N62604.AR.001331
NCBC GULFPORT
5090.3a

HUMAN HEALTH RISK ASSESSMENT AND SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT OF DIOXINS AND FURANS ASSOCIATED WITH FORMER HERBICIDE ORANGE STORAGE NCBC GULFPORT MS

3/1/2001

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NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MISSISSIPPI

Unit Identification No.: N62604
Contract No.: N62467-89-D-0317/128

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March 2001

FOREWORD

To meet its mission objectives, the U.S. Navy performs a variety of operations, some requiring the use, handling, storage, or disposal of hazardous materials. Through accidental spills and leaks and conventional methods of past disposal, hazardous materials may have entered the environment in ways unacceptable by today's standards. With growing knowledge of the long-term effects of hazardous materials on the environment, the Department of Defense initiated various programs to investigate and remediate conditions related to suspected past releases of hazardous materials at their facilities.

One of these programs is the Installation Restoration (IR) program. This program complies with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA), the Resource Conservation and Recovery Act (RCRA), and the Hazardous and Solid Waste Amendments (HSWA) of 1984. These acts establish the means to assess and clean up hazardous waste sites for both private-sector and Federal facilities.

The Southern Division, Naval Facilities Engineering Command manages and the U.S. Environmental Protection Agency and the Mississippi Department of Environmental Quality oversee the Navy environmental program at Naval Construction Battalion Center (NCBC), Gulfport, Mississippi. All aspects of the program are conducted in compliance with State and Federal regulations, as ensured by the participation of these regulatory agencies.

Questions regarding the delisting petition at NCBC Gulfport should be addressed to Mr. Art Conrad, Code 1865, at (843) 820-5520.

EXECUTIVE SUMMARY

A Human Health and Screening Level Ecological Risk Assessment for the Naval Construction Battalion Center Gulfport (NCBC) was conducted to meet the requirements of the Mississippi Department of Environmental Quality joint Agreed Order No. 3466-97. The purpose of this assessment was to characterize the risks to humans and screening level ecological species associated with potential exposures to dioxins and furans present at, and migrating from, the NCBC. These dioxins and furans are associated with former herbicide orange storage at the NCBC. All dioxin and furan data in this risk assessment are expressed as total tetrachlorodibenzo-p-dioxin (TCDD) toxicity equivalent (TEQ) (See Subsection 3.1.1 for discussion of this topic). Only cancer risks are evaluated for TCDD TEQs for the Human Health Risk Assessment. The Screening level Ecological Risk Assessment focussed on toxicological effects to sensitive aquatic species and their predators.

The only area not evaluated is the swamp area north of Outfall 3. Because of impending litigation concerning this area, it will be evaluated as part of the upcoming Feasibility Study.

This assessment was conducted using data from three sources. First, human and ecological receptors data were gathered during a 6-week Community Survey and Exposure Assessment (CSEA) of the base and the surrounding neighborhoods. The CSEA, conducted in 1996, gathered site-specific data on actual and potential human and ecological exposure pathways to the dioxin in the ditch system.

Second, dioxin concentrations in surface soil, sediment, and surface water were determined in a massive on-base and off-base delineation program conducted in 1997 and 1998. Over 200 environmental samples were collected from surface soil and sediment on base and from sediment in the ditch system leading from the base. Surface water and sediment samples were collected from all drainage pathways as far as Bernard Bayou and Brickyard Creek.

Third, fishing activity data was determined during a Creel study conducted in 1999. Fish tissue collection and analysis was also conducted in 1999. Fish were collected from all drainage areas leading from NCBC.

Every human receptor identified in the CSEA was evaluated in the human health risk assessment. The reasonable maximal exposure, a highly conservative approach required by the U.S. Environmental Protection Agency (USEPA), was assumed for all receptors. On-base receptors evaluated include: on-base residents (present and future hypothetical), on-base visitors and trespassers, three different types of base workers, and fishers. Off-base receptors include: residents (present and future), off-base visitors and trespassers, three types of workers, and fishers.

There are no unacceptable risks (cancer risk greater than one in a million lifetime) to any off-base receptors evaluated in this risk assessment. A human coming into contact with the ditch sediments does not represent an unacceptable risk. Fishing and consumption of fish caught in the ditch system also does not represent an unacceptable cancer risk.

There are no unacceptable risks in the residential areas on base. Some areas of the base, if developed as residential areas, could represent an unacceptable risk to residential receptors. However, this situation does not currently exist, and due to the ongoing military activity in the areas, it is unlikely to exist in the future.

Exposure to some areas of the base, particularly the site 8 vicinity and several areas of the ditch system, could represent unacceptable cancer risks to long-term workers, residents, and trespassers. This is especially true if Site 8, as it now exists, were opened for unrestricted access.

Ecological receptors evaluated include rare, endangered, and threatened species. Also evaluated were fish, invertebrates, amphibians, aquatic plants, and semi-aquatic wildlife (raccoons, piscivorous birds, and mink). The screening level ecological risk assessment characterized risks by comparing TCDD TEQs derived from surface water and sediment analytical data to screening level benchmarks protective of sensitive species such as fish. Food chain modeling was also used to estimate exposures to wildlife that may consume contaminated aquatic prey. The estimated exposures for wildlife were then compared to threshold effect doses to determine if these receptors were at risk. Fish tissue TCDD TEQ levels, although not predicted to adversely affect fish populations, were sufficiently elevated to represent a potential risk to sensitive mammals and birds that feed primarily on fish.

Based on USEPA guidance, one of three possible courses of action may be chosen following the screening level ecological risk assessment (ERA). The three possible actions are (1) no further action, (2) conduct a baseline ERA, with one of the first steps being to reevaluate the conservative assumptions used in the screening level ERA, or (3) undertake a remedial action. Based on Navy policy on conducting ERAs, if further action is required after the screening level ERA, the first step is to reevaluate the screening level ERA assumptions (Step 3a of the Navy policy). The results of the screening level ERA indicate that the conservative exposure assumptions of the screening level ERA should be reevaluated.

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GLOSSARY

% UCL	percent Confidence Limit
ABB-ES	ABB Environmental Services, Inc.
AO	Agreed Order
BCF	bioconcentration factor
BMP	Biological Monitoring Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
COPC	chemical of potential concern
CSEA	Community Survey and Exposure Assessment
CSF	cancer slope factor
CT	central tendency
2,4-D	2,4-dichlorophenoxyacetic acid
DNA	deoxyribonucleic acid
DQO	Data Quality Objective
ELCR	excess lifetime cancer risk
EPC	exposure point concentration
ERA	Ecological Risk Assessment
FDA	Food and Drug Administration
g/m^3	gram per cubic meter
goc	gram organic carbon
HSWA	Hazardous and Solid Waste Amendments
HCOPC	
HEAST	Health Effects Assessment Summary Tables
HLA	Harding Lawson Associates
HO	herbicide orange
HQ	Hazard Quotient
IR	Installation Restoration
kg/mg	kilograms per milligram
K_{oc}	organic carbon partition coefficient
K_{ow}	octanol-water partition coefficient
ℓ/goc	liters per gram organic carbon
LOAEL	lowest observed adverse effect level
µg/kg	micrograms per kilogram
µg	micrograms
MDWFP	Mississippi Department of Wildlife, Fisheries, and Parks
m^3/kg	cubic meters per kilogram

mg/day	milligrams per day
mg/kg	milligrams per kilogram
mg/kg-day	milligrams per kilograms-day
MS/MSD	matrix spike and matrix spike duplicate
MSDEQ	Mississippi Department of Environmental Quality
NCBC	Naval Construction Battalion Center
NCP	National Oil and Hazardous Substances Contingency Plan
NFESC	Naval Facilities Engineering Service Center
ng/goc	nanogram per gram organic carbon
NOAEL	no observed adverse effect level
PCB	polychlorinated biphenyl
PCDF	polychlorinated dibenzofuran
PEF	Particulate Emission Factor
pg/ℓ	picograms per liter
ppb	parts per billion
ppm	parts per million
ppt	parts per trillion
QA/QC	quality assurance and quality control
QC	quality control
RBC	Risk-Based Concentration
RfD	reference dose
RGO	remedial goal option
RI/FS	Remedial Investigation/Feasibility Study
RME	reasonable maximum exposure
SARA	Superfund Amendments and Reauthorization Act
SCM	site conceptual model
SQL	sample quantitation limit
SRT	sediment recovery trap
2,4,5-T	2,4,5-trichlorophenoxyacetic acid
TCDD	tetrachlorodibenzo-p-dioxin
TEF	toxic equivalency factor
TEQ	toxicity equivalency quotient
TOC	total organic carbon
UCL	Upper Confidence Limit
USAF	U.S. Air Force
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound

CHAPTER 1.0

1.0 INTRODUCTION

On February 14, 1996, the Mississippi Department of Environmental Quality (MSDEQ) issued Administrative Orders No. 3193-96 and 3194-96 to the U.S. Navy and the U.S. Air Force (USAF), respectively. In 1997, the Administrative Orders, replaced by a joint Agreed Order (AO) No. 3466-97, "set in place a focused yet comprehensive strategy to be implemented for the further delineation and, if warranted, environmental remediation of the dioxin and/or dioxin-related contamination attributable to the prior storage and handling of herbicide orange on NCBC Gulfport that may now be present in surface soils, sediment, and/or groundwater on, beneath, or in proximity to, that facility."

This human health risk assessment and screening level ecological risk assessment has been conducted in response to Sections D and E of the AO. The risk assessment closely follows U.S. Environmental Protection Agency (USEPA) guidance to meet the intent of the AO with regard to evaluating the risks associated with exposure to herbicide orange- (HO-) related chemicals. The media evaluated are sediments, surface water, and surface soil. HO-related chemicals in groundwater were evaluated in the *Groundwater Monitoring Report, Naval Construction Battalion Center (NCBC), Gulfport, Mississippi* (Harding Lawson Associates [HLA], 1999a).

The remainder of this document is divided into the following chapters:

- Chapter 2.0 provides a brief description of the HO storage site and a synopsis of the investigations that produced the analytical data utilized in this analysis.

- Chapter 3.0 provides an overview of the methodology and the results of the human health risk assessment, including remediation goal options for surface soil and sediment.

- Chapter 4.0 provides the methodology and results of the screening level ecological risk assessment.

- Chapter 5.0 provides conclusions and recommendations resulting from the human health risk assessment and screening level ecological risk assessment.

2.0 NCBC SITE AND INVESTIGATION HISTORY

2.1 SITE HISTORY. NCBC Gulfport is located in the western part of the city of Gulfport, in Harrison County, Mississippi (Figure 2-1). The base occupies 1,100 acres approximately 2 miles north of the Gulf of Mexico and 1 mile west of U.S. Highway 49. The primary mission of NCBC is the support of four battalions of the Naval Construction Force and the storage and maintenance of pre-positioned War Reserve Material. The base has approximately 4,000 military personnel assigned to it along with 1,600 civilian dependents and civilian employees.

2.2 HERBICIDE ORANGE STORAGE AREA. Between 1968 and 1977, a 25-acre area on NCBC was used as a storage depot for HO prior to its shipment to Vietnam. According to U.S. Air Force (USAF) records, approximately 850,000 gallons of HO, contained in 55-gallon drums, was stored on the site. Pictures of the storage operation show that the HO drums were placed on their sides, in stacks of three, and stored in the open. Interviews with workers at NCBC Gulfport indicated that spills and drum ruptures were commonplace and, although there were efforts to re-drum the HO, a significant amount of HO was lost at the site.

2.3 PREVIOUS INVESTIGATIONS AND SITE 8 REMEDIATION. During the 1980s, the USAF conducted aggressive remediation activities at Site 8. The site was divided into three areas; designated as A, B, and C (Figure 2-2). These investigations showed that extensive areas of Site 8 were contaminated with dioxin, some at very high dioxin levels (greater than 260 parts per million [ppm]). Between 1986 and 1988 the USAF excavated and incinerated on site all Site 8 soil containing dioxin at concentrations of 1 parts per billion (ppb) or greater. The resulting ash piles, placed back on the site, were later demonstrated to contain only very low levels (70 parts per trillion [ppt]) of dioxin (ABB Environmental Services, Inc. [ABB-ES], 1997a).

Dioxin migration off NCBC was confirmed in 1995 during a base-wide sediment-sampling episode that also discovered dioxin-contaminated sediment in several northern drainage outfalls. Localized dioxin sampling and remediation along 28th Street and Outfalls 1, 3 North, and 4 North was accomplished during a construction project conducted during late 1995. Part of the remediation activities during this construction project involved air monitoring during excavation activities (ABB-ES, 1995a and 1995b). The air monitoring indicated the possibility that dioxin-contaminated soil could become airborne if disturbed.

2.3.1 Community Survey and Exposure Assessment In addition to the Human Health and Ecological Risk Assessment, Section D of the AO required a Community Survey and Exposure Assessment (CSEA) of the base and the surrounding neighborhoods. In response to community concerns, and to gather

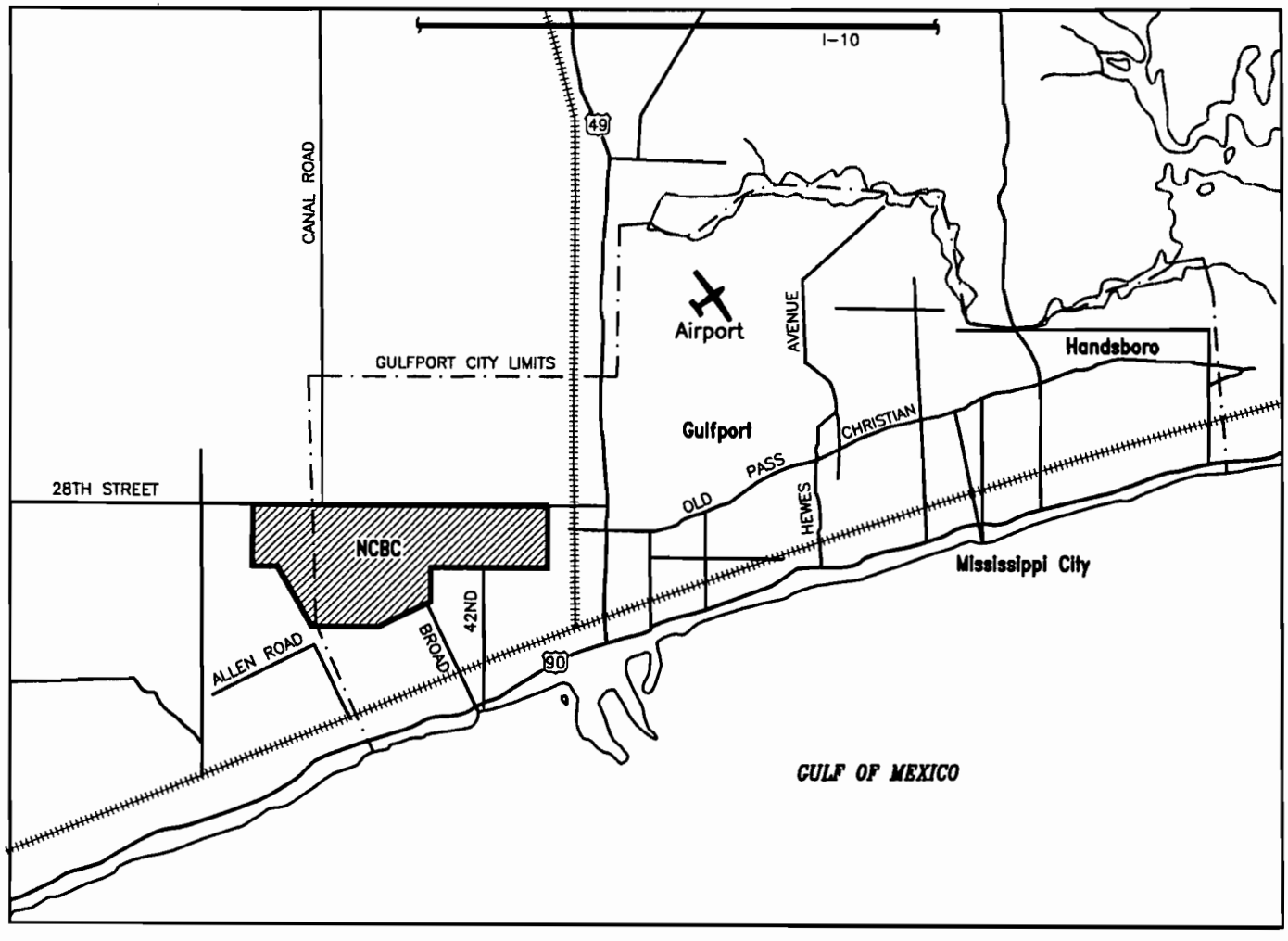

FIGURE 2-1
NCBC GULFPORT VICINITY MAP

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HUMAN HEALTH RISK ASSESSMENT AND SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT OF DIOXINS AND FURANS ASSOCIATED WITH FORMER HERBICIDE ORANGE STORAGE

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site-specific data on potential human exposure pathways to the dioxin in the ditch system, NCBC Gulfport conducted the 6-week CSEA in the latter part of 1996 and the final report was submitted to MSDEQ in 1997 (ABB-ES, 1997b).

During the CSEA, more than 1,700 homes in the vicinity of the base were visited and information was collected from more than 800 residents. The survey area is shown in Figure 2-3. The data from the CSEA was used to help develop the exposure assessment portion of this risk assessment.

2.3.2 Surface Water and Sediment Delineation Sections A and F of the AO require that a full delineation of the on-site and off-site dioxin contamination be conducted prior to developing remediation plans. This action provided the majority of the analytical data used to support this Human and Ecological Risk Assessment. The surface water and sediment delineation was conducted in two parts (Phases I and II) between 1997 and 1999 (HLA, 1999a).

2.3.2.1 Phase I Phase I was conducted during April and May 1997. The primary objective was to identify and delineate environmental media (sediment, surface water, soil, and groundwater) that may be impacted by dioxin resulting from either the storage of HO at NCBC or migration off Site 8. To better satisfy the requirements of the AO, the Phase I study was divided into on-base delineation and off-base delineation.

The on-base delineation focused on evaluating the drainage areas impacted by the migration of dioxin-contaminated sediments, assessing the extent of the dioxin contamination, and delineating the levels of dioxin in the drainage areas. Phase I characterized the extent of surface soil dioxin contamination at Site 8. Other potential point sources such as two landfills open during the HO storage period (Installation Restoration [IR] Sites 4 and 5) and alternate storage areas around Site 8 were also studied in Phase I.

Based on a prior hydrologic assessment of NCBC, the base was divided into six different surface water drainage areas (Numbered 1 to 6). These areas are presented in Figure 2-4. Sediment samples were collected from all six drainage areas. Because previous investigation results had shown a strong correlation between dioxin concentrations and total organic carbon (TOC) (ABB-ES, 1995c and 1996a), the sampling methodology focused on a biased sampling of sediments from low-energy (organic-rich) environments.

Although a prior study at NCBC had demonstrated that dioxin was not significantly dissolved in surface water (ABB-ES, 1995d), this media was evaluated in Phase I. Surface water samples were collected at 10 percent of the sediment sampling locations. During the Phase I investigation, two seeps leading from landfills active during the HO-storage period (IR Sites 4 and 5) were identified. Two water samples were collected from Site 4 seeps. No seep samples were collected from Site 5 due to a prolonged period without significant precipitation resulting in no flowing seeps. To characterize the extent of dioxin contamination at Site 8, surface soil samples on and around the former storage areas were collected.

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The off-base delineation was designed to assess the extent of dioxin contamination and delineate the levels of dioxin in these drainage areas. The AO required the study include all drainage features leading from NCBC, specifically naming Canal Number 1, Turkey Creek, Brickyard Creek, and Bernard Bayou. Figure 2-5 presents these off-base drainage areas. The off-base delineation focused only on sediment and surface water in the drainage areas. Again, surface water samples were collected at only 10 percent of the sediment sampling locations. No surface soils were collected for the off-base delineation. Sediment is material in drainage ditches or channels that is intermittently covered by water. Sediment includes material that has been deposited by water on the sides of drainage channels. Soil is material outside drainage ditches or channels that is virtually continuously exposed to the atmosphere.

A total of 157 sediment samples were collected from on-base and off-base sample locations. Thirty-three surface soil samples were collected at Site 8 and six surface soil samples were collected from other on-base sites. Seven groundwater samples were collected; four from Site 4 and three from Site 5. Seventeen surface water samples were collected from on- and off-base locations, and two seep samples were collected from the western edge of Site 4.

All sediment, surface water, groundwater, and seep samples were analyzed for 2,3,7,8-substituted polychlorinated dibenzo-p-dioxins and dibenzofurans using USEPA SW-846, Method 8290. The Phase I report was submitted in 1998 (ABB-ES, 1998a). The analytical results are provided in Appendix A.

2.3.2.2 Phase II The objective of Phase II was to better delineate areas identified in Phase I with either high dioxin concentrations or highly variable dioxin concentrations. Only sediment samples were collected in Phase II. TOC analysis was employed to help refine delineation areas with high dioxin concentration variability.

Phase II concentrated on three areas on base and three areas off base. The on-base areas were Drainage Areas 1, 2, and 5 (Figures 3-1, 3-2, and 3-3 in Appendix C). The off-base areas were the Outfall 3 Swamp, Bernard Bayou, and Brickyard Bayou (Figures 3-4, 3-5, and 3-6 in Appendix C).

The Phase II report was submitted in 1999 (HLA, 1999a). A more complete discussion of the analytical results used in this risk assessment are provided in Section 3.1. The analytical results are provided in Appendix A.

2.3.3 Creel Study A Creel study was conducted at the NCBC in Gulfport, Mississippi during the period January through April 1999 to determine the fish species most likely consumed by humans on and around the base. The study results also helped guide fish collection conducted as part of the Biological Monitoring Plan (BMP) (ABB-ES, 1998b). The Creel study confirmed earlier CSEA results that humans are consuming fish collected from the ditch system around NCBC (Figure 2-6). The study recommended the BMP attempt to

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collect several members of the Sunfish (*Centrarchidae*) and Catfish (*Ictaluridae*) families. Additional families sampled may include Perch (*Percidae*), and Temperate bass (*Percichthyidae*). There was no evidence of consumption of crayfish (*Procambrus sp.*) collected from the ditch system and the study recommended that this species not be further evaluated. Figure 2-7 shows off-base fishing areas.

2.3.4 Biological Sampling Events Fish tissue samples were collected during two sampling rounds conducted in March and August 1999. A total of 56 whole body and fish fillet samples were obtained and analyzed during the fish-sampling program. The fillet fish data were collected specifically for the Human Health Risk Assessment. Eight biological sampling locations were selected based on the results of the CSEA and the Creel study. The sampling locations are discussed in Subsection 4.3.4. Briefly, the eight sampling locations included Outfall 3 (BIO-1), Canal 1 (BIO-2), Turkey Creek (BIO-3, BIO-4, and BIO-5), Bernard Bayou (BIO-6), and Brickyard Creek (BIO-7 and BIO-8).

Table B-1 of Appendix B provides a summary of the fish samples collected during this program. Sampling methodologies and a summary of the fish samples obtained during these events are provided in two Ecological Sampling Services reports prepared by C^2 Environmental Services and included in Appendix B.

