.75			0.18	0.0071	
Endrin	ND	ND	0.01	0.1		1	0.75			0.18	ND	
Endrin aldehyde	ND	ND	0.01	0.1		1	0.75			0.18	ND	
Endrin ketone	ND	ND	0.01	0.1		1	0.75			0.18	ND	
gamma-BHC (Lindane)	ND	ND	2.0	20		1	0.75			0.18	ND	
Gamma Chlordane	8.E-04	2.E-04	2.14	10.7	1.74E-03	1	0.75	2.33E-03	0.01291667	0.18	0.0155	1
Heptachlor	NB	NB	NA	NA		1	0.75			0.18	ND	
Heptachlor epoxide	NB	NB	NA	NA		1	0.75			0.18	ND	
MCPA	NB	NB	NA	NA		1	0.75			0.18	ND	1.12
MCPP	NB	NB	NA	NA		1	0.75			0.18	ND	
Methoxychlor	NB	NB	NA	NA		1	0.75			0.18	0.0247	
Toxaphene	NB	NB	NA	NA		1	0.75			0.18	ND	
SVOCs												
1,2,4-Trichlorobenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
1,2-Dichlorobenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
1,3-Dichlorobenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
1,4-Dichlorobenzene	NB	NB	NA	NA		1	0.75			0.18	0.112	
2,4,5-Trichlorophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4,6-Trichlorophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4-Dichlorophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4-Dinitrophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4-Dinitrotoluene	NB	NB	NA	NA		1	0.75			0.18	ND	
2,6-Dinitrotoluene	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Chloronaphthalene	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Chlorophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Methylnaphthalene	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Methylphenol (o-cresol)	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Nitroanaline	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Nitrophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
3- & 4-Methylphenol	NB	NB	NA	NA		1	0.75			0.18	ND	
3,3'-Dichlorobenzidine	NB	NB	NA	NA		1	0.75			0.18	ND	
3-Nitroanaline	NB	NB	NA	NA		1	0.75			0.18	ND	
4,6-Dinitro-2-methylphenol	NB	NB	NA	NA		1	0.75			0.18	ND	
4-Bromophenyl phenyl ether	NB	NB	NA	NA		1	0.75			0.18	ND	
4-Chloro-3-methylphenol	NB	NB	NA	NA		1	0.75			0.18	ND	

Appendix E-3c
Food Chain Model For
Great Blue Heron Ingesting Fish
Creek Segment D
Dead Creek
Sauget Area I

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Time and Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Ratio of Time in Area	Exposure Dose mg/kg/day	Food		Sediment	Sediment
									Total Conc. in Food mg/kg wet	Ingestion Rate kg/kg/day	Sediment Concentration mg/kg dry	BSAF
4-Chloroanaline	NB	NB	NA	NA		1	0.75			0.18	ND	
4-Chlorophenyl phenyl ether	NB	NB	NA	NA		1	0.75			0.18	ND	
4-Nitroanaline	NB	NB	NA	NA		1	0.75			0.18	ND	
4-Nitrophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
Acenapthene	NB	NB	NA	NA		1	0.75			0.18	ND	
Acenaphthylene	NB	NB	NA	NA		1	0.75			0.18	ND	
Anthracene	NB	NB	NA	NA		1	0.75			0.18	ND	
Benzo(a)anthracene	NB	NB	NA	NA		1	0.75			0.18	ND	
Benzo(a)pyrene	NB	NB	NA	NA		1	0.75			0.18	0.0848	
Benzo(b)fluoranthene	NB	NB	NA	NA		1	0.75			0.18	0.136	
Benzo(g,h,I,)perylene	NB	NB	NA	NA		1	0.75			0.18	0.14	
Benzo(k)fluoranthene	NB	NB	NA	NA		1	0.75			0.18	0.138	
Bis(2-chloroethoxy)methane	NB	NB	NA	NA		1	0.75			0.18	ND	
Bis(2-chloroethyl)ether	NB	NB	NA	NA		1	0.75			0.18	ND	
Bis(2-chloroisopropyl)ether	NB	NB	NA	NA		1	0.75			0.18	ND	
bis(2-ethylhexyl)phthalate	ND	NB	1.1	NA		1	0.75			0.18	ND	1.38
Butylbenzylphthalate	NB	NB	NA	NA		1	0.75			0.18	ND	
Carbazole	NB	NB	NA	NA		1	0.75			0.18	ND	
Chrysene	NB	NB	NA	NA		1	0.75			0.18	ND	
Dibenzo(a,h)anthracene	NB	NB	NA	NA		1	0.75			0.18	ND	0.552
Dibenzofuran	NB	NB	NA	NA		1	0.75			0.18	ND	
Diethylphthalate	NB	NB	NA	NA		1	0.75			0.18	ND	0.266
Dimethylphthalate	NB	NB	NA	NA		1	0.75			0.18	ND	
Di-n-butylphthalate	ND	ND	0.1	1.1		1	0.75			0.18	ND	
Di-n-octylphthalate	NB	NB	NA	NA		1	0.75			0.18	ND	
Fluoranthene	NB	NB	NA	NA		1	0.75			0.18	0.131	
Fluorene	NB	NB	NA	NA		1	0.75			0.18	ND	
Hexachlorobenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
Hexachlorobutadiene	ND	NB	6.0	NA		1	0.75			0.18	ND	
Hexachlorocyclopentadiene	NB	NB	NA	NA		1	0.75			0.18	ND	
Hexachloroethane	NB	NB	NA	NA		1	0.75			0.18	ND	
Indeno(1,2,3-c,d)pyrene	NB	NB	NA	NA	8.83E-03	1	0.75	1.18E-02	0.06543333	0.18	0.13	0.604
Isophorone	NB	NB	NA	NA		1	0.75			0.18	ND	
Naphthalene	NB	NB	NA	NA		1	0.75			0.18	ND	
Nitrobenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
N-Nitroso-di-N-propylamine	NB	NB	NA	NA		1	0.75			0.18	ND	
N-Nitrosodiphenylamine	NB	NB	NA	NA		1	0.75			0.18	ND	
Pentachlorophenol	NB	NB	NA	NA	2.20E-06	1	0.75	2.93E-06	1.6284E-05	0.18	0.0069	0.00236
Phenanthrene	NB	NB	NA	NA		1	0.75			0.18	0.101	
Phenol	NB	NB	NA	NA		1	0.75			0.18	ND	
Pyrene	NB	NB	NA	NA		1	0.75			0.18	0.132	
Total PAHs	2.E-04	2.E-05	40.0	400	8.83E-03	1	0.75	1.18E-02	0.06543333	0.18	2.01	
VOCs												
1,1,1-Trichloroethane	NB	NB	NA	NA		1	0.75			0.18	ND	
1,1,2,2-Tetrachloroethane	NB	NB	NA	NA		1	0.75			0.18	ND	
1,1,2-Trichloroethane	NB	NB	NA	NA		1	0.75			0.18	ND	
1,1-Dichloroethane	NB	NB	NA	NA		1	0.75			0.18	ND	
1,1-Dichlorothene	NB	NB	NA	NA		1	0.75			0.18	ND	
1,2-Dichloroethane	ND	ND	17.2	34.4		1	0.75			0.18	ND	
1,2-Dichloroethene(total)	NB	NB	NA	NA		1	0.75			0.18	ND	
1,2-Dichloropropane	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Butanone(MEK)	NB	NB	NA	NA		1	0.75			0.18	0.00807	
2-Hexanone	NB	NB	NA	NA		1	0.75			0.18	ND	
4-Methyl-2-pentanone (MIBK)	NB	NB	NA	NA		1	0.75			0.18	ND	
Acetone	NB	NB	NA	NA		1	0.75			0.18	ND	
Benzene	NB	NB	NA	NA		1	0.75			0.18	ND	
Bromodichloromethane	NB	NB	NA	NA		1	0.75			0.18	ND	

Appen... E-3c
Food Chain Model For
Great Blue Heron Ingesting Fish
Creek Segment D
Dead Creek
Sauget Area I

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Time and Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Ratio of Time in Area	Food: Exposure Dose mg/kg/day	Food: Total Conc. in Food mg/kg wet	Food: Ingestion Rate kg/kg/day	Sediment: Sediment Concentration mg/kg dry	Sediment: BSAF
Bromoform	NB	NB	NA	NA		1	0.75			0.18	ND	
Bromomethane	NB	NB	NA	NA		1	0.75			0.18	ND	
Carbon disulfide	NB	NB	NA	NA		1	0.75			0.18	ND	
Carbon tetrachloride	NB	NB	NA	NA		1	0.75			0.18	ND	
Chlorobenzene	NB	NB	NA	NA		1	0.75			0.18	0.0313	
Chloroform	NB	NB	NA	NA		1	0.75			0.18	ND	
Chloroethane	NB	NB	NA	NA		1	0.75			0.18	ND	
Chloromethane	NB	NB	NA	NA		1	0.75			0.18	ND	
cis-1,3-Dichloropropene	NB	NB	NA	NA		1	0.75			0.18	ND	
Dibromochloromethane	NB	NB	NA	NA		1	0.75			0.18	ND	
Ethylbenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
Methylene chloride	NB	NB	NA	NA		1	0.75			0.18	0.00268	
Styrene	NB	NB	NA	NA		1	0.75			0.18	ND	
Tetrachloroethene	NB	NB	NA	NA		1	0.75			0.18	ND	
Toluene	NB	NB	NA	NA		1	0.75			0.18	0.0029	
trans-1,3-Dichloropropene	NB	NB	NA	NA		1	0.75			0.18	ND	
Trichloroethene	NB	NB	NA	NA		1	0.75			0.18	ND	
Vinyl chloride	NB	NB	NA	NA		1	0.75			0.18	ND	
Xylenes (total)	NB	NB	NA	NA		1	0.75			0.18	ND	
Inorganics												
Aluminum, Total	2.E-02	NB	109.7	NA	2.12E+00	1	0.75	2.83E+00	15.6991437	0.18	10900	$\ln[Al_{fish}] = -21.2593 + 2.583 \ln[Al_{sed}]$
Antimony	NB	NB	NA	NA		1	0.75			0.18	ND	
Arsenic, Total	BSAF NA	BSAF NA	5.1	12.84		1	0.75			0.18	11.4	
Barium, Total	BSAF NA	BSAF NA	20.8	41.7		1	0.75			0.18	312	
Beryllium	NB	NB	NA	NA		1	0.75			0.18	0.838	
Cadmium, Total	BSAF NA	BSAF NA	1.45	20		1	0.75			0.18	19.8	
Calcium	NB	NB	NA	NA		1	0.75			0.18	8530	
Chromium, Total	1.E-01	3.E-02	1.00	5.00	1.40E-01	1	0.75	1.87E-01	1.04023	0.18	49.3	0.0211
Cobalt	BSAF NA	BSAF NA	15.0	30		1	0.75			0.18	9.47	
Copper, Total	6.E-03	4.E-03	47.0	61.7	2.66E-01	1	0.75	3.54E-01	1.96874545	0.18	386	$\ln[Cu]_{fish} = -1.9259+0.4371 \ln[Cu]_{sed}$
Iron	NB	NB	NA	NA		1	0.75			0.18	17200	
Lead, Total	1.E-01	1.E-02	1.13	11.3	1.10E-01	1	0.75	1.47E-01	0.818006	0.18	98.2	0.00833
Magnesium	NB	NB	NA	NA		1	0.75			0.18	3770	
Manganese	BSAF NA	NB	977	NA		1	0.75			0.18	137	
Mercury	BSAF NA	BSAF NA	0.0064	0.064		1	0.75			0.18	0.238	
Molybdenum	BSAF NA	BSAF NA	3.50	35.3		1	0.75			0.18	2.33	
Nickel, Total	BSAF NA	BSAF NA	77.40	107		1	0.75			0.18	287	
Potassium	NB	NB	NA	NA		1	0.75			0.18	1800	
Selenium	2.E-01	8.E-02	0.50	1	8.21E-02	1	0.75	1.09E-01	0.60833	0.18	1.27	0.479
Silver	NB	NB	NA	NA		1	0.75			0.18	0.825	
Sodium	NB	NB	NA	NA		1	0.75			0.18	175	
Thallium	NB	NB	NA	NA		1	0.75			0.18	ND	
Tin	BSAF NA	BSAF NA	6.80	16.9		1	0.75			0.18	5.23	
Vanadium	BSAF NA	NB	11.40	NA		1	0.75			0.18	31.5	
Zinc, Total	5.E-01	5.E-02	14.5	131	6.58E+00	1	0.75	8.77E+00	48.7452322	0.18	4100	$\ln[Zn]_{fish} = 2.4275 + 0.1754 \ln[Zn]_{sed}$
PCBs												
Monochlorobiphenyl	NB	NB	NA	NA		1	0.75			0.18	0.00263	
Dichlorobiphenyl	NB	NB	NA	NA		1	0.75			0.18	ND	
Trichlorobiphenyl	NB	NB	NA	NA	6.10E-04	1	0.75	8.13E-04	0.004515	0.18	0.00645	0.84
Tetrachlorobiphenyl	NB	NB	NA	NA	5.04E-02	1	0.75	6.72E-02	0.373325	0.18	0.0654	6.85
Pentachlorobiphenyl	NB	NB	NA	NA	5.53E-02	1	0.75	7.37E-02	0.4095	0.18	0.18	2.73
Hexachlorobiphenyl	NB	NB	NA	NA	6.59E-02	1	0.75	8.79E-02	0.48816667	0.18	0.116	5.05
Heptachlorobiphenyl	NB	NB	NA	NA	6.84E-03	1	0.75	9.12E-03	0.05066	0.18	0.0408	1.49
Octachlorobiphenyl	NB	NB	NA	NA	1.36E-03	1	0.75	1.81E-03	0.01005167	0.18	0.0148	0.815
Nonachlorobiphenyl	NB	NB	NA	NA		1	0.75			0.18	0.0173	
Decachlorobiphenyl	NB	NB	NA	NA		1	0.75			0.18	0.0483	

Appendix E-3c
Food Chain Model For
Great Blue Heron Ingesting Fish
Creek Segment D
Dead Creek
Sauget Area I

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Time and Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Ratio of Time in Area	Exposure Dose mg/kg/day	Food		Sediment	Sediment
									Total Conc. in Food mg/kg wet	Ingestion Rate kg/kg/day	Sediment Concentration mg/kg dry	BSAF
Total PCBs	6.E-01	6.E-02	0.2	1.8	1.02E-01	1	0.75	1.36E-01	0.7566561	0.18	0.494	$\ln[PCBf_{lipid}/\%lipids] = 1.6666 + 0.6806 \ln[PCB_{sed}/\%OC]$
Dioxins												
1,2,3,4,6,7,8,9-OCDD	NB	NB	NA	NA	4.00E-05	1	0.75	5.33E-05	0.00029627	0.18	0.0559	0.00636
1,2,3,4,6,7,8-HpCDD	NB	NB	NA	NA	1.05E-05	1	0.75	1.41E-05	7.8058E-05	0.18	0.00493	0.019
1,2,3,4,7,8-HxCDD	NB	NB	NA	NA	1.10E-07	1	0.75	1.47E-07	8.1458E-07	0.18	0.000025	0.0391
1,2,3,6,7,8-HxCDD	NB	NB	NA	NA	2.86E-06	1	0.75	3.81E-06	2.1193E-05	0.18	0.000173	0.147
1,2,3,7,8,9-HxCDD	NB	NB	NA	NA	1.39E-07	1	0.75	1.85E-07	1.0292E-06	0.18	0.000065	0.019
1,2,3,7,8-PeCDD	NB	NB	NA	NA		1	0.75			0.18	ND	0.484
2,3,7,8-TCDD	NB	NB	NA	NA		1	0.75			0.18	ND	1.77
Total HpCDD	NB	NB	NA	NA	1.36E-05	1	0.75	1.81E-05	0.00010041	0.18	0.00934	0.0129
Total HxCDD	NB	NB	NA	NA	4.11E-06	1	0.75	5.47E-06	3.0416E-05	0.18	0.00113	0.0323
Total PeCDD	NB	NB	NA	NA	3.52E-06	1	0.75	4.70E-06	0.0000261	0.18	0.00029	0.108
Total TCDD	NB	NB	NA	NA	3.01E-05	1	0.75	4.01E-05	0.0002229	0.18	0.00287	0.0932
Furans												
1,2,3,4,6,7,8,9-OCDF	NB	NB	NA	NA	2.87E-04	1	0.75	3.82E-04	0.0021235	0.18	0.031	0.0822
1,2,3,4,6,7,8-HpCDF	NB	NB	NA	NA	2.24E-05	1	0.75	2.98E-05	0.00016578	0.18	0.00406	0.049
1,2,3,4,7,8,9-HpCDF	NB	NB	NA	NA	1.58E-06	1	0.75	2.11E-06	1.1696E-05	0.18	0.000192	0.0731
1,2,3,4,7,8-HxCDF	NB	NB	NA	NA	1.91E-06	1	0.75	2.55E-06	1.4167E-05	0.18	0.000085	0.2
1,2,3,6,7,8-HxCDF	NB	NB	NA	NA	7.24E-08	1	0.75	9.65E-08	5.3623E-07	0.18	0.0000267	0.0241
1,2,3,7,8,9-HxCDF	NB	NB	NA	NA		1	0.75			0.18	0.0000233	
1,2,3,7,8-PeCDF	NB	NB	NA	NA	5.45E-07	1	0.75	7.27E-07	4.0391E-06	0.18	0.0000717	0.0676
2,3,4,6,7,8-HxCDF	NB	NB	NA	NA	1.59E-07	1	0.75	2.12E-07	1.1757E-06	0.18	0.0000583	0.0242
2,3,4,7,8-PeCDF	NB	NB	NA	NA	6.06E-07	1	0.75	8.07E-07	4.4853E-06	0.18	0.0000233	0.231
2,3,7,8-TCDF	NB	NB	NA	NA	7.13E-06	1	0.75	9.51E-06	5.2813E-05	0.18	0.0000375	1.69
Total HpCDF	NB	NB	NA	NA	1.20E-04	1	0.75	1.59E-04	0.00088587	0.18	0.0151	0.0704
Total HxCDF	NB	NB	NA	NA	1.16E-04	1	0.75	1.55E-04	0.00085907	0.18	0.00272	0.379
Total PeCDF	NB	NB	NA	NA	1.04E-04	1	0.75	1.39E-04	0.00077208	0.18	0.000425	2.18
Total TCDF	NB	NB	NA	NA	6.29E-05	1	0.75	8.39E-05	0.0004662	0.18	0.000378	1.48
Dioxin - TEQ	1.E-01	1.E-02	0.000014	0.00014	1.97E-06	1	0.75	2.63E-06	1.4627E-05	0.18	0.000176	$\ln[\text{Total TEQ}_{fish}/\%lipids] = -1.748 + 0.7556 \ln[\text{Total TEQ}_{sed}/\%OC]$

Notes:
NA = Not available/applicable
NB = Benchmark not available
ND = Not detected
BSAF NA = Biota-Sediment Accumulation Factor not available
Half the detection limit is used for compounds that were not detected.
*Exposure in sediment (creek bottom soil) only
The lowest arsenic benchmarks are used (i.e. benchmarks for copper acetoarsentate rather than sodium arsenite).
For lead, the lead acetate benchmarks are used rather than metallic lead.
The lowest selenium benchmarks are used (i.e. benchmarks for selinomethionine rather than sodium selenite).

Food Chain Model Components:
Hazard Index Estimate = [Food Dose]/Toxicological Benchmark

Food Dose = Sediment Concentration x Site Specific BSAF

Average Fraction Organic Carbon in Segment D Sediments *0.018*
Average Fraction Lipid in Forage Fish *0.015*

Appendix E-3d
Food Chain Model For
Great Blue Heron Ingesting Fish
Creek Segment E
Dead Creek
Sauget Area I

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Time and Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Ratio of Time in Area	Exposure Dose mg/kg/day	Food Total Conc. in Food mg/kg wet	Food Ingestion Rate kg/kg/day	Sediment Concentration mg/kg dry	Sediment BSAF
Cyanide	NB	NB	NA	NA		1	0.75			0.18	ND	
Herbicides and Pesticides												
2,3,5-T	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4,5-TP (Silvex)	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4-D	NB	NB	NA	NA		1	0.75			0.18	0.0101	
2,4-DB	NB	NB	NA	NA		1	0.75			0.18	ND	0.83
4,4'-DDD	NB	NB	NA	NA		1	0.75			0.18	0.0099	
4,4'-DDE	NB	NB	NA	NA	4.05E-03	1	0.75	5.39E-03	0.02996682	0.18	0.0048	7.12
4,4'-DDT	NB	NB	NA	NA		1	0.75			0.18	0.0094	
Total DDT	1.E+00	1.E-01	0.0028	0.028	4.05E-03	1	0.75	5.39E-03	0.02996682	0.18	0.0193	
Aldrin	NB	NB	NA	NA		1	0.75			0.18	ND	
Alpha-BHC	BSAF NA	BSAF NA	0.56	2.25		1	0.75			0.18	0.0005	
Alpha Chlordane	BSAF NA	BSAF NA	2.14	10.7		1	0.75			0.18	0.00319	
beta-BHC	ND	ND	0.56	2.25		1	0.75			0.18	ND	
Dalapon	NB	NB	NA	NA		1	0.75			0.18	ND	
delta-BHC	ND	ND	0.56	2.25		1	0.75			0.18	ND	
Dicamba	NB	NB	NA	NA	3.11E-05	1	0.75	4.15E-05	0.0002305	0.18	0.0025	0.0922
Dichloroprop	NB	NB	NA	NA		1	0.75			0.18	ND	0.0465
Dieldrin	3.E-02	NB	0.077	NA	2.09E-03	1	0.75	2.79E-03	0.01549429	0.18	0.0226	0.777
Dinoseb	NB	NB	NA	NA		1	0.75			0.18	ND	
Endosulfan I	BSAF NA	NB	10	NA		1	0.75			0.18	0.0001	
Endosulfan II	BSAF NA	NB	10	NA		1	0.75			0.18	0.0007	
Endosulfan sulfate	BSAF NA	NB	10	NA		1	0.75			0.18	0.0045	
Endrin	ND	ND	0.01	0.1		1	0.75			0.18	ND	
Endrin aldehyde	ND	ND	0.01	0.1		1	0.75			0.18	ND	
Endrin ketone	ND	ND	0.01	0.1		1	0.75			0.18	ND	
gamma-BHC (Lindane)	ND	ND	2.0	20		1	0.75			0.18	ND	
Gamma Chlordane	1.E-04	3.E-05	2.14	10.7	2.92E-04	1	0.75	3.89E-04	0.00216176	0.18	0.00245	1
Heptachlor	NB	NB	NA	NA		1	0.75			0.18	ND	
Heptachlor epoxide	NB	NB	NA	NA		1	0.75			0.18	0.000	
MCPA	NB	NB	NA	NA		1	0.75			0.18	ND	1.12
MCPP	NB	NB	NA	NA		1	0.75			0.18	ND	
Methoxychlor	NB	NB	NA	NA		1	0.75			0.18	0.0007	
Toxaphene	NB	NB	NA	NA		1	0.75			0.18	ND	
SVOCs												
1,2,4-Trichlorobenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
1,2-Dichlorobenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
1,3-Dichlorobenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
1,4-Dichlorobenzene	NB	NB	NA	NA		1	0.75			0.18	0.14	
2,4,5-Trichlorophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4,6-Trichlorophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4-Dichlorophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4-Dinitrophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4-Dinitrotoluene	NB	NB	NA	NA		1	0.75			0.18	ND	
2,6-Dinitrotoluene	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Chloronaphthalene	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Chlorophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Methylnaphthalene	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Methylphenol (o-cresol)	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Nitroanaline	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Nitrophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
3- & 4-Methylphenol	NB	NB	NA	NA		1	0.75			0.18	ND	
3,3'-Dichlorobenzidine	NB	NB	NA	NA		1	0.75			0.18	ND	
3-Nitroanaline	NB	NB	NA	NA		1	0.75			0.18	ND	
4,6-Dinitro-2-methylphenol	NB	NB	NA	NA		1	0.75			0.18	ND	
4-Bromophenyl phenyl ether	NB	NB	NA	NA		1	0.75			0.18	ND	
4-Chloro-3-methylphenol	NB	NB	NA	NA		1	0.75			0.18	ND	

Appendix E-3d
Food Chain Model For
Great Blue Heron Ingesting Fish
Creek Segment E
Dead Creek
Sauget Area I