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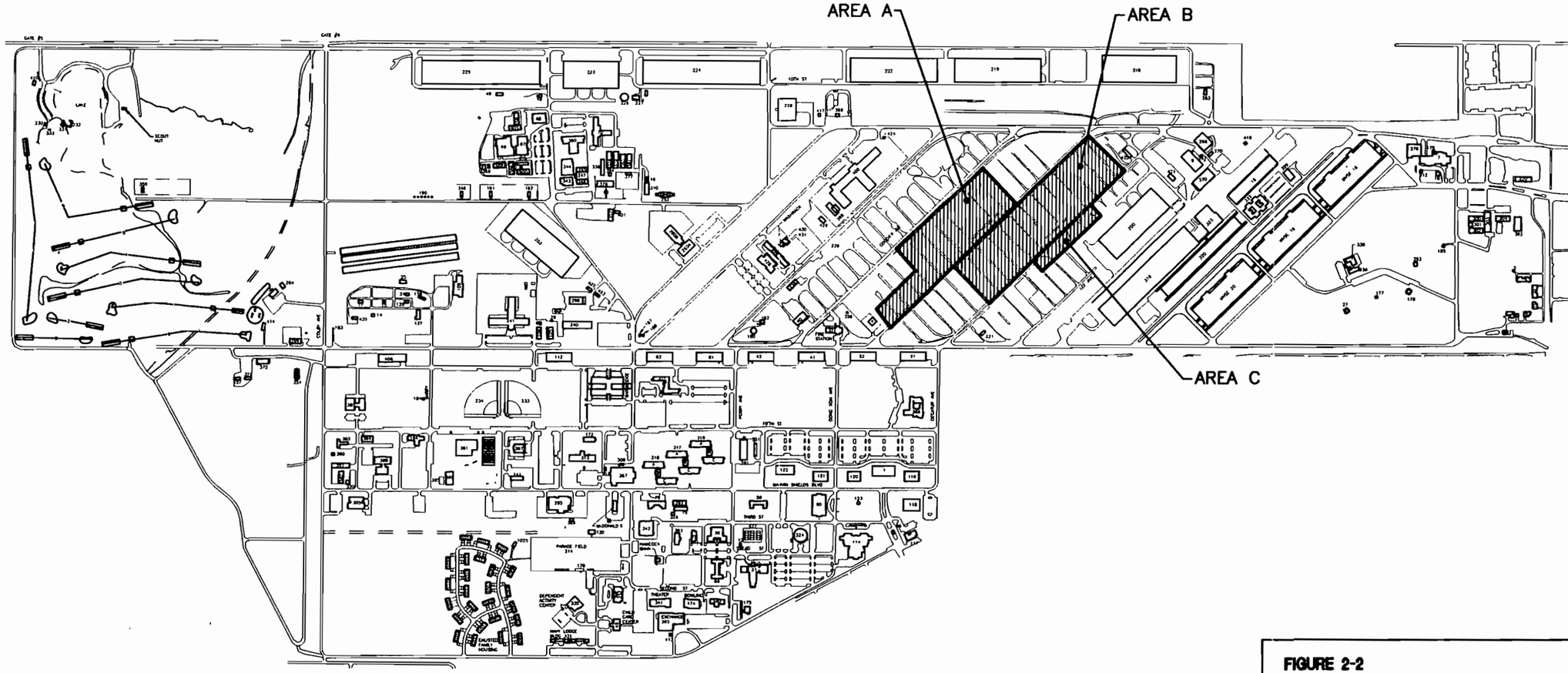

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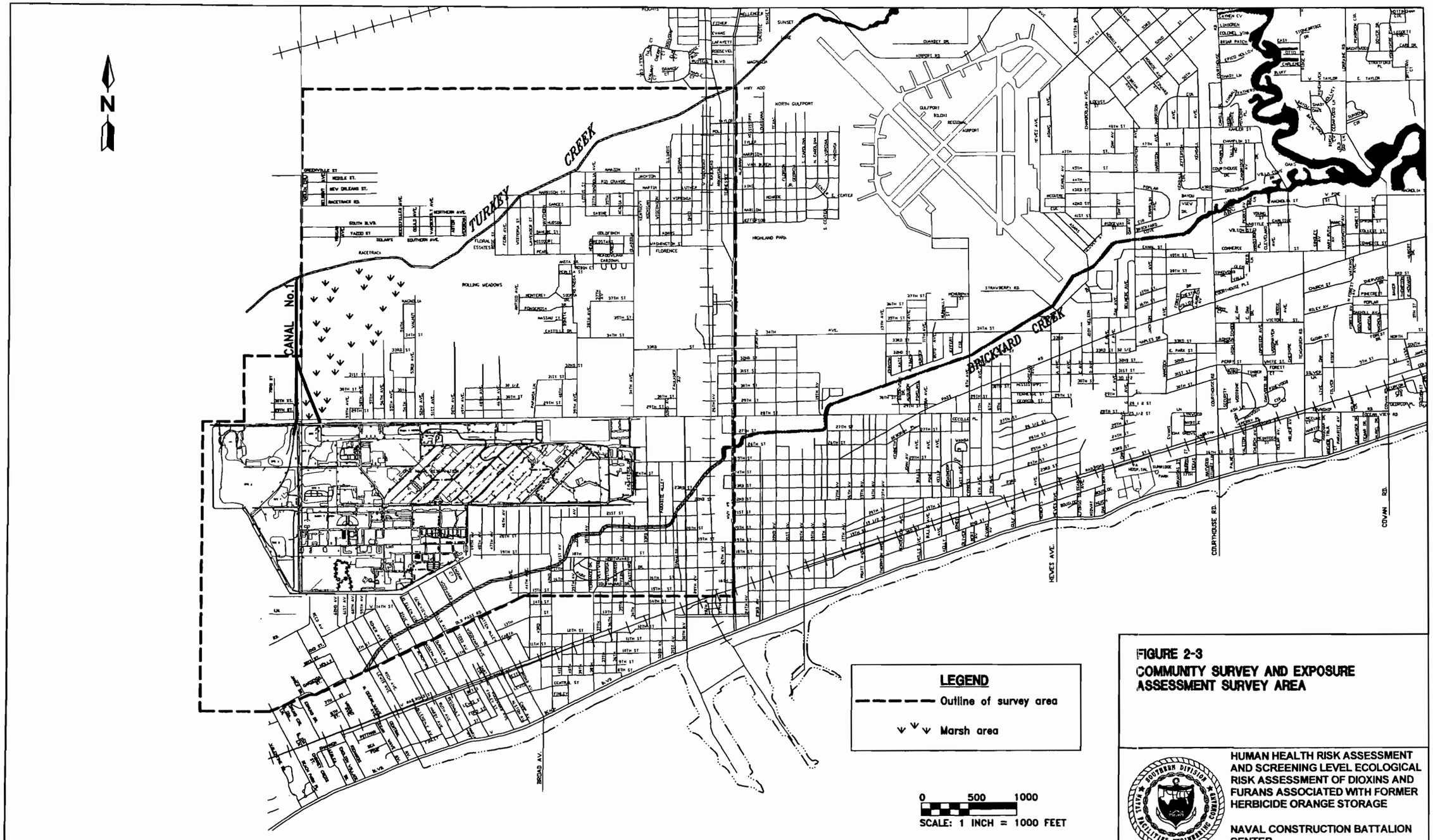
FIGURE 2-2
FORMER HERBICIDE ORANGE STORAGE AREA

HUMAN HEALTH RISK ASSESSMENT AND SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT OF DIOXINS AND FURANS ASSOCIATED WITH FORMER HERBICIDE ORANGE STORAGE

NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI



C:\DWG\HLA\44238\0254035\COMMUNITY SURVEY\DMF\000323

FIGURE 2-3
COMMUNITY SURVEY AND EXPOSURE ASSESSMENT SURVEY AREA

HUMAN HEALTH RISK ASSESSMENT AND SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT OF DIOXINS AND FURANS ASSOCIATED WITH FORMER HERBICIDE ORANGE STORAGE

NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI

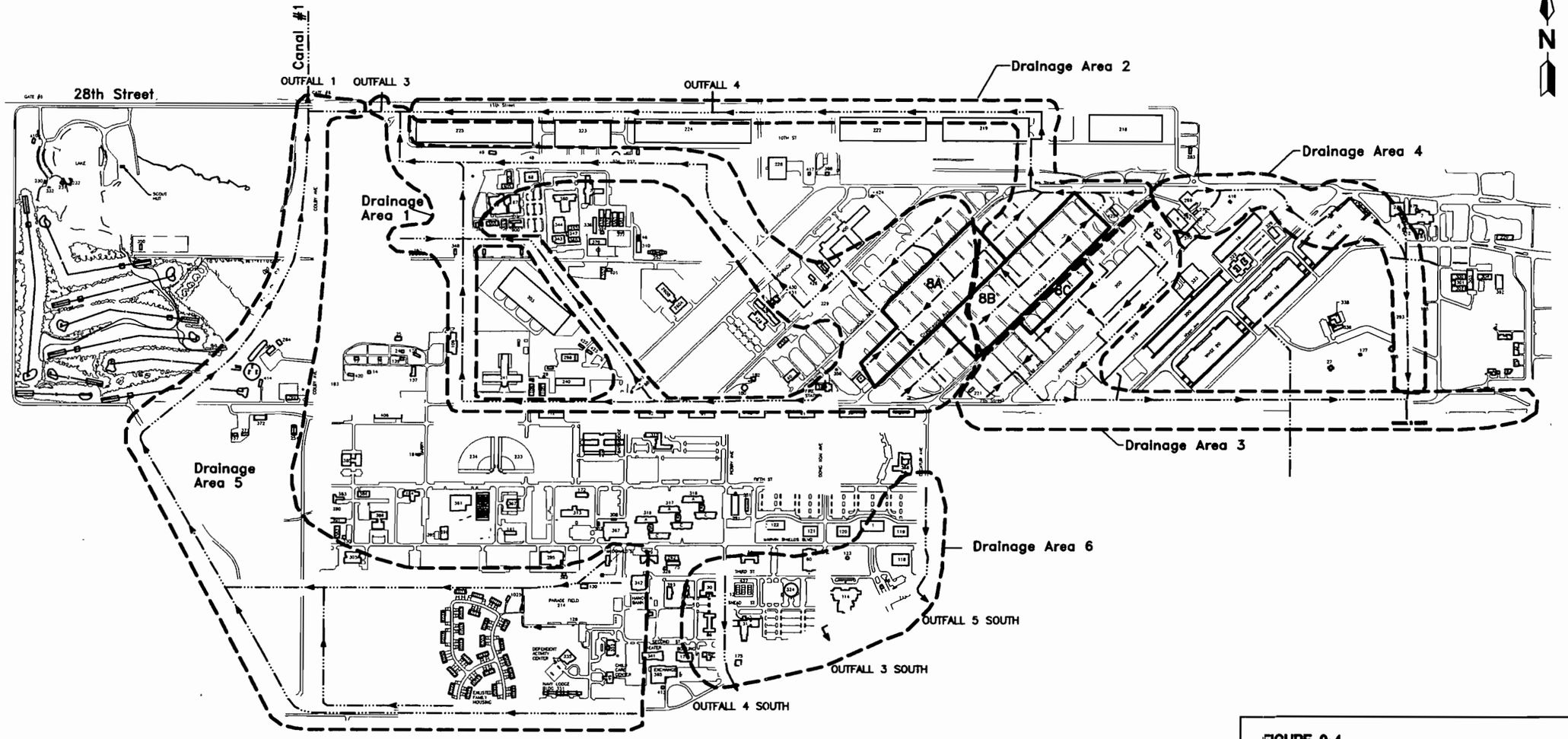


FIGURE 2-4
ON-BASE DRAINAGE AREAS

HUMAN HEALTH RISK ASSESSMENT AND SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT OF DIOXINS AND FURANS ASSOCIATED WITH FORMER HERBICIDE ORANGE STORAGE

NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI

C:\DWG\HLA\44236\0254035\DRAINAGE 1-6\DMF\000320

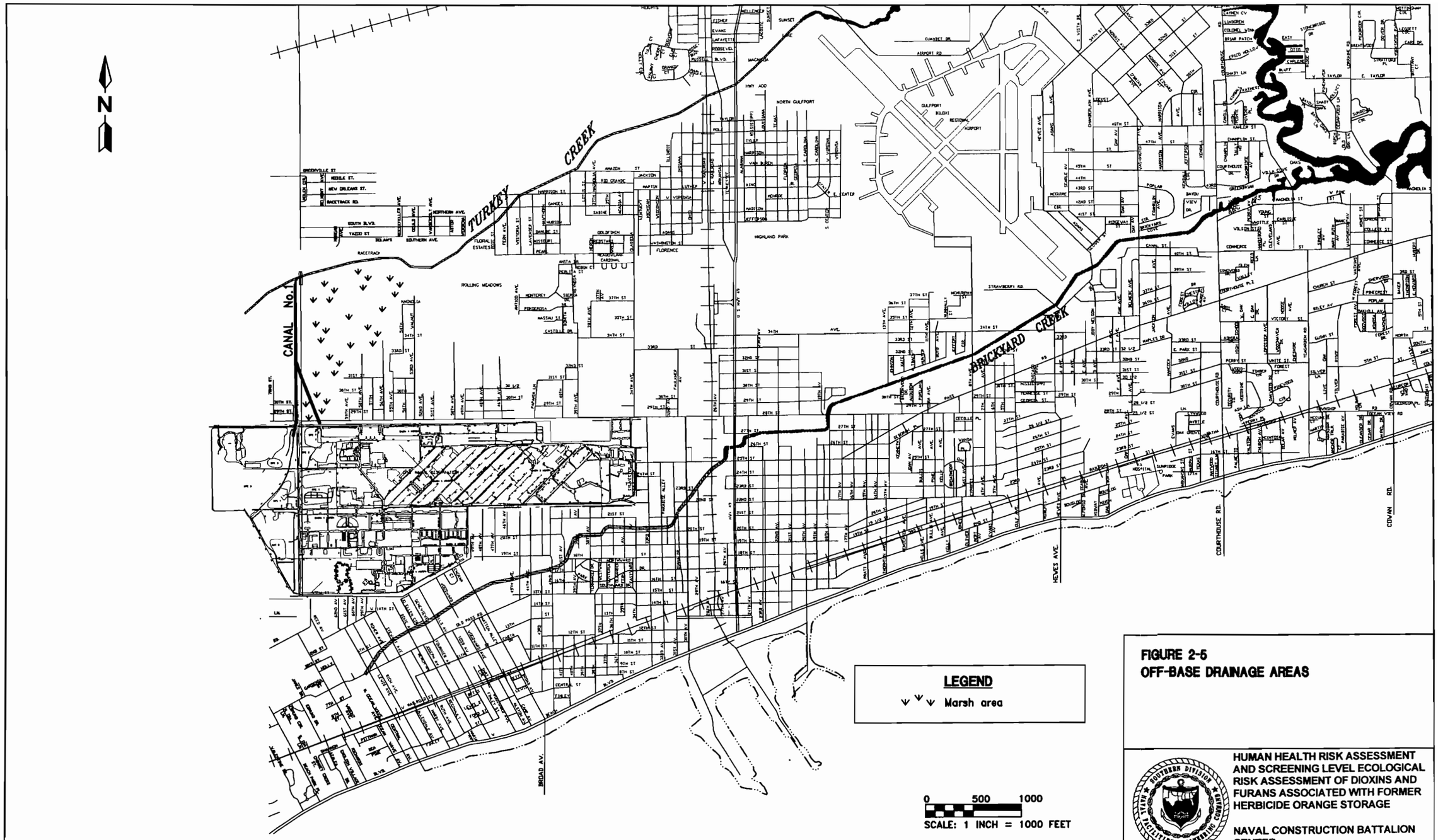


FIGURE 2-5
OFF-BASE DRAINAGE AREAS

HUMAN HEALTH RISK ASSESSMENT AND SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT OF DIOXINS AND FURANS ASSOCIATED WITH FORMER HERBICIDE ORANGE STORAGE

NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI

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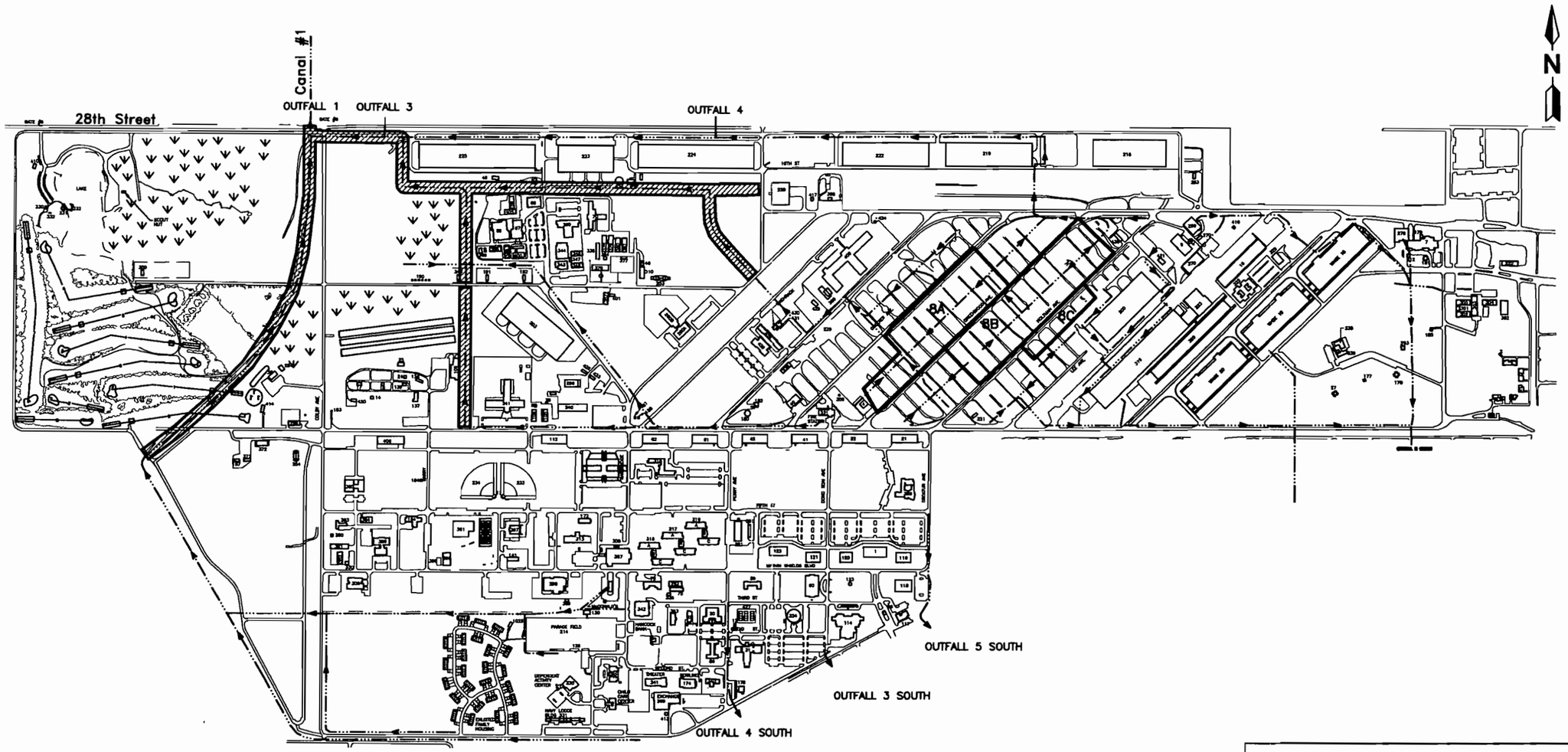
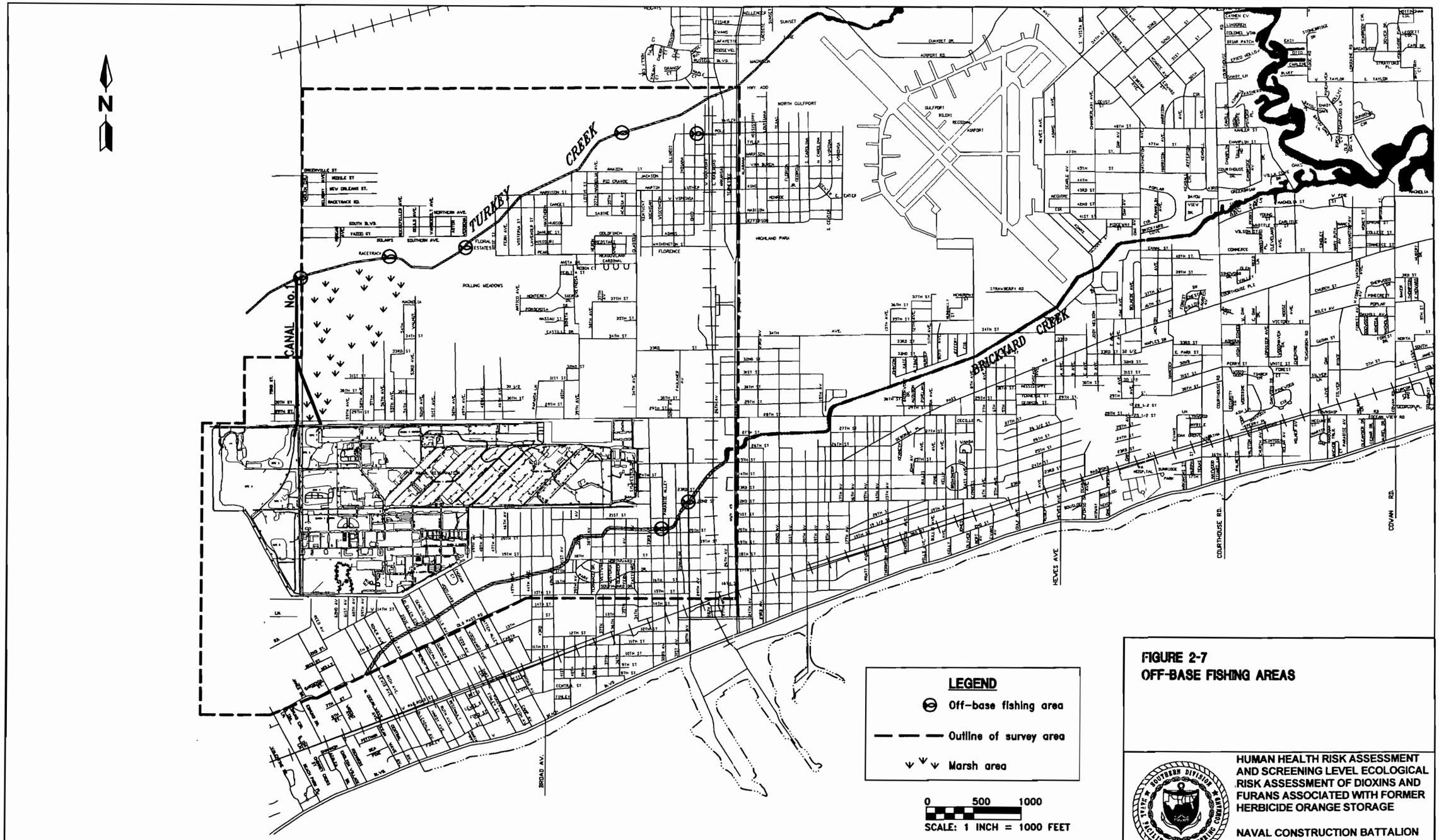


FIGURE 2-6
ON-BASE FISHING AREAS

HUMAN HEALTH RISK ASSESSMENT AND SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT OF DIOXINS AND FURANS ASSOCIATED WITH FORMER HERBICIDE ORANGE STORAGE

NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI

C:\DWG\HLA\44236\0254035\ON-BASE FISH\DMF\000323



C:\DWG\HLA\44236\0254035\OFF-BASE FISH\DMF\000322

FIGURE 2-7
OFF-BASE FISHING AREAS

HUMAN HEALTH RISK ASSESSMENT AND SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT OF DIOXINS AND FURANS ASSOCIATED WITH FORMER HERBICIDE ORANGE STORAGE

NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI

3.0 HUMAN HEALTH RISK ASSESSMENT

This risk assessment is conducted in accordance with USEPA risk assessment guidance documents, including:

- USEPA's *Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A)* (USEPA, 1989a);
- Guidance for Data Usability in Risk Assessment (Part A), Final (USEPA, 1992a);
- Region IV Risk Assessment Guidance (USEPA, 1995a); and
- Specific risk assessment guidance documents and directives (USEPA, 1991a, 1991b, 1992b, 1992c, and 1997a).