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Time and Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Ratio of Time in Area	Exposure Dose mg/kg/day	Food			Sediment	
									Total Conc. in Food mg/kg wet	Ingestion Rate kg/kg/day	Sediment Concentration mg/kg dry	BSAF	
4-Chloroanaline	NB	NB	NA	NA		1	0.75			0.18	ND		
4-Chlorophenyl phenyl ether	NB	NB	NA	NA		1	0.75			0.18	ND		
4-Nitroanaline	NB	NB	NA	NA		1	0.75			0.18	ND		
4-Nitrophenol	NB	NB	NA	NA		1	0.75			0.18	ND		
Acenapthene	NB	NB	NA	NA		1	0.75			0.18	ND		
Acenaphthylene	NB	NB	NA	NA		1	0.75			0.18	ND		
Anthracene	NB	NB	NA	NA		1	0.75			0.18	0.05		
Benzo(a)anthracene	NB	NB	NA	NA		1	0.75			0.18	0.142		
Benzo(a)pyrene	NB	NB	NA	NA		1	0.75			0.18	0.108		
Benzo(b)fluoranthene	NB	NB	NA	NA		1	0.75			0.18	0.177		
Benzo(g,h,I,)perylene	NB	NB	NA	NA		1	0.75			0.18	0.155		
Benzo(k)fluoranthene	NB	NB	NA	NA		1	0.75			0.18	0.153		
Bis(2-chloroethoxy)methane	NB	NB	NA	NA		1	0.75			0.18	ND		
Bis(2-chloroethyl)ether	NB	NB	NA	NA		1	0.75			0.18	ND		
Bis(2-chloroisopropyl)ether	NB	NB	NA	NA		1	0.75			0.18	ND		
bis(2-ethylhexyl)phthalate	1.E-02	NB	1.1	NA	1.27E-02	1	0.75	1.69E-02	0.09375882	0.18	0.08	1.38	
Butylbenzylphthalate	NB	NB	NA	NA		1	0.75			0.18	ND		
Carbazole	NB	NB	NA	NA		1	0.75			0.18	ND		
Chrysene	NB	NB	NA	NA		1	0.75			0.18	0.162		
Dibenzo(a,h)anthracene	NB	NB	NA	NA	4.97E-03	1	0.75	6.63E-03	0.03682165	0.18	0.0756	0.552	
Dibenzofuran	NB	NB	NA	NA		1	0.75			0.18	ND		
Diethylphthalate	NB	NB	NA	NA		1	0.75			0.18	ND	0.266	
Dimethylphthalate	NB	NB	NA	NA		1	0.75			0.18	ND		
Di-n-butylphthalate	BSAF NA	BSAF NA	0.1	1.1		1	0.75			0.18	0.07		
Di-n-octylphthalate	NB	NB	NA	NA		1	0.75			0.18	ND		
Fluoranthene	NB	NB	NA	NA		1	0.75			0.18	0.203		
Fluorene	NB	NB	NA	NA		1	0.75			0.18	ND		
Hexachlorobenzene	NB	NB	NA	NA		1	0.75			0.18	ND		
Hexachlorobutadiene	ND	NB	6.0	NA		1	0.75			0.18	ND		
Hexachlorocyclopentadiene	NB	NB	NA	NA		1	0.75			0.18	ND		
Hexachloroethane	NB	NB	NA	NA		1	0.75			0.18	ND		
Indeno(1,2,3-c,d)pyrene	NB	NB	NA	NA	1.11E-02	1	0.75	1.48E-02	0.08207294	0.18	0.154	0.604	
Isophorone	NB	NB	NA	NA		1	0.75			0.18	ND		
Naphthalene	NB	NB	NA	NA		1	0.75			0.18	ND		
Nitrobenzene	NB	NB	NA	NA		1	0.75			0.18	ND		
N-Nitroso-di-N-propylamine	NB	NB	NA	NA		1	0.75			0.18	ND		
N-Nitrosodiphenylamine	NB	NB	NA	NA		1	0.75			0.18	ND		
Pentachlorophenol	NB	NB	NA	NA	6.60E-06	1	0.75	8.79E-06	4.8852E-05	0.18	0.02	0.00236	
Phenanthrene	NB	NB	NA	NA		1	0.75			0.18	0.165		
Phenol	NB	NB	NA	NA		1	0.75			0.18	ND		
Pyrene	NB	NB	NA	NA		1	0.75			0.18	0.172		
Total PAHs	4.E-04	4.E-05	40.0	400	1.61E-02	1	0.75	2.14E-02	0.11889459	0.18	2.29		
VOCs													
1,1,1-Trichloroethane	NB	NB	NA	NA		1	0.75			0.18	ND		
1,1,2,2-Tetrachloroethane	NB	NB	NA	NA		1	0.75			0.18	ND		
1,1,2-Trichloroethane	NB	NB	NA	NA		1	0.75			0.18	ND		
1,1-Dichloroethane	NB	NB	NA	NA		1	0.75			0.18	ND		
1,1-Dichlorothene	NB	NB	NA	NA		1	0.75			0.18	ND		
1,2-Dichloroethane	ND	ND	17.2	34.4		1	0.75			0.18	ND		
1,2-Dichloroethene(total)	NB	NB	NA	NA		1	0.75			0.18	ND		
1,2-Dichloropropane	NB	NB	NA	NA		1	0.75			0.18	ND		
2-Butanone(MEK)	NB	NB	NA	NA		1	0.75			0.18	0.011		
2-Hexanone	NB	NB	NA	NA		1	0.75			0.18	ND		
4-Methyl-2-pentanone (MIBK)	NB	NB	NA	NA		1	0.75			0.18	ND		
Acetone	NB	NB	NA	NA		1	0.75			0.18	0.04		
Benzene	NB	NB	NA	NA		1	0.75			0.18	ND		
Bromodichloromethane	NB	NB	NA	NA		1	0.75			0.18	ND		

Appendix E-3d
Food Chain Model For
Great Blue Heron Ingesting Fish
Creek Segment E
Dead Creek
Sauget Area I

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Time and Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Ratio of Time in Area	Exposure Dose mg/kg/day	Food Total Conc. in Food mg/kg wet	Food Ingestion Rate kg/kg/day	Sediment Concentration mg/kg dry	Sediment BSAF
Bromoform	NB	NB	NA	NA		1	0.75			0.18	ND	
Bromomethane	NB	NB	NA	NA		1	0.75			0.18	ND	
Carbon disulfide	NB	NB	NA	NA		1	0.75			0.18	ND	
Carbon tetrachloride	NB	NB	NA	NA		1	0.75			0.18	ND	
Chlorobenzene	NB	NB	NA	NA		1	0.75			0.18	0.0	
Chloroform	NB	NB	NA	NA		1	0.75			0.18	ND	
Chloroethane	NB	NB	NA	NA		1	0.75			0.18	ND	
Chloromethane	NB	NB	NA	NA		1	0.75			0.18	ND	
cis-1,3-Dichloropropene	NB	NB	NA	NA		1	0.75			0.18	ND	
Dibromochloromethane	NB	NB	NA	NA		1	0.75			0.18	ND	
Ethylbenzene	NB	NB	NA	NA		1	0.75			0.18	0.004	
Methylene chloride	NB	NB	NA	NA		1	0.75			0.18	0.0028	
Styrene	NB	NB	NA	NA		1	0.75			0.18	ND	
Tetrachloroethene	NB	NB	NA	NA		1	0.75			0.18	ND	
Toluene	NB	NB	NA	NA		1	0.75			0.18	0.004	
trans-1,3-Dichloropropene	NB	NB	NA	NA		1	0.75			0.18	ND	
Trichloroethene	NB	NB	NA	NA		1	0.75			0.18	ND	
Vinyl chloride	NB	NB	NA	NA		1	0.75			0.18	ND	
Xylenes (total)	NB	NB	NA	NA		1	0.75			0.18	ND	
Inorganics												
Aluminum, Total	2.E-02	NB	109.7	NA	1.70E+00	1	0.75	2.26E+00	12.5661813	0.18	10000	$\ln[Al_{fish}] = -21.2593 + 2.583\ \ln[Al_{sed}]$
Antimony	NB	NB	NA	NA		1	0.75			0.18	1.8	
Arsenic, Total	BSAF NA	BSAF NA	5.1	12.84		1	0.75			0.18	11	
Barium, Total	BSAF NA	BSAF NA	20.8	41.7		1	0.75			0.18	288	
Beryllium	NB	NB	NA	NA		1	0.75			0.18	0.75	
Cadmium, Total	BSAF NA	BSAF NA	1.45	20		1	0.75			0.18	24	
Calcium	NB	NB	NA	NA		1	0.75			0.18	8070	
Chromium, Total	2.E-01	4.E-02	1.00	5.00	2.11E-01	1	0.75	2.82E-01	1.56562	0.18	74	0.0211
Cobalt	BSAF NA	BSAF NA	15.0	30		1	0.75			0.18	8.1	
Copper, Total	9.E-03	7.E-03	47.0	61.7	4.17E-01	1	0.75	5.56E-01	3.0867523	0.18	1080	$\ln[Cu]_{fish} = -1.9259+0.4371\ \ln[Cu]_{sed}$
Iron	NB	NB	NA	NA		1	0.75			0.18	17900	
Lead, Total	1.E-01	1.E-02	1.13	11.3	1.42E-01	1	0.75	1.89E-01	1.04958	0.18	126	0.00833
Magnesium	NB	NB	NA	NA		1	0.75			0.18	4530	
Manganese	BSAF NA	NB	977	NA		1	0.75			0.18	174	
Mercury	BSAF NA	BSAF NA	0.0064	0.064		1	0.75			0.18	0.71	
Molybdenum	BSAF NA	BSAF NA	3.50	35.3		1	0.75			0.18	0.55	
Nickel, Total	BSAF NA	BSAF NA	77.40	107		1	0.75			0.18	270	
Potassium	NB	NB	NA	NA		1	0.75			0.18	2080	
Selenium	ND	ND	0.50	1		1	0.75			0.18	ND	0.479
Silver	NB	NB	NA	NA		1	0.75			0.18	1.38	
Sodium	NB	NB	NA	NA		1	0.75			0.18	242	
Thallium	NB	NB	NA	NA		1	0.75			0.18	0.66	
Tin	BSAF NA	BSAF NA	6.80	16.9		1	0.75			0.18	7.08	
Vanadium	BSAF NA	NB	11.40	NA		1	0.75			0.18	30	
Zinc, Total	4.E-01	5.E-02	14.5	131	6.28E+00	1	0.75	8.38E+00	46.5429092	0.18	3150	$\ln[Zn]_{fish} = 2.4275 + 0.1754\ \ln[Zn]_{sed}$
PCBs												
Monochlorobiphenyl	NB	NB	NA	NA		1	0.75			0.18	ND	
Dichlorobiphenyl	NB	NB	NA	NA		1	0.75			0.18	0	
Trichlorobiphenyl	NB	NB	NA	NA	6.54E-04	1	0.75	8.73E-04	0.00484729	0.18	0	0.84
Tetrachlorobiphenyl	NB	NB	NA	NA	2.82E-02	1	0.75	3.76E-02	0.20912647	0.18	0	6.85
Pentachlorobiphenyl	NB	NB	NA	NA	8.42E-02	1	0.75	1.12E-01	0.62388529	0.18	0	2.73
Hexachlorobiphenyl	NB	NB	NA	NA	2.63E-02	1	0.75	3.50E-02	0.19472206	0.18	0	5.05
Heptachlorobiphenyl	NB	NB	NA	NA	2.86E-03	1	0.75	3.81E-03	0.02116676	0.18	0	1.49
Octachlorobiphenyl	NB	NB	NA	NA	1.07E-03	1	0.75	1.42E-03	0.00791029	0.18	0	0.815
Nonachlorobiphenyl	NB	NB	NA	NA		1	0.75			0.18	0	
Decachlorobiphenyl	NB	NB	NA	NA		1	0.75			0.18	0	

Appendix E-3d
Food Chain Model For
Great Blue Heron Ingesting Fish
Creek Segment E
Dead Creek
Sauget Area I

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Time and Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Ratio of Time in Area	Exposure Dose mg/kg/day	Food		Sediment	Sediment
									Total Conc. in Food mg/kg wet	Ingestion Rate kg/kg/day	Concentration mg/kg dry	BSAF
Total PCBs	4.E-01	4.E-02	0.2	1.8	7.11E-02	1	0.75	9.48E-02	0.52671531	0.18	0.27	$\ln[PCBf_{wet}/\%lipids] = 1.6666 + 0.6806 \ln[PCB_{sed}/\%OC]$
Dioxins												
1,2,3,4,6,7,8,9-OCDD	NB	NB	NA	NA	3.04E-05	1	0.75	4.05E-05	0.00022503	0.18	0.04	0.00636
1,2,3,4,6,7,8-HpCDD	NB	NB	NA	NA	5.54E-06	1	0.75	7.39E-06	4.1074E-05	0.18	0.00	0.019
1,2,3,4,7,8-HxCDD	NB	NB	NA	NA		1	0.75			0.18	ND	0.0391
1,2,3,6,7,8-HxCDD	NB	NB	NA	NA	6.44E-07	1	0.75	8.59E-07	4.7732E-06	0.18	0.00	0.147
1,2,3,7,8,9-HxCDD	NB	NB	NA	NA	6.34E-08	1	0.75	8.45E-08	4.6941E-07	0.18	0.00	0.019
1,2,3,7,8-PeCDD	NB	NB	NA	NA	1.30E-06	1	0.75	1.74E-06	9.6515E-06	0.18	0.00	0.484
2,3,7,8-TCDD	NB	NB	NA	NA		1	0.75			0.18	ND	1.77
Total HpCDD	NB	NB	NA	NA	1.32E-05	1	0.75	1.76E-05	9.7888E-05	0.18	0.01	0.0129
Total HxCDD	NB	NB	NA	NA	2.86E-06	1	0.75	3.82E-06	2.1204E-05	0.18	0.00	0.0323
Total PeCDD	NB	NB	NA	NA	3.94E-06	1	0.75	5.25E-06	0.00002916	0.18	0.00	0.108
Total TCDD	NB	NB	NA	NA		1	0.75			0.18	ND	0.0932
Furans												
1,2,3,4,6,7,8,9-OCDF	NB	NB	NA	NA	1.63E-04	1	0.75	2.17E-04	0.00120399	0.18	0.02	0.0822
1,2,3,4,6,7,8-HpCDF	NB	NB	NA	NA	9.63E-06	1	0.75	1.28E-05	7.1338E-05	0.18	0.00	0.049
1,2,3,4,7,8,9-HpCDF	NB	NB	NA	NA	3.84E-07	1	0.75	5.12E-07	2.8445E-06	0.18	0.00	0.0731
1,2,3,4,7,8-HxCDF	NB	NB	NA	NA	5.43E-07	1	0.75	7.24E-07	4.0235E-06	0.18	0.00	0.2
1,2,3,6,7,8-HxCDF	NB	NB	NA	NA	6.98E-08	1	0.75	9.30E-08	5.1673E-07	0.18	0.00	0.0241
1,2,3,7,8,9-HxCDF	NB	NB	NA	NA		1	0.75			0.18	ND	
1,2,3,7,8-PeCDF	NB	NB	NA	NA		1	0.75			0.18	ND	0.0676
2,3,4,6,7,8-HxCDF	NB	NB	NA	NA		1	0.75			0.18	ND	0.0242
2,3,4,7,8-PeCDF	NB	NB	NA	NA		1	0.75			0.18	ND	0.231
2,3,7,8-TCDF	NB	NB	NA	NA	3.80E-06	1	0.75	5.07E-06	2.8183E-05	0.18	0.00	1.69
Total HpCDF	NB	NB	NA	NA	6.96E-05	1	0.75	9.28E-05	0.00051558	0.18	0.01	0.0704
Total HxCDF	NB	NB	NA	NA	4.70E-05	1	0.75	6.26E-05	0.00034779	0.18	0.00	0.379
Total PeCDF	NB	NB	NA	NA	8.83E-05	1	0.75	1.18E-04	0.000654	0.18	0.00	2.18
Total TCDF	NB	NB	NA	NA	5.43E-05	1	0.75	7.24E-05	0.00040221	0.18	0.00	1.48
Dioxin - TEQ	8.E-02	8.E-03	0.000014	0.00014	1.06E-06	1	0.75	1.41E-06	7.8387E-06	0.18	0.00007	$\ln[\text{Total TEQ}_{fish}/\%lipids] = -1.748 + 0.7556 \ln[\text{Total TEQ}_{sed}/\%OC]$

Notes:
NA = Not available/applicable
NB = Benchmark not available
ND = Not detected
BSAF NA = Biota-Sediment Accumulation Factor not available
Half the detection limit is used for compounds that were not detected.
*Exposure in sediment (creek bottom soil) only
The lowest arsenic benchmarks are used (i.e. benchmarks for copper acetoarsentate rather than sodium arsenite).
For lead, the lead acetate benchmarks are used rather than metallic lead.
The lowest selenium benchmarks are used (i.e. benchmarks for selinomethionine rather than sodium selenite).

Food Chain Model Components:
Hazard Index Estimate = [Food Dose]/Toxicological Benchmark

Food Dose = Sediment Concentration x Site Specific BSAF

Average Fraction Organic Carbon in Segment E Sediments	*0.017*
Average Fraction Lipid in Forage Fish	*0.015*

Appendix E-3e
Food Chain Model For
Great Blue Heron Ingesting Fish
Creek Segment F
Dead Creek
Sauget Area I

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Time and Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Ratio of Time in Area	Exposure Dose mg/kg/day	Food		Sediment	Sediment
									Total Conc. in Food mg/kg wet	Ingestion Rate kg/kg/day	Sediment Concentration mg/kg dry	BSAF
Cyanide	NB	NB	NA	NA		1	0.75			0.18	0.84	
Herbicides and Pesticides												
2,3,5-T	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4,5-TP (Silvex)	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4-D	NB	NB	NA	NA		1	0.75			0.18	0.0107	
2,4-DB	NB	NB	NA	NA		1	0.75			0.18	ND	0.83
4,4'-DDD	NB	NB	NA	NA		1	0.75			0.18	ND	
4,4'-DDE	NB	NB	NA	NA	1.64E-03	1	0.75	2.18E-03	0.01212	0.18	0.0010	7.12
4,4'-DDT	NB	NB	NA	NA		1	0.75			0.18	0.0035	
Total DDT	6.E-01	6.E-02	0.0028	0.028	1.64E-03	1	0.75	2.18E-03	0.01212	0.18	0.00695	
Aldrin	NB	NB	NA	NA		1	0.75			0.18	0.00023	
Alpha-BHC	ND	ND	0.56	2.25		1	0.75			0.18	ND	
Alpha Chlordane	BSAF NA	BSAF NA	2.14	10.7		1	0.75			0.18	0.00247	
beta-BHC	BSAF NA	BSAF NA	0.56	2.25		1	0.75			0.18	0.0011	
Dalapon	NB	NB	NA	NA		1	0.75			0.18	ND	
delta-BHC	ND	ND	0.56	2.25		1	0.75			0.18	ND	
Dicamba	NB	NB	NA	NA	5.09E-05	1	0.75	6.79E-05	0.0003771	0.18	0.0041	0.0922
Dichloroprop	NB	NB	NA	NA		1	0.75			0.18	ND	0.0465
Dieldrin	9.E-03	NB	0.077	NA	6.70E-04	1	0.75	8.93E-04	0.0049632	0.18	0.0038	0.777
Dinoseb	NB	NB	NA	NA		1	0.75			0.18	ND	
Endosulfan I	ND	NB	10	NA		1	0.75			0.18	ND	
Endosulfan II	ND	NB	10	NA		1	0.75			0.18	ND	
Endosulfan sulfate	BSAF NA	NB	10	NA		1	0.75			0.18	0.0032	
Endrin	ND	ND	0.01	0.1		1	0.75			0.18	ND	
Endrin aldehyde	ND	ND	0.01	0.1		1	0.75			0.18	ND	
Endrin ketone	ND	ND	0.01	0.1		1	0.75			0.18	ND	
gamma-BHC (Lindane)	ND	ND	2.0	20		1	0.75			0.18	ND	
Gamma Chlordane	2.E-04	4.E-05	2.14	10.7	4.53E-04	1	0.75	6.04E-04	0.00335393	0.18	0.00199	1
Heptachlor	NB	NB	NA	NA		1	0.75			0.18	ND	
Heptachlor epoxide	NB	NB	NA	NA		1	0.75			0.18	ND	
MCPA	NB	NB	NA	NA		1	0.75			0.18	ND	1.12
MCPP	NB	NB	NA	NA		1	0.75			0.18	1.6	
Methoxychlor	NB	NB	NA	NA		1	0.75			0.18	ND	
Toxaphene	NB	NB	NA	NA		1	0.75			0.18	ND	
SVOCs												
1,2,4-Trichlorobenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
1,2-Dichlorobenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
1,3-Dichlorobenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
1,4-Dichlorobenzene	NB	NB	NA	NA		1	0.75			0.18	0.09	
2,4,5-Trichlorophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4,6-Trichlorophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4-Dichlorophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4-Dinitrophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2,4-Dinitrotoluene	NB	NB	NA	NA		1	0.75			0.18	ND	
2,6-Dinitrotoluene	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Chloronaphthalene	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Chlorophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Methylnaphthalene	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Methylphenol (o-cresol)	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Nitroanaline	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Nitrophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
3- & 4-Methylphenol	NB	NB	NA	NA		1	0.75			0.18	ND	
3,3'-Dichlorobenzidine	NB	NB	NA	NA		1	0.75			0.18	ND	
3-Nitroanaline	NB	NB	NA	NA		1	0.75			0.18	ND	
4,6-Dinitro-2-methylphenol	NB	NB	NA	NA		1	0.75			0.18	ND	
4-Bromophenyl phenyl ether	NB	NB	NA	NA		1	0.75			0.18	ND	
4-Chloro-3-methylphenol	NB	NB	NA	NA		1	0.75			0.18	ND	

Appendix E-3e
Food Chain Model For
Great Blue Heron Ingesting Fish
Creek Segment F
Dead Creek
Sauget Area I

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Time and Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Ratio of Time in Area	Exposure Dose mg/kg/day	Food		Sediment	Sediment
									Total Conc. in Food mg/kg wet	Ingestion Rate kg/kg/day	Concentration mg/kg dry	BSAF
4-Chloroanaline	NB	NB	NA	NA		1	0.75			0.18	ND	
4-Chlorophenyl phenyl ether	NB	NB	NA	NA		1	0.75			0.18	ND	
4-Nitroanaline	NB	NB	NA	NA		1	0.75			0.18	ND	
4-Nitrophenol	NB	NB	NA	NA		1	0.75			0.18	ND	
Acenapthene	NB	NB	NA	NA		1	0.75			0.18	ND	
Acenaphthylene	NB	NB	NA	NA		1	0.75			0.18	ND	
Anthracene	NB	NB	NA	NA		1	0.75			0.18	ND	
Benzo(a)anthracene	NB	NB	NA	NA		1	0.75			0.18	0.0623	
Benzo(a)pyrene	NB	NB	NA	NA		1	0.75			0.18	0.0796	
Benzo(b)fluoranthene	NB	NB	NA	NA		1	0.75			0.18	0.147	
Benzo(g,h,I,)perylene	NB	NB	NA	NA		1	0.75			0.18	0.123	
Benzo(k)fluoranthene	NB	NB	NA	NA		1	0.75			0.18	0.129	
Bis(2-chloroethoxy)methane	NB	NB	NA	NA		1	0.75			0.18	ND	
Bis(2-chloroethyl)ether	NB	NB	NA	NA		1	0.75			0.18	ND	
Bis(2-chloroisopropyl)ether	NB	NB	NA	NA		1	0.75			0.18	ND	
bis(2-ethylhexyl)phthalate	3.E-02	NB	1.1	NA	2.84E-02	1	0.75	3.79E-02	0.21072135	0.18	0.09	1.38
Butylbenzylphthalate	NB	NB	NA	NA		1	0.75			0.18	ND	
Carbazole	NB	NB	NA	NA		1	0.75			0.18	ND	
Chrysene	NB	NB	NA	NA		1	0.75			0.18	0.137	
Dibenzo(a,h)anthracene	NB	NB	NA	NA		1	0.75			0.18	ND	0.552
Dibenzofuran	NB	NB	NA	NA		1	0.75			0.18	ND	
Diethylphthalate	NB	NB	NA	NA		1	0.75			0.18	ND	0.266
Dimethylphthalate	NB	NB	NA	NA		1	0.75			0.18	ND	
Di-n-butylphthalate	ND	ND	0.1	1.1		1	0.75			0.18	ND	
Di-n-octylphthalate	NB	NB	NA	NA		1	0.75			0.18	ND	
Fluoranthene	NB	NB	NA	NA		1	0.75			0.18	0.13	
Fluorene	NB	NB	NA	NA		1	0.75			0.18	ND	
Hexachlorobenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
Hexachlorobutadiene	BSAF NA	NB	6.0	NA		1	0.75			0.18	0.061	
Hexachlorocyclopentadiene	NB	NB	NA	NA		1	0.75			0.18	ND	
Hexachloroethane	NB	NB	NA	NA		1	0.75			0.18	ND	
Indeno(1,2,3-c,d)pyrene	NB	NB	NA	NA	1.46E-02	1	0.75	1.94E-02	0.10790562	0.18	0.106	0.604
Isophorone	NB	NB	NA	NA		1	0.75			0.18	ND	
Naphthalene	NB	NB	NA	NA		1	0.75			0.18	ND	
Nitrobenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
N-Nitroso-di-N-propylamine	NB	NB	NA	NA		1	0.75			0.18	ND	
N-Nitrosodiphenylamine	NB	NB	NA	NA		1	0.75			0.18	ND	
Pentachlorophenol	NB	NB	NA	NA	5.32E-06	1	0.75	7.09E-06	3.9412E-05	0.18	0.02	0.00236
Phenanthrene	NB	NB	NA	NA		1	0.75			0.18	0.0593	
Phenol	NB	NB	NA	NA		1	0.75			0.18	ND	
Pyrene	NB	NB	NA	NA		1	0.75			0.18	0.12	
Total PAHs	4.E-04	4.E-05	40.0	400	1.46E-02	1	0.75	1.94E-02	0.10790562	0.18	1.4	
VOCs												
1,1,1-Trichloroethane	NB	NB	NA	NA		1	0.75			0.18	ND	
1,1,2,2-Tetrachloroethane	NB	NB	NA	NA		1	0.75			0.18	0.00	
1,1,2-Trichloroethane	NB	NB	NA	NA		1	0.75			0.18	0.00	
1,1-Dichloroethane	NB	NB	NA	NA		1	0.75			0.18	ND	
1,1-Dichlorothene	NB	NB	NA	NA		1	0.75			0.18	ND	
1,2-Dichloroethane	BSAF NA	BSAF NA	17.2	34.4		1	0.75			0.18	0.00	
1,2-Dichloroethene(total)	NB	NB	NA	NA		1	0.75			0.18	ND	
1,2-Dichloropropane	NB	NB	NA	NA		1	0.75			0.18	ND	
2-Butanone(MEK)	NB	NB	NA	NA		1	0.75			0.18	0.010	
2-Hexanone	NB	NB	NA	NA		1	0.75			0.18	ND	
4-Methyl-2-pentanone (MIBK)	NB	NB	NA	NA		1	0.75			0.18	ND	
Acetone	NB	NB	NA	NA		1	0.75			0.18	0.05	
Benzene	NB	NB	NA	NA		1	0.75			0.18	ND	
Bromodichloromethane	NB	NB	NA	NA		1	0.75			0.18	0.0013	

Appendix E-3e
Food Chain Model For
Great Blue Heron Ingesting Fish
Creek Segment F
Dead Creek
Sauget Area I

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Time and Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Ratio of Time in Area	Exposure Dose mg/kg/day	Food Total Conc. in Food mg/kg wet	Food Ingestion Rate kg/kg/day	Sediment Concentration mg/kg dry	Sediment BSAF
Bromoform	NB	NB	NA	NA		1	0.75			0.18	0.00295	
Bromomethane	NB	NB	NA	NA		1	0.75			0.18	ND	
Carbon disulfide	NB	NB	NA	NA		1	0.75			0.18	ND	
Carbon tetrachloride	NB	NB	NA	NA		1	0.75			0.18	ND	
Chlorobenzene	NB	NB	NA	NA		1	0.75			0.18	0.0	
Chloroform	NB	NB	NA	NA		1	0.75			0.18	ND	
Chloroethane	NB	NB	NA	NA		1	0.75			0.18	ND	
Chloromethane	NB	NB	NA	NA		1	0.75			0.18	ND	
cis-1,3-Dichloropropene	NB	NB	NA	NA		1	0.75			0.18	ND	
Dibromochloromethane	NB	NB	NA	NA		1	0.75			0.18	0.002	
Ethylbenzene	NB	NB	NA	NA		1	0.75			0.18	ND	
Methylene chloride	NB	NB	NA	NA		1	0.75			0.18	0.0032	
Styrene	NB	NB	NA	NA		1	0.75			0.18	ND	
Tetrachloroethene	NB	NB	NA	NA		1	0.75			0.18	ND	
Toluene	NB	NB	NA	NA		1	0.75			0.18	0.006	
trans-1,3-Dichloropropene	NB	NB	NA	NA		1	0.75			0.18	ND	
Trichloroethene	NB	NB	NA	NA		1	0.75			0.18	ND	
Vinyl chloride	NB	NB	NA	NA		1	0.75			0.18	ND	
Xylenes (total)	NB	NB	NA	NA		1	0.75			0.18	0.00	
Inorganics												
Aluminum, Total	1.E-02	NB	109.7	NA	1.26E+00	1	0.75	1.67E+00	9.29988778	0.18	8900	$\ln[Al_{fish}] = -21.2593 + 2.583 \ln[Al_{sed}]$
Antimony	NB	NB	NA	NA		1	0.75			0.18	0.6	
Arsenic, Total	BSAF NA	BSAF NA	5.1	12.84		1	0.75			0.18	10	
Barium, Total	BSAF NA	BSAF NA	20.8	41.7		1	0.75			0.18	220	
Beryllium	NB	NB	NA	NA		1	0.75			0.18	0.64	
Cadmium, Total	BSAF NA	BSAF NA	1.45	20		1	0.75			0.18	21	
Calcium	NB	NB	NA	NA		1	0.75			0.18	12000	
Chromium, Total	5.E-02	1.E-02	1.00	5.00	4.81E-02	1	0.75	6.42E-02	0.35659	0.18	17	0.0211
Cobalt	BSAF NA	BSAF NA	15.0	30		1	0.75			0.18	8.9	
Copper, Total	5.E-03	3.E-03	47.0	61.7	2.12E-01	1	0.75	2.83E-01	1.57001389	0.18	230	$\ln[Cu]_{fish} = -1.9259+0.4371 \ln[Cu]_{sed}$
Iron	NB	NB	NA	NA		1	0.75			0.18	22500	
Lead, Total	9.E-02	9.E-03	1.13	11.3	9.91E-02	1	0.75	1.32E-01	0.733873	0.18	88	0.00833
Magnesium	NB	NB	NA	NA		1	0.75			0.18	5290	
Manganese	BSAF NA	NB	977	NA		1	0.75			0.18	424	
Mercury	BSAF NA	BSAF NA	0.0064	0.064		1	0.75			0.18	0.42	
Molybdenum	BSAF NA	BSAF NA	3.50	35.3		1	0.75			0.18	0.76	
Nickel, Total	BSAF NA	BSAF NA	77.40	107		1	0.75			0.18	344	
Potassium	NB	NB	NA	NA		1	0.75			0.18	1600	
Selenium	1.E-01	5.E-02	0.50	1	5.21E-02	1	0.75	6.94E-02	0.385595	0.18	0.81	0.479
Silver	NB	NB	NA	NA		1	0.75			0.18	0.65	
Sodium	NB	NB	NA	NA		1	0.75			0.18	159	
Thallium	NB	NB	NA	NA		1	0.75			0.18	ND	
Tin	BSAF NA	BSAF NA	6.80	16.9		1	0.75			0.18	5.05	
Vanadium	BSAF NA	NB	11.40	NA		1	0.75			0.18	26	
Zinc, Total	5.E-01	5.E-02	14.5	131	6.96E+00	1	0.75	9.28E+00	51.5654904	0.18	5650	$\ln[Zn]_{fish} = 2.4275 + 0.1754 \ln[Zn]_{sed}$
PCBs												
Monochlorobiphenyl	NB	NB	NA	NA		1	0.75			0.18	0	
Dichlorobiphenyl	NB	NB	NA	NA		1	0.75			0.18	ND	
Trichlorobiphenyl	NB	NB	NA	NA	5.71E-04	1	0.75	7.62E-04	0.00423303	0.18	0	0.84
Tetrachlorobiphenyl	NB	NB	NA	NA	1.68E-02	1	0.75	2.24E-02	0.12468539	0.18	0	6.85
Pentachlorobiphenyl	NB	NB	NA	NA	1.09E-02	1	0.75	1.45E-02	0.08051966	0.18	0	2.73
Hexachlorobiphenyl	NB	NB	NA	NA	1.28E-02	1	0.75	1.70E-02	0.09447472	0.18	0	5.05
Heptachlorobiphenyl	NB	NB	NA	NA	2.83E-03	1	0.75	3.77E-03	0.02094371	0.18	0	1.49
Octachlorobiphenyl	NB	NB	NA	NA	1.15E-03	1	0.75	1.53E-03	0.00851629	0.18	0	0.815
Nonachlorobiphenyl	NB	NB	NA	NA		1	0.75			0.18	0	
Decachlorobiphenyl	NB	NB	NA	NA		1	0.75			0.18	0	

Appendix E-3e
Food Chain Model For
Great Blue Heron Ingesting Fish
Creek Segment F
Dead Creek
Sauget Area I

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Time and Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Ratio of Time in Area	Exposure Dose mg/kg/day	Food		Sediment	Sediment
									Total Conc. in Food mg/kg wet	Ingestion Rate kg/kg/day	Sediment Concentration mg/kg dry	BSAF
Total PCBs	3.E-01	3.E-02	0.2	1.8	4.93E-02	1	0.75	6.58E-02	0.36533517	0.18	0.08	$\ln[PCBf_{wet}/\%lipids] = 1.6666 + 0.6806 \ln[PCB_{sed}/\%OC]$
Dioxins												
1,2,3,4,6,7,8,9-OCDD	NB	NB	NA	NA	1.03E-05	1	0.75	1.38E-05	7.6427E-05	0.18	0.01	0.00636
1,2,3,4,6,7,8-HpCDD	NB	NB	NA	NA	6.48E-06	1	0.75	8.65E-06	4.8034E-05	0.18	0.00	0.019
1,2,3,4,7,8-HxCDD	NB	NB	NA	NA	3.50E-07	1	0.75	4.66E-07	2.5898E-06	0.18	0.00	0.0391
1,2,3,6,7,8-HxCDD	NB	NB	NA	NA	3.21E-06	1	0.75	4.28E-06	2.3759E-05	0.18	0.00	0.147
1,2,3,7,8,9-HxCDD	NB	NB	NA	NA	5.14E-07	1	0.75	6.86E-07	3.8107E-06	0.18	0.00	0.019
1,2,3,7,8-PeCDD	NB	NB	NA	NA	6.21E-06	1	0.75	8.28E-06	4.6007E-05	0.18	0.00	0.484
2,3,7,8-TCDD	NB	NB	NA	NA		1	0.75			0.18	ND	1.77
Total HpCDD	NB	NB	NA	NA	8.22E-06	1	0.75	1.10E-05	6.0876E-05	0.18	0.00	0.0129
Total HxCDD	NB	NB	NA	NA	1.43E-05	1	0.75	1.91E-05	0.00010615	0.18	0.00	0.0323
Total PeCDD	NB	NB	NA	NA	1.98E-05	1	0.75	2.63E-05	0.00014635	0.18	0.00	0.108
Total TCDD	NB	NB	NA	NA	7.36E-05	1	0.75	9.81E-05	0.00054506	0.18	0.00	0.0932
Furans												
1,2,3,4,6,7,8,9-OCDF	NB	NB	NA	NA	1.42E-04	1	0.75	1.90E-04	0.0010529	0.18	0.01	0.0822
1,2,3,4,6,7,8-HpCDF	NB	NB	NA	NA	1.04E-05	1	0.75	1.38E-05	7.6803E-05	0.18	0.00	0.049
1,2,3,4,7,8,9-HpCDF	NB	NB	NA	NA	9.81E-07	1	0.75	1.31E-06	7.2689E-06	0.18	0.00	0.0731
1,2,3,4,7,8-HxCDF	NB	NB	NA	NA	3.91E-06	1	0.75	5.22E-06	2.8989E-05	0.18	0.00	0.2
1,2,3,6,7,8-HxCDF	NB	NB	NA	NA		1	0.75			0.18	ND	0.0241
1,2,3,7,8,9-HxCDF	NB	NB	NA	NA		1	0.75			0.18	0.00	
1,2,3,7,8-PeCDF	NB	NB	NA	NA	8.40E-07	1	0.75	1.12E-06	6.2207E-06	0.18	0.00	0.0676
2,3,4,6,7,8-HxCDF	NB	NB	NA	NA	1.82E-07	1	0.75	2.43E-07	1.35E-06	0.18	0.00	0.0242
2,3,4,7,8-PeCDF	NB	NB	NA	NA	3.32E-06	1	0.75	4.42E-06	2.4566E-05	0.18	0.00	0.231
2,3,7,8-TCDF	NB	NB	NA	NA	5.58E-05	1	0.75	7.43E-05	0.00041301	0.18	0.00	1.69
Total HpCDF	NB	NB	NA	NA	5.77E-05	1	0.75	7.69E-05	0.00042715	0.18	0.00	0.0704
Total HxCDF	NB	NB	NA	NA	4.24E-04	1	0.75	5.66E-04	0.00314272	0.18	0.00	0.379
Total PeCDF	NB	NB	NA	NA	3.57E-04	1	0.75	4.76E-04	0.00264172	0.18	0.00	2.18
Total TCDF	NB	NB	NA	NA	2.43E-04	1	0.75	3.24E-04	0.00180094	0.18	0.00	1.48
Dioxin - TEQ	2.E-01	2.E-02	0.000014	0.00014	3.07E-06	1	0.75	4.09E-06	2.2736E-05	0.18	0.00016	$\ln[\text{Total TEQ}_{fish}/\%lipids] = -1.748 + 0.7556 \ln[\text{Total TEQ}_{sed}/\%OC]$

Notes:
NA = Not available/applicable
NB = Benchmark not available
ND = Not detected
BSAF NA = Biota-Sediment Accumulation Factor not available
Half the detection limit is used for compounds that were not detected.
*Exposure in sediment (creek bottom soil) only
The lowest arsenic benchmarks are used (i.e. benchmarks for copper acetoarsentate rather than sodium arsenite).
For lead, the lead acetate benchmarks are used rather than metallic lead.
The lowest selenium benchmarks are used (i.e. benchmarks for selinomethionine rather than sodium selenite).

Food Chain Model Components:
Hazard Index Estimate = [Food Dose]/Toxicological Benchmark

Food Dose = Sediment Concentration x Site Specific BSAF

Average Fraction Organic Carbon in Segment F Sediments *0.0089*
Average Fraction Lipid in Forage Fish *0.015*

Appe. -4a
Food Chain Model for River Otter Ingesting Sediment and Fish
Creek Segment
Dead Creek
Sauget Area I

Compound	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose	LOAEL Benchmark Dose	Overall Exposure Dose mg/kg	Ratio of Forage Area to Site	Time on Site Ratio	Exposure Dose mg/kg/day	Total Conc in Food mg/kg wet	Food Ingestion Rate kg/kg/day	Proportion of Dose	Sediment[1] RAF	Sediment Concentration mg/kg dry	Dry Sediment Ing. Rate kg/kg/day	Proportion of Dose	BSAF
Cyanide	2 E-06	1 E-09	30	369	4 80E-07	0.003	1	0 00018		0.10		1	0 40	0.00040	1 00	
Pesticides/Herbicides																
2,4,5-T	1 E-06	4 E-09	1 4	4 6	1 66E-06	0 003	1	0.00000552		0 10		1	0 014	0 00040	1 00	
2,4,5-TP (Silvex)	2 E-10	9 E-11	11	23	2 12E-09	0 003	1	7 08E-07		0.10		1	0 0018	0.00040	1 00	
2,4-D	2 E-06	4 E-09	0 47	2 3	1 01E-06	0 003	1	3 376E-06		0.10		1	0 0084	0.00040	1 00	
2,4-DB	2 E-07	7 E-08	8 5	26	1 97E-06	0.003	1	0.00065803	0 0065487	0 10	1.00	1	0 0079	0 00040	0.00	0 83
4,4'-DDD	NB	NB	NA	NA	1 26E-08	0 003	1	0 0000042		0.10		1	0 0105	0.00040	1 00	
4,4'-DDE	NB	NB	NA	NA	8 47E-08	0.003	1	0 00282405	0 02822571	0 10	1 00	1	0.0037	0 00040	0 00	7 12
4,4'-DDT	NB	NB	NA	NA	3 43E-08	0 003	1	0 00001144		0 10		1	0 0286	0 00040	1.00	
Total DDT	2 E-06	4 E-08	0 4	2	8 52E-08	0 003	1	0.00283985	0 02822571	0.10	0 99	1	0 0432	0.00040	0 01	
Aldrin	5 E-09	9 E-10	0 093	0 47	4 32E-10	0 003	1	1 44E-07		0 10		1	0 00036	0.00040	1 00	
alpha BHC	8 E-08	1 E-06	0 010	0 06	8 40E-10	0.003	1	0 00000028		0 10		1	0 0007	0 00040	1 00	
Alpha-Chlordane	ND	ND	1 2	2 3		0 003	1			0.10		1	ND	0 00040		
beta-BHC	1 E-08	2 E-09	0 2	0 91	1 84E-09	0 003	1	6 12E-07		0 10		1	0 0015	0 00040	1 00	
Delapon	1 E-06	4 E-09	3 9	13	4 74E-08	0.003	1	0 0000158		0 10		1	0 040	0 00040	1.00	
delta-BHC	7 E-08	8 E-09	0 010	0 06	6 72E-10	0 003	1	2 24E-07		0.10		1	0 00056	0.00040	1 00	
Dicamba	4 E-07	1 E-07	0 19	0 63	8 25E-08	0 003	1	2 7513E-05	0 00026369	0 10	0 96	1	0 0029	0 00040	0 04	0 0922
Dichloroprop	NB	NB	NA	NA	1 00E-07	0 003	1	0 00003333	0.0003089	0 10	0 92	1	0 0086	0 00040	0.08	0 0465
Dieldrin	2 E-04	2 E-05	0.009	0.09	1 89E-08	0.003	1	0 00063156	0 00828538	0.10	1 00	1	0 0076	0 00040	0.00	0.777
Dinoseb	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Endosulfan I	ND	NB	0 07	NA		0 003	1			0.10		1	ND	0 00040		
Endosulfan II	5 E-08	NB	0 07	NA	3 34E-09	0.003	1	1 112E-06		0 10		1	0 0028	0 00040	1.00	
Endosulfan sulfate	5 E-08	NB	0 07	NA	3 67E-09	0 003	1	1 224E-06		0 10		1	0 0031	0 00040	1 00	
Endrin	ND	ND	0 023	0 23		0 003	1			0 10		1	ND	0 00040		
Endrin aldehyde	ND	ND	0 023	0 23		0.003	1			0 10		1	ND	0 00040		
Endrin ketone	5 E-08	5 E-09	0 023	0 23	1 15E-09	0 003	1	3 828E-07		0 10		1	0 0010	0 00040	1 00	
gamma-BHC (Lindane)	4 E-10	4 E-11	3 7	37	1 57E-09	0 003	1	5 24E-07		0 10		1	0 0013	0 00040	1 00	
Gamma Chlordane	1 E-07	5 E-08	1 2	2 3	1 26E-07	0 003	1	4 1942E-05	0 00041786	0.10	1 00	1	0 00039	0 00040	0 00	1
Heptachlor	2 E-08	2 E-09	0 081	0 81	1 44E-09	0 003	1	0 00000048		0 10		1	0 0012	0 00040	1 00	
Heptachlor epoxide	2 E-07	2 E-08	0 081	0 81	1 39E-08	0 003	1	0 00000462		0 10		1	0 011	0 00040	1 00	
MCPA - nd	ND	ND	3 5	10		0 003	1			0 10		1	ND	0 00040		1 12
MCPP	1 E-06	5 E-07	1 4	4 2	2 05E-08	0 003	1	0 000684		0 10		1	1 7	0 00040	1 00	
Methoxychlor	1 E-09	6 E-10	1 9	3 7	2 09E-09	0 003	1	6 98E-07		0 10		1	0 0017	0 00040	1 00	
Toxaphene	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
SVOCs						0 003										
1,2,4-Trichlorobenzene	8 E-06	2 E-06	7 4	27	5 90E-07	0 003	1	0 0001968		0 10		1	0 49	0 00040	1 00	
1,2-Dichlorobenzene	1 E-06	NB	43	NA	5 46E-07	0 003	1	0 000182		0 10		1	0 46	0 00040	1 00	
1,3-Dichlorobenzene	NB	NB	NA	NA	1 20E-07	0 003	1	0 00004		0 10		1	0 10	0 00040	1 00	
1,4-Dichlorobenzene	3 E-06	3 E-09	10	104	2 89E-07	0 003	1	0 0000964		0 10		1	0 24	0 00040	1 00	
2,4,5-Trichlorophenol	3 E-09	1 E-09	50	149	1 48E-07	0 003	1	0 0000492		0 10		1	0 12	0 00040	1 00	
2,4,6-Trichlorophenol	NB	NB	NA	NA	1 22E-07	0 003	1	0 0000408		0 10		1	0 10	0 00040	1 00	
2,4-Dichlorophenol	NB	NB	NA	NA	2 45E-07	0 003	1	0 0000816		0 10		1	0 20	0 00040	1 00	
2,4-Dinitrophenol	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
2,4-Dinitrotoluene	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
2,6-Dinitrotoluene	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
2-Chloronaphthalene	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
2-Chlorophenol	NB	NB	NA	NA	1 56E-07	0 003	1	0 000052		0 10		1	0 13	0 00040	1 00	
2-Methylnaphthalene	NB	NB	NA	NA	2 93E-07	0 003	1	0 0000976		0 10		1	0 24	0 00040	1 00	
2-Methylphenol (o-cresol)	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
2-Nitroanaline	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
2-Nitrophenol	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
3- & 4-Methylphenol	2 E-09	9 E-10	80	208	1 78E-07	0 003	1	0 0000588		0 10		1	0 15	0 00040	1 00	
3,3'-Dichlorobenzidine	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
3-Nitroanaline	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
4,6-Dinitro-2-methylphenol	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
4-Bromophenyl phenyl ether	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
4-Chloro-3-methylphenol	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
4-Chloroanaline	1 E-07	NB	4 6	NA	5 35E-07	0 003	1	0 0001784		0 10		1	0 45	0 00040	1 00	
4-Chlorophenyl phenyl ether	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
4-Nitroanaline	NB	NB	NA	NA	8 93E-07	0 003	1	0 0002976		0 10		1	0 74	0 00040	1 00	
4-Nitrophenol	NB	NB	NA	NA	5 28E-07	0 003	1	0 000176		0.10		1	0 44	0 00040	1 00	
Acenaphthene	2 E-09	9 E-10	87	173	1 64E-07	0 003	1	0 0000548		0 10		1	0 137	0 00040	1 00	
Acenaphthylene	NB	NB	NA	NA	1 49E-07	0 003	1	0 0000496		0 10		1	0 124	0 00040	1 00	
Anthracene	7 E-09	NB	25	NA	1 82E-07	0 003	1	0 0000606		0.10		1	0 152	0 00040	1.00	
Benzo(a)anthracene	NB	NB	NA	NA	2 03E-07	0 003	1	0 0000676		0 10		1	0 169	0 00040	1 00	
Benzo(a)pyrene	5 E-07	5 E-08	0.25	2 5	1 27E-07	0 003	1	0 0000424		0 10		1	0 106	0 00040	1 00	
Benzo(b)fluoranthene	NB	NB	NA	NA	1 92E-07	0 003	1	0 000064		0 10		1	0 16	0 00040	1 00	
Benzo(g,h,i)perylene	NB	NB	NA	NA	1 74E-07	0 003	1	0 000058		0 10		1	0 145	0 00040	1 00	
Benzo(k)fluoranthene	NB	NB	NA	NA	1 87E-07	0 003	1	0 0000624		0.10		1	0 156	0 00040	1 00	
Bis(2-chloroethoxy)methane	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Bis(2-chloroethyl)ether	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Bis(2-chloroisopropyl)ether	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Bis(2-ethylhexyl)phthalate	3 E-05	3 E-06	4 6	46	1 24E-04	0 003	1	0 04136374	0 41252143	0 10	1 00	1	0 28	0 00040	0 00	1 38
Butylbenzylphthalate	NB	NB	NA	NA	1 91E-07	0 003	1	0 0000636		0 10		1	0 16	0 00040	1 00	
Carbazole	NB	NB	NA	NA	1 60E-07	0 003	1	0 0000532		0 10		1	0 133	0 00040	1 00	
Chrysene	NB	NB	NA	NA	2 04E-07	0 003	1	0 0000068		0 10		1	0 17	0 00040	1 00	
Dibenzo(a,h)anthracene	NB	NB	NA	NA	1 36E-06	0 003	1	0 00454312	0 045126	0 10	0 99	1	0 0763	0 00040	0 01	0 552
Dibenzofuran	NB	NB	NA	NA	1 76E-07	0 003	1	0 0000588		0 10		1	0 147	0 00040	1 00	
Diethylphthalate - nd	ND	NB	1150	NA		0 003	1			0 10		1	ND	0 00040		0 266
Dimethylphthalate	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		