The risk assessment is conducted to determine if contamination at NCBC poses potential health risks to individuals under current and/or foreseeable future site conditions. The standard risk assessment process consists of seven steps. They are data evaluation, identification of chemical of potential concern (COPC), an exposure assessment, a toxicity assessment, risk characterization, an uncertainty analysis, and calculation of remedial goal options (RGOs).

This risk assessment is organized along these seven steps with a brief technical discussion presented in the front of each section. Section 3.1 covers Data Evaluation, Section 3.2 explains COPC selection, Section 3.3 describes the Exposure Assessment, Section 3.4 is the Toxicity Assessment, Section 3.5 provides the Risk Characterization results, Section 3.6 analyzes uncertainties, and Section 3.7 presents the RGO calculations.

3.1 DATA EVALUATION. This first step in the data evaluation process is to determine if the analytical data collected is sufficient for use in a risk assessment. The USEPA allows the use of only the highest quality data (USEPA Levels C and D) in a risk assessment (USEPA, 1989a). This requirement is satisfied because all the data in this risk assessment is all USEPA Level D data.

The next steps in the data evaluation process are to sort the data by medium; review analytical methods, analytical quantitation limits and data qualifiers and codes; and select a final data set. This risk assessment, however, focuses only on HO-related chemicals, including 2,3,7,8-substituted dibenzo-p-dioxins and dibenzofurans. Prior to data evaluation of these chemicals, a special step, called the USEPA Tetrachlorodibenzo-p-dioxin (TCDD) Toxic Equivalency Approach (USEPA, 1989b), must be applied. This step is described below.

3.1.1 The TCDD Toxic Equivalency Factor (TEQ) Approach The analytical methodology for detecting 2,3,7,8-substituted dibenzo-p-dioxins and dibenzofurans

in soil and sediment (USEPA Method 8290) actually detects a total of 75 tetra- through octa-chlorinated dioxin and furan congeners. However, only those 17 congeners with chlorine substitutions at molecular positions 2, 3, 7, and 8 are of toxicological importance. In addition, there are significant differences in the toxicity of the different 2,3,7,8-substituted dioxins and furans. Some are far more toxic than others. A simple presentation of the detected concentrations of all congeners is insufficient to adequately assess the potential toxicological effects associated with exposure to a complex mixture of these compounds (USEPA, 1989b).

To address this problem, the USEPA developed a method that reasonably estimates the toxicity of each congener by assigning a toxic equivalency factor (TEF). This value was based upon both toxicology data and structure-activity studies on the toxic mechanism of dioxin (USEPA, 1989b). These studies showed 2,3,7,8-TCDD to be the most toxic of all the different congeners and it was assigned a TEF of 1. All other 2,3,7,8-substituted congeners were less toxic and were assigned a TEF relative to TCDD. Those congeners without substitutions at molecular positions 2, 3, 7, and 8 were considered non-toxic, at least in terms of carcinogenic potency, and assigned a TEF of zero. The TEFs for the various dioxin and furan congeners are provided in Table 3-1.

Applying the TEF to the analytical results of the various dioxin and furan congeners provides an expression of an equivalent amount of 2,3,7,8-TCDD. This is termed the TCDD TEQ. For example, the TCDD TEQ of a sample with 100 ppt of 2,3,7,8-pentachloro-*p*-dioxin is 50 ppt since the TEF for congener is 0.5 (100×0.5 = 50). This process is repeated for all 2,3,7,8-substituted dioxin and furan congeners detected in a sample, and the sum of all these values is called the total TCDD TEQ. All dioxin and furan data in this risk assessment are total TCDD TEQs.

3.1.2 Data by Media A thorough discussion of all data collection activities is provided in the Surface Water and Sediment Delineation Report (HLA, 1999a). Appendix A provides analytical data resulting from Phase I and Phase II delineation activities. The Surface Water and Sediment Delineation Report (HLA, 1999a) also discuss the extensive quality assurance/quality control (QA/QC) procedures involved with dioxin and furan sampling and analysis. All environmental samples and associated quality control (QC) samples (including source blanks, rinsate blanks, field duplicates, and matrix spike and matrix spike duplicate [MS/MSD] samples) were collected in accordance with the procedures outlined in the On-Site and Off-Site Delineation Work Plans (ABB-ES, 1996a and 1996b).

For this risk assessment, all analytical samples were divided into sediment, surface soil, and surface water, and biota. Surface soil samples were further divided in Site 8 and non-site 8 data. Sediment data were further divided into on base and off base. HO-related chemicals in on-base groundwater were evaluated in the *Groundwater Monitoring Report, NCBC Gulfport, Mississippi* (HLA, 1999a) and no significant concentrations were found. The offbase Outfall 3 area is proposed as a Brownfield site. Off-base

Table 3-1
USEPA Dioxin and Furan Toxic Equivalency Factors

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Congener	Toxic Equivalency Factor
Dioxins	
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1
Other TCDDs	0
2,3,7,8-Pentachloro-p-dibenzodioxin (PeCDD)	0.5
Other PeCDDs	0
2,3,4,7,8-Hexachloro-p-dibenzodioxin (HxCDD)	0.1
Other HxCDDs	0
1,2,3,4,6,7,8-Heptachloro-p-dibenzodioxin (HpCDD)	0.01
Other HpCDDs	0
Octachloro-p-dibenzodioxin (OCDD)	0.001
Furans	
2,3,7,8 - Tetrachloro-p-dibenzofuran (TCDF)	0.1
Other TCDFs	0
2,3,7,8 - Pentachloro-p-dibenzofuran (PeCDF)	0.05
Other PeCDFs	0
2,3,7,8 - Hexachloro-p-dibenzofuran (HxCDF)	0.1
Other HxCDFs	0
2,3,7,8 - Heptachloro-p-dibenzofuran (HpCDF)	0.01
Other HpCDFs	0
Octachlorodibenzofuran (OCDF)	0.001

Source: Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-Dioxins and -Dibenzofurans and 1989 Update (USEPA, 1989b).

Note: USEPA = U.S. Environmental Protection Agency.

groundwater samples will be collected and evaluated according to procedures established in the *Risk Evaluation Procedures for Voluntary Cleanup and Redevelopment of Brownfield Sites - Subpart II.*

3.1.3 Analytical Methods The analytical methodology utilized to measure dioxin/furan, herbicides, and TOC were validated to Naval Facilities Engineering Service Center (NFESC) Level D Data Quality Objectives (DQOs). Level D data validation was performed by evaluating conformance to QC criteria established for each analytical method in conjunction with the USEPA CLP National Functional Guidelines for Organic Data Review (1994a), where applicable. The analytical data were further evaluated for usability in the quantitative risk assessment by evaluating quantitation limits, evaluating qualified and coded data, comparing concentrations detected in samples to concentrations detected in blanks. An in-depth discussion of the analytical methodology and QA/QC process is presented in the Surface Water and Sediment Delineation Report (HLA, 1999a).

3.1.4 Quantitation Limits An analysis of the sample quantitation limits (SQLs) is necessary to assure that analytes were not overlooked due to the inability of the laboratory to detect them. This is especially important for analytes not detected in any sample. This analysis is conducted by comparing the SQLs for soils and sediments to the USEPA Region III Risk-Based Concentration (RBC) values. Surface water SQLs were evaluated using the USEPA Region IV Water Quality Standards (USEPA, 1996a) or USEPA Primary and Secondary Drinking Water Standards (USEPA, 1996b). Analyte-specific SQLs that are above RBCs are identified so that they can be discussed in the uncertainty analysis.

3.1.5 Data Codes and Qualifiers Both the laboratory and data validators may assign qualifiers to analytical results. The qualifiers assigned by the data validators supersede the laboratory qualifiers. In this risk assessment, all positive detections, including those with the "J" (estimated) qualifier were considered detected concentrations. The analytical data for analytes detected in some, but not all media, were also retained in the risk assessment data set. Analytes not detected in a media were not retained in the risk assessment. Sample results with an "R" (rejected) validation qualifier were eliminated from the risk assessment data set because QC indicated that the result is unusable.

3.1.6 Final Data Set The Data Evaluation process results in a data set that is usable for the remainder of the risk assessment. This data set has undergone a rigorous QA/QC process to provide the best foundation for the subsequent risk analysis.

3.2 COPC SELECTION. In this risk assessment, COPCs are defined as HO-related chemicals that were detected in at least one sample above risk-based screening concentrations (where available), or other regulatory standards. The COPC selection process described below is based on relevant USEPA guidance for selecting COPCs.

3.2.1 COPC Selection Criteria COPCs include all HO-related chemicals that are positively detected in at least one sample and the maximum detected concentration is above the relevant screening criteria. For surface soil and sediment, the screening criteria is USEPA Region III RBCs for residential receptors. For surface water the screening criteria the USEPA Region IV Water Quality Standards (USEPA, 1996a) or USEPA Primary and Secondary Standards (USEPA, 1996b). For biota the screening level was the Food and Drug Administration (FDA) advisory level for dioxin in fish tissue.

3.2.2 Selection of COPCs All HO-related analytes in this risk assessment were evaluated as COPCs using the criteria described above. Surface soil was divided into two on-base groups, Site 8 and non-Site 8. The medium for all samples of soil/sediment-like material collected off base was considered to be sediment. These samples were collected in drainage channels or in areas where sediment deposition had occurred due to overflow of water in the drainage channels. Sediment was divided into two groups, on base and off base. Because of the surface water's relatively rapid movement through the ditch system, all surface water samples are combined in selecting COPCs. Biota is also considered as one media.

Specific COPCs for human health are identified for each medium at NCBC in tables presented below. The COPC tables (Tables 3-2 through 3-7) indicate the analytes detected, the frequency of detection, the detection limits, the concentration range detected, the average detected concentration, the screening concentration, and the COPC selection decision.

In this risk assessment, if an analyte is selected as a COPC, additional data are also provided in the table. The additional data provided depends on the number of samples. Per USEPA guidance (1992c), the 95 percent Upper Confidence Limit (% UCL) is not calculated if there are less than 10 total samples. The first two additional values in the table, the 95% UCL (if calculated) and the average concentration are statistics of the detected concentration range in the data set. These statistics facilitate a comparison of the detection frequency, detection limits, detected concentrations and the confidence limits of detected concentrations. This comparison can help differentiate data outliers or "hotspots."

The third and fourth additional values are the exposure point concentrations (reasonable maximum exposure [RME] and central tendency [CT]). The RME and CT values are selected as representative chemical concentrations for input into the risk assessment calculations. Many risk assessments do not provide these data in the COPC tables. Rather, this information is provided in later data tables along with much of the same information presented in the COPC tables. In practice, this redundant process makes it difficult for the reader to compare the selected representative concentration with the important data provided in the COPC table.

3.2.2.1 Surface Soil Two groups of surface soil samples were collected during the Phase I and Phase II investigations. The first group, collected to determine the nature and extent of dioxin contamination on Site 8, concentrated exclusively on the site and surrounding areas. The second group

Table 3-2
Selection Table for 2,3,7,8-TCDD TEQ as a Chemical of Potential Concern, Site 8 Surface Soil

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentration Range[2]	Average of Detected Concentrations[3]	Risk-Based Screening Value[4]	Chemical of Potential Concern	95th % UCL[5]	Average of All Samples[6]	Exposure Point Concentration	
									RME[7]	CT[8]
Chlorinated Herbicides (µg/kg)										
2,4,5-T	1/9	21 to 23	52	52	78,000	No	NC	15.3	NC	NC
2,3,7,8-substituted Dioxins and Furans (ng/kg)										
Total TEQ	32/32	NA	0 to 181	28.8	4.3	Yes[9]	99.5	28.8	99.5	28.8

[1] Frequency of detection is the number of samples in which the analyte was detected in relation to the total number of samples analyzed (excluding rejected values). Some TCDD TEQs have a value of "0" due to rounding of very small numbers.

[2] For duplicate samples having one nondetect value, one-half of the contract required quantification limit/contract required detection limit is used as a surrogate concentration for the sample where nondetect was reported.

[3] The average of detected concentrations is the arithmetic average of all samples in which the analyte was detected. It does not include those samples with "R", "U", or "UJ" validation qualifiers.

[4] The screening values are from the USEPA Region III Risk Based Concentration Table (April 1999) for residential receptors. Carcinogens are set at 1×10^{-6} cancer risk, non-carcinogens are set at a Hazard Index of 0.1.

[5] The 95th percent upper confidence limit (UCL) is calculated on the log-transformed average of all samples using the formula provided in the USEPA "Supplemental Guidance to RAGS: Calculating the Concentration Term." The 95 percent UCL is not calculated when there are less than 10 total samples (USEPA, 1992c).

[6] The average of all samples assigns a value of one-half of the reported detection limit as a surrogate where nondetect was reported. Because the TCDD TEQ is a calculated value, a sample with a reported value of "0" may not have a detection limit. As there is no detection limit for this sample, the value was dropped from the data set for average calculations only.

[7] The reasonable maximum exposure (RME) concentration is equal to the lesser of the maximum detected concentration or the 95th percent UCL.

[8] The central tendency (CT) concentration is equal to the lesser of the average of all samples or the maximum exposure point concentration.

[9] Total TEQ was included as a chemical of concern because the maximum calculated total TEQ exceeded the risk-based screening value.

Notes: Site IDs for chlorinated herbicide analyses: L8001, L8003, L8005, L8010, L8013, L8016, L8025, and L8027; Duplicate sample: L8013. Site IDs for dioxin and furan analyses: L8001, L8002, L8005, L8006, L8007, L8008, L8010, L8011, L8012, L8013, L8015, L8016, L8017, L8018, L8019, L8020, L8021, L8022, L8023, L8024, L8025, L8026, L8027, L8028, L8029, L8030, L8031, L8032, L8033; Duplicate samples: L8013, L8020, and L8031.

TCDD = tetrachloro-p-dibenzodioxin.
TEQ = TCDD toxic equivalency.
%UCL = percent Upper Confidence Level.
RME = Reasonable Maximum Exposure.
CT = Central Tendency.
µg/kg = micrograms per kilogram, or parts per billion (ppb).
2,4,5-T = 2,4,5-trichlorophenoxyacetic acid.
NC = not calculated.
ng/kg = nanograms per kilogram, or parts per trillion (ppt).
NA = not applicable because total TEQ is a calculated value.
USEPA = U.S. Environmental Protection Agency.
RAGS = Risk Assessment Guidance for Superfund.
ID = identification.

Table 3-3
Selection Table for 2,3,7,8-TCDD TEQ as a Chemical of Potential Concern, All Non-Site 8 Surface Soil

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentration Range[2]	Average of Detected Concentrations[3]	Risk-Based Screening Value[4]	Chemical of Potential Concern	95th % UCL[5]	Average of All Samples[6]	Exposure Point Concentration	
									RME[7]	CT[8]
2,3,7,8-substituted Dioxins and Furans (ng/kg)										
Total TEQ	6/6	NA	2 to 79	26.3	4.3	Yes[9]	NC	26.3	79	26.3

[1] Frequency of detection is the number of samples in which the analyte was detected in relation to the total number of samples analyzed (excluding rejected values). Some TCDD TEQs have a value of "0" due to rounding of very small numbers.

[2] For duplicate samples having one nondetect value, one-half of the contract required quantification limit/contract required detection limit is used as a surrogate concentration for the sample where nondetect was reported.

[3] The average of detected concentrations is the arithmetic average of all samples in which the analyte was detected. It does not include those samples with "R", "U", or "UJ" validation qualifiers.

[4] The screening values are from the USEPA Region III Risk Based Concentration Table (April 1999) for residential receptors. Carcinogens are set at 1×10^{-6} cancer risk, non-carcinogens are set at a Hazard Index of 0.1.

[5] The 95th percent upper confidence limit (UCL) is calculated on the log-transformed average of all samples using the formula provided in the USEPA "Supplemental Guidance to RAGS: Calculating the Concentration Term." The 95 percent UCL is not calculated when there are less than 10 total samples (USEPA, 1992c).

[6] The average of all samples assigns a value of one-half of the reported detection limit as a surrogate where nondetect was reported. Because the TCDD TEQ is a calculated value, a sample with a reported value of "0" may not have a detection limit. As there is no detection limit for this sample, the value was dropped from the data set for average calculations only.

[7] The reasonable maximum exposure (RME) concentration is equal to the lesser of the maximum detected concentration or the 95th percent UCL.

[8] The central tendency (CT) concentration is equal to the lesser of the average of all samples or the maximum exposure point concentration.

[9] Total TEQ was included as a chemical of concern because the maximum calculated total TEQ exceeded the risk-based screening value.

Notes: Site IDs: D1008, D1010, D1013, D5004, D5007, D5013; Duplicate samples: None.

TCDD = tetrachloro-p-dibenzodioxin.
TEQ = TCDD toxic equivalency.
% UCL = percent Upper Confidence Level (see footnote 5).
RME = Reasonable Maximum Exposure.
CT = Central Tendency.
ng/kg = nanograms per kilogram, or parts per trillion (ppt).
NA = not applicable, because total TEQ is a calculated value.
NC = not calculated.
USEPA = U.S. Environmental Protection Agency.
RAGS = Risk Assessment Guidance for Superfund.
ID = identification.

Table 3-4
Selection Table for 2,3,7,8-TCDD TEQ as a Chemical of Potential Concern, All On-Base Sediments

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentration Range[2]	Average of Detected Concentrations[3]	Risk-Based Screening Value[4]	Chemical of Potential Concern	95th % UCL[5]	Average of All Samples[6]	Exposure Point Concentration	
									RME[7]	CT[8]
2,3,7,8-substituted Dioxins and Furans (ng/kg)										
Total TEQ	114/114	NA	0.02 to 3,990	180	4.3	Yes[9]	365	180	365	180

[1] Frequency of detection is the number of samples in which the analyte was detected in relation to the total number of samples analyzed (excluding rejected values). Some TCDD TEQs have a value of "0" due to rounding of very small numbers.

[2] For duplicate samples having one nondetect value, one-half of the contract required quantification limit/contract required detection limit is used as a surrogate concentration for the sample where nondetect was reported.

[3] The average of detected concentrations is the arithmetic average of all samples in which the analyte was detected. It does not include those samples with "R", "U", or "UJ" validation qualifiers.

[4] The screening values are from the USEPA Region III Risk Based Concentration Table (April 1999) for residential receptors. Carcinogens are set at 1x10-6 cancer risk, non-carcinogens are set at a Hazard Index of 0.1.

[5] The 95th percent upper confidence limit (UCL) is calculated on the log-transformed average of all samples using the formula provided in the USEPA "Supplemental Guidance to RAGS: Calculating the Concentration Term." The 95 percent UCL is not calculated when there are less than 10 total samples. (USEPA, 1992c).

[6] The average of all samples assigns a value of one-half of the reported detection limit as a surrogate where nondetect was reported. Because the TCDD TEQ is a calculated value, a sample with a reported value of "0" may not have a detection limit. As there is no detection limit for this sample, the value was dropped from the data set for average calculations only.

[7] The reasonable maximum exposure (RME) concentration is equal to the lesser of the maximum detected concentration or the 95th percent UCL.

[8] The central tendency (CT) concentration is equal to the lesser of the average of all samples or the maximum exposure point concentration.

[9] Total TEQ was included as a chemical of concern because the maximum calculated total TEQ exceeded the risk-based screening value.

See notes at end of table.

Table 3-4 (Continued)
Selection Table for 2,3,7,8-TCDD TEQ as a Chemical of Potential Concern, All On-Base Sediments

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Notes: Site IDs: D1001, D1002, D1003, D1004, D1005, D1006, D1007, D1008, D1009, D1010, D1011, D1012, D1013, D1014, D1015, D1016, D1017, D1018, D1019, D1020, D1021, D1022, D1023, D1024, D1025, D1026, D1027, D1028, D1029, D1030, D1031, D1032, D1033, D1034, D1035, D1036, D1037, D1038, D1039, D2001, D2002, D2003, D2004, D2005, D2006, D2007, D2008, D2009, D2010, D2011, D2012, D2013, D2014, D2015, D2016, D2017, D2018, D2019, D2020, D2021, D2022, D2023, D2024, D2025, D2026, D2027, D2028, D2029, D2030, D2031, D2032, D2033, D3001, D3002, D3003, D3004, D3005, D3006, D3007, D3008, D4001, D4002, D4003, D5002, D5004, D5005, D5006, D5007, D5008, D5009, D5010, D5011, D5012, D5013, D5014, D5015, D5016, D5017, D5018, D5019, D5020, D5021, D5032, D5033, D5035, D6001, D6002, D6003, D6004, D6005, D6006, EE01D, EE01U, EE03D, EE03U, EE04D, EE04U, EE05D, EE05U, EE06D, EE06U, EE07D, EE07U, EE09D, EE09U, EE10D, EE10U, EE13D, EE13U, EEN1D, EEN1U, EEN2D, EEN2U. Duplicate samples: D1001D, D1015D, D2001D, D2006D, D3002D, D3007D, D5011D.

TCDD = tetrachloro-p-dibenzodioxin.
TEQ = TCDD Toxic Equivalency.
% UCL = percent Upper Confidence Level. See footnote 5.
RME = Reasonable Maximum Exposure.
CT = Central Tendency.
ng/kg = nanograms per kilogram, or parts per trillion (ppt).
NA = not applicable, because total TEQ is a calculated value.
USEPA = U.S. Environmental Protection Agency.
RAGS = Risk Assessment Guidance for Superfund.
ID = identification.

Table 3-5
Selection Table for 2,3,7,8-TCDD TEQ as a Chemical of Potential Concern, All Off-Base Sediments

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentration Range[2]	Average of Detected Concentrations[3]	Risk-Based Screening Value[4]	Chemical of Potential Concern	95th % UCL[5]	Average of All Samples[6]	Exposure Point Concentration	
									RME[7]	CT[8]
2,3,7,8-substituted Dioxins and Furans (ng/kg)										
Total TEQ	36/37	NA	1 to 61	13.6	4.3	Yes[9]	30	13.3	30	13.3

[1] Frequency of detection is the number of samples in which the analyte was detected in relation to the total number of samples analyzed (excluding rejected values). Some TCDD TEQs have a value of "0" due to rounding of very small numbers.

[2] For duplicate samples having one nondetect value, one-half of the contract required quantification limit/contract required detection limit is used as a surrogate concentration for the sample where nondetect was reported.

[3] The average of detected concentrations is the arithmetic average of all samples in which the analyte was detected. It does not include those samples with "R", "U", or "UJ" validation qualifiers.

[4] The screening values are from the USEPA Region III Risk Based Concentration Table (April 1999) for residential receptors. Carcinogens are set at 1x10-6 cancer risk, non-carcinogens are set at a Hazard Index of 0.1.

[5] The 95th percent upper confidence limit (UCL) is calculated on the log-transformed average of all samples using the formula provided in the USEPA "Supplemental Guidance to RAGS: Calculating the Concentration Term." The 95 percent UCL is not calculated when there are less than 10 total samples. (USEPA, 1992c).