Appendix E-4a
Food Chain Model for River Otter Ingesting Sediment and Fish
Creek Segment
Deed Creek
Sauget Area I

Compound	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose	LOAEL Benchmark Dose	Overall Exposure Dose mg/kg	Ratio of Forage Area to Site	Time on Site Ratio	Exposure Dose mg/kg/day	Total Conc in Food mg/kg wet	Food Ingestion Rate kg/kg/day	Proportion of Dose	RAF	Sediment[1] Sediment Concentration mg/kg dry	Dry Sediment Ing. Rate kg/kg/day	Proportion of Dose	BSAF
Di-n-butylphthalate	1 E-09	3 E-10	139	463	1 45E-07	0 003	1	0 0000484		0 10		1	0 12	0 00040	1 00	
Di-n-octylphthalate	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Fluoranthene	2 E-09	NB	126	NA	2 48E-07	0 003	1	0 0000828		0 10		1	0 207	0 00040	1 00	
Fluorene	2 E-09	NB	124	NA	1 93E-07	0 003	1	0 0000644		0 10		1	0 161	0 00040	1 00	
Hexachlorobenzene	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Hexachlorobutadiene	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Hexachlorocyclopentadiene	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Hexachloroethane	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Indeno(1,2,3-c,d)pyrene	NB	NB	NA	NA	2 83E-05	0 003	1	0 00944157	0 09383571	0 10	0 99	1	0 145	0 00040	0 01	0 604
Isophorone	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Naphthalene	7 E-08	4 E-08	3 2	6 4	2 39E-07	0 003	1	0 0000798		0 10		1	0 199	0 00040	1 00	
Nitrobenzene	NB	1 E-07	NA	1 2	1 58E-07	0 003	1	0 0000526		0 10		1	0 13	0 00040	1 00	
N-Nitroso-di-N-propylamine	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
N-Nitrosodiphenylamine	2 E-08	2 E-09	9 1	91	1 69E-07	0 003	1	0 0000564		0 10		1	0 14	0 00040	1 00	
Pentachlorophenol	3 E-07	9 E-06	1 8	5 9	5 17E-07	0 003	1	0 00017236	0 00083956	0 10	0 37	1	0 27	0 00040	0 63	0 00236
Phenanthrene	NB	NB	NA	NA	2 58E-07	0 003	1	0 0000866		0 10		1	0 215	0 00040	1 00	
Phenol	1 E-08	7 E-09	15	30	1 94E-07	0 003	1	0 0000646		0 10		1	0 16	0 00040	1 00	
Pyrene	1 E-07	6 E-06	1 9	3 2	2 60E-07	0 003	1	0 0000866		0 10		1	0 217	0 00040	1 00	
Total PAHs	NB	NB	NA	NA	4 50E-05	0 003	1	0 01500417	0 13896171	0 10	0 93	1	2 77	0 00040	0 07	
VOCs																
1,1,1-Trichloroethane	2 E-11	NB	257	NA	5 23E-09	0 003	1	1 744E-06		0 10		1	0 00436	0 00040	1 00	
1,1,2,2-Tetrachloroethane	NB	ND	NA	41		0 003	1			0 10		1	ND	0 00040		
1,1,2-Trichloroethane	ND	ND	0 97	11		0 003	1			0 10		1	ND	0 00040		
1,1-Dichloroethane	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
1,1-Dichloroethene	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
1,2-Dichloroethane	ND	ND	17 2	34 4		0 003	1			0 10		1	ND	0 00040		
1,2-Dichloroethene (total)	4 E-10	NB	11 2	NA	4 85E-09	0 003	1	1 616E-06		0 10		1	0 00404	0 00040	1 00	
1,2-Dichloropropane	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
2-Butanone (MEK)	5 E-11	2 E-11	810	2091	4 26E-08	0 003	1	0 0000142		0 10		1	0 0355	0 00040	1 00	
2-Hexanone	NB	NB	NA	NA	2 51E-08	0 003	1	0 00000836		0 10		1	0 0209	0 00040	1 00	
4-Methyl-2-pentanone	NB	NB	NA	NA	2 57E-08	0 003	1	0 00000856		0 10		1	0 0214	0 00040	1 00	
Acetone	4 E-08	6 E-09	4 6	23	1 92E-07	0 003	1	0 000064		0 10		1	0 16	0 00040	1 00	
Benzene	1 E-09	1 E-10	6 5	65	8 54E-09	0 003	1	2 848E-06		0 10		1	0 00712	0 00040	1 00	
Bromodichloromethane	NB	ND	NA	4 4		0 003	1			0 10		1	ND	0 00040		
Bromoform	ND	ND	8 2	16		0 003	1			0 10		1	ND	0 00040		
Bromomethane	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Carbon disulfide	7 E-09	NB	2 3	NA	1 62E-08	0 003	1	0 00000508		0 10		1	0 0127	0 00040	1 00	
Carbon tetrachloride	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Chlorobenzene	6 E-08	NB	21	NA	1 30E-08	0 003	1	0 000432		0 10		1	1 08	0 00040	1 00	
Chloroform	5 E-10	2 E-10	6 9	19	3 26E-09	0 003	1	1 088E-06		0 10		1	0 00272	0 00040	1 00	
Chloroethane	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Chloromethane	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
cis-1,3-Dichloropropene	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Dibromochloromethane	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Ethylbenzene	8 E-10	3 E-10	44	133	3 43E-08	0 003	1	0 00001144		0 10		1	0 0286	0 00040	1 00	
Methylene chloride	1 E-09	1 E-10	2 7	22 9	2 87E-09	0 003	1	9 56E-07		0 10		1	0 00239	0 00040	1 00	
Styrene	1 E-11	7 E-12	230	460	3 00E-09	0 003	1	0 000001		0 10		1	0 0025	0 00040	1 00	
Tetrachloroethene	2 E-08	4 E-09	0 35	1 73	6 14E-09	0 003	1	2 048E-06		0 10		1	0 00512	0 00040	1 00	
Toluene	2 E-09	2 E-10	6 4	64 3	1 33E-08	0 003	1	0 00000444		0 10		1	0 0111	0 00040	1 00	
trans-1,3-Dichloropropene	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Trichloroethene	3 E-08	3 E-09	0 173	1 732	5 60E-09	0 003	1	1 868E-06		0 10		1	0 00467	0 00040	1 00	
Vinyl chloride	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Xylenes (total)	3 E-07	2 E-07	0 52	0 643	1 46E-07	0 003	1	0 0000488		0 10		1	0 122	0 00040	1 00	
Inorganics																
Aluminum, Total	3 E-02	3 E-03	0 487	4 87	1 45E-02	0 003	1	4 82408712	10 6808712	0 10	0 22	1	9390	0 00040	0 78	$\ln[Al_{bsf}] = -21\ 2593 + 2\ 583\ \ln[Al_{sed}]$
Antimony	6 E-05	6 E-06	0 032	0 32	1 90E-06	0 003	1	0 000632		0 10		1	1 58	0 00040	1 00	
Arsenic, Total	1 E-05	NB	1 2	NA	1 36E-05	0 003	1	0 00452		0 10		1	11 3	0 00040	1 00	
Barium	6 E-05	4 E-05	6 6	9 75	3 86E-04	0 003	1	0 1286		0 10		1	322	0 00040	1 00	
Beryllium	2 E-06	NB	0 3	NA	6 49E-07	0 003	1	0 0002164		0 10		1	0 541	0 00040	1 00	
Cadmium, Total	5 E-05	5 E-06	0 450	4 5	2 42E-05	0 003	1	0 00806		0 10		1	20 2	0 00040	1 00	
Calcium	NB	NB	NA	NA	9 79E-03	0 003	1	3 264		0 10		1	8160	0 00040	1 00	
Chromium, Total	4 E-07	NB	1276	NA	5 35E-04	0 003	1	0 17821	1 4981	0 10	0 84	1	71	0 00040	0 16	0 0211
Cobalt	NB	NB	NA	NA	1 03E-05	0 003	1	0 003436		0 10		1	8 59	0 00040	1 00	
Copper, Total	3 E-04	2 E-04	7 1	9 18	1 93E-03	0 003	1	0 64395368	2 84753679	0 10	0 44	1	898	0 00040	0 56	$\ln[Cu]_{bsf} = -1\ 9259 + 0.4371\ \ln[Cu]_{sed}$
Iron	NB	NB	NA	NA	1 66E-02	0 003	1	5 52		0 10		1	13800	0 00040	1 00	
Lead, Total	1 E-04	1 E-05	3 70	37	3 68E-04	0 003	1	0 1226835	0 826835	0 10	0 68	1	99 5	0 00040	0 32	0 00833
Magnesium	NB	NB	NA	NA	7 18E-03	0 003	1	2 392		0 10		1	5980	0 00040	1 00	
Manganese	6 E-06	2 E-06	41 00	132	2 36E-04	0 003	1	0 0786		0 10		1	197	0 00040	1 00	
Mercury	2 E-05	3 E-06	0 015	0 075	2 28E-07	0 003	1	0 000076		0 10		1	0 19	0 00040	1 00	
Molybdenum	2 E-05	2 E-06	0 066	0 66	1 12E-06	0 003	1	0 0003748		0 10		1	0 937	0 00040	1 00	
Nickel, Total	2 E-06	1 E-06	19 00	37	4 62E-04	0 003	1	0 154		0 10		1	385	0 00040	1 00	
Potassium	NB	NB	NA	NA	2 11E-03	0 003	1	0 704		0 10		1	1760	0 00040	1 00	
Selenium	1 E-03	9 E-04	0 09	0 151	1 29E-04	0 003	1	0 0430353	0 426789	0 10	0 99	1	0 891	0 00040	0 01	0 479
Silver	9 E-06	9 E-09	10 30	104	9 52E-07	0 003	1	0 0003172		0 10		1	0 793	0 00040	1 00	
Sodium	NB	NB	NA	NA	2 63E-04	0 003	1	0 0878		0 10		1	219	0 00040	1 00	
Thallium	3 E-04	2 E-05	0 00	0 034	7 99E-07	0 003	1	0 0002664		0 10		1	0 666	0 00040	1 00	
Tin	2 E-06	1 E-06	5 80	8 7	9 41E-08	0 003	1	0 003136		0 10		1	7 84	0 00040	1 00	
Vanadium	3 E-04	3 E-05	0 09	0 892	3 05E-05	0 003	1	0 01016		0 10		1	25 4	0 00040	1 00	
Zinc, Total	3 E-04	1 E-04	75 0	149	2 17E-02	0 003	1	7 24176229	51 0576229	0 10	0 71	1	5340	0 00040	0 29	$\ln[Zn]_{bsf} = 2\ 4275 + 0\ 1754\ \ln[Zn]_{sed}$

Appx. c-4a

Food Chain Model for River Otter Ingesting Sediment and Fish
Creek Segment
Dead Creek
Sauget Area I

Compound	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose	LOAEL Benchmark Dose	Overall Exposure Dose mg/kg	Ratio of Forage Area to Site	Time on Site Ratio	Exposure Dose mg/kg/day	Total Conc in Food mg/kg wet	Food Ingestion Rate kg/kg/day	Proportion of Dose	Sediment[1] RAF	Sediment Concentration mg/kg dry	Dry Sediment Ing Rate kg/kg/day	Proportion of Dose	BSAF
PCBs																
Monochlorobiphenyl	NB	NB	NA	NA	2 64E-09	0 003	1	0 00000088		0 10		1	0 0022	0 00040	1 00	
Dichlorobiphenyl	NB	NB	NA	NA	1 44E-08	0 003	1	0 0000048		0 10		1	0 012	0 00040	1 00	
Trichlorobiphenyl	NB	NB	NA	NA	5 67E-05	0 003	1	0 0188936	0 1881	0 10	1 00	1	0 209	0 00040	0 00	0 84
Tetrachlorobiphenyl	NB	NB	NA	NA	2 20E-03	0 003	1	0 73432857	7 33926571	0 10	1 00	1	1	0 00040	0 00	6 85
Pentachlorobiphenyl	NB	NB	NA	NA	7 57E-04	0 003	1	0 2521869	2 518425	0 10	1 00	1	0 861	0 00040	0 00	2 73
Hexachlorobiphenyl	NB	NB	NA	NA	1 54E-04	0 003	1	0 0512232	0 51186357	0 10	1 00	1	0 0946	0 00040	0 00	5 05
Heptachlorobiphenyl	NB	NB	NA	NA	2 69E-05	0 003	1	0 00862631	0 0860475	0 10	1 00	1	0 0539	0 00040	0 00	1 49
Octachlorobiphenyl	NB	NB	NA	NA	7 74E-06	0 003	1	0 00257901	0 0256725	0 10	1 00	1	0 0294	0 00040	0 00	0 815
Nonachlorobiphenyl	NB	NB	NA	NA	1 46E-06	0 003	1	0 00000488		0 10		1	0 0122	0 00040	1 00	
Decachlorobiphenyl	NB	NB	NA	NA	4 99E-08	0 003	1	0 00001664		0 10		1	0 0416	0 00040	1 00	
Total PCBs	7 E-03	3 E-03	0 085	0 17	5 70E-04	0 003	1	0 19004951	1 8945751	0 10	1 00	1 0	1 48	0 00040	0 00	ln[PCBI$_{ww}$/%lipids] = 1 8666 +0 6806 ln[PCB$_{sed}$/%OC]
Dioxins																
1,2,3,4,6,7,8,9-OCDD	NB	NB	NA	NA	4 87E-07	0 003	1	0 00016221	0 00102214	0 10	0 63	1	0 15	0 00040	0 37	0 00636
1,2,3,4,6,7,8-HpCDD	NB	NB	NA	NA	9 57E-08	0 003	1	3 1908E-05	0 00026868	0 10	0 84	1	0 0131	0 00040	0 16	0 019
1,2,3,4,7,8-HxCDD	NB	NB	NA	NA	5 70E-10	0 003	1	1 9E-07	1 7344E-06	0 10	0 91	1	0 0000414	0 00040	0 09	0 0391
1,2,3,6,7,8-HxCDD	NB	NB	NA	NA	1 70E-08	0 003	1	5 6687E-06	5 5283E-05	0 10	0 98	1	0 000351	0 00040	0 02	0 147
1,2,3,7,8,9-HxCDD	NB	NB	NA	NA	7 18E-10	0 003	1	2 3919E-07	1 9991E-06	0 10	0 84	1	0 0000982	0 00040	0 16	0 019
1,2,3,7,8-PeCDD	NB	NB	NA	NA	1 04E-06	0 003	1	3 4699E-06	3 4433E-05	0 10	0 99	1	0 0000864	0 00040	0 01	0 484
2,3,7,8-TCDD	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		1 77
Total HpCDD	NB	NB	NA	NA	4 78E-07	0 003	1	0 00015879	0 00123149	0 10	0 78	1	0 0991	0 00040	0 22	0 0129
Total HxCDD	NB	NB	NA	NA	8 08E-06	0 003	1	2 6946E-05	0 00024156	0 10	0 90	1	0 00696	0 00040	0 10	0 0323
Total PeCDD	NB	NB	NA	NA	3 33E-06	0 003	1	1 1096E-05	0 00010727	0 10	0 97	1	0 000927	0 00040	0 03	0 108
Total TCDD	NB	NB	NA	NA	8 94E-06	0 003	1	2 9807E-05	0 00028659	0 10	0 98	1	0 00287	0 00040	0 04	0 0932
Furans																
1,2,3,4,6,7,8,9-OCDF	NB	NB	NA	NA	1 48E-06	0 003	1	0 00048796	0 00468779	0 10	0 96	1	0 053	0 00040	0 04	0 0822
1,2,3,4,6,7,8-HpCDF	NB	NB	NA	NA	1 29E-07	0 003	1	4 3053E-05	0 00040005	0 10	0 93	1	0 00762	0 00040	0 07	0 049
1,2,3,4,7,8,9-HpCDF	NB	NB	NA	NA	3 33E-09	0 003	1	1 1113E-06	1 0573E-05	0 10	0 95	1	0 000135	0 00040	0 05	0 0731
1,2,3,4,7,8-HxCDF	NB	NB	NA	NA	7 53E-09	0 003	1	2 5103E-06	2 4643E-05	0 10	0 98	1	0 000115	0 00040	0 02	0 2
1,2,3,6,7,8-HxCDF	NB	NB	NA	NA	3 70E-10	0 003	1	1 2346E-07	1 089E-06	0 10	0 87	1	0 0000414	0 00040	0 13	0 0241
1,2,3,7,8,9-HxCDF	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
1,2,3,7,8-PeCDF	NB	NB	NA	NA	8 56E-10	0 003	1	2 8508E-07	2 7018E-06	0 10	0 95	1	0 0000373	0 00040	0 05	0 0676
2,3,4,6,7,8-HxCDF	NB	NB	NA	NA	1 83E-10	0 003	1	6 1054E-08	5 2894E-07	0 10	0 87	1	0 0000204	0 00040	0 13	0 0242
2,3,4,7,8-PeCDF	NB	NB	NA	NA	2 33E-09	0 003	1	7 7714E-07	7 6478E-06	0 10	0 98	1	0 0000309	0 00040	0 02	0 231
2,3,7,8-TCDF	NB	NB	NA	NA	1 76E-08	0 003	1	5 8815E-06	5 8486E-05	0 10	1 00	1	0 0000323	0 00040	0 00	1 69
Total HpCDF	NB	NB	NA	NA	2 00E-09	0 003	1	0 00066799	0 00634354	0 10	0 95	1	0 0841	0 00040	0 05	0 0704
Total HxCDF	NB	NB	NA	NA	2 49E-06	0 003	1	0 00082834	0 00820264	0 10	0 99	1	0 0202	0 00040	0 01	0 379
Total PeCDF	NB	NB	NA	NA	3 21E-07	0 003	1	0 00010692	0 00108742	0 10	1 00	1	0 000457	0 00040	0 00	2 18
Total TCDF	NB	NB	NA	NA	1 09E-07	0 003	1	3 6245E-05	0 00036154	0 10	1 00	1	0 000228	0 00040	0 00	1 48
Dioxin - TEQ	2 E-02	2 E-03	4 6635E-07	4 663E-06	7 85E-09	0 003	1	2 6187E-06	2 5051E-05	0 10	0 98	1 0	0 00028	0 00040	0 04	ln[Total TEQ$_{ww}$/%lipids] = -1 746 + 0 7556 ln[Total TEQ$_{sed}$/%OC]

Notes:
NA=Not available/applicable
NB = Benchmark not available
ND = Not detected
BSAF NA = Biota-Sediment Accumulation Factor not available
Bolded values indicate a Hazard Index greater than 1
Half the detection limit is used for compounds that were not detected

Food Chain Model Components:

$$\text{Hazard Index Estimate} = \frac{[\text{Food Dose}] + [\text{Sediment Dose}]}{\text{Toxicological Benchmark}}$$

Food Ingestion Rate (EPA 1993)

[1]For the sediment component, we convert the food ingestion rate from wet weight to dry weight (invertebrate moisture=80%, plant moisture=70%) and then calculate a sediment ingestion rate from the sediment proportion in the diet (dry weight) estimated in Beyer et al (1994)

Average Fraction Organic Carbon in Segment B Sediments	*0.014*
Average Fraction Lipid in Forage Fish	*0.015*

Appendix E-4b
Food Chain Model for River Otter Ingesting Sediment and Fish
Creek Segment C
Dead Creek
Sauget Area I

Compound	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose	LOAEL Benchmark Dose	Overall Exposure Dose mg/kg	Ratio of Forage Area to Site	Time on Site Ratio	Exposure Dose mg/kg/day	Food: Total Conc in Food mg/kg wet	Food: Ingestion Rate kg/kg/day	Food: Proportion of Dose	Sediment[1]: RAF	Sediment: Sediment Concentration mg/kg dry	Sediment: Dry Sediment Ing. Rate kg/kg/day	Sediment: Proportion of Dose	BSAF
Cyanide	ND	ND	30	369		0 002	1			0 10		1	ND	0 00040		
Pesticides/Herbicides																
2,4,5-T	ND	ND	1 4	4 6		0 002	1			0 10		1	ND	0 00040		
2,4,5-TP (Silvex)	ND	ND	11	23		0 002	1			0 10		1	ND	0 00040		
2,4-D	ND	ND	0 47	2 3		0 002	1			0 10		1	ND	0 00040		
2,4-DB	ND	ND	8 5	28		0 002	1			0 10		1	ND	0 00040		0 83
4,4'-DDD	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
4,4'-DDE	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		7 12
4,4'-DDT	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Total DDT	ND	ND	0 4	2		0 002	1			0 10		1	ND	0 00040		
Aldrin	ND	ND	0 093	0 47		0 002	1			0 10		1	ND	0 00040		
alpha BHC	ND	ND	0 010	0 06		0 002	1			0 10		1	ND	0 00040		
Alpha-Chlordane	6 E-10	3 E-10	1 2	2 3	7 36E-10	0 002	1	3 68E-07		0 10		1	0 00092	0 00040	1 00	
beta-BHC	ND	ND	0 2	0 91		0 002	1			0 10		1	ND	0 00040		
Dalapon	ND	ND	3 9	13		0 002	1			0 10		1	ND	0 00040		
delta-BHC	5 E-08	7 E-09	0 010	0 06	5 32E-10	0 002	1	2 66E-07		0 10		1	0 00067	0 00040	1 00	
Dicamba	7 E-07	2 E-07	0 19	0 63	1 27E-07	0 002	1	6 3492E-05	0 00050852	0 10	0 96	1	0 0086	0 00040	0 04	0 0922
Dichloroprop	NB	NB	NA	NA	6 26E-08	0 002	1	0 00003131	0 0002883	0 10	0 92	1	0 0062	0 00040	0 08	0 0465
Dieldrin	7 E-05	7 E-06	0 009	0 09	5 88E-07	0 002	1	0 00029389	0 00291966	0 10	0 99	1	0 0048	0 00040	0 01	0 777
Dinoseb	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Endosulfan I	ND	NB	0 07	NA		0 002	1			0 10		1	ND	0 00040		
Endosulfan II	ND	NB	0 07	NA		0 002	1			0 10		1	ND	0 00040		
Endosulfan sulfate	5 E-06	NB	0 07	NA	3 33E-09	0 002	1	1 664E-06		0 10		1	0 0042	0 00040	1 00	
Endrin	ND	ND	0 023	0 23		0 002	1			0 10		1	ND	0 00040		
Endrin aldehyde	ND	ND	0 023	0 23		0 002	1			0 10		1	ND	0 00040		
Endrin ketone	2 E-07	2 E-08	0 023	0 23	4 58E-09	0 002	1	2 288E-06		0 10		1	0 0057	0 00040	1 00	
gamma-BHC (Lindane)	ND	ND	3 7	37		0 002	1			0 10		1	ND	0 00040		
Gamma Chlordane	1 E-07	6 E-08	1 2	2 3	1 75E-07	0 002	1	8 7262E-05	0 00086842	0 10	0 99	1	0 00110	0 00040	0 01	1
Heptachlor	ND	ND	0 061	0 61		0 002	1			0 10		1	ND	0 00040		
Heptachlor epoxide	ND	ND	0 061	0 61		0 002	1			0 10		1	ND	0 00040		
MCPA - nd	ND	ND	3 5	10		0 002	1			0 10		1	ND	0 00040		1 12
MCPP	ND	ND	1 4	4 2		0 002	1			0 10		1	ND	0 00040		
Methoxychlor	2 E-09	9 E-10	1 9	3 7	3 32E-09	0 002	1	0 00000166		0 10		1	0 0042	0 00040	1 00	
Toxaphene	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
SVOCs																
1,2,4-Trichlorobenzene	ND	ND	7 4	27		0 002	1			0 10		1	ND	0 00040		
1,2-Dichlorobenzene	ND	NB	43	NA		0 002	1			0 10		1	ND	0 00040		
1,3-Dichlorobenzene	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
1,4-Dichlorobenzene	ND	ND	10	104		0 002	1			0 10		1	ND	0 00040		
2,4,5-Trichlorophenol	ND	ND	80	149		0 002	1			0 10		1	ND	0 00040		
2,4,6-Trichlorophenol	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
2,4-Dichlorophenol	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
2,4-Dinitrophenol	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
2,4-Dinitrotoluene	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
2,6-Dinitrotoluene	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
2-Chloronaphthalene	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
2-Chlorophenol	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
2-Methylnaphthalene	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
2-Methylphenol (o-cresol)	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
2-Nitroaniline	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
2-Nitrophenol	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
3- & 4-Methylphenol	ND	ND	80	208		0 002	1			0 10		1	ND	0 00040		
3,3'-Dichlorobenzidine	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
3-Nitroaniline	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
4,6-Dinitro-2-methylphenol	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
4-Bromophenyl phenyl ether	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
4-Chloro-3-methylphenol	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
4-Chloroaniline	ND	NB	4 6	NA		0 002	1			0 10		1	ND	0 00040		
4-Chlorophenyl phenyl ether	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
4-Nitroaniline	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
4-Nitrophenol	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Acenaphthene	ND	ND	87	173		0 002	1			0 10		1	ND	0 00040		
Acenaphthylene	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Anthracene	ND	NB	25	NA		0 002	1			0 10		1	ND	0 00040		
Benzo(a)anthracene	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Benzo(a)pyrene	ND	ND	0 25	2 5		0 002	1			0 10		1	ND	0 00040		
Benzo(b)fluoranthene	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Benzo(g,h,i)perylene	NB	NB	NA	NA	5 20E-08	0 002	1	0 000026		0 10		1	0 065	0 00040	1 00	
Benzo(k)fluoranthene	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Bis(2-chloroethoxy)methane	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Bis(2-chloroethyl)ether	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Bis(2-chloroisopropyl)ether	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Bis(2-ethylhexyl)phthalate	ND	ND	4 6	46		0 002	1			0 10		1	ND	0 00040		1 38
Butylbenzylphthalate	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Carbazole	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Chrysene	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Dibenzo(a,h)anthracene	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		0 562
Dibenzofuran	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Diethylphthalate - nd	ND	NB	1156	NA		0 002	1			0 10		1	ND	0 00040		0 266
Dimethylphthalate	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		

Appen[illegible]b
Food Chain Model for River Otter Ingesting Sediment and Fish
Creek Segment C
Dead Creek
Sauget Area I

Compound	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose	LOAEL Benchmark Dose	Overall Exposure Dose mg/kg	Ratio of Forage Area to Site	Time on Site Ratio	Exposure Dose mg/kg/day	Food				Sediment[1]			BSAF
									Total Conc in Food mg/kg wet	Ingestion Rate kg/kg/day	Proportion of Dose	RAF	Sediment Concentration mg/kg dry	Dry Sediment Ing Rate kg/kg/day	Proportion of Dose	
Di-n-butylphthalate	ND	ND	139	463		0 002	1			0 10		1	ND	0 00040		
Di-n-octylphthalate	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Fluoranthene	ND	NB	126	NA		0 002	1			0 10		1	ND	0 00040		
Fluorene	ND	NB	124	NA		0 002	1			0 10		1	ND	0 00040		
Hexachlorobenzene	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Hexachlorobutadiene	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Hexachlorocyclopentadiene	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Hexachloroethane	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Indeno(1,2,3-c,d)pyrene	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		0 604
Isophorone	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Naphthalene	ND	ND	3 2	6 4		0 002	1			0 10		1	ND	0 00040		
Nitrobenzene	NB	ND	NA	1 2		0 002	1			0 10		1	ND	0 00040		
N-Nitroso-di-N-propylamine	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
N-Nitrosodiphenylamine	ND	ND	91	91		0 002	1			0 10		1	ND	0 00040		
Pentachlorophenol	4 E-09	1 E-09	1 8	5 9	7 71E-09	0 002	1	3 8542E-08	1 4302E-06	0 10	0 37	1	0 01	0 00040	0 63	0 00236
Phenanthrene	NB	NB	NA	NA	2 00E-08	0 002	1	0 00001		0 10		1	0 025	0 00040	1 00	
Phenol	ND	ND	15	30		0 002	1			0 10		1	ND	0 00040		
Pyrene	ND	ND	1 9	3 2		0 002	1			0 10		1	ND	0 00040		
Total PAHs	NB	NB	NA	NA	1 41E-08	0 002	1	0 000704		0 10		1	1 76	0 00040	1 00	
VOCs																
1,1,1-Trichloroethane	ND	NB	257	NA		0 002	1			0 10		1	ND	0 00040		
1,1,2,2-Tetrachloroethane	NB	ND	NA	41		0 002	1			0 10		1	ND	0 00040		
1,1,2-Trichloroethane	ND	ND	0 97	11		0 002	1			0 10		1	ND	0 00040		
1,1-Dichloroethane	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
1,1-Dichloroethene	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
1,2-Dichloroethane	ND	ND	17 2	34 4		0 002	1			0 10		1	ND	0 00040		
1,2-Dichloroethene (total)	ND	NB	11 2	NA		0 002	1			0 10		1	ND	0 00040		
1,2-Dichloropropane	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
2-Butanone (MEK)	8 E-12	3 E-12	810	2091	6 08E-09	0 002	1	0 00000304		0 10		1	0 0076	0 00040	1 00	
2-Hexanone	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
4-Methyl-2-pentanone	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Acetone	6 E-09	1 E-09	4 6	23	2 74E-08	0 002	1	0 00001368		0 10		1	0 0342	0 00040	1 00	
Benzene	4 E-10	4 E-11	6 5	65	2 40E-09	0 002	1	0 0000012		0 10		1	0 003	0 00040	1 00	
Bromodichloromethane	NB	ND	NA	4 4		0 002	1			0 10		1	ND	0 00040		
Bromoform	ND	ND	8 2	16		0 002	1			0 10		1	ND	0 00040		
Bromomethane	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Carbon disulfide	ND	NB	2 3	NA		0 002	1			0 10		1	ND	0 00040		
Carbon tetrachloride	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Chlorobenzene	5 E-09	NB	21	NA	1 04E-07	0 002	1	0 000052		0 10		1	0 13	0 00040	1 00	
Chloroform	ND	ND	6 9	19		0 002	1			0 10		1	ND	0 00040		
Chloroethane	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Chloromethane	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
cis-1,3-Dichloropropene	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Dibromochloromethane	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Ethylbenzene	ND	ND	44	133		0 002	1			0 10		1	ND	0 00040		
Methylene chloride	1 E-09	1 E-10	2 7	22 9	2 72E-09	0 002	1	0 00000136		0 10		1	0 0034	0 00040	1 00	
Styrene	9 E-12	5 E-12	230	460	2 18E-09	0 002	1	0 00000106		0 10		1	0 0027	0 00040	1 00	
Tetrachloroethene	ND	ND	0 35	1 73		0 002	1			0 10		1	ND	0 00040		
Toluene	5 E-10	5 E-11	6 4	64 3	3 34E-09	0 002	1	1 672E-06		0 10		1	0 00418	0 00040	1 00	
trans-1,3-Dichloropropene	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Trichloroethene	ND	ND	0 173	1 732		0 002	1			0 10		1	ND	0 00040		
Vinyl chloride	NB	NB	NA	NA		0 002	1			0 10		1	ND	0 00040		
Xylenes (total)	6 E-09	5 E-09	0 52	0 643	2 98E-09	0 002	1	1 492E-06		0 10		1	0 00373	0 00040	1 00	
Inorganics																
Aluminum, Total	2 E-02	2 E-03	0 487	4 87	1 17E-02	0 002	1	5 86298139	15 3298139	0 10	0 26	1	10800	0 00040	0 74	$\ln[Al_{bsaf}] = -21\ 2593 + 2\ 583\ \ln[Al_{sed}]$
Antimony	2 E-05	2 E-06	0 032	0 32	6 32E-07	0 002	1	0 000316		0 10		1	0 79	0 00040	1 00	
Arsenic, Total	7 E-06	NB	1 2	NA	7 78E-06	0 002	1	0 00388		0 10		1	9 7	0 00040	1 00	
Barium	3 E-05	2 E-05	6 8	9 75	1 99E-04	0 002	1	0 0996		0 10		1	249	0 00040	1 00	
Beryllium	2 E-06	NB	0 3	NA	6 62E-07	0 002	1	0 0003312		0 10		1	0 828	0 00040	1 00	
Cadmium, Total	2 E-05	2 E-06	0 450	4 5	1 06E-05	0 002	1	0 00532		0 10		1	13 3	0 00040	1 00	
Calcium	NB	NB	NA	NA	6 25E-03	0 002	1	3 124		0 10		1	7810	0 00040	1 00	
Chromium, Total	1 E-07	NB	1276	NA	1 81E-04	0 002	1	0 090611	0 76171	0 10	0 84	1	36 1	0 00040	0 16	0 0211
Cobalt	NB	NB	NA	NA	7 53E-06	0 002	1	0 003764		0 10		1	9 41	0 00040	1 00	
Copper, Total	4 E-05	3 E-05	7 1	9 18	3 14E-04	0 002	1	0 15687951	1 13279515	0 10	0 72	1	109	0 00040	0 28	$\ln[Cu]_{bsaf} = -1\ 9259+0\ 4371\ \ln[Cu]_{sed}$
Iron	NB	NB	NA	NA	1 41E-02	0 002	1	7 04		0 10		1	17600	0 00040	1 00	
Lead, Total	3 E-05	3 E-06	3 70	37	1 07E-04	0 002	1	0 0532656	0 359656	0 10	0 68	1	43 2	0 00040	0 32	0 00633
Magnesium	NB	NB	NA	NA	3 54E-03	0 002	1	1 772		0 10		1	4430	0 00040	1 00	
Manganese	4 E-06	1 E-06	41 00	132	1 51E-04	0 002	1	0 0756		0 10		1	189	0 00040	1 00	
Mercury	5 E-06	1 E-06	0 015	0 075	7 65E-06	0 002	1	0 00003824		0 10		1	0 0956	0 00040	1 00	
Molybdenum	ND	ND	0 066	0 66		0 002	1			0 10		1	ND	0 00040		
Nickel, Total	1 E-05	8 E-06	19 00	37	2 10E-04	0 002	1	0 1052		0 10		1	263	0 00040	1 00	
Potassium	NB	NB	NA	NA	1 50E-03	0 002	1	0 748		0 10		1	1870	0 00040	1 00	
Selenium	ND	ND	0 09	0 151		0 002	1			0 10		1	ND	0 00040		0 479
Silver	ND	ND	10 30	104		0 002	1			0 10		1	ND	0 00040		
Sodium	NB	NB	NA	NA	9 92E-06	0 002	1	0 0496		0 10		1	124	0 00040	1 00	
Thallium	ND	ND	0 00	0 034		0 002	1			0 10		1	ND	0 00040		
Tin	5 E-07	4 E-07	5 80	8 7	3 13E-08	0 002	1	0 001564		0 10		1	3 91	0 00040	1 00	
Vanadium	3 E-04	3 E-05	0 09	0 892	2 48E-05	0 002	1	0 0124		0 10		1	31	0 00040	1 00	
Zinc, Total	1 E-04	7 E-05	75 0	149	1 04E-02	0 002	1	5 20515044	43 4915044	0 10	0 84	1	2140	0 00040	0 16	$\ln[Zn]_{bsaf} = 2\ 4275 + 0\ 1754\ \ln[Zn]_{sed}$

Appendix E-4b
Food Chain Model for River Otter Ingesting Sediment and Fish
Creek Segment C
Dead Creek
Sauget Area I

Compound	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose	LOAEL Benchmark Dose	Overall Exposure Dose mg/kg	Ratio of Forage Area to Site	Time on Site Ratio	Exposure Dose mg/kg/day	Total Conc in Food mg/kg wet	Food Ingestion Rate kg/kg/day	Proportion of Dose	Sediment[1] RAF	Sediment Concentration mg/kg dry	Dry Sediment Ing Rate kg/kg/day	Proportion of Dose	BSAF
PCBs																
Monochlorobiphenyl	NB	NB	NA	NA	1.12E-09	0.002	1	0.00000056		0.10		1	0.0014	0.00040	1.00	
Dichlorobiphenyl	NB	NB	NA	NA	2.43E-09	0.002	1	1.216E-06		0.10		1	0.00304	0.00040	1.00	
Trichlorobiphenyl	NB	NB	NA	NA	3.62E-07	0.002	1	0.0001808	0.00179716	0.10	0.99	1	0.00271	0.00040	0.01	0.84
Tetrachlorobiphenyl	NB	NB	NA	NA	8.41E-06	0.002	1	0.00420504	0.04201934	0.10	1.00	1	0.00777	0.00040	0.00	6.85
Pentachlorobiphenyl	NB	NB	NA	NA	5.05E-06	0.002	1	0.00252634	0.02621858	0.10	1.00	1	0.0117	0.00040	0.00	2.73
Hexachlorobiphenyl	NB	NB	NA	NA	7.85E-06	0.002	1	0.003923	0.03919066	0.10	1.00	1	0.00983	0.00040	0.00	5.05
Heptachlorobiphenyl	NB	NB	NA	NA	1.93E-06	0.002	1	0.0009655	0.00962226	0.10	1.00	1	0.00818	0.00040	0.00	1.49
Octachlorobiphenyl	NB	NB	NA	NA	1.02E-06	0.002	1	0.00051082	0.00507659	0.10	0.99	1	0.00789	0.00040	0.01	0.815
Nonachlorobiphenyl	NB	NB	NA	NA	7.29E-09	0.002	1	3.628E-06		0.10		1	0.00907	0.00040	1.00	
Decachlorobiphenyl	NB	NB	NA	NA	1.18E-06	0.002	1	0.00000588		0.10		1	0.0147	0.00040	1.00	
Total PCBs	5.E-04	2.E-04	0.085	0.17	3.83E-05	0.002	1	0.01912998	0.19102378	0.10	1.00	1.0	0.07	0.00040	0.00	ln[PCB$_{ww}$/%lipids] = 1.6666 +0.6806 ln[PCB$_{sed}$/%OC]
Dioxins																
1,2,3,4,6,7,8,9-OCDD	NB	NB	NA	NA	7.98E-09	0.002	1	3.9783E-06	2.2143E-05	0.10	0.56	1	0.00441	0.00040	0.44	0.00636
1,2,3,4,6,7,8-HpCDD	NB	NB	NA	NA	1.26E-09	0.002	1	6.289E-07	4.965E-06	0.10	0.79	1	0.000331	0.00040	0.21	0.019
1,2,3,4,7,8-HxCDD	NB	NB	NA	NA		0.002	1			0.10		1	ND	0.00040		0.0391
1,2,3,6,7,8-HxCDD	NB	NB	NA	NA	4.13E-10	0.002	1	2.0649E-07	1.9981E-06	0.10	0.97	1	0.0000172	0.00040	0.03	0.147
1,2,3,7,8,9-HxCDD	NB	NB	NA	NA	3.80E-11	0.002	1	1.9E-08	0.00000015	0.10	0.79	1	0.00001	0.00040	0.21	0.019
1,2,3,7,8-PeCDD	NB	NB	NA	NA		0.002	1			0.10		1	ND	0.00040		0.484
2,3,7,8-TCDD	NB	NB	NA	NA		0.002	1			0.10		1	ND	0.00040		1.77
Total HpCDD	NB	NB	NA	NA	1.99E-09	0.002	1	9.9573E-07	7.1493E-06	0.10	0.72	1	0.000702	0.00040	0.28	0.0129
Total HxCDD	NB	NB	NA	NA	1.13E-09	0.002	1	5.664E-07	4.898E-06	0.10	0.86	1	0.000192	0.00040	0.14	0.0323
Total PeCDD	NB	NB	NA	NA	2.32E-09	0.002	1	1.1604E-06	1.1084E-05	0.10	0.96	1	0.00013	0.00040	0.04	0.108
Total TCDD	NB	NB	NA	NA		0.002	1			0.10		1	ND	0.00040		0.0932
Furans																
1,2,3,4,6,7,8,9-OCDF	NB	NB	NA	NA	2.01E-08	0.002	1	1.0059E-05	9.4746E-05	0.10	0.94	1	0.00146	0.00040	0.06	0.0822
1,2,3,4,6,7,8-HpCDF	NB	NB	NA	NA	2.10E-09	0.002	1	1.05E-06	9.5163E-06	0.10	0.91	1	0.000248	0.00040	0.09	0.049
1,2,3,4,7,8,9-HpCDF	NB	NB	NA	NA	1.37E-10	0.002	1	6.8499E-08	6.4059E-07	0.10	0.94	1	0.0000111	0.00040	0.06	0.0731
1,2,3,4,7,8-HxCDF	NB	NB	NA	NA	3.04E-10	0.002	1	1.5202E-07	1.4626E-06	0.10	0.96	1	0.00000939	0.00040	0.02	0.2
1,2,3,6,7,8-HxCDF	NB	NB	NA	NA	1.97E-11	0.002	1	9.8553E-09	8.1433E-08	0.10	0.83	1	0.00000428	0.00040	0.17	0.0241
1,2,3,7,8,9-HxCDF	NB	NB	NA	NA		0.002	1			0.10		1	ND	0.00040		
1,2,3,7,8-PeCDF	NB	NB	NA	NA		0.002	1			0.10		1	ND	0.00040		0.0676
2,3,4,6,7,8-HxCDF	NB	NB	NA	NA	2.72E-11	0.002	1	1.3606E-08	1.1253E-07	0.10	0.83	1	0.00000589	0.00040	0.17	0.0242
2,3,4,7,8-PeCDF	NB	NB	NA	NA		0.002	1			0.10		1	ND	0.00040		0.231
2,3,7,8-TCDF	NB	NB	NA	NA	2.19E-09	0.002	1	1.0933E-06	1.0901E-05	0.10	1.00	1	0.00000817	0.00040	0.00	1.89
Total HpCDF	NB	NB	NA	NA	1.03E-08	0.002	1	5.1536E-06	4.8079E-05	0.10	0.93	1	0.000885	0.00040	0.07	0.0704
Total HxCDF	NB	NB	NA	NA	7.40E-08	0.002	1	3.6992E-05	0.00036504	0.10	0.99	1	0.00122	0.00040	0.01	0.379
Total PeCDF	NB	NB	NA	NA	1.08E-07	0.002	1	5.3994E-05	0.00053869	0.10	1.00	1	0.000313	0.00040	0.00	2.18
Total TCDF	NB	NB	NA	NA	1.28E-06	0.002	1	6.378E-06	6.3582E-05	0.10	1.00	1	0.0000544	0.00040	0.00	1.48
Dioxin - TEQ	2.E-03	2.E-04	4.8635E-07	4.663E-06	7.75E-10	0.002	1	3.876E-07	3.7532E-06	0.10	0.97	1.0	0.00003	0.00040	0.03	ln[Total TEQ$_{ww}$/%lipids] = -1.746 + 0.7556 ln[Total TEQ$_{sed}$/%OC]

Notes:
NA=Not available/applicable
NB = Benchmark not available
ND = Not detected
BSAF NA = Biota-Sediment Accumulation Factor not available
Bolded values indicate a Hazard Index greater than 1
Half the detection limit is used for compounds that were not detected

Food Chain Model Components:

$$\text{Hazard Index Estimate} = \frac{|\text{Food Dose}| + |\text{Sediment Dose}|}{\text{Toxicological Benchmark}}$$

Food Ingestion Rate (EPA 1993)

[1]For the sediment component, we convert the food ingestion rate from wet weight to dry weight (invertebrate moisture=80%, plant moisture=70%) and then calculate a sediment ingestion rate from the sediment proportion in the diet (dry weight) estimated in Beyer et al (1994)

Average Fraction Organic Carbon in Segment C Sediments 0.019
Average Fraction Lipid in Forage Fish 0.015

Appendix 4c

Food Chain Model for River Otter Ingesting Sediment and Fish
Creek Segment D
Dead Creek
Sauget Area I

Compound	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose	LOAEL Benchmark Dose	Overall Exposure Dose mg/kg	Ratio of Forage Area to Site	Time on Site Ratio	Exposure Dose mg/kg/day	Food: Total Conc. in Food mg/kg wet	Food: Ingestion Rate kg/kg/day	Food: Proportion of Dose	Sediment[1]: RAF	Sediment: Sediment Concentration mg/kg dry	Sediment: Dry Sediment Ing. Rate kg/kg/day	Sediment: Proportion of Dose	BSAF
Cyanide	ND	ND	30	369		0.001	1			0.10		1	ND	0.00040		
Pesticides/Herbicides																
2,4,5-T	2.E-09	5.E-10	1.4	4.6	2.16E-09	0.001	1	0.00000216		0.10		1	0.0054	0.00040	1.00	
2,4,5-TP (Silvex)	ND	ND	11	23		0.001	1			0.10		1	ND	0.00040		
2,4-D	ND	ND	0.47	2.3		0.001	1			0.10		1	ND	0.00040		
2,4-DB	ND	ND	8.5	26		0.001	1			0.10		1	ND	0.00040		0.83
4,4'-DDD	NB	NB	NA	NA	5.60E-10	0.001	1	0.00000056		0.10		1	0.0014	0.00040	1.00	
4,4'-DDE	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		7.12
4,4'-DDT	NB	NB	NA	NA	2.25E-08	0.001	1	0.00002248		0.10		1	0.0562	0.00040	1.00	
Total DDT	8.E-08	1.E-08	0.4	2	2.98E-08	0.001	1	0.00002984		0.10		1	0.0746	0.00040	1.00	
Aldrin	2.E-08	4.E-09	0.093	0.47	2.01E-09	0.001	1	2.012E-06		0.10		1	0.00503	0.00040	1.00	
alpha BHC	ND	ND	0.010	0.06		0.001	1			0.10		1	ND	0.00040		
Alpha-Chlordane	2.E-09	1.E-09	1.2	2.3	2.71E-09	0.001	1	2.712E-06		0.10		1	0.00678	0.00040	1.00	
beta-BHC	ND	ND	0.2	0.91		0.001	1			0.10		1	ND	0.00040		
Dalapon	5.E-09	1.E-09	3.9	13	1.90E-08	0.001	1	0.000019		0.10		1	0.0475	0.00040	1.00	
delta-BHC	3.E-08	4.E-09	0.010	0.06	3.30E-10	0.001	1	3.298E-07		0.10		1	0.000824	0.00040	1.00	
Dicamba	9.E-08	3.E-08	0.19	0.63	1.73E-08	0.001	1	1.7316E-05	0.00016598	0.10	0.96	1	0.0018	0.00040	0.04	0.0922
Dichloroprop	NB	NB	NA	NA	1.06E-07	0.001	1	0.00010605	0.0009765	0.10	0.92	1	0.021	0.00040	0.08	0.0465
Dieldrin	9.E-04	9.E-05	0.009	0.09	8.27E-08	0.001	1	0.00827405	0.0822325	0.10	0.99	1	0.127	0.00040	0.01	0.777
Dinoseb	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Endosulfan I	ND	NB	0.07	NA		0.001	1			0.10		1	ND	0.00040		
Endosulfan II	ND	NB	0.07	NA		0.001	1			0.10		1	ND	0.00040		
Endosulfan sulfate	4.E-08	NB	0.07	NA	2.84E-09	0.001	1	0.00000284		0.10		1	0.0071	0.00040	1.00	
Endrin	ND	ND	0.023	0.23		0.001	1			0.10		1	ND	0.00040		
Endrin aldehyde	ND	ND	0.023	0.23		0.001	1			0.10		1	ND	0.00040		
Endrin ketone	ND	ND	0.023	0.23		0.001	1			0.10		1	ND	0.00040		
gamma-BHC (Lindane)	ND	ND	3.7	37		0.001	1			0.10		1	ND	0.00040		
Gamma Chlordane	1.E-08	6.E-07	1.2	2.3	1.30E-08	0.001	1	0.00129787	0.01291667	0.10	1.00	1	0.0155	0.00040	0.00	1
Heptachlor	ND	ND	0.061	0.61		0.001	1			0.10		1	ND	0.00040		
Heptachlor epoxide	ND	ND	0.061	0.61		0.001	1			0.10		1	ND	0.00040		
MCPA - nd	ND	ND	3.5	10		0.001	1			0.10		1	ND	0.00040		1.12
MCPP	ND	ND	1.4	4.2		0.001	1			0.10		1	ND	0.00040		
Methoxychlor	5.E-09	3.E-09	1.9	3.7	9.86E-09	0.001	1	0.00000986		0.10		1	0.0247	0.00040	1.00	
Toxaphene	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
SVOCs																
1,2,4-Trichlorobenzene	ND	ND	7.4	27		0.001	1			0.10		1	ND	0.00040		
1,2-Dichlorobenzene	ND	NB	43	NA		0.001	1			0.10		1	ND	0.00040		
1,3-Dichlorobenzene	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
1,4-Dichlorobenzene	4.E-09	4.E-10	10	104	4.48E-08	0.001	1	0.0000448		0.10		1	0.112	0.00040	1.00	
2,4,5-Trichlorophenol	ND	ND	60	149		0.001	1			0.10		1	ND	0.00040		
2,4,6-Trichlorophenol	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
2,4-Dichlorophenol	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
2,4-Dinitrophenol	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
2,4-Dinitrotoluene	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
2,6-Dinitrotoluene	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
2-Chloronaphthalene	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
2-Chlorophenol	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
2-Methylnaphthalene	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
2-Methylphenol (o-cresol)	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
2-Nitroaniline	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
2-Nitrophenol	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
3- & 4-Methylphenol	ND	ND	60	205		0.001	1			0.10		1	ND	0.00040		
3,3'-Dichlorobenzidine	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
3-Nitroaniline	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
4,6-Dinitro-2-methylphenol	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
4-Bromophenyl phenyl ether	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
4-Chloro-3-methylphenol	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
4-Chloroaniline	ND	NB	4.6	NA		0.001	1			0.10		1	ND	0.00040		
4-Chlorophenyl phenyl ether	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
4-Nitroaniline	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
4-Nitrophenol	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Acenaphthene	ND	ND	87	173		0.001	1			0.10		1	ND	0.00040		
Acenaphthylene	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Anthracene	ND	NB	25	NA		0.001	1			0.10		1	ND	0.00040		
Benzo(a)anthracene	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Benzo(a)pyrene	1.E-07	1.E-08	0.25	2.5	3.39E-08	0.001	1	0.00003392		0.10		1	0.0848	0.00040	1.00	
Benzo(b)fluoranthene	NB	NB	NA	NA	5.44E-08	0.001	1	0.0000544		0.10		1	0.136	0.00040	1.00	
Benzo(g,h,i)perylene	NB	NB	NA	NA	5.60E-08	0.001	1	0.000056		0.10		1	0.14	0.00040	1.00	
Benzo(k)fluoranthene	NB	NB	NA	NA	5.52E-08	0.001	1	0.0000552		0.10		1	0.138	0.00040	1.00	
Bis(2-chloroethoxy)methane	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Bis(2-chloroethyl)ether	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Bis(2-chloroisopropyl)ether	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Bis(2-ethylhexyl)phthalate	ND	ND	4.6	46		0.001	1			0.10		1	ND	0.00040		1.38
Butylbenzylphthalate	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Carbazole	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Chrysene	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Dibenzo(a,h)anthracene	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		0.552
Dibenzofuran	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Diethylphthalate - nd	ND	NB	1156	NA		0.001	1			0.10		1	ND	0.00040		0.266
Dimethylphthalate	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		