[6] The average of all samples assigns a value of one-half of the reported detection limit as a surrogate where nondetect was reported. Because the TCDD TEQ is a calculated value, a sample with a reported value of "0" may not have a detection limit. As there is no detection limit for this sample, the value was dropped from the data set for average calculations only.

[7] The reasonable maximum exposure (RME) concentration is equal to the lesser of the maximum detected concentration or the 95th percent UCL.

[8] The central tendency (CT) concentration is equal to the lesser of the average of all samples or the maximum exposure point concentration.

[9] Total TEQ was included as a chemical of concern because the maximum calculated total TEQ exceeded the risk-based screening value.

Notes: Site IDs: BB001, BB002, BB003, BB004, BB005, BB006, BB007, BB008, BB009, BB010, BC001, BC002, BC003, BC004, BC005, BC006, BC007, C1001, C1002, C1003, C1004, C1005, C1006, TC001, TC002, TC004, TC005, TC006, TC007, TC008, TC009, TC010, WM001, WM002, WM003, WM004, WM005. Duplicate samples: C1001D, TC006D, WM005D.

TCDD = tetrachloro-p-dibenzodioxin.
TEQ = TCDD toxic equivalency.
% UCL = percent Upper Confidence Level.
RME = Reasonable Maximum Exposure.
CT = Central Tendency.
ng/kg = nanograms per kilogram, or parts per trillion (ppt).
NA = not applicable, because total TEQ is a calculated value.
USEPA = U.S. Environmental Protection Agency.
RAGS = Risk Assessment Guidance for Superfund.
ID = identification.

Table 3-6
Selection Table for 2,3,7,8-TCDD TEQ as a Chemical of Potential Concern All Surface Water Samples

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentration Range[2]	Average of Detected Concentrations[3]	Risk-Based Screening Value[4]	Chemical of Potential Concern	95th % UCL[5]	Average of All Samples[6]	Exposure Point Concentration	
									RME[7]	CT[8]
2,3,7,8-substituted Dioxins and Furans (pg/ℓ)										
Total TEQ	20/20	NA	0.02 - 7*	3.5	10	No[9]	NC	NC	NC	NC

[1] Frequency of detection is the number of samples in which the analyte was detected in relation to the total number of samples analyzed (excluding rejected values). Some TCDD TEQs have a value of "0" due to rounding of very small numbers.

[2] The value indicated by an asterisk is the average of a sample and its duplicate. For duplicate samples having one nondetect value, one-half of the contract required quantification limit/contract required detection limit is used as a surrogate concentration for the sample where nondetect was reported.

[3] The average of detected concentrations is the arithmetic average of all samples in which the analyte was detected. It does not include those samples with "R", "U", or "UJ" validation qualifiers.

[4] The screening value is the USEPA Region IV Surface Water Screening value for fresh water (USEPA, 1996a). The value is based on the "marketability of fish" and is more conservative than the Federal Maximum Contaminant L (30 pg/ℓ) for drinking water.

[5] The 95th percent upper confidence limit (UCL) is calculated on the log-transformed average of all samples using the formula provided in the USEPA "Supplemental Guidance to RAGS: Calculating the Concentration Term." The 95 percent UCL is not calculated when there are less than 10 total samples. (USEPA, 1992c).

[6] The average of all samples assigns a value of one-half of the reported detection limit as a surrogate where nondetect was reported. Because the TCDD TEQ is a calculated value, a sample with a reported value of "0" may not have a detection limit. As there is no detection limit for this sample, the value was dropped from the data set for average calculations only.

[7] The reasonable maximum exposure (RME) concentration is equal to the lesser of the maximum detected concentration or the 95th percent UCL.

[8] The central tendency (CT) concentration is equal to the lesser of the average of all samples or the maximum exposure point concentration.

[9] Total TEQ was not included as a chemical of concern because the maximum calculated total TEQ did not exceed the risk-based screening value.

Notes: Site IDs: BB003, BC003, C1001, D1001, D1003, D1005, D1008, D1010, D1013, D2003, D2006, D3003, D3005, D3007, D5004, D5007, D5009, D5013, TC002, TC004, TC006, WM002. Duplicate samples: C1001D, D2006D, D3007D, TC006D.

TCDD = tetrachloro-p-dibenzodioxin.
TEQ = TCDD toxic equivalency.
%UCL = percent Upper Confidence Level.
RME = Reasonable Maximum Exposure.
CT = Central Tendency.
pg/ℓ = picograms per liter.
NA = not applicable, because total TEQ is a calculated value.
NC = not calculated.
USEPA = U.S. Environmental Protection Agency.
RAGS = Risk Assessment Guidance for Superfund.
ID = identification.

Table 3-7
Selection Table for 2,3,7,8-TCDD TEQ as a Chemical of Potential Concern, All Biological Samples

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentration Range[2]	Average of Detected Concentrations[3]	Risk-Based Screening Value[4]	Chemical of Potential Concern	95th % UCL[5]	Average of All Samples[6]	Exposure Point Concentration	
									RME[7]	CT[8]
2,3,7,8-substituted Dioxins and Furans (ng/kg)										
All Fish Combined										
Total TEQ	15/56	NA	1 to10	0.89	25	No[9]	1.8	0.89	NC	NC
Catfish										
Total TEQ	4/18	NA	1 to 2	0.39	25	No[9]	1.3	0.39	NC	NC
Large Mouth Bass										
Total TEQ	4/17	NA	2 to 5	0.75	25	No[9]	1.9	0.75	NC	NC
Bluegill										
Total TEQ	1/8	NA	3	3	25	No[9]	1.7	0.38	NC	NC
Stripped Mullet										
Total TEQ	1/3	NA	2	0.67	25	No[9]	NC	0.67	NC	NC
All Other Non-Edible Fish Species										
Total TEQ	5/8	NA	1 to 10	2.9	NSC	No[9]	NC	2.9	NC	NC

See notes at end of table.

Table 3-7 (Continued)
Selection Table for 2,3,7,8-TCDD TEQ as a Chemical of Potential Concern, All Biological Samples

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

[1] Frequency of detection is the number of samples in which the analyte was detected in relation to the total number of samples analyzed (excluding rejected values). Some TCDD TEQs have a value of "0" due to rounding of very small numbers.

[2] For duplicate samples having one nondetect value, one-half of the contract required quantification limit/contract required detection limit is used as a surrogate concentration for the sample where nondetect was reported.

[3] The average of detected concentrations is the arithmetic average of all samples in which the analyte was detected. It does not include those samples with "R", "U", or "UJ" validation qualifiers.

[4] The screening value is the FDA advisory level that states "fish with 2,3,7,8-TCDD content averaging less than 25 ppt pose no serious health concern." (USEPA, 1984). This level applies to edible fish only.

[5] The 95th percent upper confidence limit (UCL) is calculated on the log-transformed average of all samples using the formula provided in the USEPA "Supplemental Guidance to RAGS: Calculating the Concentration Term." The 95 percent UCL is not calculated when there are less than 10 total samples. (USEPA, 1992c).

[6] The average of all samples assigns a value of one-half of the reported detection limit as a surrogate where nondetect was reported. Because the TCDD TEQ is a calculated value, a sample with a reported value of "0" may not have a detection limit. As there is no detection limit for this sample, the value was dropped from the data set for average calculations only.

[7] The reasonable maximum exposure (RME) concentration is equal to the lesser of the maximum detected concentration or the 95th percent UCL.

[8] The central tendency (CT) concentration is equal to the lesser of the average of all samples or the maximum exposure point concentration.

[9] Total TEQ was not included as a chemical of concern because the maximum calculated total TEQ did not exceed the risk-based screening value or because there was no screening concentration.

Notes: Sample IDs: BIO-1-FF-CF, BIO-1-FF-LB, BIO-2-FF-CF, BIO-2-FF-LB, BIO-2-WF-BG, BIO-2-WF-CF, BIO-2-WF-GS, BIO-2-WF-LB, BIO-3-FF-BG, BIO-3-WF-BG, BIO-3-WF-CS, BIO-3-WF-PP, BIO-4-FF-BG, BIO-4-FF-CF, BIO-4-WF-BG, BIO-4-WF-BT, BIO-4-WF-CF, BIO-5-FF-CF, BIO-5-FF-LB, BIO-5-WF-GS, BIO-5-WF-LB, BIO-5-WF-SS, BIO-6-FF-CF, BIO-6-FF-LB, BIO-6-WF-CF, BIO-6-WF-LB, BIO-6-WF-SM, BIO-7-FF-LB, BIO-7-WF-LB, BIO-7-WF-SM, BIO-8-FF-CF, BIO-8-FF-LB, BIO-8-WF-CF, BIO-8-WF-LB, BIO-8-WF-SM, BIO-9-WF-AM. Duplicate samples: BIO-6-WF-LBR, BIO-8-WF-CFR, BIO-6-FF-CFR, BIO-2-WF-GSR, BIO-5-FF-LBR.

TCDD = tetrachloro-p-dibenzodioxin.
TEQ = TCDD toxic equivalency.
% UCL = percent Upper Confidence Level.
RME = Reasonable Maximum Exposure.
CT = Central Tendency.
ng/kg = nanograms per kilogram, or parts per trillion (ppt).
NSC = no screening concentration.
NA = not applicable, because total TEQ is a calculated value.
NC = not calculated.
FDA = Federal Department of Agriculture.
ppt = parts per trillion.
USEPA = U.S. Environmental Protection Agency.
RAGS = Risk Assessment Guidance for Superfund.
ID = identification.

was collected from areas of the drainage system that remain dry except during brief periods of significant precipitation. These two surface soil sample groups were evaluated separately.

Site 8 Surface Soils. A total of 33 surface soil samples, and 4 duplicates, were collected from the Site 8 area. The exact sample locations are provided in Figure 2-7 of the Surface Water and Sediment Delineation Report (HLA, 1999a). This figure is provided in Appendix C. All samples were analyzed for dioxins and furans. Eight samples were analyzed for TOC and nine samples were analyzed for chlorinated herbicides related to HO. An evaluation of the dioxin and herbicide analytical results as COPCs is presented in Table 3-2. Dioxins and furans, expressed as 2,3,7,8-TCDD TEQs, were detected in concentrations sufficient to be considered as COPCs. The full analytical results of these samples are provided in Appendix A. For reference, the site identifiers for chlorinated herbicides and dioxins and furans are provided in the notes section of Table 3-2.

Non-Site 8 Surface Soils. A total of six surface soil samples were collected from areas other than Site 8. No duplicate samples were collected. Three samples were collected from Drainage Area 1 and three from Drainage Area 5. The exact sample locations are provided in Figures 2-1 and 2-5 of the Surface Water and Sediment Delineation Report (HLA, 1999a) (see Appendix C). These surface soil samples were only analyzed for dioxins and furans. An evaluation of the dioxin analytical results as COPCs is presented in Table 3-3. Dioxins and furans, expressed as 2,3,7,8-TCDD TEQs, were detected in concentrations sufficient to be considered as COPCs. The full analytical results of these samples are provided in Appendix A. For reference, the sample identifiers are provided in the notes section of Table 3-3.

3.2.2.2 Sediment For the purposes of this risk assessment, the 149 sediment samples, and 7 duplicates, collected in the Phases I and II investigations were divided into two groups. The first group encompasses all on-base sediment samples. All sediment samples are included in this data set. This included a small subset of sediment samples collected from areas constantly under water. Although USEPA guidance (USEPA, 1995a) allows for such samples to be excluded from any risk assessment, for completeness and to assess the possibility of future movement in areas not constantly under water, they were left in the data set. Their inclusion had no impact on the data set.

The second sediment group includes all sediment samples collected off base. Again, for the reasons stated above, all sediment samples, including those collected from areas constantly covered with water, were included in this data set. Their inclusion had no impact on the data set.

On-Base Sediments. A total of 114 sediment samples, and 7 duplicate samples, were collected from the ditch system on base. The exact sample locations are provided in Figures 2-1 through 2-6, 2-13, and 3-1 through 3-5 of the Surface Water and Sediment Delineation Report (HLA, 1999a) (see Appendix C). All sediment samples were analyzed for dioxins and furans. Sixteen samples were analyzed for chlorinated herbicides related to HO. An evaluation of the analytical results as COPCs is presented in Table 3-4. Dioxins and furans, expressed as 2,3,7,8-TCDD TEQs, were detected in concentrations sufficient to

be considered as COPCs. The full analytical results of these samples are provided in Appendix A. For reference the sample identifiers are provided in the notes section of Table 3-4.

Off-Base Sediments. A total of 37 sediment samples, and 3 duplicate samples, were collected from the ditch system off base. The exact sample locations are provided in Figures 2-8 through 2-10, 3-4, and 3-5 of the Surface Water and Sediment Delineation Report (HLA, 1999a) (see Appendix C). All sediment samples were analyzed for dioxins and furans. Eight samples were analyzed for chlorinated herbicides related to HO. An evaluation of the analytical results as COPCs is presented in Table 3-5. Dioxins and furans, expressed as 2,3,7,8-TCDD TEQs, were detected in concentrations sufficient to be considered as COPCs. The full analytical results of these samples are provided in Appendix A. For reference the sample identifiers are provided in the notes section of Table 3-5. It should be noted that samples WL011 through WL020, shown in Figure 3-6 of Appendix C, are not included in the evaluation. These samples are part of the Outfall 3 swamp area delineation. The Outfall 3 area is proposed as a Brownfield site. Baseline and remedial exposure models will be developed for the proposed Brownfield area according to the procedures established in the *Risk Evaluation Procedures for Voluntary Cleanup and Redevelopment of Brownfield Sites - Subpart II.*

3.2.2.3 Surface Water Samples For the purposes of this risk assessment all surface water samples have been grouped together. A total of 20 surface water samples, and 4 duplicates, were collected during the Phase I investigation. The leachate samples from Site 4 were not included because this water source has already undergone corrective action and is no longer a dioxin source to surface water (Morrison-Knutsen, Corp., 1998). The exact surface water sample locations are provided in Figures 2-1 through 2-3, 2-5, and 2-8 through 2-11 of the Surface Water and Sediment Delineation Report (HLA, 1999a) (see Appendix C). All surface water samples were analyzed for dioxins and furans and chlorinated herbicides related to HO. An evaluation of the analytical results as COPCs is presented in Table 3-6. No analytes were detected in concentrations great enough for the analyte to be considered a COPC. The full analytical results of these samples are provided in Appendix A. For reference the sample identifiers are provided in the notes section of Table 3-6.

3.2.2.4 Fish Tissue Samples A total of 56 biological samples (whole fish and fish fillets) were collected during the two biological sampling episodes. Three sample duplicates were also submitted. All samples were analyzed only for dioxins and furans. An evaluation of the analytical results as COPCs is presented in Table 3-7. The entire data set is presented as well by species. The edible species (largemouth bass, catfish, stripped mullet, and bluegill) were compared to the FDA's fish tissue advisory level for dioxin in fish tissue. No analytes were detected in these edible species at concentrations great enough for the analyte to be considered a COPC. The full analytical results of these samples are provided in Appendix B. For reference the sample identifiers are provided in the notes section of Table 3-7.

3.3 EXPOSURE ASSESSMENT. The exposure assessment assesses how humans are or could potentially be exposed to the COPCs identified in the preceding step. It also estimates the magnitude of the actual or potential exposure. This is performed for both current and future potential site land uses in three-step process.

The first step is to characterize the exposure setting. This includes evaluating the physical characteristics of the site, the physical and chemical characteristics of the COPCs, and identifying who could possibly come into contact with the COPCs. People who could possibly come into contact with the COPCs are called "receptors."

The second step is to identify how receptors could come into contact with the COPCs. The routes that receptors can come into contact with COPCs are called "exposure pathways." Likely or confirmed exposure pathways are called "confirmed exposure pathways." These are presented graphically in a site conceptual model (SCM). An SCM was developed for on-base receptors and off-base receptors.

The final step in the exposure assessment is to quantify how much of a dose of each COPC each receptor receives by each confirmed exposure pathway. Each of these three steps is further described below.

3.3.1 Exposure Setting The exposure setting at NCBC is highly diverse due to the extensive movement of sediment throughout the base and into the surrounding neighborhood. Impacted areas include the actual HO storage areas (Site 8), the sediment in the ditch system (both on base and off base), surface soil in Drainage Areas 1 and 5, and surface water in the drainage system.

The demographics at NCBC Gulfport were evaluated during the CSEA (ABB-ES, 1997b). Much of NCBC is highly industrialized, with development consistent with an active military base. Site 8 is completely surrounded by the industrialized area of NCBC. The major drainage features from Site 8, Drainage Areas 1 and 2, are also within the industrialized areas. However, other impacted areas on base are near two residential housing areas and all of the off-base drainage features are surrounded by residential developments.

The CSEA identified six different receptors at NCBC. They were on-base residents, off-base residents, on-base workers, off-base workers, trespassers, and fishers. Each of these receptors was evaluated in the risk assessment. Some receptor populations, for example workers, were evaluated using a single receptor. Each residential receptor was evaluated separately.

3.3.2 Physical and Chemical Characteristics HO was a reddish-brown liquid typically made up of a 50-50 mixture of the butyl esters of two chlorinated phenols (2,4-dichlorophenoxyacetic acid [2,4-D] and 2,4,5-trichlorophenoxy-acetic acid [2,4,5-T]) and diesel fuel. Dioxin was a synthesis byproduct of 2,4,5-T and was not synthesized intentionally. Dioxin, a colorless and odorless solid at room temperature has a very low water solubility but is soluble in fuels, solvents, and fats and is also known to have a high affinity for organic carbon. In the environment dioxin is believed to have a

very long half-life, perhaps in decades when bound to soil particles. While hydrolysis and photodegredation of dioxin have been demonstrated in the laboratory, under most environmental conditions these reactions are not relevant.

3.3.3 Exposure Pathways An exposure pathway consists of four necessary elements: a source or mechanism of chemical release, a transport or retention medium, a point of human contact, and a route of exposure at the point of contact (USEPA, 1989a). Exposure pathways that have all four elements and are reasonably likely to occur are considered potentially complete pathways. Only potentially complete exposure pathways are evaluated in this risk assessment.

3.3.3.1 Site Conceptual Model The source of the dioxins and furans at NCBC is the HO storage area at Site 8. From this source there are two important transport and receiving media. The first, surface soil at Site 8, is the relevant to occupational and worker receptors. Overland flow of water may have resulted in migration of dioxins and furans to other surface soils and wind erosion has been demonstrated to mobilize dioxins and furans into the air.

The second, and most significant, transport and retention media is the sediment throughout the ditch system. All identified receptors, both on base and off base, can come into contact with this media. Water flow through the ditch system has resulted in migration of dioxins and furans along with the sediment bed load. Dioxins and furans may bioaccumulate into fish living in the ditch system and humans or other species may catch and consume these fish. Due to the chemical characteristics of these chemicals, surface water is not expected to be a relevant exposure pathway.

Conceptual models were developed that summarize the potential exposure pathways by which people could be exposed to contamination detected in the various exposure media. Figure 3-1 shows the conceptual model for all receptors on the NCBC. Figure 3-2 shows the conceptual model for all receptors off base.

3.3.3.2 Receptors Once the complete exposure pathways are defined, the next step is to identify those receptors for both present and future land uses. The CSEA provided this information. Human receptors were identified for both current and potential future land uses. These receptors include workers and residents at NCBC, workers and residents living near the ditch system off base, and people who catch and consume fish from the ditch system. Exposure scenarios have been developed to evaluate each of these receptors. Human receptors for each of the impacted media are discussed below. In addition, Tables 3-8 and 3-9 provide summaries of each receptor by media for on-base and off-base complete exposure pathways, respectively. They also describe both current and future land use scenarios.

Site 8 Surface Soils. There are currently no industrial or occupational activities on Site 8. Site 8A (approximately 12 acres) is largely covered by ash piles, construction rubble, and concrete, with some sparse vegetation. Prior to HO

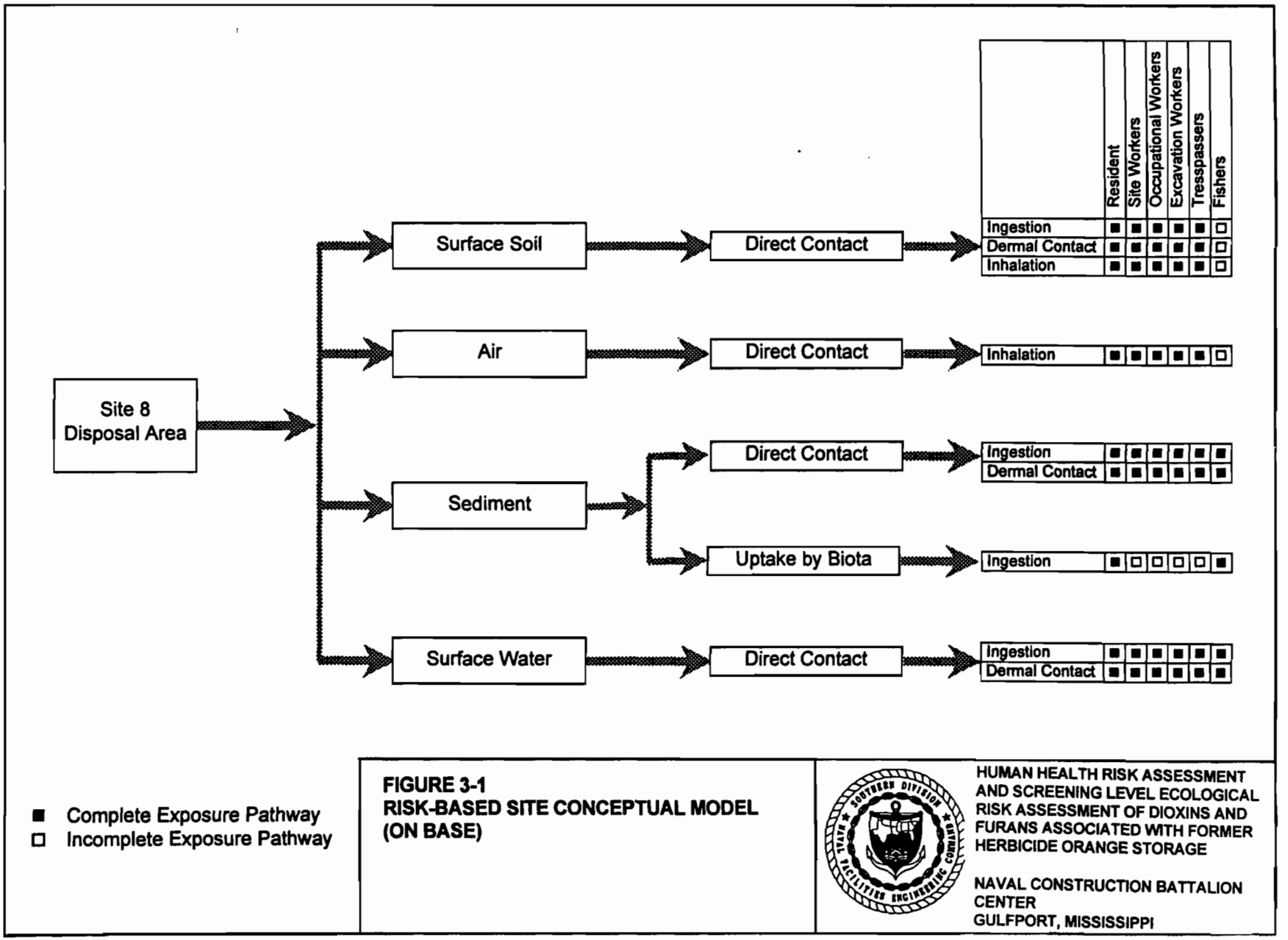


FIGURE 3-1
RISK-BASED SITE CONCEPTUAL MODEL
(ON BASE)

HUMAN HEALTH RISK ASSESSMENT AND SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT OF DIOXINS AND FURANS ASSOCIATED WITH FORMER HERBICIDE ORANGE STORAGE

NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI

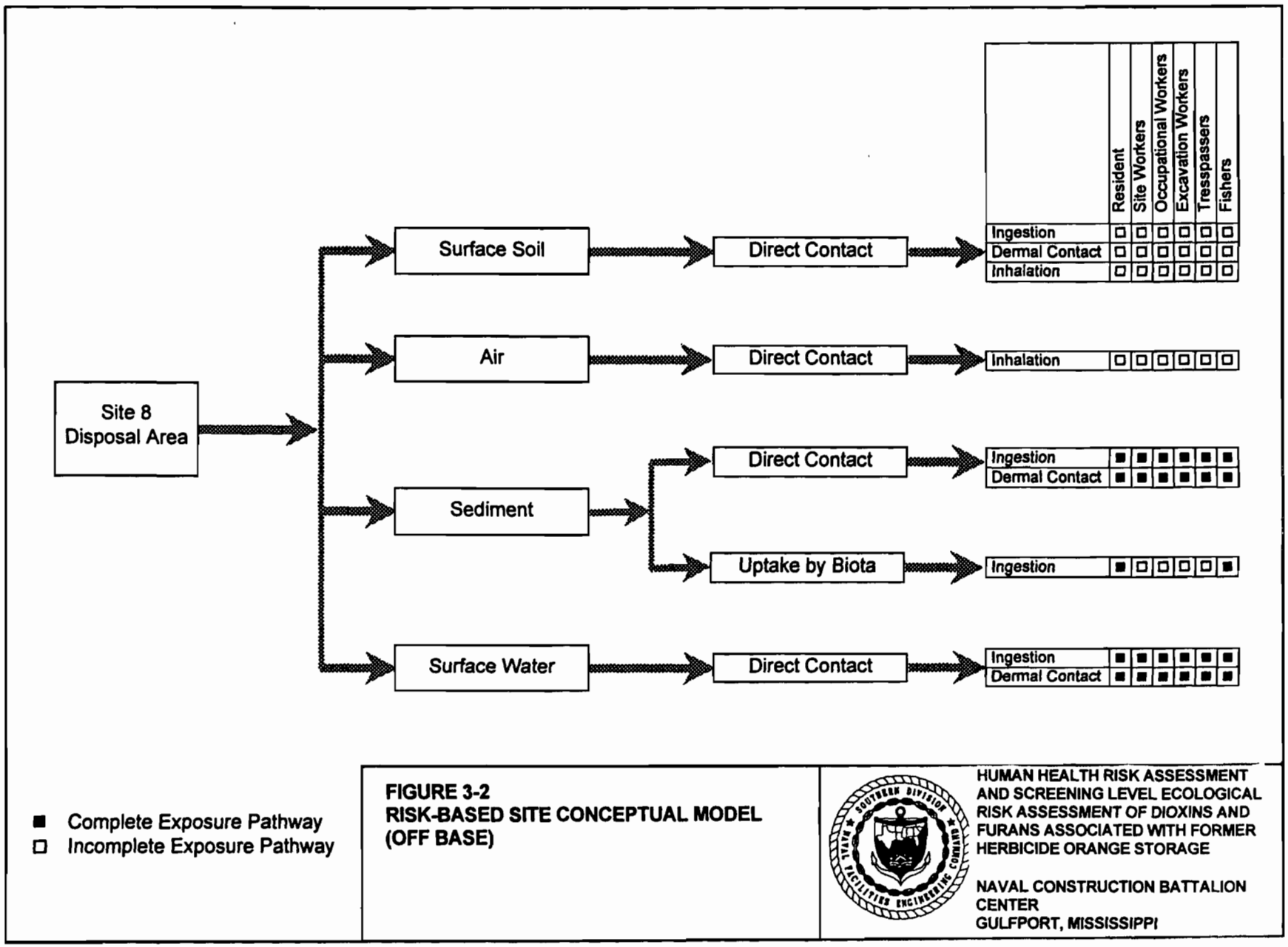


FIGURE 3-2
RISK-BASED SITE CONCEPTUAL MODEL
(OFF BASE)

HUMAN HEALTH RISK ASSESSMENT AND SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT OF DIOXINS AND FURANS ASSOCIATED WITH FORMER HERBICIDE ORANGE STORAGE

NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI

Table 3-8
Summary of Receptors and Complete Exposure Pathways, Current and Future Land Use On Base

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of
Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Medium of Exposure	Route of Exposure	Potentially Exposed Population	Selected for Evaluation?	Reason for Selection or Evaluation
Current Land Use				
Surface Soil	Dermal contact with soil, ingestion of soil, and inhalation of fugitive dust.	Resident (adult and child)	No	No humans currently reside in areas where surface soil is impacted by HO-related dioxins or furans.
		Trespasser (adult and adolescent)	Yes	Adolescents and adults may be exposed to contaminants in the surface soil while trespassing.
		Occupational worker (adult)	Yes	Occupational workers may be exposed to contaminants in surface soil.
		Site maintenance worker (adult)	Yes	Site maintenance workers may be exposed to contaminants in surface soil while performing routine site activities.
		Excavation worker (adult)	Yes	Excavation workers can come into contact during excavation activities.
		Resident (adult and child)	No	No humans currently reside in areas where surface soil is impacted by HO-related dioxins or furans.
Surface water	Ingestion and dermal contact with surface water.	Trespasser (adult and adolescent)	Yes	Adolescent and adult receptors may be exposed to surface water while playing or fishing in the ditch system.
Sediment	Dermal contact with sediment.	Trespasser (adult and adolescent)	Yes	Adolescent and adult receptors may be exposed to sediments while playing or fishing in the ditch system
Future Land Use				
Surface soil	Dermal contact with soil, ingestion of soil, and inhalation of fugitive dust.	Resident (adult and child)	Yes	While highly unlikely, a future residential exposure scenario is included in this evaluation.
		Trespasser (adult and adolescent)	Yes	Adolescents and adults may be exposed to contaminants in the surface soil while trespassing.

See notes at end of table.

Table 3-8 (Continued)
Summary of Receptors and Complete Exposure Pathways, Current and Future Land Use On Base

Human Health Risk Assessment and Screening Level Ecological Risk Assessment
of Dioxins and Furans Associated with Former Herbicide Orange Storage
Human and Ecological Baseline Risk Assessment
Naval Construction Battalion Center
Gulfport, Mississippi

Medium of Exposure	Route of Exposure	Potentially Exposed Population	Selected for Evaluation?	Reason for Selection or Evaluation
Future Land Use (continued)				
		Occupational worker (adult)	Yes	Occupational workers are present near the site and future activities may include these receptors.
		Site maintenance worker (adult)	Yes	Site maintenance workers may be exposed to contaminants in surface soil while performing routine site activities.
		Excavation worker (adult)	Yes	Excavation workers can come into contact during excavation activities.
Surface Water	Ingestion and dermal con-tact with surface water.	Resident (adult and child)	Yes	Residential receptors may be exposed to surface water while playing or fishing in the ditch system.
		Recreational user (adult and adolescent)	Yes	Adolescent and adult receptors may be exposed to surface water while playing or fishing in the ditch system.
Sediment	Dermal contact with sediment.	Resident (adult and child)	Yes	Residential receptors may be exposed to sediments while playing or fishing in the ditch system.
		Trespasser (adult and adolescent)	Yes	Adolescent and adult receptors may be exposed to sediments while playing or fishing in the ditch system.
		Recreational user (adult and adolescent)	Yes	Adolescent and adult receptors may be exposed to sediments while playing or fishing in the ditch system.
Biota	Fish Ingestion	Resident (adult and child)	Yes	Residential receptors may consume fish caught from the ditch system.
		Recreational user (adult and adolescent)	Yes	Adolescent and adult receptors may consume fish caught from the ditch system.

Notes: HO = herbicide orange.
OU = operable unit.

Table 3-9
Summary of Receptors and Complete Exposure Pathways, Current and Future Land Use Off Base

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of
Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Medium of Exposure	Route of Exposure	Potentially Exposed Population	Selected for Evaluation?	Reason for Selection or Evaluation
Current Land Use				
Surface Soil	Dermal contact with soil, ingestion of soil, and inhalation of fugitive dust.	Resident (adult and child)	No	No surface soil impacted by HO-related dioxins or furans.
		Trespasser (adult and adolescent)	No	
		Occupational worker (adult)	No	
		Site maintenance worker (adult)	No	
		Excavation worker (adult)	No	
Surface water	Ingestion and dermal contact with surface water.	Resident (adult and child)	Yes	Residential receptors may be exposed to sediments while playing or fishing in the ditch system.
		Trespasser (adult and adolescent)	Yes	Adolescent and adult receptors may be exposed to surface water while playing or fishing in the ditch system.
		Occupational worker (adult)	Yes	Occupational workers may be exposed to surface water in future activities.
		Site maintenance worker (adult)	Yes	Site maintenance workers may be exposed to contaminants in surface water while performing routine site activities.
		Excavation worker (adult)	Yes	Excavation workers can come into contact during excavation activities.
Sediment	Dermal contact with sediment.	Resident (adult and child)	Yes	Residential receptors may be exposed to sediments while playing or fishing in the ditch system.
		Trespasser (adult and adolescent)	Yes	Adolescent and adult receptors may be exposed to sediments while playing or fishing in the ditch system.
		Occupational worker (adult)	Yes	Occupational workers are present near the site and future activities may include these receptors.
		Site maintenance worker (adult)	Yes	Site maintenance workers may be exposed to contaminants in surface soil while performing routine site activities.
		Excavation worker (adult)	Yes	Excavation workers can come into contact during excavation activities.

See notes at end of table.

Table 3-9 (Continued)
Summary of Receptors and Complete Exposure Pathways, Current and Future Land Use Off Base

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of
Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Medium of Exposure	Route of Exposure	Potentially Exposed Population	Selected for Evaluation?	Reason for Selection or Evaluation
Future Land Use				
Surface soil	Dermal contact with soil, ingestion of soil, and inhalation of fugitive dust.	Resident (adult and child)	No	No surface soil impacted by HO-related dioxins or furans.
		Trespasser (adult and adolescent)	No	
		Occupational worker (adult)	No	
		Site maintenance worker (adult)	No	
		Excavation worker (adult)	No	
		Excavation worker (adult)	No	
Surface water	Ingestion and dermal contact with surface water.	Resident (adult and child)	Yes	Residential receptors may be exposed to sediments while playing or fishing in the ditch system.
		Trespasser (adult and adolescent)	Yes	Adolescent and adult receptors may be exposed to surface water while playing or fishing in the ditch system.
		Occupational worker (adult)	Yes	Occupational workers may be exposed to surface water in future activities.
		Site maintenance worker (adult)	Yes	Site maintenance workers may be exposed to contaminants in surface water while performing routine site activities.
		Excavation worker (adult)	Yes	Excavation workers can come into contact during excavation activities.
Sediment	Dermal contact with sediment.	Resident (adult and child)	Yes	Residential receptors may be exposed to sediments while playing or fishing in the ditch system.
		Trespasser (adult and adolescent)	Yes	Adolescent and adult receptors may be exposed to sediments while playing or fishing in the ditch system.
		Occupational worker (adult)	Yes	Occupational workers are present near the site and future activities may include these receptors.
		Site maintenance worker (adult)	Yes	Site maintenance workers may be exposed to contaminants in surface soil while performing routine site activities.
		Excavation worker (adult)	Yes	Excavation workers can come into contact during excavation activities.

See notes at end of table.

Table 3-9 (Continued)
Summary of Receptors and Complete Exposure Pathways, Current and Future Land Use Off Base

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of
Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Medium of Exposure	Route of Exposure	Potentially Exposed Population	Selected for Evaluation?	Reason for Selection or Evaluation
Biota	Fish Ingestion	Resident (adult and child)	Yes	Residential receptors may consume fish caught from the ditch system.
		Recreational user (adult and adolescent)	Yes	Adolescent and adult receptors may consume fish caught from the ditch system.

Note: HO = herbicide orange.

storage in about 1961, the Site 8A surface was stabilized with a soil/Portland cement mixture to provide a hardened surface for heavy equipment operation and storage. Site 8B (approximately 17 acres) is covered with concrete and sparse vegetation. Site 8C (approximately 1 acre) is covered by sparse vegetation. There are no buildings on Sites 8A, 8B, or 8C. Site 8A is completely surrounded with a fence, but Sites 8B and 8C are open. Nearby occupational workers may be exposed through incidental ingestion, dermal contact, and inhalation of windborne particulates. The same exposure pathways exist for site workers (those conducting mowing or other site maintenance activities), and excavation workers. Due to the highly industrialized nature of the Site 8 area (large warehouses, railroad tracks, etc.) it is unlikely that residential receptors would be present at the site. However, trespasser (adult and adolescent) receptors (someone occasionally walking across the unfenced portions of the site) are possible. These receptors could come into contact through incidental ingestion, dermal contact, and inhalation of windborne particulates.

Non-Site 8 Surface Soil. There are both industrial and occupational activities in these areas. Surface conditions vary throughout the NCBC. These conditions include paved and unpaved areas, as well as varying degrees of vegetation. The risk assessment considers exposure of a worker to soil in unpaved, sparsely vegetated areas as a reasonable worst-case scenario. Nearby occupational workers may be exposed through incidental ingestion, dermal contact, and inhalation of windborne particulates. The same exposure pathways exist for site workers (those conducting mowing or other site maintenance activities), and excavation workers. The areas around Drainage Area 5 could be developed as residential. These receptors could be exposed through incidental ingestion, dermal contact, and inhalation of windborne particulates. The trespasser (adult and adolescent) receptor (someone occasionally walking across the unfenced portions of the site) could also come into contact through incidental ingestion, dermal contact, and inhalation of windborne particulates.

On-Base Sediments. Dioxin impacted sediments are present throughout large areas of the drainage system at NCBC. While some areas are covered with water year round, others are accessible during the dry parts of the year. Nearby occupational workers may be exposed through incidental ingestion and dermal contact. The same exposure pathways exist for site workers (those conducting mowing or other site maintenance activities), and excavation workers. Due to the highly industrialized nature of NCBC (large warehouses, railroad tracks, etc.) it is unlikely that residential receptors would be present in much of the on-base ditch system. However, some parts of Drainage Area 5 are presently residential and could be further developed. In addition, trespasser (adult and adolescent) receptors (someone occasionally walking across the unfenced portions of the site) are possible. These receptors could come into contact through incidental ingestion and dermal contact. Persons engaged in fishing activities could also be exposed to sediments and these receptors were evaluated as part of the trespasser receptors.

Off-Base Sediments. Dioxin impacted sediments are also present throughout areas of the drainage system leading off base at NCBC. While areas are

covered with water year round, some are accessible during the dry parts of the year. Most of the area around this drainage system is highly residential and could be further developed as residential. In addition, trespasser (adult and adolescent) receptors (someone occasionally walking across the unfenced portions of the site) are possible. These receptors could come into contact through incidental ingestion and dermal contact. Persons engaged in fishing activities could also be exposed to sediments and these receptors will be evaluated as part of the trespasser receptors. Nearby occupational workers may be exposed through incidental ingestion and dermal contact. The same exposure pathways exist for site workers (those conducting mowing or other site maintenance activities), and excavation workers.

Surface Water. Most of the area around this drainage system is highly residential and could be further developed as residential. In addition, trespasser (adult and adolescent) receptors (someone occasionally walking across the unfenced portions of the site) are possible. These receptors could come into contact through incidental ingestion and dermal contact. Persons engaged in fishing activities could also be exposed to surface water and these receptors will be evaluated as part of the trespasser receptors. Nearby occupational workers may be exposed through incidental ingestion and dermal contact. The same exposure pathways exist for site workers (those conducting mowing or other site maintenance activities), and excavation workers.

3.3.4 Quantification of Exposures The final step of the exposure assessment is to quantify exposure (dose) for each receptor by each complete exposure pathway. Basic assumptions, called exposure variables, are used in this step to estimate the total exposure a receptor may ingest, absorb through the skin (dermal absorption), or inhale. This step identifies the combination of exposure variables that result in the most intense exposure that may "reasonably" be expected to occur under current and future site conditions (USEPA, 1989a). The resulting exposure scenarios are referred to as the RME for each exposure pathway. This is performed for every complete exposure pathway selected for evaluation.

The exposure variables used in this risk assessment can be grouped into three major areas. These areas are chemical-, population-, and assessment-related variables. The impact of each variable will be discussed below.

3.3.4.1 Chemical-Related Variable As briefly discussed in Subsection 3.2.2, a single chemical concentration is selected for input into the risk assessment. This chemical concentration, called the exposure point concentration (EPC), is considered representative of the COPC concentration in a particular medium at the exposure point. EPCs for each medium, selected in a manner consistent with USEPA guidance (USEPA, 1995a), were the lesser of either the 95 percent UCL on the arithmetic mean or the maximum detected concentration for each medium.

The 95 percent UCL was calculated using USEPA guidance (USEPA, 1992c) using the equation:

$$95\%\,UCL = e^{\left(\bar{x}+0.5s^2+\left(sH/\sqrt{n-1}\right)\right)}$$

Where:

UCL = upper confidence limit,
e = constant (base of the natural log, equal to 2.718),
$\bar{x}$ = mean of transformed data,
s = standard deviation of the transformed data,
H = H-statistic (from table published in Gilbert, 1987), and
n = number of samples.

In calculating the 95 percent UCLs, samples in which the analyte was not detected were assigned a value equal to one-half the reporting limit.

3.3.4.2 Population-Related Variable Population-related variables describe the characteristics of a hypothetical individual receptor within each potentially exposed population. Hypothetically exposed populations were identified through analysis of exposure setting and exposure pathway information. Population-related variables include contact rates, such as exposure frequencies and ingestion rates, and physical characteristics of human bodies, such as body weights and surface areas. When applicable, contact rates were selected from standard default exposure parameters (USEPA, 1991a and 1995a) or dermal exposure assessment guidance (USEPA, 1992b). If site-specific factors indicated that such parameters were not appropriate, alternative parameters were used based on knowledge of human behavior and the relative accessibility of the sites. Parameters describing the physical characteristics of the exposed populations were identified from appropriate USEPA guidance (USEPA, 1989a, 1989b, 1991a, and 1995a) and are presented in Tables 3-10.

3.3.4.3 Assessment-Related Variable The assessment-related variable involved in exposure quantification is the averaging time. Averaging time reflects the duration of exposure and depends on the type of effect being evaluated. Exposure intake during a defined interval (e.g., a lifetime) is averaged over the entire period, resulting in an estimate of average daily intake. Since only 2,3,7,9-TCDD was selected as a COPC in any media, and this chemical is only considered a carcinogen, only carcinogenic averaging times were used in the risk calculations. The averaging time for carcinogenic effects is assumed to be a 70-year lifetime expressed in days (25,550 days)(USEPA, 1989a).

3.3.4.4 Quantification of Exposure for Complete Pathways Once complete exposure pathways are selected for evaluation, the final step of the exposure assessment is to quantify exposure (i.e., intake) for each pathway. This quantification process involves developing exposure scenarios to estimate the total amount of contaminants that a hypothetical receptor may ingest, absorb through the skin (dermal absorption), or inhale from each exposure pathway. Based on current knowledge of the sites, quantification of exposure was based on residential and industrial land use at NCBC. These assumptions are based on current industrial land use and potential future residential, industrial, commercial, and recreational uses of the base and the surrounding area.

Table 3-10
Risk Assessment Input Parameters for All Receptors

Human Health Risk Assessment and Screening Level Ecological Risk
Assessment of Dioxins and Furans Associated with Former Herbicide
Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Abbreviation	Value	Description
Soil and Sediment Ingestion Rate		
Irw	50	Ingestion Rate – site worker (mg/day)
Irex	480	Ingestion Rate – excavation worker (mg/day)
Irocc	50	Ingestion Rate – occupation worker (mg/day)
Irad	100	Ingestion Rate – adult resident (mg/day)
Irc	200	Ingestion Rate – child resident (mg/day)
Irtrad	50	Ingestion Rate – adult trespasser (mg/day)
Irtrc	100	Ingestion Rate – adolescent trespasser (mg/day)
FI	1	Fraction Ingestion (unitless)
Inhalation Rate		
InhRw	0.833	Inhalation Rate – site worker (m^3/hr)
InhRex	2.5	Inhalation Rate – excavation worker (m^3/hr)
InhRocc	1	Inhalation Rate – occupational worker (m^3/hr)
InhRad	0.833	Inhalation Rate – adult resident (m^3/day)
InhRc	0.833	Inhalation Rate – child resident (m^3/day)
InhRtrad	0.833	Inhalation Rate – adult trespasser (m^3/day)
InhRtrc	0.833	Inhalation Rate – child trespasser (m^3/day)
Particulate Emission Factors		
PEF	4.97×10^7	Particulate Emission Factor (m^3/kg)
Exposure Time		
ETw	8	Exposure Time – site worker (hr/day)
ETex	8	Exposure Time – excavation worker (hr/day)
ETocc	8	Exposure Time – occupational worker (hr/day)
ETad	16	Exposure Time – adult resident (hr/day)
ETc	4	Exposure Time – child resident (hr/day)
ETtrad	1	Exposure Time – adult trespasser (hr/day)
ETtrc	1	Exposure Time – child trespasser (hr/day)
Exposure Frequencies (Surface soil)		
EFw	24	Exposure Frequency – site worker (day/yr)
EFex	30	Exposure Frequency – excavation worker (day/yr)
EFocc	250	Exposure Frequency – occupation worker (day/yr)
EFad	350	Exposure Frequency – adult resident (day/yr)
EFc	350	Exposure Frequency – child resident (day/yr)
EFtrad	24	Exposure Frequency – adult trespasser (day/yr)
EFtrc	30	Exposure Frequency – adolescent trespasser (day/yr)
Exposure Frequencies (Sediment)		
EFw	12	Exposure Frequency – site worker (day/yr)
EFex	30	Exposure Frequency – excavation worker (day/yr)
EFocc	30	Exposure Frequency – occupation worker (day/yr)
EFad	30	Exposure Frequency – adult resident (day/yr)
EFc	30	Exposure Frequency – child resident (day/yr)
EFtrad	24	Exposure Frequency – adult trespasser (day/yr)
EFtrc	30	Exposure Frequency – adolescent trespasser (day/yr)
Exposure Duration		
EDw	25	Exposure Duration – site worker (years)
EDex	1	Exposure Duration – excavation worker (years)
EDocc	25	Exposure Duration – occupation worker (years)
EDad	24	Exposure Duration – adult resident (years)
EDc	6	Exposure Duration – child resident (years)
EDtrad	19	Exposure Duration – adult trespasser (years)
EDtrc	11	Exposure Duration – adolescent trespasser (years)

See notes at end of table.