Appendix E-4c
Food Chain Model for River Otter Ingesting Sediment and Fish
Creek Segment D
Dead Creek
Sauget Area I

Compound	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose	LOAEL Benchmark Dose	Overall Exposure Dose mg/kg	Ratio of Forage Area to Site	Time on Site Ratio	Exposure Dose mg/kg/day	Total Conc in Food mg/kg wet	Food Ingestion Rate kg/kg/day	Proportion of Dose	Sediment[1] RAF	Sediment Concentration mg/kg dry	Dry Sediment Ing. Rate kg/kg/day	Proportion of Dose	BSAF
Di-n-butylphthalate	ND	ND	139	463		0.001	1			0.10		1	ND	0.00040		
Di-n-octylphthalate	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Fluoranthene	4.E-10	NB	126	NA	5.24E-06	0.001	1	0.0000524		0.10		1	0.131	0.00040	1.00	
Fluorene	ND	NB	124	NA		0.001	1			0.10		1	ND	0.00040		
Hexachlorobenzene	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Hexachlorobutadiene	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Hexachlorocyclopentadiene	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Hexachloroethane	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Indeno(1,2,3-c,d)pyrene	NB	NB	NA	NA	6.60E-06	0.001	1	0.00660533	0.06543333	0.10	0.99	1	0.13	0.00040	0.01	0.604
Isophorone	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Naphthalene	ND	ND	3.2	6.4		0.001	1			0.10		1	ND	0.00040		
Nitrobenzene	NB	ND	NA	1.2		0.001	1			0.10		1	ND	0.00040		
N-Nitroso-di-N-propylamine	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
N-Nitrosodiphenylamine	ND	ND	9.1	91		0.001	1			0.10		1	ND	0.00040		
Pentachlorophenol	2.E-09	7.E-10	1.8	5.9	4.39E-09	0.001	1	4.3884E-06	1.6284E-05	0.10	0.37	1	0.0069	0.00040	0.63	0.00236
Phenanthrene	NB	NB	NA	NA	4.04E-06	0.001	1	0.0000404		0.10		1	0.101	0.00040	1.00	
Phenol	ND	ND	15	30		0.001	1			0.10		1	ND	0.00040		
Pyrene	3.E-06	2.E-06	1.9	3.2	5.26E-06	0.001	1	0.0000526		0.10		1	0.132	0.00040	1.00	
Total PAHs	NB	NB	NA	NA	7.35E-06	0.001	1	0.00734733	0.06543333	0.10	0.89	1	2.01	0.00040	0.11	
VOCs																
1,1,1-Trichloroethane	ND	NB	257	NA		0.001	1			0.10		1	ND	0.00040		
1,1,2,2-Tetrachloroethane	NB	ND	NA	41		0.001	1			0.10		1	ND	0.00040		
1,1,2-Trichloroethane	ND	ND	0.97	11		0.001	1			0.10		1	ND	0.00040		
1,1-Dichloroethane	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
1,1-Dichloroethene	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
1,2-Dichloroethane	ND	ND	17.2	34.4		0.001	1			0.10		1	ND	0.00040		
1,2-Dichloroethene (total)	ND	NB	11.2	NA		0.001	1			0.10		1	ND	0.00040		
1,2-Dichloropropane	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
2-Butanone (MEK)	4.E-12	2.E-12	810	2091	3.23E-09	0.001	1	3.228E-06		0.10		1	0.00807	0.00040	1.00	
2-Hexanone	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
4-Methyl-2-pentanone	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Acetone	ND	ND	4.6	23		0.001	1			0.10		1	ND	0.00040		
Benzene	ND	ND	6.5	65		0.001	1			0.10		1	ND	0.00040		
Bromodichloromethane	NB	ND	NA	4.4		0.001	1			0.10		1	ND	0.00040		
Bromoform	ND	ND	8.2	16		0.001	1			0.10		1	ND	0.00040		
Bromomethane	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Carbon disulfide	ND	NB	2.3	NA		0.001	1			0.10		1	ND	0.00040		
Carbon tetrachloride	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Chlorobenzene	6.E-10	NB	21	NA	1.25E-06	0.001	1	0.00001252		0.10		1	0.0313	0.00040	1.00	
Chloroform	ND	ND	6.9	19		0.001	1			0.10		1	ND	0.00040		
Chloroethane	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Chloromethane	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
cis-1,3-Dichloropropene	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Dibromochloromethane	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Ethylbenzene	ND	ND	44	133		0.001	1			0.10		1	ND	0.00040		
Methylene chloride	4.E-10	5.E-11	2.7	22.9	1.07E-09	0.001	1	1.072E-06		0.10		1	0.00268	0.00040	1.00	
Styrene	ND	ND	230	460		0.001	1			0.10		1	ND	0.00040		
Tetrachloroethene	ND	ND	0.35	1.73		0.001	1			0.10		1	ND	0.00040		
Toluene	2.E-10	2.E-11	6.4	64.3	1.16E-09	0.001	1	0.00000116		0.10		1	0.0029	0.00040	1.00	
trans-1,3-Dichloropropene	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Trichloroethene	ND	ND	0.173	1.732		0.001	1			0.10		1	ND	0.00040		
Vinyl chloride	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Xylenes (total)	ND	ND	0.52	0.643		0.001	1			0.10		1	ND	0.00040		
Inorganics																
Aluminum, Total	1.E-02	1.E-03	0.487	4.87	5.93E-03	0.001	1	5.92991437	15.6991437	0.10	0.26	1	10900	0.00040	0.74	$\ln[Al_{bio}] = -21.2593 + 2.583\ln[Al_{sed}]$
Antimony	ND	ND	0.032	0.32		0.001	1			0.10		1	ND	0.00040		
Arsenic, Total	4.E-06	NB	1.2	NA	4.56E-06	0.001	1	0.00456		0.10		1	11.4	0.00040	1.00	
Barium	2.E-05	1.E-05	6.8	9.75	1.25E-04	0.001	1	0.1248		0.10		1	312	0.00040	1.00	
Beryllium	1.E-06	NB	0.3	NA	3.35E-07	0.001	1	0.0003352		0.10		1	0.838	0.00040	1.00	
Cadmium, Total	2.E-06	2.E-06	0.450	4.5	7.92E-06	0.001	1	0.00792		0.10		1	19.8	0.00040	1.00	
Calcium	NB	NB	NA	NA	3.41E-03	0.001	1	3.412		0.10		1	8530	0.00040	1.00	
Chromium, Total	1.E-07	NB	1278	NA	1.24E-04	0.001	1	0.123743	1.04023	0.10	0.84	1	49.3	0.00040	0.16	0.0211
Cobalt	NB	NB	NA	NA	3.79E-06	0.001	1	0.003788		0.10		1	9.47	0.00040	1.00	
Copper, Total	5.E-05	4.E-05	7.1	9.18	3.51E-04	0.001	1	0.35127455	1.98874545	0.10	0.56	1	386	0.00040	0.44	$\ln[Cu]_{bio} = -1.9259+0.4371\ln[Cu]_{sed}$
Iron	NB	NB	NA	NA	6.88E-03	0.001	1	6.88		0.10		1	17200	0.00040	1.00	
Lead, Total	3.E-05	3.E-06	3.70	37	1.21E-04	0.001	1	0.1210806	0.818006	0.10	0.66	1	98.2	0.00040	0.32	0.00833
Magnesium	NB	NB	NA	NA	1.51E-03	0.001	1	1.506		0.10		1	3770	0.00040	1.00	
Manganese	1.E-06	4.E-07	41.00	132	5.48E-05	0.001	1	0.0548		0.10		1	137	0.00040	1.00	
Mercury	6.E-06	1.E-06	0.015	0.075	9.52E-06	0.001	1	0.0000952		0.10		1	0.238	0.00040	1.00	
Molybdenum	1.E-05	1.E-05	0.086	0.86	9.32E-07	0.001	1	0.000932		0.10		1	2.33	0.00040	1.00	
Nickel, Total	6.E-06	3.E-06	19.00	37	1.15E-04	0.001	1	0.1148		0.10		1	287	0.00040	1.00	
Potassium	NB	NB	NA	NA	7.20E-04	0.001	1	0.72		0.10		1	1800	0.00040	1.00	
Selenium	7.E-04	4.E-04	0.09	0.151	8.13E-05	0.001	1	0.081341	0.80833	0.10	0.99	1	1.27	0.00040	0.01	0.479
Silver	3.E-06	3.E-06	10.30	104	3.30E-07	0.001	1	0.00033		0.10		1	0.825	0.00040	1.00	
Sodium	NB	NB	NA	NA	7.00E-05	0.001	1	0.07		0.10		1	175	0.00040	1.00	
Thallium	ND	ND	0.00	0.034		0.001	1			0.10		1	ND	0.00040		
Tin	4.E-07	2.E-07	5.80	8.7	2.09E-06	0.001	1	0.002092		0.10		1	5.23	0.00040	1.00	
Vanadium	1.E-04	1.E-05	0.09	0.892	1.26E-05	0.001	1	0.0126		0.10		1	31.5	0.00040	1.00	
Zinc, Total	9.E-05	4.E-05	75.0	149	6.51E-03	0.001	1	6.51452322	48.7452322	0.10	0.75	1	4100	0.00040	0.25	$\ln[Zn]_{bio} = 2.4275 + 0.1754\ln[Zn]_{sed}$

Appx. C-4c

Food Chain Model for River Otter Ingesting Sediment and Fish
Creek Segment D
Dead Creek
Sauget Area I

Compound	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose	LOAEL Benchmark Dose	Overall Exposure Dose mg/kg	Ratio of Forage Area to Site	Time on Site Ratio	Exposure Dose mg/kg/day	Total Conc in Food mg/kg wet	Food Ingestion Rate kg/kg/day	Proportion of Dose	RAF	Sediment[1] Sediment Concentration mg/kg dry	Sediment[1] Dry Sediment Ing. Rate kg/kg/day	Sediment[1] Proportion of Dose	BSAF
PCBs																
Monochlorobiphenyl	NB	NB	NA	NA	1.05E-09	0.001	1	1.052E-06		0.10		1	0.00263	0.00040	1.00	
Dichlorobiphenyl	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		
Trichlorobiphenyl	NB	NB	NA	NA	4.54E-07	0.001	1	0.00045408	0.004515	0.10	0.99	1	0.00845	0.00040	0.01	0.84
Tetrachlorobiphenyl	NB	NB	NA	NA	3.74E-05	0.001	1	0.03735866	0.373325	0.10	1.00	1	0.0654	0.00040	0.00	6.85
Pentachlorobiphenyl	NB	NB	NA	NA	4.10E-05	0.001	1	0.041022	0.4095	0.10	1.00	1	0.16	0.00040	0.00	2.73
Hexachlorobiphenyl	NB	NB	NA	NA	4.89E-05	0.001	1	0.04886307	0.48816667	0.10	1.00	1	0.116	0.00040	0.00	5.05
Heptachlorobiphenyl	NB	NB	NA	NA	5.08E-06	0.001	1	0.00508232	0.05068	0.10	1.00	1	0.0408	0.00040	0.00	1.49
Octachlorobiphenyl	NB	NB	NA	NA	1.01E-08	0.001	1	0.00101109	0.01005167	0.10	0.99	1	0.0148	0.00040	0.01	0.815
Nonachlorobiphenyl	NB	NB	NA	NA	6.92E-09	0.001	1	0.00000692		0.10		1	0.0173	0.00040	1.00	
Decachlorobiphenyl	NB	NB	NA	NA	1.93E-08	0.001	1	0.00001932		0.10		1	0.0483	0.00040	1.00	
Total PCBs	9 E-04	4 E-04	0.085	0.17	7.59E-05	0.001	1	0.07588321	0.7586561	0.10	1.00	1.0	0.494	0.00040	0.00	ln(PCB$_{fish}$/%lipids] = 1.6666 +0.6806 ln(PCB$_{sed}$/%OC]
Dioxins																
1,2,3,4,6,7,8,9-OCDD	NB	NB	NA	NA	5.20E-08	0.001	1	5.1987E-05	0.00029827	0.10	0.57	1	0.0559	0.00040	0.43	0.00636
1,2,3,4,6,7,8-HpCDD	NB	NB	NA	NA	9.78E-09	0.001	1	9.7778E-06	7.8058E-05	0.10	0.80	1	0.00493	0.00040	0.20	0.019
1,2,3,4,7,8-HxCDD	NB	NB	NA	NA	9.15E-11	0.001	1	9.1458E-08	8.1458E-07	0.10	0.89	1	0.000025	0.00040	0.11	0.0391
1,2,3,6,7,8-HxCDD	NB	NB	NA	NA	2.19E-09	0.001	1	2.1885E-06	2.1193E-05	0.10	0.97	1	0.000173	0.00040	0.03	0.147
1,2,3,7,8,9-HxCDD	NB	NB	NA	NA	1.29E-10	0.001	1	1.2892E-07	1.0292E-06	0.10	0.80	1	0.000065	0.00040	0.20	0.019
1,2,3,7,8-PeCDD	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		0.484
2,3,7,8-TCDD	NB	NB	NA	NA		0.001	1			0.10		1	ND	0.00040		1.77
Total HpCDD	NB	NB	NA	NA	1.38E-08	0.001	1	1.3777E-05	0.00010041	0.10	0.73	1	0.00934	0.00040	0.27	0.0129
Total HxCDD	NB	NB	NA	NA	3.49E-09	0.001	1	3.4936E-06	3.0416E-05	0.10	0.87	1	0.00113	0.00040	0.13	0.0323
Total PeCDD	NB	NB	NA	NA	2.73E-09	0.001	1	2.726E-06	0.0000261	0.10	0.95	1	0.00029	0.00040	0.04	0.108
Total TCDD	NB	NB	NA	NA	2.34E-08	0.001	1	2.3436E-05	0.0002229	0.10	0.95	1	0.00287	0.00040	0.05	0.0932
Furans																
1,2,3,4,6,7,8,9-OCDF	NB	NB	NA	NA	2.25E-07	0.001	1	0.00022475	0.0021235	0.10	0.94	1	0.031	0.00040	0.06	0.0622
1,2,3,4,6,7,8-HpCDF	NB	NB	NA	NA	1.82E-08	0.001	1	1.8202E-05	0.00016578	0.10	0.91	1	0.00406	0.00040	0.09	0.049
1,2,3,4,7,8,9-HpCDF	NB	NB	NA	NA	1.25E-09	0.001	1	1.2464E-06	1.1696E-05	0.10	0.94	1	0.000192	0.00040	0.06	0.0731
1,2,3,4,7,8-HxCDF	NB	NB	NA	NA	1.45E-09	0.001	1	1.4507E-06	1.4167E-05	0.10	0.98	1	0.000095	0.00040	0.02	0.2
1,2,3,6,7,8-HxCDF	NB	NB	NA	NA	8.43E-11	0.001	1	8.4303E-08	5.3623E-07	0.10	0.83	1	0.0000267	0.00040	0.17	0.0241
1,2,3,7,8,9-HxCDF	NB	NB	NA	NA	9.32E-12	0.001	1	9.32E-09		0.10		1	0.0000233	0.00040	1.00	
1,2,3,7,8-PeCDF	NB	NB	NA	NA	4.33E-10	0.001	1	4.3256E-07	4.0391E-06	0.10	0.93	1	0.0000717	0.00040	0.07	0.0876
2,3,4,6,7,8-HxCDF	NB	NB	NA	NA	1.41E-10	0.001	1	1.4086E-07	1.1757E-06	0.10	0.83	1	0.0000583	0.00040	0.17	0.0242
2,3,4,7,8-PeCDF	NB	NB	NA	NA	4.68E-10	0.001	1	4.5785E-07	4.4853E-06	0.10	0.98	1	0.0000233	0.00040	0.02	0.231
2,3,7,8-TCDF	NB	NB	NA	NA	5.30E-09	0.001	1	5.2983E-06	5.2813E-06	0.10	1.00	1	0.0000375	0.00040	0.00	1.69
Total HpCDF	NB	NB	NA	NA	9.46E-08	0.001	1	9.4627E-05	0.00088587	0.10	0.94	1	0.0151	0.00040	0.06	0.0704
Total HxCDF	NB	NB	NA	NA	8.70E-08	0.001	1	8.6995E-05	0.00085907	0.10	0.99	1	0.00272	0.00040	0.01	0.379
Total PeCDF	NB	NB	NA	NA	7.74E-08	0.001	1	7.7378E-05	0.00077208	0.10	1.00	1	0.000426	0.00040	0.00	2.18
Total TCDF	NB	NB	NA	NA	4.68E-08	0.001	1	4.6771E-05	0.0004662	0.10	1.00	1	0.000376	0.00040	0.00	1.48
Dioxin - TEQ	3.E-03	3 E-04	4.6635E-07	4.663E-06	1.53E-09	0.001	1	1.5331E-06	1.4627E-05	0.10	0.95	1.0	0.000176	0.00040	0.05	ln[Total TEQ$_{fish}$/%lipids] = -1.748 + 0.7556 ln[Total TEQ$_{sed}$/%OC]

Notes:
NA=Not available/applicable
NB = Benchmark not available
ND = Not detected
BSAF NA = Biota-Sediment Accumulation Factor not available
Bolded values indicate a Hazard Index greater than 1
Half the detection limit is used for compounds that were not detected

Food Chain Model Components:

$$\text{Hazard Index Estimate} = \frac{[\text{Food Dose}] + [\text{Sediment Dose}]}{\text{Toxicological Benchmark}}$$

Food Ingestion Rate (EPA 1993)

[1]For the sediment component, we convert the food ingestion rate from wet weight to dry weight (invertebrate moisture=80%, plant moisture=70%) and then calculate a sediment ingestion rate from the sediment proportion in the diet (dry weight) estimated in Beyer et al. (1994)

Average Fraction Organic Carbon in Segment D Sediments *0.018*
Average Fraction Lipid in Forage Fish *0.015*

Appendix E-4d
Food Chain Model for River Otter Ingesting Sediment and Fish
Creek Segment
Dead Creek E
Seuget Area I