Table 3-10 (Continued)
Risk Assessment Input Parameters for All Receptors

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Abbreviation	Value	Description
Body Weights		
BWw	70	Body Weight – all workers (kg)
BWad	70	Body Weight – adult resident (kg)
BWc	15	Body Weight – child resident (kg)
BWtrad	70	Body Weight – adult trespasser (kg)
BWtrc	40	Body Weight – adolescent trespasser (kg)
Skin Surface Area		
SAw	5,750	Surface Area – site worker (cm^2)
SAex	5,750	Surface Area – excavation worker (cm^2)
SAocc	2,300	Surface Area – occupational worker (cm^2)
SAad	5,750	Surface Area – adult (cm^2)
SAtrad	5,750	Surface Area – adult trespasser (cm^2)
SAFc	766.7	Surface Area Factor – child (cm^2*yr/kg)
SAFtrc	1,136.3	Surface Area Factor – adolescent trespasser (cm^2*yr/kg)
For the child resident and child trespasser, SA (surface area) = Sum (SAx*BWx)/EFx		
where: SAx = age specific surface area		
BWx = age specific body weight		
EFx = exposure frequency		
Dermal Absorption Factor		
ABSd	0.01	Absorption Factor (unitless)
Skin Adherence Factors		
AF	1	Soil to Skin Adherence Factor – all receptors (mg/cm^2-event)
Conversion Factors		
CF	1×10^{-6}	Conversion Factor (kg/mg)
Averaging Time		
ATc	25,550	Averaging Time – Cancer (days)

Notes:
mg/day = milligrams per day.
m^3/hr = cubic meter per hour.
m^3/day = cubic meter per day.
mg^3/kg = cubic meter per kilogram.
hr/day = hour per day.
day/yr = day per year.
kg = kilogram.
cm^2 = centimeter squared.
cm^2*yr/kg = centimeter squared times year per kilogram.
mg/cm^2-event = milligrams per squared centimeter per event.
kg/mg = kilograms per milligram.

Calculation of Intakes. The equations used to calculate intake are those presented in USEPA guidance (USEPA, 1989a). The general equation for calculating chemical intake is as follows:

$$\text{Intake} = \frac{C \times CR \times EF \times ED \times CF}{BW \times AT}$$

where:

Intake = average daily intake over the averaging period (milligram per kilogram of body weight per day [mg/kg of body weight-day]),
C = concentration of the chemical in the exposure medium (milligrams per kilogram [mg/kg]),
CR = contact rate for the medium of concern (milligrams per day [mg/day]),
EF = exposure frequency (days per year),
ED = exposure duration (year),
CF = conversion factor (1×10^{-6} kilograms per milligram [kg/mg])
BW = body weight of the hypothetically exposed individual (kilogram), and
AT = averaging time (70 years times 365 days per year)

The various inputs to the risk assessment equation described above are presented in Table 3-10. Further information on these input variables are presented in the risk calculation spreadsheets in Appendix C.

Particulate Emission Factor. Exposures to COPCs may occur through inhalation of windborne particulate matter (dust) less than 10 microns in diameter (PM_{10}) to which the chemicals may adhere. The Particulate Emission Factor (PEF) relates the contaminant concentration in soil with the concentration of respirable particles (PM_{10}) in the air due to fugitive dust emissions from surface contamination sites. This relationship assumes a relatively continuous and constant potential for emission due to wind erosion over an extended period of time (Cowherd, 1985). The equation, which calculates a PEF, is:

$$PEF\left(\frac{m^3}{kg}\right) = \frac{Q}{C} \times \frac{3{,}600\frac{s}{h}}{0.036 \times (1-v) \times \left(\frac{U_m}{U_i}\right)^3 \times F(x)}$$

Where:		Default Value:
PEF	particulate emission factor (m^3/kg)	1.25×10^9 m^3/kg
$\frac{Q}{C}$	inverse of mean concentration at center of square source (g/m^2-s per kg/m^3)	90.80
0.036	respirable fraction (g/m^2-hr)	0.036 g/m^2-h
V	fraction of vegetative cover (unitless)	0.5 (50 percent)
U_m	mean annual wind speed (m/s)	4.5 m/sec
U_i	equivalent threshold value of wind speed at 7 meters (m/sec)	12.8 m/sec
F(x)	function dependent on $\frac{U_m}{U_i}$ (0.194 determined using Cowherd 1985, unitless)	

This model was selected because it represents a conservative estimate for intake of particulates. Generally for undisturbed sites with vegetative cover, air pathways are relatively minor contributors to risk (USEPA, 1991a). Default values for some physical parameters were used in the modeling approach. The default values provide a sufficiently conservative estimate of air concentrations.

Dermal Absorption from Water. Dermal exposure from water requires additional calculations before intake values can be calculated. The permeability constant approach is used to estimate dermal exposures to contaminants detected in water (USEPA, 1992b). The non-steady-state model employs a dermal permeability constant estimated from the compound's octanol-water partition coefficient to estimate absorption from water.

Dermal Absorption from Soil. Dermal absorption from soil also requires is additional calculations before intake values can be calculated. (USEPA, 1992b). Percutaneous absorption of chemicals detected in soil is both chemical and matrix dependent. According to USEPA Region IV guidance (USEPA, 1995a), absorption factors for organics are 1 percent. A soil adherence factor of 1 milligram of soil per square centimeter of skin per event is used in the dermal intake equations (USEPA, 1992b and 1995a).

3.4 TOXICITY ASSESSMENT. The purpose of the toxicity assessment is to evaluate the evidence of potential adverse effects that may be associated with exposure to each COPC. With this information, a relationship between the extent of exposure and the likelihood or severity of adverse human health effects is developed. The toxicity assessment is developed in a two-step process: hazard identification and dose-response assessment.

3.4.1 Hazard Identification In risk assessment, hazard is defined as any chemical exposure at a site that is capable of doing harm to human health. In most cases, the potential toxic effects associated with contaminants detected at hazardous wastes sites have already been identified. Those analytes selected as COPCs were deemed to present potential hazards.

3.4.2 Dose-Response Assessment The dose-response assessment quantifies the relationship between the intake of a COPC and the likelihood that a toxic effect may result from exposure. There are two major types of toxic effects, noncarcinogenic and carcinogenic, and they are evaluated separately (USEPA, 1989a). Cancer slope factors (CSFs) are used as the dose response value for carcinogens and reference doses (RfDs) are used for noncarcinogens. However, since 2,3,7,8-TCDD was the only COPC selected in any media, and presently the USEPA considers it only as a carcinogen, the remaining discussion will focus only on carcinogenic effects.

The USEPA assumes that carcinogenic effects are non-threshold effects. This means that any dose, no matter how small, is assumed to pose a finite probability of generating a response. Thus, no dose of a carcinogen is thought to be risk free. The USEPA uses a two-part evaluation for carcinogens. The first a weight-of-evidence classification and the second is the CSF. The CSF is used to calculate cancer risks.

The weight-of-evidence evaluation determines the likelihood that a chemical is a human carcinogen. USEPA has developed a system for characterizing the overall weight of evidence for a chemical's carcinogenicity based on animal,

human, and other supportive data (USEPA, 1989a). The three major factors considered in characterizing the overall weight-of-evidence for carcinogenicity are: the quality of evidence from human studies; the quality of evidence from animal studies; and other supportive information, such as mutagenicity data and structure-activity data.

USEPA's final classification of the overall weight-of-evidence has the following five categories:

> Group A - Human Carcinogen This category indicates there is sufficient evidence from epidemiological studies to support a causal association between an agent and human cancer.
>
> Group B - Probable Human Carcinogen This category generally indicates there is at least limited evidence from epidemiological studies of carcinogenicity to humans (Group B1) or that, in the absence of data on humans, there is sufficient evidence of carcinogenicity in animals (Group B2).
>
> Group C - Possible Human Carcinogen This category indicates that there is limited evidence of carcinogenicity in animals in the absence of data on humans.
>
> Group D - Not Classified This category indicates that the evidence for carcinogenicity in animals is inadequate.

2,3,7,8-TCDD currently has no weight of evidence classification due to the continuing USEPA reassessment. However, 2,3,7,8-TCDD used to be considered a Group B2.

The CSF is a chemical-specific toxicity value developed by the USEPA Carcinogenic Risk Assessment Verification Endeavor and is based upon the dose of a chemical and the probability of a carcinogenic response. This value is used in calculating all carcinogenic risks due to ingestion and inhalation. However, risks associated with dermal exposures (most commonly for soil and water dermal contact) are evaluated using slightly modified CSFs (USEPA, 1995a). Oral dose-response values are usually based on an administered dose in animals rather than on the absorbed dose. Dermal risks are due to dermal absorption and it is necessary to adjust the CSF based on administered doses to account for absorption. For dermal exposures, the toxicity values are adjusted to account for absorption by dividing the oral CSF by the absorption efficiency in the equation:

$$CSF_{adjusted} = \frac{CSF_{oral}}{ABSEFF_{oral}}$$

$ABSEFF_{oral}$ is the absorption efficiency. This, however, is meaningless for TCDD since $ABSEFF_{oral}$ is 100 percent.

3.4.3 Sources of Dose-Response Values The source of CSF for 2,3,7,8-TCDD was the USEPA Health Effects Assessment Summary Tables (HEAST) (USEPA, 1996c). The CSF value for 2,3,7,8-TCDD is 1.5×10^{5} per milligram per kilogram-day (1.5×10^{5} $(mg/kg\text{-}day)^{-1}$).

3.5 HUMAN HEALTH RISK CHARACTERIZATION. Risk characterization integrates the exposure and toxicity information to quantitatively evaluate the potential health risks associated with exposure to COPCs at a site. Carcinogenic risks associated with exposure to individual chemicals are estimated by multiplying the exposure pathway-specific chemical intake (e.g., oral, dermal, inhalation) for each carcinogen by its exposure route-specific CSF (e.g., oral CSF, dermal CSF, inhalation CSF). The calculated value is a chemical-specific excess lifetime cancer risk (ELCR) and represents an upper bound of the probability of an individual developing cancer over a lifetime as the result of exposure to a chemical. The equation used calculate the ECLR for 2,3,7,8-TCDD in this risk analysis is:

$$Risk = CDI \times CSF$$

Where:

Risk = unitless probability of cancer risk resulting from exposure to 2,3,7,8-TCDD,

CDI = chronic daily intake of 2,3,7,8-TCDD (averaged over 70 years in mg/[(kg of BW)(day)], and

CSF = Cancer Slope Factor for 2,3,7,8-TCDD [1.5×10^{5} $(mg/(kg\ of\ BW\text{-}day))^{-1}$.]

The results of the carcinogenic risk assessment are compared with guidelines established by the MSDEQ and USEPA. MSDEQ has defined unacceptable risks as those greater than 1 in 1,000,000 (1×10^{-6}). The USEPA, in the National Oil and Hazardous Substances Contingency Plan (NCP), indicates that the total lifetime cancer risk due to exposure to the COPCs at a site, by each complete exposure pathway, should not exceed a range of 1 in 1,000,000 (1×10^{-6}) to 1 in 10,000 (1×10^{-4}) (USEPA, 1990a). For reference, the average cancer burden in the United States in 1993 was 1 in 3 for women and 1 in 2 for men (American Cancer Society, 1994).

3.5.1 Carcinogenic Risks The following cancer risks are presented by media and by receptor (Table 3-11). Risks are calculated for presented land use followed by future potential land use. The actual risk calculation spreadsheets are provided in Appendix D. For receptors where the ECLR is greater that 1×10^{-6}, additional risk calculations using the CT value for the EPC concentration are also provided. These risk calculations are not meant to replace the RME risks. Rather, they provide risk managers with additional information on the range of risks when considering the average TCDD TEQ concentration on the site.

Table 3-11
Calculated Risks For All Receptors

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of Dioxins and Furans Associated with Former Herbicide Orange Storage Naval Construction Battalion Center Gulfport, Mississippi

Land Use	Exposure Route	ELCR* (RME)	ELCR* (CT)
Current Land Use			
Surface Soil: (Site 8)			
Adolescent Trespasser:	Incidental ingestion	4×10^{-7}	
	Dermal contact	2×10^{-7}	
	Inhalation of particulates	1×10^{-11}	
	Total Adolescent Trespasser:	6×10^{-7}	
Adult Trespasser:	Incidental ingestion	2×10^{-7}	
	Dermal contact	3×10^{-7}	
	Inhalation of particulates	2×10^{-11}	
	Total Adult Trespasser:	5×10^{-7}	
	Total Risk to Trespasser (Adolescent and Adult) Exposed to Surface Soil:	1×10^{-6}	
Occupational Worker	Incidental ingestion	3×10^{-6}	8×10^{-7}
	Dermal contact	6×10^{-7}	3×10^{-7}
	Inhalation of particulates	9×10^{-10}	3×10^{-10}
	Total Occupational Worker:	3×10^{-6}	1×10^{-6}
Site Worker	Incidental ingestion	3×10^{-7}	
	Dermal contact	3×10^{-7}	
	Inhalation of particulates	8×10^{-11}	
	Total Site Worker:	5×10^{-7}	
Excavation Worker	Incidental ingestion	1×10^{-7}	
	Dermal contact	1×10^{-8}	
	Inhalation of particulates	4×10^{-12}	
	Total Excavation Worker:	1×10^{-7}	
Surface Soil: (Non-Site 8)			
Child Resident:	Incidental ingestion	1×10^{-5}	4×10^{-6}
	Dermal contact	2×10^{-6}	6×10^{-7}
	Inhalation of particulates	1×10^{-11}	3×10^{-12}
	Total Child Resident:	1×10^{-5}	5×10^{-6}
Adult Resident:	Incidental ingestion	9×10^{-7}	3×10^{-7}
	Dermal contact	5×10^{-7}	2×10^{-7}
	Inhalation of particulates	6×10^{-10}	3×10^{-10}
	Total Adult Resident	1×10^{-6}	5×10^{-7}
	Total Resident	2×10^{-5}	6×10^{-6}
Adolescent Trespasser:	Incidental ingestion	4×10^{-7}	
	Dermal contact	1×10^{-7}	
	Inhalation of particulates	1×10^{-11}	
	Total Adolescent Trespasser:	5×10^{-7}	
Adult Trespasser:	Incidental ingestion	2×10^{-7}	
	Dermal contact	2×10^{-7}	
	Inhalation of particulates	2×10^{-11}	
	Total Adult Trespasser:	4×10^{-7}	
	Total Risk to Trespasser (Adolescent and Adult) Exposed to Surface Soil:	9×10^{-7}	

See notes at end of table.

Table 3-11 (Continued)
Calculated Risks For All Receptors

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of
Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Land Use	Exposure Route	ELCR* (RME)	ELCR* (CT)
Occupational Worker	Incidental ingestion	2×10^{-6}	7×10^{-7}
	Dermal contact	5×10^{-7}	3×10^{-7}
	Inhalation of particulates	7×10^{-10}	2×10^{-10}
	Total Occupational Worker:	3×10^{-6}	1×10^{-6}
Site Worker	Incidental ingestion	2×10^{-7}	
	Dermal contact	2×10^{-7}	
	Inhalation of particulates	7×10^{-11}	
	Total Site Worker:	4×10^{-7}	
Excavation Worker	Incidental ingestion	1×10^{-7}	
	Dermal contact	1×10^{-8}	
	Inhalation of particulates	3×10^{-12}	
	Total Excavation Worker:	1×10^{-7}	
Sediment On Base			
Child Resident:	Incidental ingestion	5×10^{-6}	3×10^{-6}
	Dermal contact	7×10^{-7}	4×10^{-7}
	Total Child Resident:	6×10^{-6}	3×10^{-6}
Adult Resident:	Incidental ingestion	2×10^{-6}	1×10^{-6}
	Dermal contact	1×10^{-6}	6×10^{-7}
	Total Adult Resident	3×10^{-6}	2×10^{-6}
	Total Resident	9×10^{-6}	5×10^{-6}
Adolescent Trespasser:	Incidental ingestion	2×10^{-6}	8×10^{-7}
	Dermal contact	7×10^{-7}	3×10^{-7}
	Total Adolescent Trespasser:	2×10^{-6}	1×10^{-6}
Adult Trespasser:	Incidental ingestion	7×10^{-7}	3×10^{-7}
	Dermal contact	8×10^{-7}	4×10^{-7}
	Total Adult Trespasser:	2×10^{-6}	7×10^{-7}
	Total Risk to Trespasser (Adolescent and Adult) Exposed to Sediment:	4×10^{-6}	2×10^{-6}
Occupational Worker	Incidental ingestion	6×10^{-7}	
	Dermal contact	3×10^{-7}	
	Total Occupational Worker:	8×10^{-7}	
Site Worker	Incidental ingestion	5×10^{-7}	
	Dermal contact	5×10^{-7}	
	Total Site Worker:	1×10^{-6}	
Excavation Worker	Incidental ingestion	5×10^{-7}	
	Dermal contact	5×10^{-8}	
	Total Excavation Worker:	5×10^{-7}	
Sediment Off Base			
Child Resident:	Incidental ingestion	4×10^{-7}	
	Dermal contact	6×10^{-8}	
	Total Child Resident:	5×10^{-7}	
Adult Resident:	Incidental ingestion	2×10^{-7}	
	Dermal contact	1×10^{-7}	
	Total Adult Resident	3×10^{-7}	
	Total Resident	8×10^{-7}	

See notes at end of table.

Table 3-11 (Continued)
Calculated Risks For All Receptors

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of
Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Land Use	Exposure Route	ELCR* (RME)	ELCR* (CT)
Adolescent Trespasser:	Incidental ingestion	1×10^{-7}	
	Dermal contact	5×10^{-8}	
	Total Adolescent Trespasser:	1×10^{-7}	
Adult Trespasser:	Incidental ingestion	6×10^{-8}	
	Dermal contact	7×10^{-8}	
	Total Adult Trespasser:	1×10^{-7}	
	Total Risk to Trespasser (Adolescent and Adult) Exposed to Sediment:	2×10^{-7}	
Occupational Worker	Incidental ingestion	1×10^{-7}	
	Dermal contact	2×10^{-8}	
	Total Occupational Worker:	1×10^{-7}	
Site Worker	Incidental ingestion	4×10^{-8}	
	Dermal contact	4×10^{-8}	
	Total Site Worker:	8×10^{-8}	
Excavation Worker	Incidental ingestion	4×10^{-8}	
	Dermal contact	4×10^{-9}	
	Total Excavation Worker:	4×10^{-8}	
Future Land Use			
Surface Soil: (Site 8)			
Child Resident:	Incidental ingestion	2×10^{-5}	5×10^{-6}
	Dermal contact	2×10^{-6}	3×10^{-7}
	Inhalation of particulates	2×10^{-11}	4×10^{-12}
	Total Child Resident:	2×10^{-5}	5×10^{-6}
Adult Resident:	Incidental ingestion	7×10^{-6}	2×10^{-6}
	Dermal contact	4×10^{-6}	1×10^{-6}
	Inhalation of particulates	1×10^{-9}	3×10^{-10}
	Total Adult Resident	1×10^{-5}	3×10^{-6}
	Total Resident	3×10^{-5}	8×10^{-6}
Surface Soil: (Non-Site 8)			
Child Resident:	Incidental ingestion	1×10^{-5}	4×10^{-6}
	Dermal contact	2×10^{-6}	6×10^{-7}
	Inhalation of particulates	1×10^{-11}	3×10^{-12}
	Total Child Resident:	1×10^{-5}	6×10^{-6}
Adult Resident:	Incidental ingestion	6×10^{-6}	2×10^{-6}
	Dermal contact	3×10^{-6}	1×10^{-6}
	Inhalation of particulates	9×10^{-9}	3×10^{-10}
	Total Adult Resident	9×10^{-6}	3×10^{-6}
	Total Resident	2×10^{-5}	9×10^{-6}

Notes: * = receptor totals may vary due to rounding of scientific notation to 1 significant digit..
ELCR = excess lifetime cancer risk.
RME =Reasonable Maximal Exposure.
CT = Central Tendency.

3.5.2 Present Land Use The inhalation of particulates was not a risk driver in any case presented below.

3.5.2.1 RME Site 8 Surface Soil The risk characterization results for RME for present land use surface soil exposure scenarios are shown in Table 3-11 and in Appendix D. The cancer risks associated with exposure to surface soil (ingestion, dermal contact, and fugitive dust inhalation) are 1×10^{-6} for the trespasser (combined adolescent and adult), 3×10^{-6} for an occupational worker, 5×10^{-7} for a site worker and 1×10^{-7} for an excavation worker. The occupational worker cancer risk exceeds the MSDEQ 1×10^{-6} risk level.

3.5.2.2 CT Site 8 Surface Soil The risk characterization results for CT for present land use surface soil are shown in Table 3-11 and in Appendix D. The cancer risks associated with CT exposure to surface soil (ingestion, dermal contact, and fugitive dust inhalation) are 1×10^{-6} for occupational worker. This does not exceed the MSDEQ 1×10^{-6} risk level.

3.5.2.3 RME Non-Site 8 Surface Soil The risk characterization results for RME for present land use surface soil exposure scenarios are shown in Table 3-11 and in Appendix D. The cancer risks associated with exposure to surface soil (ingestion, dermal contact, and fugitive dust inhalation) are 3×10^{-5} for an aggregate resident (combined child and adult), 9×10^{-7} for the trespasser (combined adolescent and adult), 3×10^{-6} for an occupational worker, 4×10^{-7} for a site worker and 1×10^{-7} for an excavation worker. The aggregate (combined adult and child) resident and occupational worker cancer risk exceed the MSDEQ 1×10^{-6} risk level.

3.5.2.4 CT Non-Site 8 Surface Soil The risk characterization results for CT present land use surface soil are shown in Table 3-11 and in Appendix D. The cancer risks associated with CT exposure to surface soil (ingestion, dermal contact, and fugitive dust inhalation) are 6×10^{-6} for the aggregate resident and 1×10^{-6} for the occupational worker. The aggregate resident still exceeds the MSDEQ 1×10^{-6} risk level.

3.5.2.5 RME On-Base Sediment The risk characterization results for RME present on-base sediment exposure scenarios are shown in Table 3-11 and in Appendix D. The cancer risks associated with exposure to on-base sediment (ingestion, dermal contact, and fugitive dust inhalation) are 9×10^{-6} for an aggregate resident (combined child and adult), 4×10^{-6} for the trespasser (combined adolescent and adult), 8×10^{-7} for an occupational worker, 1×10^{-6} for a site worker and 5×10^{-7} for an excavation worker. The combined resident, the aggregate trespasser, and the occupational worker cancer risks exceed the MSDEQ 1×10^{-6} risk level.

3.5.2.6 CT On-Base Sediment The risk characterization results for CT present land use sediment are shown in Table 3-11 and in Appendix D. The cancer risks associated with CT exposure to sediment (ingestion and dermal contact) are 5×10^{-6} for the aggregate resident and 2×10^{-6} for the aggregate trespasser. The aggregate resident and the aggregate trespasser still exceed the MSDEQ 1×10^{-6} risk level.

3.5.2.7 RME Off-Base Sediment The risk characterization results for RME present off-base sediment exposure scenarios are shown in Table 3-11 and in Appendix D. The cancer risks associated with exposure to off-base sediment (ingestion, dermal contact, and fugitive dust inhalation) are 8×10^{-7} for an aggregate resident (combined child and adult), 2×10^{-7} for the trespasser (combined adolescent and adult), 1×10^{-7} for an occupational worker, 8×10^{-8} for a site worker and 4×10^{-8} for an excavation worker. None of the cancer risks exceed the MSDEQ 1×10^{-6} risk level.

3.5.3 Future Land Use

3.5.3.1 RME Site 8 Surface Soil The risk characterization results for RME future land use surface soil exposure scenarios are shown in Table 3-11 and in Appendix D. The cancer risks associated with exposure to surface soil (ingestion, dermal contact, and fugitive dust inhalation) are 3×10^{-5} for an aggregate resident (combined child and adult). The trespasser, occupational worker, site worker, and excavation worker risks are the same as the present use scenario. The cancer risks associated with exposure to surface soil (ingestion, dermal contact, and fugitive dust inhalation) are 1×10^{-6} for the trespasser (combined adolescent and adult), 3×10^{-6} for an occupational worker, 5×10^{-7} for a site worker and 1×10^{-7} for an excavation worker. The combined resident cancer risk and the occupational worker exceed the MSDEQ 1×10^{-6} risk level.

3.5.3.2 CT Site 8 Surface Soil The risk characterization results for CT present land use surface soil are shown in Table 3-11 and in Appendix D. The cancer risks associated with CT exposure to surface soil (ingestion, dermal contact, and fugitive dust inhalation) are 8×10^{-6} for the aggregate resident and 1×10^{-6} for the occupational worker. The combined resident cancer risk still exceeds the MSDEQ 1×10^{-6} risk level.

3.5.3.3 RME Non-Site 8 Surface Soil The risk characterization results for RME future land use surface soil exposure scenarios are shown in Table 3-11 and in Appendix D. The cancer risks associated with exposure to surface soil (ingestion, dermal contact, and fugitive dust inhalation) are 2×10^{-5} for an aggregate resident (combined child and adult). The trespasser, occupational worker, site worker, and excavation worker risks are the same as the present use scenario. The cancer risks associated with exposure to surface soil (ingestion, dermal contact, and fugitive dust inhalation) are 9×10^{-7} for the trespasser (combined adolescent and adult), 3×10^{-6} for an occupational worker, 4×10^{-7} for a site worker and 1×10^{-7} for an excavation worker. The combined resident and the occupational worker cancer risk exceed the MSDEQ 1×10^{-6} risk level.

3.5.3.4 CT Non-Site 8 Surface Soil The risk characterization results for CT present land use surface soil are shown in Table 3-11 and in Appendix D. The cancer risks associated with CT exposure to surface soil (ingestion, dermal contact, and fugitive dust inhalation) are 9×10^{-6} for the aggregate resident

and 1×10^{-6} for the occupational worker. The combined resident cancer risk still exceeds the MSDEQ 1×10^{-6} risk level.

3.5.4 Cumulative Risk Summary USEPA Region IV guidance requires an assessment of cumulative receptor risk. The cumulative risks for each land use are provided in Table 3-12.

3.6 UNCERTAINTY ANALYSIS. Risk estimates are conservative values resulting from multiple layers of conservative assumptions inherent in the risk assessment process. Quantitative estimates of risk are based on numerous assumptions, most of which are intended to be protective of human health. As such, these risk estimates are not truly probabilistic estimates of risk, but are estimates based on a series of conservative assumptions about exposure and toxicity.

The most common sources of uncertainty in this risk assessment can be categorized into three areas. They are site-specific factors (e.g., variability in analytical data and exposure assessment), toxicity factors, and the actual risk characterization. Unfortunately, the toxicity factor and risk characterization uncertainties are beyond the control of any risk assessment as they apply to all risk assessments. The sources of uncertainties and their impact on the risk assessment are provided in Table 3-13.

3.6.1 Data Collection, Analysis, and Evaluation A certain amount of uncertainty is associated with the representative nature of the data collected to complete the risk evaluation at each site. Additional uncertainties associated with estimating exposure result from the variance in sampling and analytical techniques. In this risk assessment, two general uncertainties related to data collection are the nature and extent of contamination and adequate characterization of exposure areas.

3.6.2 Nature and Extent of Contamination The nature and extent of contamination is normally unknown. Even with extensive sampling, chemical concentrations in all potential areas of exposure are not known. There is always inherent uncertainty in the assumption that the nature and extent of contamination has been adequately characterized. This is especially true for moving material like sediment and surface water.

3.6.3 Adequate Characterization of Exposure Areas Contaminated areas, such as those organic-rich areas of the ditch system, are sometimes small relative to the area in which a receptor could potentially be exposed. The biased sampling protocol in the on-base and off-base delineation plan, while useful in determining the extent of contamination, most likely resulted in a data set that overestimated exposure.

3.6.4 Exposure Assessment The use of standard USEPA input variables into the risk assessment always results in major areas of uncertainty in the resulting risk calculations. The areas include assumptions about land use (especially future land use), use of the RME, EPC calculation, and the exposure input variables.

Table 3-12
Total Risk Summary, Current and Future Land Use

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of
Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Land Use		Exposure Route	Total ELCR* (RME)	ELCR* (CT)
Current Land Use				
On-base Receptors				
Total Resident	Non-site 8 soil; on-base sediment	Ingestion, dermal contact, and fugitive dust inhalation	3×10^{-5}	1×10^{-5}
Total Trespasser	Site 8 soil; non-Site 8 soil; on-base sediment	Ingestion, dermal contact, and fugitive dust inhalation	6×10^{-6}	2×10^{-6}
Occupational Worker	Site 8 soil; non-Site 8 soil; on-base sediment	Ingestion, dermal contact, and fugitive dust inhalation	7×10^{-6}	2×10^{-6}
Site Worker	Site 8 soil; non-Site 8 soil; on-base sediment	Ingestion, dermal contact, and fugitive dust inhalation	2×10^{-6}	NC
Excavation Worker	Site 8 soil; non-Site 8 soil; on-base sediment	Ingestion, dermal contact, and fugitive dust inhalation	7×10^{-7}	NC
Off-base Receptors				
Total Resident	Off-base sediment	Ingestion and dermal contact	8×10^{-7}	NC
Total Trespasser	Off-base sediment	Ingestion and dermal contact	2×10^{-7}	NC
Occupational Worker	Off-base sediment	Ingestion and dermal contact	1×10^{-7}	NC
Site Worker	Off-base sediment	Ingestion and dermal contact	8×10^{-8}	NC
Excavation Worker	Off-base sediment	Ingestion and dermal contact	4×10^{-8}	NC
Future Land Use				
On-base Receptors				
Total Resident	Site 8 soil; non-Site 8 soil; on-base sediment	Ingestion, dermal contact, and fugitive dust inhalation	6×10^{-5}	1×10^{-5}
Total Trespasser	Site 8 soil; non-Site 8 soil; on-base sediment	Ingestion, dermal contact, and fugitive dust inhalation	6×10^{-6}	2×10^{-6}
Occupational Worker	Site 8 soil; non-Site 8 soil; on-base sediment	Ingestion, dermal contact, and fugitive dust inhalation	7×10^{-6}	2×10^{-6}
Site Worker	Site 8 soil; non-Site 8 soil; on-base sediment	Ingestion, dermal contact, and fugitive dust inhalation	2×10^{-6}	NC
Excavation Worker	Site 8 soil; non-Site 8 soil; on-base sediment	Ingestion, dermal contact, and fugitive dust inhalation	7×10^{-7}	NC
Off-base Receptors				
Total Resident	Off-base sediment	Ingestion and dermal contact	8×10^{-7}	NC
Total Trespasser	Off-base sediment	Ingestion and dermal contact	2×10^{-7}	NC
Occupational Worker	Off-base sediment	Ingestion and dermal contact	1×10^{-7}	NC
Site Worker	Off-base sediment	Ingestion and dermal contact	8×10^{-8}	NC
Excavation Worker	Off-base sediment	Ingestion and dermal contact	4×10^{-8}	NC

* Receptor totals may vary from spreadsheets due to rounding algorithm.

Notes: ELCR = excess lifetime cancer risk.
RME =Reasonable Maximal Exposure.
CT = Central Tendency.
NC = not calculated.

Table 3-13
Sources of Risk Assessment Uncertainty

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of Dioxins and Furans
Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Potential Source	Direction of Effect	Justification
Exposure Assessment		
Exposure point concentrations	Overestimate	Sampling data are assumed to be representative of the exposures. RME values assume a high end exposure that is not truly representative of actual exposures. The use of the CT values helps put the potential actual risk into perspective.
Exposure Assessment		
Likelihood of exposure pathways	Overestimate	Actual exposure may not occur.
Exposure assumptions	Overestimate	Parameters selected are highly conservative estimates of exposure representing a high-end exposure. The RME exposure is most likely not going to occur and the cumulative risk is unreasonably high.
Absorption of soil contaminants through the skin	Overestimate	Dermal absorption of chemicals is a function of the length of actual skin contact. Contact may be insufficient to result in the absorption assumed.
Exposure point concentrations	Unknown, probably overestimate	Based on numerous assumptions resulting in conservative exposure point concentrations.
Toxicity Assessment		
Extrapolation of animal toxicity data to human	Greatly overestimates	This is the greatest area of uncertainty in dioxin risk assessment. The incredibly high cancer CSF for 2,3,7,8-TCDD is based on highly sensitive animal species. It has been repeatedly demonstrated that humans are much less sensitive to the carcinogenic effects of 2,3,7,8-TCDD and the CSF greatly overestimates carcinogenic risks in humans.
Use of linear multistage model to derive cancer slope factors	Overestimate	Model assumes a non-threshold, linear low dose-relationship for carcinogens. Many compounds induce cancer by non-genotoxic mechanisms. Model results in 95 percent upper confidence limits of cancer potency. Potency is unlikely to be higher and may be as low as zero.
Lack of inhalation toxicity values	Underestimate	Inhalation reference doses and cancer slope factors are not available for all human health chemicals of potential concern being evaluated for inhalation exposures (fugitive dust and volatiles while showering). Therefore, risks cannot be quantified and are underestimated.
Risk Characterization		
Summation of risk among chemicals within exposure pathways	Greatly overestimates	The summation of risks by all pathways is unreasonable and generates risks that are highly unlikely to occur.

Notes: RME = Reasonable Maximal Exposure.
CT = Central Tendency.
CSF = cancer slope factor.
TCDD = tetrachlorodibenzo-p-dioxin.

3.6.5 Land Use The potential future land use for NCBC is not assured. In the absence of a defined future land use, the receptor scenario evaluated was selected to provide assessment of potential exposures under the full spectrum of potential future land uses. Another area of significant uncertainty is the future residential receptor, especially on Site 8. It is highly unlikely that an unrestricted residential exposure would occur at Site 8. The area is highly industrialized and will likely remain so in the future.

3.6.6 Exposure Parameters. The selection and use of exposure parameters contribute to the uncertainty inherent in a risk estimate. There are several exposure parameters that impact most risk assessments as described below.

3.6.6.1 Reasonable Maximum Exposure The exposure assessments conducted in this risk assessment are characterized as an RME. As such, the exposure estimates represent a mix of "high end" exposure parameter values that result in an exposure estimate that is unlikely to be exceeded in an exposed population. Because some of these parameters are functions of the behavior patterns and personal habits of the exposed populations, no one value can be assumed representative of all possible exposure conditions. Further, uncertainties (e.g., body weight, surface area, and ingestion rates) associated with assigning single exposure parameters to a heterogeneous population, which includes both men and women and the young and the old, are considered significant. However, the risk assessment incorporates assumptions or procedures that result in the estimate of an upper bound of risk. This type of exposure assessment tends to overestimate risks for the large majority of an exposed population. To address the most conservative exposure scenario available, the future resident (an RME) is normally evaluated in a risk assessment.

3.6.6.2 Exposure Point Concentration (EPC) USEPA guidance specifies using the 95 percent UCL on the arithmetic mean concentration of the site sampling results for the concentration term in the intake equation for risk assessment calculations for soil (USEPA, 1995a). In order to use the UCL of the arithmetic mean, samples are collected randomly, based on the assumption that an exposed individual would move randomly across the site. An overestimation of the risk may occur.

3.6.6.3 The Particulate Exposure Factor (PEF) The PEF that is used to estimate the concentration of soil particles that a receptor may inhale is the same for multiple receptors (e.g., resident and excavation worker). It is likely that more soil particles would be suspended in air during soil excavation activities and, therefore, an excavation worker would be exposed to greater concentrations of COPCs associated with airborne soil particles than a resident. Risk associated with inhalation exposures for the excavation worker may be underestimated. In actual practice, however, use of a larger PEF results in only slightly larger additional risks (usually much less than an order of magnitude). Since the inhalation risk estimates for the excavation worker were several orders of magnitude less than the MSDEQ risk level, the lack of an excavation worker-specific PEF does not significantly underestimate the risks to this receptor.

3.6.7 Toxicity Assessment The greatest area of uncertainty in dioxin risk assessments is the CSF. This incredibly high factor dominates all other input factors into the risk equation. The identification of human carcinogens, based on animal data, is a primary source of uncertainty in the use of toxicity values. It is not certain that the identification of carcinogenic

activity in an animal species means that carcinogenic activity in humans will occur. In some cases, the metabolic processes involved in carcinogenic activity in a particular organ in animals may not exist in humans. Available evidence indicates a limited number of substances that are classified as human carcinogens (USEPA Class A substances). CSFs are generally based on animal studies, many of which are performed at high doses relative to the site-specific exposures that potentially could occur. These data require interpretation and/or extrapolation in the low dose area of the dose-response curve. The CSFs used in the risk assessment generally represent a "high end" estimate. The CSFs are the 95 percent UCL on the actual slope derived from the scientific data and, therefore, are likely overestimates of the potency.

3.7 REMEDIAL GOAL OPTIONS. Those media with estimated RME incremental lifetime cancer risks above 1×10^{-6} are selected for development of media cleanup levels in accordance with USEPA Region IV guidance (USEPA, 1995a). RGOs are intended to provide the basis for the development of remedial alternatives in the Feasibility Study.

From the risk summary tables, those receptors with estimated ELCRs above 1×10^{-6} in all media to which the receptor is exposed were identified. Total TCDD TEQ is, therefore, a contaminant of concern (COC) for these receptors. RGOs were calculated for each receptor and land use using the following equation (USEPA, 1995a):

$$\frac{EPC_{Chemical}}{CR_{Chemical}} = \frac{RGO_{Chemical}}{TR_{Chemical}}$$

Where:

EPC = Exposure Point Concentration
CR = Calculated Risk
RGO = Remedial Goal Option
TR = Target Risk

For each receptor for which RGOs were calculated, the EPCs and risk estimates used in this equation were obtained from the risk calculation spreadsheets (Appendix C). In accordance with USEPA Region IV guidance (USEPA, 1995a), RGOs were calculated for target cancer risks of 1×10^{-6}, 1×10^{-5}, and 1×10^{-4}. Some RGOs are based on technical limitations rather than risk levels. Phase I of the surface water and sediment delineation study included a Triplicate Study to evaluate the reproducibility of dioxin analyses in the low ppt range. This study demonstrated that analytical variability between split samples became unacceptably high at 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) toxicity equivalent (TEQ) concentrations below 15 ppt (ABB-ES, 1996a). Table 3-14 provides the calculated RGOs.

Table 3-14
Remedial Goal Options

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of
Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Site	Media	Receptor	Range of Detected Concentrations (ng/kg)	Exposure Point Concentration (ng/kg)	Screening Concentration[1] (ng/kg)	RGO at Total Excess Lifetime Cancer Risk Levels[2] (ng/kg)		
						10^{-6}	10^{-5}	10^{-4}
Present Land Use								
Site 8	Surface Soil	Occupational Worker	0 to 181	99.5	4.3	[2]50	[2]500	[2]5,000
Non-Site 8	Surface Soil	Total Resident	2 to 79	79	4.3	[3]3.9	39	390
		Occupational Worker	2 to 79	79	4.3	[2]50	[2]500	[2]5,000
On Base	Sediment	Total Resident	0.02 to 3,990	365	4.3	42	420	4,200
		Total Trespasser	0.02 t o 3,990	365	4.3	162	1,620	16,200
		Occupational Worker	0.02 t o 3,990	365	4.3	[2]102	[2]1,020	[2]10,200
Future Land Use								
Site 8	Surface Soil	Total Resident	0 to 181	99.5	4.3	[3]15	[3]150	[3]1,500
Non-Site 8	Surface Soil	Total Resident	2 to 79	79	4.3	[3]15	[3]150	[3]1,500

[1] The screening values are from the U.S. Environmental Protection Agency Region III Risk Based Concentration Table (April 1999) for residential receptors.

[2] RGOs may differ significantly due to rounding of scientific notation to one significant digit.

[3] This is the theoretical risk-based RGO; however, at the Naval Construction Battalion Center in Gulfport, a technology based detection limit of 15 ng/kg has been demonstrated (ABB-ES, 1996a). It is strongly recommended that 15 ng/kg be used as the RGO for the 10^{-6} total excess lifetime cancer risk level.

Notes: ng/kg = nanograms per kilogram.
RGO = remedial goal option.
ppt = parts per trillion.
TCDD = tetrachlorodibenzo-p-dioxin.

4.0 SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT

The screening level Ecological Risk Assessment (ERA) follows the recent USEPA guidance, Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments (USEPA, 1997b), hereafter referred to as the "process document". The process document requires that a screening level ERA be completed to determine whether the site poses no (or negligible) ecological risk or whether further evaluation is required. If further evaluation is required, a more detailed baseline ERA will be completed.

This ERA evaluates actual and potential adverse effects to ecological receptors associated with exposure to dioxin contamination at, and in the vicinity of NCBC Gulfport. The purpose of the screening level ERA is to determine whether the contaminants pose ecological risks or whether further evaluation of specific exposure pathways is necessary. Although the screening level ERA follows the Process Document, it is also consistent with the methodologies and current guidance materials from USEPA at Superfund sites including the following:

- *Risk Assessment Guidance for Superfund: Environmental Evaluation Manual* (USEPA, 1989c)
- *Ecological Assessment at Hazardous Waste Sites: A Field and Laboratory Reference* (USEPA, 1989d)
- *Framework for Ecological Risk Assessment* (USEPA, 1992d)
- *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (USEPA, 1997b)
- *Supplemental Guidance to RAGS: Region 4 Bulletins on Ecological Risk Assessment* (USEPA, 1995b) and
- *Guidelines for Ecological Risk Assessment* (USEPA, 1998a).

Risk assessment guidance included in the USEPA "Eco Update" bulletins (1991c, 1992e, and 1992f) and other publications (e.g., Maughan, 1993; Suter, 1993) were also consulted.

The screening level ERA for NCBC Gulfport is presented in Sections 4.1 through 4.8, including the site characteristics and ecological setting (Section 4.1), screening level problem formulation (Section 4.2), hazard assessment (Section 4.3), screening level exposure assessment (Section 4.4), screening level ecological effects or toxicity assessment (Section 4.5), screening level risk characterization (Section 4.6), screening level uncertainty analysis (Section 4.7) and screening level ERA summary/recommendations (Section 4.8).

4.1 SITE CHARACTERISTICS AND ECOLOGICAL SETTING. Chapter 2.0 summarized the site and investigation history. An HLA ecologist visited NCBC Gulfport on August 23-27, 1999, to characterize habitats that exist at the site and to determine appropriate receptors in support of the ERA. The results of the

site walkover are included in Appendix E. The ecological setting is divided into five subsections: 4.1.1 discusses the site-related characteristics of the NCBC base; 4.1.2 discusses the vegetative cover at NCBC Gulfport; 4.1.3 characterizes the wildlife habitat; 4.1.4 discusses aquatic habitat; and 4.1.5 provides a summary of rare, endangered, and threatened species that may potentially be found at NCBC Gulfport.

4.1.1 Dioxin Characteristics, Sources, and Migration Pathways Dioxin has a high octanol-water partition coefficient (K_{ow}) and a very low solubility. For 2,3,7,8-TCDD, K_{ow} is $10^{6.80}$ and the solubility is 0.0000193 gram per cubic meter (g/m^3) (Mackay, 1991). This combination of characteristics means that in soil, sediment, and the water column, dioxin is primarily associated with particulate and organic matter. Dioxin exhibits little potential for significant leaching or volatilization once sorbed to particulate matter (USEPA, 1994b).

The original contaminant source was dioxin-contaminated soils on Sites 8A, 8B, and 8C. These contaminated soils were the result of spills and leaks from the storage of HO from 1968 to 1977. Storage was discontinued in 1977 when the HO drums were removed from the base. From 1986 to 1988, contaminated soils from Sites 8A, 8B, and 8C were incinerated and the resulting ash remains on Site 8A.

Movement of dioxin-contaminated soils from Sites 8A, 8B, and 8C has occurred both during and after the HO storage period. Movement has primarily been attributed to soil erosion by surface water runoff.

Figure 2-4 shows the on-base drainage areas. The major part of Site 8A and a small part of Site 8B drain off base via Drainage Area 1. The remainder of Site 8B and a very small part of Site 8C drain off base via Drainage Area 2. Almost all of Site 8C drains off base via Drainage Area 3.

Erosion by surface water runoff has moved contaminated soil into the drainage ditches. Due to the affinity of dioxin for particulate and organic matter, dioxin does not significantly dissolve in water. Water flow in the ditches has transported the dioxin-contaminated material downstream in the ditches. The material eventually settles and forms sediment in the bottom of the drainage ditches. Storm events have both added additional contaminated materials to the drainage ditches and increased flow in the drainage ditches. Increased flows in the drainage ditches serves to suspend sediment and transport it further downstream. Deposition of sediment theoretically should occur in areas of energy reduction, such as turns in a drainage ditch; however, sampling results do not always support this theory. It is believed that contaminated sediments have been deposited in the ditches and not generally outside the edges of the ditches.

Dioxin TEQ results indicate that dioxin has primarily migrated throughout the base drainage ditches in Drainage Areas 1, 2, and to a lesser extent, 3.

Drainage Areas 1 and 2 drain to the northwest corner of the base and exit base property at Outfall 3 (Figure 2-4). Drainage leaving the base at Outfall 3 runs underneath 28th Street. Base property ends on the south side of 28th Street. There is swampland on the north side of 28th Street across from Outfall 3. Prior to 1995, surface water drainage exiting the base via Outfall 3 entered the swampland. This drainage transported dioxin-contaminated sediments into the swamp. Surface water flow through the swamp moved

dioxin-contaminated sediments downgradient. Dioxin-contaminated sediment was also deposited outside the banks of the channel as a result of high flow conditions when the water overflowed the channel banks. This deposition occurred along approximately the southernmost 2,000 feet of drainage in the swamp, where there is a distinct drainage channel. North (downgradient) of this area there is no distinct drainage channel, but a similar transport mechanism occurs in this area.

In 1995, surface drainage exiting the base via Outfall 3 was rerouted so it no longer entered the swamp. The drainage was directed to the west to enter Canal No. 1. Water in Canal No. 1 flows to the north. Therefore, since 1995, the base has not been a source of additional dioxin-contaminated sediment for the swamp. Rain falling on the swamp may continue to transport existing dioxin-contaminated sediment downstream or outside the drainage channel. The swamp drainage channel is not continuously covered by water; therefore, there is not continuous transport by water flowing through the swamp.

Other potential areas of contamination are in the vicinity of Outfall 1 (Canal No. 1) and Outfall 4 (see Figure 2-1). Sediments with dioxin concentrations exceeding 4.7 ppt were excavated from these areas and placed on Site 8A in July 1995 (ABB-ES, 1995a) as part of an interim removal action.

In April 1997, sediment/soil samples were collected from Canal No. 1 downgradient from the NCBC and from the drainage ditch downgradient of Outfall 4. Total dioxin TEQ results for these samples were all below 15.5 ppt (ABB-ES, 1998a). In October 1997, ABB-ES completed interim corrective measures at the NCBC. The interim corrective measures included the construction of two new sediment recovery traps (SRTs), the replacement of two existing SRTs, and the rehabilitation of one existing SRT within the on-base drainage ditch system (ABB-ES, 1998b). The interim corrective measures, along with other existing SRTs significantly reduce off-site migration of dioxin-contaminated soil or sediment from Outfall 1 and Outfall 4.