Compound	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose	LOAEL Benchmark Dose	Overall Exposure Dose mg/kg	Ratio of Forage Area to Site	Time on Site Ratio	Exposure Dose mg/kg/day	Total Conc in Food mg/kg wet	Food Ingestion Rate kg/kg/day	Proportion of Dose	RAF	Sediment[1] Sediment Concentration mg/kg dry	Dry Sediment Ing. Rate kg/kg/day	Proportion of Dose	BSAF
Cyanide	ND	ND	30	369		0.003	1			0.10		1	ND	0.00040		
Pesticides/Herbicides																
2,4,5-T	ND	ND	1.4	4.6		0.003	1			0.10		1	ND	0.00040		
2,4,5-TP (Silvex)	ND	ND	11	23		0.003	1			0.10		1	ND	0.00040		
2,4-D	3.E-06	5.E-06	0.47	2.3	1.21E-06	0.003	1	0.00000404		0.10		1	0.0101	0.00040	1.00	
2,4-DB	ND	ND	8.5	26		0.003	1			0.10		1	ND	0.00040		0.83
4,4'-DDD	NB	NB	NA	NA	1.18E-06	0.003	1	0.00000394		0.10		1	0.0099	0.00040	1.00	
4,4'-DDE	NB	NB	NA	NA	9.00E-06	0.003	1	0.00299859	0.02998682	0.10	1.00	1	0.0048	0.00040	0.00	7.12
4,4'-DDT	NB	NB	NA	NA	1.12E-06	0.003	1	3.748E-06		0.10		1	0.0094	0.00040	1.00	
Total DDT	2.E-06	5.E-06	0.4	2	9.01E-06	0.003	1	0.0030044	0.02998682	0.10	1.00	1	0.0193	0.00040	0.00	
Aldrin	ND	ND	0.093	0.47		0.003	1			0.10		1	ND	0.00040		
alpha BHC	6.E-06	7.E-06	0.010	0.06	5.86E-10	0.003	1	1.98E-07		0.10		1	0.0005	0.00040	1.00	
Alpha-Chlordane	3.E-06	2.E-06	1.2	2.3	3.83E-06	0.003	1	1.278E-06		0.10		1	0.00319	0.00040	1.00	
beta-BHC	ND	ND	0.2	0.91		0.003	1			0.10		1	ND	0.00040		
Dalapon	ND	ND	3.9	13		0.003	1			0.10		1	ND	0.00040		
delta-BHC	ND	ND	0.010	0.06		0.003	1			0.10		1	ND	0.00040		
Dicamba	4.E-07	1.E-07	0.19	0.63	7.22E-06	0.003	1	0.00002406	0.0002306	0.10	0.98	1	0.0025	0.00040	0.04	0.0922
Dichloroprop	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		0.0465
Dieldrin	5.E-04	5.E-05	0.009	0.09	4.86E-06	0.003	1	0.00155847	0.01549429	0.10	0.99	1	0.0226	0.00040	0.01	0.777
Dinoseb	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
Endosulfan I	2.E-09	NB	0.07	NA	1.72E-10	0.003	1	5.72E-08		0.10		1	0.0001	0.00040	1.00	
Endosulfan II	1.E-06	NB	0.07	NA	7.92E-10	0.003	1	2.64E-07		0.10		1	0.0007	0.00040	1.00	
Endosulfan sulfate	8.E-06	NB	0.07	NA	5.45E-09	0.003	1	1.816E-06		0.10		1	0.0045	0.00040	1.00	
Endrin	ND	ND	0.023	0.23		0.003	1			0.10		1	ND	0.00040		
Endrin aldehyde	ND	ND	0.023	0.23		0.003	1			0.10		1	ND	0.00040		
Endrin ketone	ND	ND	0.023	0.23		0.003	1			0.10		1	ND	0.00040		
gamma-BHC (Lindane)	ND	ND	3.7	37		0.003	1			0.10		1	ND	0.00040		
Gamma Chlordane	5.E-07	3.E-07	1.2	2.3	6.51E-07	0.003	1	0.00021716	0.00216176	0.10	1.00	1	0.00245	0.00040	0.00	1
Heptachlor	ND	ND	0.061	0.61		0.003	1			0.10		1	ND	0.00040		
Heptachlor epoxide	9.E-09	9.E-10	0.061	0.61	5.21E-10	0.003	1	1.736E-07		0.10		1	0.000	0.00040	1.00	
MCPA - nd	ND	ND	3.5	10		0.003	1			0.10		1	ND	0.00040		1.12
MCPP	ND	ND	1.4	4.2		0.003	1			0.10		1	ND	0.00040		
Methoxychlor	5.E-10	2.E-10	1.9	3.7	8.64E-10	0.003	1	2.88E-07		0.10		1	0.0007	0.00040	1.00	
Toxaphene	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
SVOCs																
1,2,4-Trichlorobenzene	ND	ND	7.4	27		0.003	1			0.10		1	ND	0.00040		
1,2-Dichlorobenzene	ND	NB	43	NA		0.003	1			0.10		1	ND	0.00040		
1,3-Dichlorobenzene	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
1,4-Dichlorobenzene	2.E-06	2.E-09	10	104	1.68E-07	0.003	1	0.000056		0.10		1	0.14	0.00040	1.00	
2,4,5-Trichlorophenol	ND	ND	50	149		0.003	1			0.10		1	ND	0.00040		
2,4,6-Trichlorophenol	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
2,4-Dichlorophenol	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
2,4-Dinitrophenol	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
2,4-Dinitrotoluene	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
2,6-Dinitrotoluene	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
2-Chloronaphthalene	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
2-Chlorophenol	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
2-Methylnaphthalene	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
2-Methylphenol (o-cresol)	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
2-Nitroaniline	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
2-Nitrophenol	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
3- & 4-Methylphenol	ND	ND	80	208		0.003	1			0.10		1	ND	0.00040		
3,3'-Dichlorobenzidine	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
3-Nitroaniline	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
4,6-Dinitro-2-methylphenol	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
4-Bromophenyl phenyl ether	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
4-Chloro-3-methylphenol	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
4-Chloroaniline	ND	NB	4.6	NA		0.003	1			0.10		1	ND	0.00040		
4-Chlorophenyl phenyl ether	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
4-Nitroaniline	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
4-Nitrophenol	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
Acenaphthene	ND	ND	87	173		0.003	1			0.10		1	ND	0.00040		
Acenaphthylene	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
Anthracene	2.E-09	NB	25	NA	6.00E-06	0.003	1	0.00002		0.10		1	0.05	0.00040	1.00	
Benzo(a)anthracene	NB	NB	NA	NA	1.70E-07	0.003	1	0.0000568		0.10		1	0.142	0.00040	1.00	
Benzo(a)pyrene	5.E-07	5.E-06	0.25	2.5	1.30E-07	0.003	1	0.0000432		0.10		1	0.108	0.00040	1.00	
Benzo(b)fluoranthene	NB	NB	NA	NA	2.12E-07	0.003	1	0.0000706		0.10		1	0.177	0.00040	1.00	
Benzo(g,h,i)perylene	NB	NB	NA	NA	1.86E-07	0.003	1	0.000062		0.10		1	0.155	0.00040	1.00	
Benzo(k)fluoranthene	NB	NB	NA	NA	1.84E-07	0.003	1	0.0000612		0.10		1	0.153	0.00040	1.00	
Bis(2-chloroethoxy)methane	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
Bis(2-chloroethyl)ether	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
Bis(2-chloroisopropyl)ether	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
Bis(2-ethylhexyl)phthalate	6.E-06	6.E-07	4.6	46	2.82E-05	0.003	1	0.00940668	0.09375882	0.10	1.00	1	0.06	0.00040	0.00	1.38
Butylbenzylphthalate	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
Carbazole	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
Chrysene	NB	NB	NA	NA	1.94E-07	0.003	1	0.0000648		0.10		1	0.162	0.00040	1.00	
Dibenzo(a,h)anthracene	NB	NB	NA	NA	1.11E-06	0.003	1	0.0037124	0.03682165	0.10	0.99	1	0.0756	0.00040	0.01	0.552
Dibenzofuran	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
Diethylphthalate - nd	ND	NB	1158	NA		0.003	1			0.10		1	ND	0.00040		0.266
Dimethylphthalate	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		

App... E-4d
Food Chain Model for River Otter Ingesting Sediment and Fish
Creek Segment
Dead Creek E
Sauget Area I

Compound	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose	LOAEL Benchmark Dose	Overall Exposure Dose mg/kg	Ratio of Forage Area to Site	Time on Site Ratio	Exposure Dose mg/kg/day	Food: Total Conc in Food mg/kg wet	Food: Ingestion Rate kg/kg/day	Food: Proportion of Dose	Sediment[1]: RAF	Sediment: Sediment Concentration mg/kg dry	Sediment: Dry Sediment Ing. Rate kg/kg/day	Sediment: Proportion of Dose	BSAF
Di-n-butylphthalate	6.E-10	2 E-10	139	463	8 86E-06	0 003	1	0 0000295		0 10		1	0 07	0 00040	1 00	
Di-n-octylphthalate	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Fluoranthene	2 E-09	NB	126	NA	2 44E-07	0 003	1	0 0000812		0 10		1	0 203	0 00040	1 00	
Fluorene	ND	NB	124	NA		0 003	1			0 10		1	ND	0 00040		
Hexachlorobenzene	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Hexachlorobutadiene	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Hexachlorocyclopentadiene	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Hexachloroethane	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Indeno(1,2,3-c,d)pyrene	NB	NB	NA	NA	2 48E-05	0 003	1	0 00826589	0 06207294	0 10	0 99	1	0 154	0 00040	0 01	0 804
Isophorone	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Naphthalene	ND	ND	3 2	6 4		0 003	1			0 10		1	ND	0 00040		
Nitrobenzene	NB	ND	NA	1 2		0 003	1			0 10		1	ND	0 00040		
N-Nitroso-di-N-propylamine	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
N-Nitrosodiphenylamine	ND	ND	9 1	91		0 003	1			0 10		1	ND	0 00040		
Pentachlorophenol	2 E-06	7 E-09	1 6	5 9	3 95E-08	0 003	1	1 3165E-05	4 8852E-05	0 10	0 37	1	0 02	0 00040	0 63	0 00236
Phenanthrene	NB	NB	NA	NA	1 98E-07	0 003	1	0 000066		0 10		1	0 165	0 00040	1 00	
Phenol	ND	ND	15	30		0 003	1			0 10		1	ND	0 00040		
Pyrene	1 E-07	6 E-06	1 9	3 2	2 06E-07	0 003	1	0 0000688		0 10		1	0 172	0 00040	1 00	
Total PAHs	NB	NB	NA	NA	3 84E-05	0 003	1	0 01280546	0 11889459	0 10	0 93	1	2 29	0 00040	0 07	
VOCs																
1,1,1-Trichloroethane	ND	NB	257	NA		0 003	1			0 10		1	ND	0 00040		
1,1,2,2-Tetrachloroethane	NB	ND	NA	41		0 003	1			0 10		1	ND	0 00040		
1,1,2-Trichloroethane	ND	ND	0 97	11		0 003	1			0 10		1	ND	0 00040		
1,1-Dichloroethane	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
1,1-Dichloroethene	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
1,2-Dichloroethane	ND	ND	17 2	34 4		0 003	1			0 10		1	ND	0 00040		
1,2-Dichloroethene (total)	ND	NB	11 2	NA		0 003	1			0 10		1	ND	0 00040		
1,2-Dichloropropane	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
2-Butanone (MEK)	2 E-11	6 E-12	810	2091	1 27E-08	0 003	1	0 00000424		0 10		1	0 0106	0 00040	1 00	
2-Hexanone	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
4-Methyl-2-pentanone	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Acetone	1 E-08	2 E-09	4 8	23	4 51E-08	0 003	1	0 00001504		0 10		1	0 0376	0 00040	1 00	
Benzene	ND	ND	6 5	65		0 003	1			0 10		1	ND	0 00040		
Bromodichloromethane	NB	ND	NA	4 4		0 003	1			0 10		1	ND	0 00040		
Bromoform	ND	ND	6 2	16		0 003	1			0 10		1	ND	0 00040		
Bromomethane	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Carbon disulfide	ND	NB	2 3	NA		0 003	1			0 10		1	ND	0 00040		
Carbon tetrachloride	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Chlorobenzene	3 E-09	NB	21	NA	5 77E-08	0 003	1	0 00001924		0 10		1	0 0481	0 00040	1 00	
Chloroform	ND	ND	6 9	19		0 003	1			0 10		1	ND	0 00040		
Chloroethane	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Chloromethane	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
cis-1,3-Dichloropropene	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Dibromochloromethane	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Ethylbenzene	1 E-10	3 E-11	44	133	4 64E-09	0 003	1	1 548E-06		0 10		1	0 00387	0 00040	1 00	
Methylene chloride	1 E-09	1 E-10	2 7	22 9	3 35E-09	0 003	1	1 116E-06		0 10		1	0 00279	0 00040	1 00	
Styrene	ND	ND	230	460		0 003	1			0 10		1	ND	0 00040		
Tetrachloroethene	ND	ND	0 35	1 73		0 003	1			0 10		1	ND	0 00040		
Toluene	6 E-10	8 E-11	6 4	64 3	4 99E-09	0 003	1	1 664E-06		0 10		1	0 00416	0 00040	1 00	
trans-1,3-Dichloropropene	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Trichloroethene	ND	ND	0 173	1 732		0 003	1			0 10		1	ND	0 00040		
Vinyl chloride	NB	NB	NA	NA		0 003	1			0 10		1	ND	0 00040		
Xylenes (total)	ND	ND	0 52	0 643		0 003	1			0 10		1	ND	0 00040		
Inorganics																
Aluminum, Total	3 E-02	3 E-03	0 487	4 87	1 58E-02	0 003	1	5 25661813	12 5661813	0 10	0 24	1	10000	0 00040	0 76	$\ln[Al_{bsaf}] = -21\ 2593 + 2\ 583\ \ln[Al_{soil}]$
Antimony	7 E-05	7 E-06	0 032	0 32	2 10E-06	0 003	1	0 0007		0 10		1	1 75	0 00040	1 00	
Arsenic, Total	1 E-05	NB	1 2	NA	1 33E-05	0 003	1	0 00444		0 10		1	11 1	0 00040	1 00	
Barium	5 E-05	4 E-05	6 8	9 75	3 46E-04	0 003	1	0 1152		0 10		1	288	0 00040	1 00	
Beryllium	3 E-06	NB	0 3	NA	8 98E-07	0 003	1	0 0002988		0 10		1	0 747	0 00040	1 00	
Cadmium, Total	6 E-05	6 E-06	0 450	4 5	2 83E-05	0 003	1	0 00944		0 10		1	23 6	0 00040	1 00	
Calcium	NB	NB	NA	NA	9 68E-03	0 003	1	3 226		0 10		1	8070	0 00040	1 00	
Chromium, Total	4 E-07	NB	1278	NA	5 56E-04	0 003	1	0 185242	1 56562	0 10	0 84	1	74 2	0 00040	0 16	0 0211
Cobalt	NB	NB	NA	NA	9 74E-06	0 003	1	0 003248		0 10		1	8 12	0 00040	1 00	
Copper, Total	3 E-04	2 E-04	7 1	9 18	2 22E-03	0 003	1	0 74067523	3 0667523	0 10	0 42	1	1080	0 00040	0 58	$\ln[Cu]_{bsaf} = -1\ 9259+0\ 4371\ \ln[Cu]_{soil}$
Iron	NB	NB	NA	NA	2 15E-02	0 003	1	7 18		0 10		1	17900	0 00040	1 00	
Lead, Total	1 E-04	1 E-05	3 70	37	4 66E-04	0 003	1	0 155358	1 04958	0 10	0 68	1	126	0 00040	0 32	0 00833
Magnesium	NB	NB	NA	NA	5 44E-03	0 003	1	1 812		0 10		1	4530	0 00040	1 00	
Manganese	5 E-06	2 E-06	41 00	132	2 09E-04	0 003	1	0 0696		0 10		1	174	0 00040	1 00	
Mercury	8 E-05	1 E-05	0 015	0 075	8 52E-07	0 003	1	0 000284		0 10		1	0 71	0 00040	1 00	
Molybdenum	1 E-05	1 E-06	0 066	0 66	6 62E-07	0 003	1	0 0002206		0 10		1	0 552	0 00040	1 00	
Nickel, Total	2 E-05	9 E-06	19 00	37	3 24E-04	0 003	1	0 108		0 10		1	270	0 00040	1 00	
Potassium	NB	NB	NA	NA	2 50E-03	0 003	1	0 832		0 10		1	2080	0 00040	1 00	
Selenium	ND	ND	0 09	0 151		0 003	1			0 10		1	ND	0 00040		0 479
Silver	2 E-07	2 E-06	10 30	104	1 66E-06	0 003	1	0 000552		0 10		1	1 38	0 00040	1 00	
Sodium	NB	NB	NA	NA	2 90E-04	0 003	1	0 0968		0 10		1	242	0 00040	1 00	
Thallium	3 E-04	2 E-05	0 00	0 034	7 90E-07	0 003	1	0 0002632		0 10		1	0 658	0 00040	1 00	
Tin	1 E-06	1 E-06	5 80	87	8 50E-06	0 003	1	0 002832		0 10		1	7 08	0 00040	1 00	
Vanadium	4 E-04	4 E-05	0 09	0 892	3 55E-05	0 003	1	0 01184		0 10		1	29 6	0 00040	1 00	
Zinc, Total	2 E-04	1 E-04	75 0	149	1 77E-02	0 003	1	5 91429092	46 5429092	0 10	0 79	1	3150	0 00040	0 21	$\ln[Zn]_{bsaf} = 2\ 4275 + 0\ 1754\ \ln[Zn]_{soil}$

Appendix E-4d
Food Chain Model for River Otter Ingesting Sediment and Fish
Creek Segment
Dead Creek E
Sauget Area I

Compound	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose	LOAEL Benchmark Dose	Overall Exposure Dose mg/kg	Ratio of Forage Area to Site	Time on Site Ratio	Exposure Dose mg/kg/day	Food Total Conc in Food mg/kg wet	Food Ingestion Rate kg/kg/day	Food Proportion of Dose	Sediment[1] RAF	Sediment Concentration mg/kg dry	Sediment Dry Sediment Ing Rate kg/kg/day	Sediment Proportion of Dose	BSAF
PCBs																
Monochlorobiphenyl	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
Dichlorobiphenyl	NB	NB	NA	NA	3.42E-09	0.003	1	0.00000114		0.10		1	0.00285	0.00040	1.00	
Trichlorobiphenyl	NB	NB	NA	NA	1.46E-06	0.003	1	0.00048735	0.00484729	0.10	0.99	1	0.00854	0.00040	0.01	0.84
Tetrachlorobiphenyl	NB	NB	NA	NA	6.26E-05	0.003	1	0.02092649	0.20912647	0.10	1.00	1	0.0346	0.00040	0.00	6.85
Pentachlorobiphenyl	NB	NB	NA	NA	1.87E-04	0.003	1	0.06249213	0.62388529	0.10	1.00	1	0.259	0.00040	0.00	2.73
Hexachlorobiphenyl	NB	NB	NA	NA	5.85E-05	0.003	1	0.01948989	0.19472206	0.10	1.00	1	0.0437	0.00040	0.00	5.05
Heptachlorobiphenyl	NB	NB	NA	NA	6.37E-06	0.003	1	0.00212312	0.02116876	0.10	1.00	1	0.0161	0.00040	0.00	1.49
Octachlorobiphenyl	NB	NB	NA	NA	2.39E-06	0.003	1	0.00079543	0.00791029	0.10	0.99	1	0.011	0.00040	0.01	0.815
Nonachlorobiphenyl	NB	NB	NA	NA	2.78E-08	0.003	1	0.00000928		0.10		1	0.0232	0.00040	1.00	
Decachlorobiphenyl	NB	NB	NA	NA	3.86E-06	0.003	1	0.00001292		0.10		1	0.0323	0.00040	1.00	
Total PCBs	2.E-03	9.E-04	0.065	0.17	1.58E-04	0.003	1	0.05278113	0.52671531	0.10	1.00	1.0	0.27	0.00040	0.00	ln[PCB$_{fish}$/%lipids] = 1.6666 +0.6806 ln[PCB$_{sed}$/%OC]
Dioxins																
1,2,3,4,6,7,8,9-OCDD	NB	NB	NA	NA	1.16E-07	0.003	1	3.8543E-05	0.00022503	0.10	0.58	1	0.0401	0.00040	0.42	0.00636
1,2,3,4,6,7,8-HpCDD	NB	NB	NA	NA	1.53E-08	0.003	1	5.0874E-06	4.1074E-05	0.10	0.81	1	0.00245	0.00040	0.19	0.019
1,2,3,4,7,8-HxCDD	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		0.0391
1,2,3,6,7,8-HxCDD	NB	NB	NA	NA	1.48E-09	0.003	1	4.9204E-07	4.7732E-06	0.10	0.97	1	0.0000368	0.00040	0.03	0.147
1,2,3,7,8,9-HxCDD	NB	NB	NA	NA	1.74E-10	0.003	1	5.8141E-08	4.6941E-07	0.10	0.81	1	0.000026	0.00040	0.19	0.019
1,2,3,7,8-PeCDD	NB	NB	NA	NA	2.92E-09	0.003	1	9.7419E-07	9.6515E-06	0.10	0.99	1	0.0000226	0.00040	0.01	0.484
2,3,7,8-TCDD	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		1.77
Total HpCDD	NB	NB	NA	NA	3.97E-08	0.003	1	1.3229E-05	9.7888E-05	0.10	0.74	1	0.0066	0.00040	0.26	0.0129
Total HxCDD	NB	NB	NA	NA	7.25E-09	0.003	1	2.418E-06	2.1204E-05	0.10	0.88	1	0.000744	0.00040	0.12	0.0323
Total PeCDD	NB	NB	NA	NA	9.12E-09	0.003	1	3.0384E-06	0.00002916	0.10	0.96	1	0.000306	0.00040	0.04	0.106
Total TCDD	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		0.0932
Furans																
1,2,3,4,6,7,8,9-OCDF	NB	NB	NA	NA	3.61E-07	0.003	1	0.00012704	0.00120399	0.10	0.95	1	0.0166	0.00040	0.05	0.0822
1,2,3,4,6,7,8-HpCDF	NB	NB	NA	NA	2.34E-08	0.003	1	7.7938E-06	7.1338E-05	0.10	0.92	1	0.00165	0.00040	0.08	0.049
1,2,3,4,7,8,9-HpCDF	NB	NB	NA	NA	9.08E-10	0.003	1	3.0209E-07	2.8445E-06	0.10	0.94	1	0.0000441	0.00040	0.06	0.0731
1,2,3,4,7,8-HxCDF	NB	NB	NA	NA	1.23E-09	0.003	1	4.1147E-07	4.0235E-06	0.10	0.98	1	0.0000228	0.00040	0.02	0.2
1,2,3,6,7,8-HxCDF	NB	NB	NA	NA	1.84E-10	0.003	1	6.1393E-08	5.1673E-07	0.10	0.84	1	0.0000243	0.00040	0.16	0.0241
1,2,3,7,8,9-HxCDF	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		
1,2,3,7,8-PeCDF	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		0.0676
2,3,4,6,7,8-HxCDF	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		0.0242
2,3,4,7,8-PeCDF	NB	NB	NA	NA		0.003	1			0.10		1	ND	0.00040		0.231
2,3,7,8-TCDF	NB	NB	NA	NA	8.48E-09	0.003	1	2.8259E-06	2.8163E-05	0.10	1.00	1	0.0000169	0.00040	0.00	1.69
Total HpCDF	NB	NB	NA	NA	1.65E-07	0.003	1	5.4878E-05	0.00051558	0.10	0.94	1	0.0083	0.00040	0.06	0.0704
Total HxCDF	NB	NB	NA	NA	1.06E-07	0.003	1	3.5195E-05	0.00034779	0.10	0.99	1	0.00104	0.00040	0.01	0.379
Total PeCDF	NB	NB	NA	NA	1.97E-07	0.003	1	6.5636E-05	0.000654	0.10	1.00	1	0.00034	0.00040	0.00	2.18
Total TCDF	NB	NB	NA	NA	1.21E-07	0.003	1	4.0344E-05	0.00040221	0.10	1.00	1	0.000306	0.00040	0.00	1.48
Dioxin - TEQ	5.E-03	5.E-04	4.6635E-07	4.663E-06	2.44E-09	0.003	1	8.1299E-07	7.8387E-06	0.10	0.96	1.0	0.00007	0.00040	0.04	ln[Total TEQ$_{fish}$/%lipids] = -1.748 + 0.7556 ln[Total TEQ$_{sed}$/%OC]

Notes:
NA=Not available/applicable
NB = Benchmark not available
ND = Not detected
BSAF NA = Biota-Sediment Accumulation Factor not available
Bolded values indicate a Hazard Index greater than 1
Half the detection limit is used for compounds that were not detected

Food Chain Model Components:

$$\text{Hazard Index Estimate} = \frac{\text{[Food Dose]} + \text{[Sediment Dose]}}{\text{Toxicological Benchmark}}$$

Food Ingestion Rate (EPA 1993)

[1]For the sediment component, we convert the food ingestion rate from wet weight to dry weight (invertebrate moisture=80%, plant moisture=70%) and then calculate a sediment ingestion rate from the sediment proportion in the diet (dry weight) estimated in Beyer et al (1994)

Average Fraction Organic Carbon in Segment E Sediments *0.017*
Average Fraction Lipid in Forage Fish *0.015*

App. E-4e
Food Chain Model for River Otter Ingesting Sediment and Fish
Creek Segment F
Dead Creek
Sauget Area I

Compound	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose	LOAEL Benchmark Dose	Overall Exposure Dose mg/kg	Ratio of Forage Area to Site	Time on Site Ratio	Exposure Dose mg/kg/day	Food Total Conc. in Food mg/kg wet	Food Ingestion Rate kg/kg/day	Food Proportion of Diet	RAF	Sediment[1] Sediment Concentration mg/kg dry	Sediment Dry Sediment Ing. Rate kg/kg/day	Sediment Proportion of Dose	BSAF
Cyanide	6 E-09	7 E-10	30	369	2 51E-07	0 00075	1	0 000334		0 10		1	0 84	0 00040	1 00	
Pesticides/Herbicides																
2,4,5-T	ND	ND	1 4	4 6		0 00075	1			0 10		1	ND	0 00040		
2,4,5-TP (Silvex)	ND	ND	11	23		0 00075	1			0 10		1	ND	0 00040		
2,4-D	7 E-09	1 E-09	0 47	2 3	3 21E-09	0 00075	1	0 00000428		0 10		1	0 0107	0 00040	1 00	
2,4-DB	ND	ND	8 5	26		0 00075	1			0 10		1	ND	0 00040		0 83
4,4'-DDD	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
4,4'-DDE	NB	NB	NA	NA	9 09E-07	0 00075	1	0 0012124	0 01212	0 10	1 00	1	0 0010	0 00040	0 00	7 12
4,4'-DDT	NB	NB	NA	NA	1 05E-09	0 00075	1	1 404E-06		0 10		1	0 0035	0 00040	1 00	
Total DDT	2 E-08	5 E-07	0 4	2	9 11E-07	0 00075	1	0 00121476	0 01212	0 10	1 00	1	0 00695	0 00040	0 00	
Aldrin	7 E-10	1 E-10	0 093	0 47	6 90E-11	0 00075	1	9 2E-08		0 10		1	0 00023	0 00040	1 00	
alpha BHC	ND	ND	0 010	0 06		0 00075	1			0 10		1	ND	0 00040		
Alpha-Chlordane	6 E-10	3 E-10	1 2	2 3	7 41E-10	0 00075	1	9 88E-07		0 10		1	0 00247	0 00040	1 00	
beta-BHC	2 E-09	3 E-10	0 2	0 91	3 15E-10	0 00075	1	0 00000042		0 10		1	0 0011	0 00040	1 00	
Delapon	ND	ND	3 9	13		0 00075	1			0 10		1	ND	0 00040		
delta-BHC	ND	ND	0 010	0 06		0 00075	1			0 10		1	ND	0 00040		
Dicamba	2 E-07	5 E-06	0 19	0 63	2 95E-08	0 00075	1	3 9348E-05	0 0003771	0 10	0 96	1	0 0041	0 00040	0 04	0 0922
Dichloroprop	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		0 0465
Dieldrin	4 E-05	4 E-06	0 009	0 09	3 73E-07	0 00075	1	0 00049784	0 0049832	0 10	1 00	1	0 0038	0 00040	0 00	0 777
Dinoseb	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
Endosulfan I	ND	NB	0 07	NA		0 00075	1			0 10		1	ND	0 00040		
Endosulfan II	ND	NB	0 07	NA		0 00075	1			0 10		1	ND	0 00040		
Endosulfan sulfate	1 E-08	NB	0 07	NA	9 72E-10	0 00075	1	1 296E-06		0 10		1	0 0032	0 00040	1 00	
Endrin	ND	ND	0 023	0 23		0 00075	1			0 10		1	ND	0 00040		
Endrin aldehyde	ND	ND	0 023	0 23		0 00075	1			0 10		1	ND	0 00040		
Endrin ketone	ND	ND	0 023	0 23		0 00075	1			0 10		1	ND	0 00040		
gamma-BHC (Lindane)	ND	ND	3 7	37		0 00075	1			0 10		1	ND	0 00040		
Gamma Chlordane	2 E-07	1 E-07	1 2	2 3	2 52E-07	0 00075	1	0 00033619	0 00335393	0 10	1 00	1	0 00199	0 00040	0 00	1
Heptachlor	ND	ND	0 061	0 61		0 00075	1			0 10		1	ND	0 00040		
Heptachlor epoxide	ND	ND	0 061	0 61		0 00075	1			0 10		1	ND	0 00040		
MCPA - nd	ND	ND	3 5	10		0 00075	1			0 10		1	ND	0 00040		1 12
MCPP	3 E-07	1 E-07	1 4	4 2	4 86E-07	0 00075	1	0 00062		0 10		1	1 6	0 00040	1 00	
Methoxychlor	ND	ND	1 9	3 7		0 00075	1			0 10		1	ND	0 00040		
Toxaphene	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
SVOCs																
1,2,4-Trichlorobenzene	ND	ND	7 4	27		0 00075	1			0 10		1	ND	0 00040		
1,2-Dichlorobenzene	ND	NB	43	NA		0 00075	1			0 10		1	ND	0 00040		
1,3-Dichlorobenzene	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
1,4-Dichlorobenzene	3 E-09	3 E-10	10	104	2 62E-08	0 00075	1	0 0000378		0 10		1	0 09	0 00040	1 00	
2,4,5-Trichlorophenol	ND	ND	50	149		0 00075	1			0 10		1	ND	0 00040		
2,4,6-Trichlorophenol	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
2,4-Dichlorophenol	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
2,4-Dinitrophenol	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
2,4-Dinitrotoluene	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
2,6-Dinitrotoluene	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
2-Chloronaphthalene	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
2-Chlorophenol	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
2-Methylnaphthalene	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
2-Methylphenol (o-cresol)	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
2-Nitroaniline	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
2-Nitrophenol	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
3- & 4-Methylphenol	ND	ND	80	206		0 00075	1			0 10		1	ND	0 00040		
3,3'-Dichlorobenzidine	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
3-Nitroaniline	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
4,6-Dinitro-2-methylphenol	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
4-Bromophenyl phenyl ether	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
4-Chloro-3-methylphenol	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
4-Chloroaniline	ND	NB	4 6	NA		0 00075	1			0 10		1	ND	0 00040		
4-Chlorophenyl phenyl ether	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
4-Nitroaniline	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
4-Nitrophenol	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
Acenaphthene	ND	ND	87	173		0 00075	1			0 10		1	ND	0 00040		
Acenaphthylene	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
Anthracene	ND	NB	25	NA		0 00075	1			0 10		1	ND	0 00040		
Benzo(a)anthracene	NB	NB	NA	NA	1 87E-06	0 00075	1	0 00002492		0 10		1	0 0623	0 00040	1 00	
Benzo(a)pyrene	1 E-07	1 E-08	0 25	2 5	2 39E-08	0 00075	1	0 00003184		0 10		1	0 0796	0 00040	1 00	
Benzo(b)fluoranthene	NB	NB	NA	NA	4 41E-06	0 00075	1	0 0000588		0 10		1	0 147	0 00040	1 00	
Benzo(g,h,i)perylene	NB	NB	NA	NA	3 69E-06	0 00075	1	0 0000492		0 10		1	0 123	0 00040	1 00	
Benzo(k)fluoranthene	NB	NB	NA	NA	3 87E-06	0 00075	1	0 0000516		0 10		1	0 129	0 00040	1 00	
Bis(2-chloroethoxy)methane	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
Bis(2-chloroethyl)ether	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
Bis(2-chloroisopropyl)ether	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
Bis(2-ethylhexyl)phthalate	3 E-08	3 E-07	4 6	46	1 58E-05	0 00075	1	0 02110637	0 21072135	0 10	1 00	1	0 09	0 00040	0 00	1 38
Butylbenzylphthalate	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
Carbazole	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
Chrysene	NB	NB	NA	NA	4 11E-06	0 00075	1	0 0000548		0 10		1	0 137	0 00040	1 00	
Dibenzo(a,h)anthracene	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		0 552
Dibenzofuran	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
Diethylphthalate - nd	ND	NB	1150	NA		0 00075	1			0 10		1	ND	0 00040		0 266
Dimethylphthalate	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		

Appendix E-4e
Food Chain Model for River Otter Ingesting Sediment and Fish
Creek Segment F
Dead Creek
Sauget Area I

Compound	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose	LOAEL Benchmark Dose	Overall Exposure Dose mg/kg	Ratio of Forage Area to Site	Time on Site Ratio	Exposure Dose mg/kg/day	Food Total Conc in Food mg/kg wet	Food Ingestion Rate kg/kg/day	Food Proportion of Dose	RAF	Sediment[1] Sediment Concentration mg/kg dry	Sediment Dry Sediment Ing Rate kg/kg/day	Sediment Proportion of Dose	BSAF
Di-n-butylphthalate	ND	ND	139	463		0 00075	1			0.10		1	ND	0 00040		
Di-n-octylphthalate	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0.00040		
Fluoranthene	3 E-10	NB	126	NA	3.90E-08	0 00075	1	0 000052		0 10		1	0 13	0 00040	1 00	
Fluorene	ND	NB	124	NA		0 00075	1			0.10		1	ND	0 00040		
Hexachlorobenzene	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
Hexachlorobutadiene	NB	NB	NA	NA	1 83E-06	0 00075	1	0 0000244		0 10		1	0 061	0.00040	1 00	
Hexachlorocyclopentadiene	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
Hexachloroethane	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0.00040		
Indeno(1,2,3-c,d)pyrene	NB	NB	NA	NA	8 12E-06	0.00075	1	0 01083298	0.10790562	0.10	1.00	1	0 108	0 00040	0.00	0 604
Isophorone	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
Naphthalene	ND	ND	3 2	6 4		0 00075	1			0.10		1	ND	0.00040		
Nitrobenzene	NB	ND	NA	1.2		0.00075	1			0 10		1	ND	0.00040		
N-Nitroso-di-N-propylamine	NB	NB	NA	NA		0.00075	1			0 10		1	ND	0 00040		
N-Nitrosodiphenylamine	ND	ND	9 1	91		0 00075	1			0 10		1	ND	0 00040		
Pentachlorophenol	4 E-09	1 E-09	1 8	5 9	7 97E-09	0 00075	1	1 0821E-05	3 9412E-05	0.10	0.37	1	0 02	0 00040	0 83	0.00236
Phenanthrene	NB	NB	NA	NA	1 78E-06	0.00075	1	0 00002372		0 10		1	0 0593	0 00040	1 00	
Phenol	ND	ND	15	30		0 00075	1			0.10		1	ND	0 00040		
Pyrene	2 E-06	1 E-06	1 9	3 2	3 60E-06	0 00075	1	0 000048		0 10		1	0 12	0 00040	1 00	
Total PAHs	NB	NB	NA	NA	8 51E-06	0 00075	1	0 01135056	0 10790562	0 10	0 95	1	1 4	0 00040	0 05	
VOCs																
1,1,1-Trichloroethane	ND	NB	257	NA		0 00075	1			0 10		1	ND	0 00040		
1,1,2,2-Tetrachloroethane	NB	3 E-11	NA	41	1 33E-09	0 00075	1	1 772E-06		0 10		1	0 00443	0 00040	1 00	
1,1,2-Trichloroethane	1 E-09	1 E-10	0 97	11	1 19E-09	0 00075	1	1 586E-06		0 10		1	0 00397	0 00040	1 00	
1,1-Dichloroethane	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
1,1-Dichloroethene	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
1,2-Dichloroethane	4 E-11	2 E-11	17 2	34 4	6 30E-10	0.00075	1	0 00000084		0 10		1	0 0021	0 00040	1 00	
1,2-Dichloroethene (total)	ND	NB	11 2	NA		0 00075	1			0 10		1	ND	0 00040		
1,2-Dichloropropane	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
2-Butanone (MEK)	4 E-12	1 E-12	810	2091	3 09E-09	0.00075	1	0 00000412		0 10		1	0 0103	0 00040	1 00	
2-Hexanone	NB	NB	NA	NA		0.00075	1			0 10		1	ND	0 00040		
4-Methyl-2-pentanone	NB	NB	NA	NA		0.00075	1			0 10		1	ND	0 00040		
Acetone	3 E-09	6 E-10	4 6	23	1 37E-08	0 00075	1	0 00001832		0.10		1	0 0458	0 00040	1 00	
Benzene	ND	ND	6 5	65		0.00075	1			0 10		1	ND	0 00040		
Bromodichloromethane	NB	9 E-11	NA	4 4	3 90E-10	0 00075	1	0.00000052		0.10		1	0.0013	0 00040	1 00	
Bromoform	1 E-10	5 E-11	8 2	16	8 85E-10	0.00075	1	0.00000118		0 10		1	0 00295	0 00040	1 00	
Bromomethane	NB	NB	NA	NA		0.00075	1			0 10		1	ND	0 00040		
Carbon disulfide	ND	NB	2 3	NA		0 00075	1			0 10		1	ND	0.00040		
Carbon tetrachloride	NB	NB	NA	NA		0 00075	1			0.10		1	ND	0 00040		
Chlorobenzene	6 E-11	NB	21	NA	1 61E-09	0.00075	1	2 144E-06		0 10		1	0 00536	0 00040	1 00	
Chloroform	ND	ND	6 9	19		0 00075	1			0 10		1	ND	0 00040		
Chloroethane	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
Chloromethane	NB	NB	NA	NA		0.00075	1			0 10		1	ND	0 00040		
cis-1,3-Dichloropropene	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
Dibromochloromethane	NB	NB	NA	NA	6 00E-10	0 00075	1	0 0000008		0 10		1	0 002	0 00040	1 00	
Ethylbenzene	ND	ND	44	133		0 00075	1			0 10		1	ND	0 00040		
Methylene chloride	4 E-10	4 E-11	2 7	22 9	9 66E-10	0 00075	1	1 288E-06		0 10		1	0 00322	0 00040	1 00	
Styrene	ND	ND	230	460		0 00075	1			0 10		1	ND	0 00040		
Tetrachloroethene	ND	ND	0 35	1 73		0 00075	1			0 10		1	ND	0 00040		
Toluene	3 E-10	3 E-11	6 4	64 3	1 60E-09	0 00075	1	2 398E-06		0 10		1	0 00599	0 00040	1 00	
trans-1,3-Dichloropropene	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
Trichloroethene	ND	ND	0 173	1 732		0 00075	1			0 10		1	ND	0 00040		
Vinyl chloride	NB	NB	NA	NA		0 00075	1			0 10		1	ND	0 00040		
Xylenes (total)	2 E-09	2 E-09	0 62	0 643	1 03E-09	0 00075	1	1 372E-06		0 10		1	0 00343	0 00040	1 00	
Inorganics																
Aluminum, Total	7 E-03	7 E-04	0 487	4 87	3 37E-03	0.00075	1	4 48998678	9 29988778	0.10	0 21	1	8900	0 00040	0 79	$\ln[Al_{bsh}] = -21\ 2593 + 2\ 583\ \ln[Al_{sed}]$
Antimony	6 E-06	6 E-07	0 032	0 32	1 66E-07	0 00075	1	0 0002508		0 10		1	0 627	0 00040	1 00	
Arsenic, Total	3 E-06	NB	1 2	NA	2 93E-06	0 00075	1	0 003906		0 10		1	9 77	0 00040	1 00	
Barium	1 E-05	7 E-06	6 6	9 75	6 60E-05	0 00075	1	0 066		0 10		1	220	0 00040	1 00	
Beryllium	6 E-07	NB	0 3	NA	1 91E-07	0 00075	1	0 0002552		0 10		1	0 638	0 00040	1 00	
Cadmium, Total	1 E-05	1 E-06	0 450	4 5	6 18E-06	0 00075	1	0 00824		0 10		1	20 6	0 00040	1 00	
Calcium	NB	NB	NA	NA	3 60E-03	0 00075	1	4 8		0 10		1	12000	0 00040	1 00	
Chromium, Total	2 E-06	NB	1276	NA	3 18E-06	0.00075	1	0 042419	0.35659	0.10	0 84	1	16 9	0 00040	0 16	0.0211
Cobalt	NB	NB	NA	NA	2 66E-06	0.00075	1	0.003548		0.10		1	8 87	0 00040	1.00	
Copper, Total	3 E-05	2 E-05	7 1	9 18	1 87E-04	0.00075	1	0 24900139	1 57001389	0 10	0 83	1	230	0.00040	0.37	$\ln[Cu]_{bsh} = -1\ 9258 + 0\ 4371\ \ln[Cu]_{sed}$
Iron	NB	NB	NA	NA	6 75E-03	0 00075	1	9		0 10		1	22500	0 00040	1 00	
Lead, Total	2 E-06	2 E-06	3 70	37	8 15E-06	0 00075	1	0 1088273	0 733873	0 10	0 88	1	88 1	0 00040	0 32	0 00833
Magnesium	NB	NB	NA	NA	1 59E-03	0 00075	1	2 116		0 10		1	5290	0 00040	1 00	
Manganese	3 E-06	1 E-06	41 00	132	1 27E-04	0 00075	1	0 1696		0 10		1	424	0 00040	1 00	
Mercury	8 E-06	2 E-06	0 015	0 075	1 26E-07	0 00075	1	0 0001676		0 10		1	0 419	0 00040	1 00	
Molybdenum	3 E-06	3 E-07	0 056	0 56	2 29E-07	0 00075	1	0 0003048		0 10		1	0 762	0 00040	1 00	
Nickel, Total	5 E-06	3 E-06	19 00	37	1 03E-04	0 00075	1	0 1376		0 10		1	344	0 00040	1 00	
Potassium	NB	NB	NA	NA	4 80E-04	0 00075	1	0 64		0 10		1	1600	0 00040	1 00	
Selenium	3 E-04	2 E-04	0 09	0 151	2 92E-05	0 00075	1	0 0388815	0 385595	0 10	0 99	1	0 805	0 00040	0 01	0 479
Silver	2 E-06	2 E-09	10 30	104	1 95E-07	0 00075	1	0 0002612		0 10		1	0 653	0 00040	1 00	
Sodium	NB	NB	NA	NA	4 77E-05	0 00075	1	0 0636		0 10		1	159	0 00040	1 00	
Thallium	ND	ND	0 00	0 034		0 00075	1			0 10		1	ND	0 00040		
Tin	3 E-07	2 E-07	5 80	8 7	1 52E-06	0 00075	1	0 00202		0 10		1	5 05	0 00040	1 00	
Vanadium	9 E-05	9 E-06	0 09	0 892	7 71E-06	0 00075	1	0 01026		0 10		1	25 7	0 00040	1 00	
Zinc, Total	7 E-05	4 E-05	75 0	149	5 56E-03	0 00075	1	7 41654904	51 5654904	0 10	0 70	1	5650	0 00040	0.30	$\ln[Zn]_{bsh} = 2\ 4275 + 0\ 1754\ \ln[Zn]_{sed}$

Appen. -4e

Food Chain Model for River Otter Ingesting Sediment and Fish
Creek Segment F
Dead Creek
Sauget Area I

Compound	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose	LOAEL Benchmark Dose	Overall Exposure Dose mg/kg	Ratio of Forage Area to Site	Time on Site Ratio	Exposure Dose mg/kg/day	Total Conc in Food mg/kg wet	Food Ingestion Rate kg/kg/day	Proportion of Dose	RAF	Sediment[1] Sediment Concentration mg/kg dry	Dry Sediment Ing. Rate kg/kg/day	Proportion of Dose	BSAF
PCBs																
Monochlorobiphenyl	NB	NB	NA	NA	8.31E-10	0.00075	1	1.108E-08		0.10		1	0.00277	0.00040	1.00	
Dichlorobiphenyl	NB	NB	NA	NA		0.00075	1			0.10		1	ND	0.00040		
Trichlorobiphenyl	NB	NB	NA	NA	3.18E-07	0.00075	1	0.0004245	0.00423303	0.10	1.00	1	0.00299	0.00040	0.00	0.84
Tetrachlorobiphenyl	NB	NB	NA	NA	9.35E-06	0.00075	1	0.01247286	0.12468539	0.10	1.00	1	0.0108	0.00040	0.00	6.85
Pentachlorobiphenyl	NB	NB	NA	NA	6.04E-06	0.00075	1	0.00805897	0.08051986	0.10	1.00	1	0.0175	0.00040	0.00	2.73
Hexachlorobiphenyl	NB	NB	NA	NA	7.09E-06	0.00075	1	0.00945191	0.09447472	0.10	1.00	1	0.0111	0.00040	0.00	5.05
Heptachlorobiphenyl	NB	NB	NA	NA	1.57E-06	0.00075	1	0.00209771	0.02094371	0.10	1.00	1	0.00634	0.00040	0.00	1.49
Octachlorobiphenyl	NB	NB	NA	NA	6.41E-07	0.00075	1	0.00085411	0.00851629	0.10	1.00	1	0.0062	0.00040	0.00	0.815
Nonachlorobiphenyl	NB	NB	NA	NA	3.90E-09	0.00075	1	0.0000052		0.10		1	0.013	0.00040	1.00	
Decachlorobiphenyl	NB	NB	NA	NA	4.56E-09	0.00075	1	0.00000608		0.10		1	0.0152	0.00040	1.00	
Total PCBs	3.E-04	2.E-04	0.085	0.17	2.74E-05	0.00075	1	0.03658704	0.36533517	0.10	1.00	1.0	0.08	0.00040	0.00	ln[PCB$_{fw}$/%lipids] = 1.6666 +0.6606 ln(PCB$_{sw}$/%OC)
Dioxins																
1,2,3,4,6,7,8,9-OCDD	NB	NB	NA	NA	7.67E-09	0.00075	1	1.0495E-05	7.6427E-05	0.10	0.73	1	0.00713	0.00040	0.27	0.00636
1,2,3,4,6,7,8-HpCDD	NB	NB	NA	NA	4.05E-09	0.00075	1	5.4034E-06	4.8034E-05	0.10	0.89	1	0.0015	0.00040	0.11	0.019
1,2,3,4,7,8-HxCDD	NB	NB	NA	NA	2.06E-10	0.00075	1	2.747E-07	2.5998E-06	0.10	0.94	1	0.0000393	0.00040	0.06	0.0391
1,2,3,6,7,8-HxCDD	NB	NB	NA	NA	1.81E-09	0.00075	1	2.4143E-06	2.3759E-05	0.10	0.98	1	0.0000959	0.00040	0.02	0.147
1,2,3,7,8,9-HxCDD	NB	NB	NA	NA	3.22E-10	0.00075	1	4.2887E-07	3.8107E-06	0.10	0.89	1	0.000119	0.00040	0.11	0.019
1,2,3,7,8-PeCDD	NB	NB	NA	NA	3.47E-09	0.00075	1	4.6233E-06	4.6007E-05	0.10	1.00	1	0.0000564	0.00040	0.00	0.484
2,3,7,8-TCDD	NB	NB	NA	NA		0.00075	1			0.10		1	ND	0.00040		1.77
Total HpCDD	NB	NB	NA	NA	5.41E-09	0.00075	1	7.2076E-06	6.0676E-05	0.10	0.84	1	0.0028	0.00040	0.16	0.0129
Total HxCDD	NB	NB	NA	NA	6.55E-09	0.00075	1	1.1395E-05	0.00010815	0.10	0.93	1	0.00195	0.00040	0.07	0.0323
Total PeCDD	NB	NB	NA	NA	1.12E-08	0.00075	1	1.4956E-05	0.00014635	0.10	0.98	1	0.000804	0.00040	0.02	0.108
Total TCDD	NB	NB	NA	NA	4.19E-08	0.00075	1	5.5894E-05	0.00054506	0.10	0.98	1	0.00347	0.00040	0.02	0.0932
Furans																
1,2,3,4,6,7,8,9-OCDF	NB	NB	NA	NA	8.12E-08	0.00075	1	0.00010833	0.0010529	0.10	0.97	1	0.0076	0.00040	0.03	0.0822
1,2,3,4,6,7,8-HpCDF	NB	NB	NA	NA	8.04E-09	0.00075	1	8.0523E-06	7.8603E-05	0.10	0.95	1	0.00093	0.00040	0.05	0.049
1,2,3,4,7,8,9-HpCDF	NB	NB	NA	NA	5.63E-10	0.00075	1	7.5049E-07	7.2889E-06	0.10	0.97	1	0.000059	0.00040	0.03	0.0731
1,2,3,4,7,8-HxCDF	NB	NB	NA	NA	2.20E-09	0.00075	1	2.9333E-06	2.8989E-05	0.10	0.99	1	0.000086	0.00040	0.01	0.2
1,2,3,6,7,8-HxCDF	NB	NB	NA	NA		0.00075	1			0.10		1	ND	0.00040		0.0241
1,2,3,7,8,9-HxCDF	NB	NB	NA	NA	1.22E-11	0.00075	1	1.624E-08		0.10		1	0.0000408	0.00040	1.00	
1,2,3,7,8-PeCDF	NB	NB	NA	NA	4.63E-10	0.00075	1	6.4391E-07	6.2207E-06	0.10	0.97	1	0.0000546	0.00040	0.03	0.0876
2,3,4,6,7,8-HxCDF	NB	NB	NA	NA	1.11E-10	0.00075	1	1.4824E-07	1.35E-06	0.10	0.91	1	0.0000331	0.00040	0.09	0.0242
2,3,4,7,8-PeCDF	NB	NB	NA	NA	1.86E-09	0.00075	1	2.4819E-06	2.4586E-05	0.10	0.99	1	0.0000631	0.00040	0.01	0.231
2,3,7,8-TCDF	NB	NB	NA	NA	3.10E-08	0.00075	1	4.1359E-05	0.00041301	0.10	1.00	1	0.000145	0.00040	0.00	1.69
Total HpCDF	NB	NB	NA	NA	3.31E-08	0.00075	1	4.4155E-05	0.00042715	0.10	0.97	1	0.0036	0.00040	0.03	0.0704
Total HxCDF	NB	NB	NA	NA	2.37E-07	0.00075	1	0.00031624	0.00314272	0.10	0.99	1	0.00492	0.00040	0.01	0.379
Total PeCDF	NB	NB	NA	NA	1.98E-07	0.00075	1	0.00026446	0.00264172	0.10	1.00	1	0.000719	0.00040	0.00	2.18
Total TCDF	NB	NB	NA	NA	1.35E-07	0.00075	1	0.00018036	0.00180094	0.10	1.00	1	0.000722	0.00040	0.00	1.48
Dioxin - TEQ	4.E-03	4.E-04	4.8635E-07	4.863E-06	1.75E-09	0.00075	1	2.336E-06	2.2736E-05	0.10	0.97	1.0	0.00016	0.00040	0.03	ln[Total TEQ$_{fw}$/%lipids] = -1.748 + 0.7556 ln[Total TEQ$_{sw}$/%OC]

Notes:
NA=Not available/applicable
NB = Benchmark not available
ND = Not detected
BSAF NA = Biota-Sediment Accumulation Factor not available
Bolded values indicate a Hazard Index greater than 1
Half the detection limit is used for compounds that were not detected

Food Chain Model Components:

$$\text{Hazard Index Estimate} = \frac{[\text{Food Dose}] + [\text{Sediment Dose}]}{\text{Toxicological Benchmark}}$$

Food Ingestion Rate (EPA 1993)

[1]For the sediment component, we convert the food ingestion rate from wet weight to dry weight (invertebrate moisture=80%, plant moisture=70%) and then calculate a sediment ingestion rate from the sediment proportion in the diet (dry weight) *estimated in* Beyer et al. (1994)

Average Fraction Organic Carbon in Segment F Sediments *0.0069*
Average Fraction Lipid in Forage Fish *0.015*