Site 8A is the major remaining source for additional dioxin-contaminated materials migrating through the base drainage system. Sites 8B and 8C soils do not appear to be major potential sources of contaminant migration. A planned remedial action will eliminate future migration from Site 8A.

4.1.2 Vegetative Cover A list of plant species expected to occur at the base and associated with downgradient aquatic habitat is presented in Table E-1 of Appendix E.

4.1.3 Wildlife Habitat Characterization The development of NCBC Gulfport has greatly reduced the natural habitat available for wildlife, although downgradient floodplains and bayous provide suitable habitat for a variety of wildlife. A list of reptiles, amphibians, birds, and mammals observed during the site walkover is presented in Table E-2 of Appendix E.

4.1.4 Aquatic Habitat Aquatic habitat associated with the NCBC Gulfport base consists of network of interconnected ditches and a canal (i.e., Canal No. 1) that convey stormwater off the base (Figure 2-4). A majority of these ditches drain, via a number of outfalls located along the northern base perimeter, to a large cypress-dominated swamp within the floodplain of Turkey Creek. Turkey Creek is a tributary to Bernard Bayou, which it joins approximately 4 miles northeast of the NCBC base (Figure 4-1). Due to the

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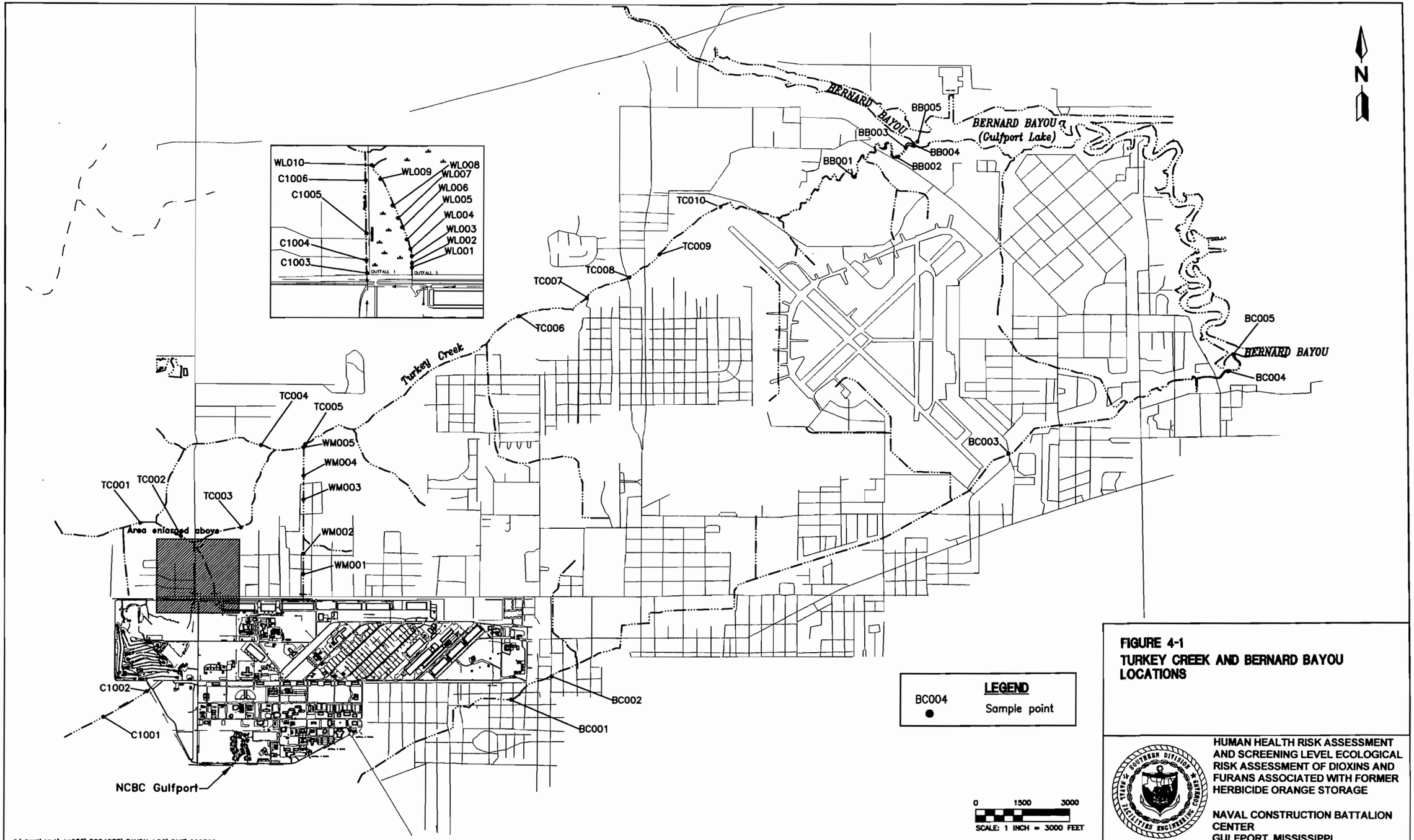

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FIGURE 4-1
TURKEY CREEK AND BERNARD BAYOU LOCATIONS

HUMAN HEALTH RISK ASSESSMENT AND SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT OF DIOXINS AND FURANS ASSOCIATED WITH FORMER HERBICIDE ORANGE STORAGE

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presence of a drainage divide at Site 8 (i.e., the primary herbicide orange storage area), stormwater also leaves the base to the southeast and discharges through several additional outfalls into Brickyard Creek. Brickyard Creek discharges to Bernard Bayou approximately 5 miles east of the NCBC base.

For the purposes of this screening level ERA, available aquatic habitat was segregated into two categories depending upon its capacity to support fish species. The majority of the stormwater drainage ditches located on the NCBC base either contain water only occasionally following rainfall events or shallow standing water; the latter habitats would experience considerable variability in environmental conditions (e.g., dissolved oxygen, temperature) that will limit suitability for most fish species. Other areas that do not generally support fish, and would certainly not contain enough fish biomass to support semi-aquatic predators, include the off-base drainage ditches associated with North Outfalls 3 and 4 (i.e., the "WL" and "WM" areas). The second category of aquatic sites consists of those that support a diverse fish community. These include Canal No. 1 and the ditch habitat immediately upgradient of Outfall 3, both located on the NCBC base, and downgradient streams and bayous (i.e., Turkey Creek, Bernard Bayou, and Brickyard Creek).

4.1.5 Rare, Endangered, and Threatened Species No rare, endangered and/or threatened species have been directly observed at, or in downgradient habitats from, NCBC Gulfport. HLA obtained information on rare, endangered, and threatened species known to occur in the vicinity of NCBC Gulfport from the Mississippi Department of Wildlife, Fisheries, and Parks (MDWFP) and the U.S. Fish and Wildlife Service (USFWS). The MDWFP indicated that there are several records of state or federally listed or proposed endangered, threatened, rare or otherwise significant animals and plants occurring in the area surrounding Gulfport (MDWFP, 1999). However, with the possible exception of the Least Tern (*Sterna antillarum*), none of the cited species have been documented in downgradient areas of the NCBC base. The USFWS indicated that three federally listed species could occur in the Gulfport area including the gopher tortoise (*Gopherus polyphemus*), Eastern indigo snake (*Drymarchon corais couperi*), and the Louisiana quillwort (*Isoetes louisianensis*). The gopher tortoise and the Eastern indigo snake typically occur in well-drained and open sandy upland pine forests, whereas the quillwort species is found "in or near shallow blackwater streams and overflow channels in riparian woodland/bayhead forests of pine flatwoods and upland longleaf pine." Plants grow in stable sand and gravel banks near and below water levels (USFWS, 2000). Information received from both resource agencies are provided in Appendix E.

4.2 SCREENING LEVEL PROBLEM FORMULATION. The screening level problem formulation is the initial step of the ERA process whereby receptors, exposure pathways, and the assessment and measurement endpoints are selected for evaluation.

Ecological exposures to constituents detected in surface water, groundwater, sediment, and biological tissue were evaluated in the screening level ERA. Ecological exposures to constituents in surface soil in the Site 8A vicinity were not evaluated because the habitat is marginal and the significance of ecological exposure is questionable. Past incineration of dioxin-contaminated soil resulted in ash piles that cover a significant percent of Site 8A.

In addition, a planned remediation will involve placing a subbase and final cover over the site, preventing exposure to dioxin-contaminated materials.

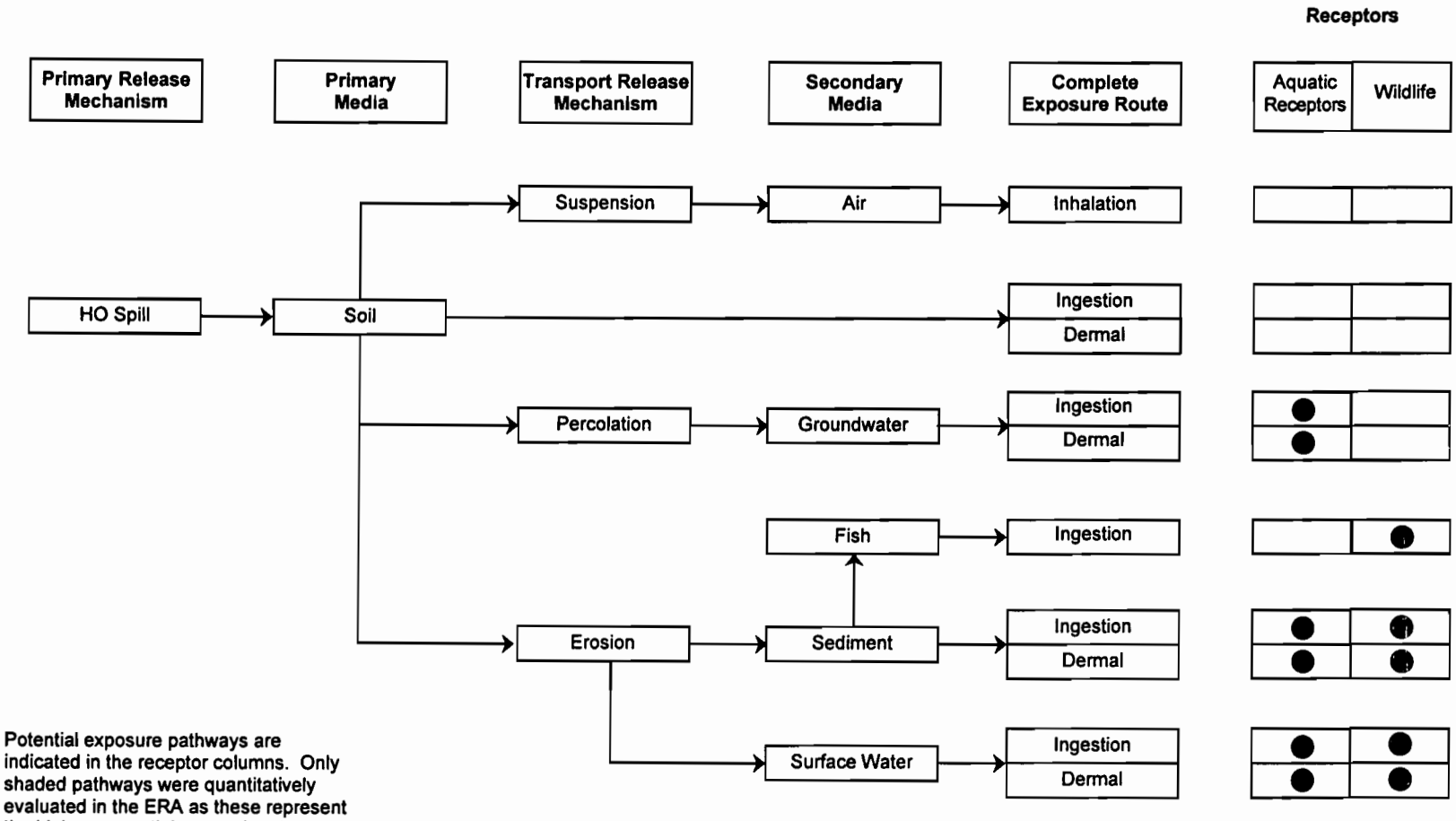
4.2.1 Identification of Receptors Plants and wildlife potentially occurring at NCBC Gulfport are presented in Appendix E, Tables E-1 and E-2. The Phases I and II Ecological Investigation Reports, prepared as part of the fish tissue sampling program, are included in Appendix B. Aquatic receptors including fish, invertebrates, amphibians, and aquatic plants occur in both the on-base drainage ditches, as well as in downgradient areas associated with the swamp and bayous. Exposures to semi-aquatic wildlife (including raccoons, piscivorous birds, and possibly mink) would most likely occur only in downgradient off-base locations.

4.2.2 Identification of Exposure Pathways The exposure pathway includes a source of contamination, potentially contaminated media, and an exposure route. A conceptual model of the exposure pathways from NCBC Gulfport to ecological receptors is depicted in the contaminant pathway model presented in Figure 4-2. For an exposure pathway to be complete, a contaminant must be able to migrate from the source to ecological receptors and contact receptors via one or more exposure routes. All potential routes of exposure are considered in the screening level ERA and are presented in the contaminant pathway model. The model identifies those exposure routes that were quantitatively evaluated in this ERA. Exposure pathways that are not shaded are either evaluated qualitatively or were not evaluated in the screening level ERA because the ecological receptor is unlikely to be exposed. This limitation was necessary to focus the risk evaluation on those pathways for which contaminant exposures are the highest and most likely to occur.

Exposure pathways are identified for two groups of ecological receptors: (1) semi-aquatic wildlife and (2) aquatic receptors. Exposure pathways were not identified for terrestrial wildlife, plants, and soil invertebrates because the Site 8 source area has been remediated above 1 ppb and plans include covering the entire site, which will effectively eliminate all ecological exposures to remaining residual contamination in surface soil. Soil samples collected from locations other than Site 8 were evaluated in the screening level ERA. These samples were collected from various stormwater drainage ditches located throughout the facility. Samples collected from ditches that were dry at the time of collection were designated as soil, rather than sediment, although they have the potential to provide limited habitat to both terrestrial and aquatic species. These data were all evaluated as sediment because aquatic organisms are a far more sensitive taxon than terrestrial species for the purposes of screening potential ecological risks. Subsection 4.3.3 provides a discussion of the sediment samples collected from the stormwater drainage ditches. The general approach used to identify exposure pathways for aquatic receptors and semi-aquatic wildlife is explained below.

4.2.2.1 Aquatic Receptors Exposure pathways for aquatic receptors (including fish, invertebrates, amphibians, and aquatic plants) in on-base drainage ditches and downgradient bayous include direct contact with and ingestion of surface water and sediment, and consumption of contaminated prey.

4.2.2.2 Semi-aquatic Wildlife Semi-aquatic wildlife may be exposed to chemicals in surface water and sediment by incidental ingestion of these media, or ingestion of prey items (e.g., aquatic plants, fish, amphibians, or



Note: Potential exposure pathways are indicated in the receptor columns. Only shaded pathways were quantitatively evaluated in the ERA as these represent the highest potential contaminant exposures. Non-shaded pathways are evaluated qualitatively, not evaluated due to the lack of appropriate toxicity information, or not evaluated because they are not considered significant pathways.

HO = herbicide orange.

FIGURE 4-2
CONTAMINANT PATHWAY MODEL FOR ECOLOGICAL RECEPTORS EXPOSED TO SURFACE WATER AND SEDIMENT

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invertebrates) that have bioaccumulated these chemicals. Only the food chain pathway was considered in this ERA because doses received via this route typically far outweigh those from other pathways (e.g., incidental sediment ingestion, drinking water consumption) (USEPA, 1993a).

4.2.3 Identification of Endpoints Although the majority of current research has focussed on the tumerogenic properties of dioxin (Lucier and others, 1993a), developmental and reproductive effects are most germane to considering potential ecological risks. Toxic effects of TCDD in animals appear to be mediated by its binding to the Ah cytosolic protein receptor in fish, mammals, and avian species (USEPA, 1993a). Following binding of TCDD to the receptor protein, the complex is translocated to the cell nucleus where it becomes associated with deoxyribonucleic acid (DNA). The interaction between the protein complex and DNA results in the transcription of one or more target genes. The toxicological effects associated with TCDD are thus a physiological response to the presence of these gene products (i.e., proteins) following exposure to TCDD. In addition to lethality, common effects include weight loss ("wasting syndrome"), decreased immunocompetence, subcutaneous edema, reproductive effects (e.g., fetotoxicity, teratogenesis), alterations in lipid metabolism and gluconeogenesis, thymic atrophy, and induction of certain enzyme systems (USEPA, 1993a). Dioxin modulates the activities of a vast array of biochemical pathways including receptors (estrogen, glucocorticoid, epidermal growth factor), hormones, components of intermediary metabolism, transforming growth factor, tumor necrosis factor, metabolic activation/deactivation mechanisms (cytochrome P450 and uridine diphosphate glucuronyltransferase isozymes), inflammation factors, interleukins, and protooncogene expression (Lucier, and others, 1993).

Although exposure to dioxin compounds can result in a variety of deleterious effects in organisms, current understanding suggests that the reproductive consequences are likely to occur at the lowest exposure thresholds (USEPA, 1993a). Moreover, plants and invertebrates appear to be generally much more tolerant of dioxin exposures than are fish, birds, and mammals.

The assessment and measurement endpoints selected for the screening level ERA are listed in Table 4-1. Assessment endpoints represent the ecological component to be protected, whereas the measurement endpoints approximate or provide a measure of the achievement of the assessment endpoint. The assessment endpoints for the NCBC Gulfport ERA were selected to evaluate the likelihood that the local population of sensitive receptors could be extrapolated as a result of exposure to dioxins that have migrated from the source area.

The measurement endpoints used to gauge the likelihood of population- and community-level effects are based on laboratory measured survival, growth, and reproductive effects. No site-specific toxicological data are available for the screening level evaluation. Table 4-1 presents the medium, assessment endpoint, endpoint species, measurement endpoint, and decision point (i.e., the outcome at which additional evaluation may be warranted).

Table 4-1
Screening Level Ecological Risk Assessment Endpoints

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of
Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Medium	Assessment Endpoint	Receptor	Measurement Endpoint	Decision Point
Surface Water and Groundwater	Probability of >10 percent contaminant-related reduction in local fish populations	Fish	TCDD TEQs in surface water (pg/ℓ) associated with adverse effects on survival, growth, and reproduction in fish species	TCDD TEQs at any sampling location exceeds surface water quality screening benchmark
Sediment	Probability of >10 percent contaminant-related reduction in local fish populations	Fish	TCDD TEQs in sediment (ng/g_{oc}) associated with adverse effects on survival, growth, and reproduction in fish species	Carbon-normalized TCDD TEQs at any sampling location exceeds sediment toxicity quality screening benchmark
Fish	Probability of >10 percent contaminant-related reduction in local fish populations	Fish	Estimated fish embryo tissue concentrations (ng/kg) associated with adverse effects on growth or embryotoxicity	Fish tissue TCDD TEQ concentrations in individual fish exceed benchmark values based on NOAELs for egg residue effects.
Fish	Probability of >10 percent contaminant-related reduction in piscivorous mammal and bird populations	Semi-aquatic wildlife	Threshold TCDD TEQ body burden in fish tissue based on measured adverse effects on growth, reproduction, or survival of mammalian and avian laboratory test populations	TCDD TEQ tissue residues exceed NOAEL-derived acceptable daily intake for mammalian and avian wildlife. HQs > 1 indicates potential risk.

Notes: > = greater than.
TCDD = 2,3,7,8-tetrachlorodibenzo-p-dioxin.
TEQ = Toxic Equivalents Quotient.
pg/ℓ = picograms per liter.
ng/g_{oc} = nanograms per gram organic carbon.
ng/kg = nanograms per kilogram.
NOAEL = no observed adverse effect level.
HQ = hazard quotient.

4.3 HAZARD ASSESSMENT. The Hazard Assessment includes a review of analytical data for each of the contaminated media where potential ecological exposures could occur. Unlike more typical screening level ERAs, the focus of this assessment is restricted to dioxin compounds and no formal contaminant selection screening was necessary.

4.3.1 Surface Water Surface water samples were collected from ditches in four of the six on-base drainage areas (Drainage Areas 1, 2, 3, and 5) and Canal No. 1; locations of these surface water samples are shown on Figures 2-1, 2-2, 2-3, 2-5, and 2-8 in Appendix C. Surface water samples collected from Drainage Area 1 include D1001, D1003 (plus a duplicate), D1005, D1008, D1010 and D1013. Surface water samples collected from Drainage Area 2 include D2003 and D2006 (plus a duplicate). Surface water samples collected from Drainage Area 3 include D3003, D3005, and D3007 (plus a duplicate). Surface water samples collected from Drainage Area 5 include D5004, D5007, D5009, and D5013. Most samples were collected between April 4-10, 1997; however, additional sampling was conducted between June 24-26, 1997, at locations D1001, D3007, and D5009. A surface water sample was collected from Canal No. 1 (C1001) on April 23, 1997.

In addition, surface water samples were collected downgradient of the NCBC base below Outfall 4 (WM002), in Turkey Creek (TC002, and TC006 [plus a duplicate]), Bernard Bayou (BB003) and Brickyard Creek (BC003) between April and May 1997. These sample locations are shown in Figures 2-9, 2-10, and 2-11 in Appendix C. Analytical results are presented in the Surface Water and Sediment Dioxin Delineation Report (HLA, 1999a).

4.3.2 Groundwater A total of 92 groundwater samples were collected at the NCBC Gulfport base in support of the dioxin delineation study. Groundwater samples were collected from Drainage Area 1 (GPT-01-04 and GPT-01-05); from Drainage Area 2 (GPT-02-04), Drainage Area 3 (GPT-03-06 [plus a duplicate] and GPT-03-07), Drainage Area 4 (GPT-04-4 [plus a duplicate], GPT-04-05, GPT-04-06, GPT-04-07, GPT-04-09 [plus a duplicate], GPT-04-10 through GPT-04-15, L4001 [plus a duplicate], L4002, R4002 [plus a duplicate], R4003 [plus a duplicate], R4004 through R4014); Drainage Area 5 (GPT-05-04 through GPT-05-14 [duplicate at GPT-05-07], R5001 though R5017 [duplicates at R5001 and R5015]); Drainage Area 7 (GPT-07-01); and Drainage Area 8 (GPT-08-08 through GPT-08-14, and R8001 through R8024 [duplicates at R8004 and R8014]).

4.3.3 Sediment Sediment samples were collected at all six on-base drainage areas (Drainage Areas 1 through 6) and Canal No. 1, as well as various downgradient locations. Sediment samples were collected from Drainage Area 1 (D1001 through D1003, D1006 through D1023 with duplicate samples obtained at D1001, D1003, D1008, D1010, D1013, D1015, and D1017). At Drainage Area 2, 15 locations were sampled (D2001 through D2006, D2008 through D2013, and D2031 through D2033) and 8 location at D3 (D3001 through D3008). Sediment samples were also obtained at Drainage Area 4 (D4001 through D4003); Drainage Area 5 (D5002 through D5005, D5007 through D5014, D5016 through D5021, D5027, D5030, and D5033 through D5035); and Drainage Area 6 (D6001 through D6006). Two samples, C1001 and C1002, were obtained from Canal No. 1. Figures 2-1, 2-2, 2-3, 2-5, and 2-8 in Appendix C show sample locations for Drainage Areas 1, 2, 3, and 5. Figure 2-4 in Appendix C shows sample locations for Drainage Area 4, Figure 2-6 in Appendix C shows sample locations for Drainage Area 6, and Figure 2-8 in Appendix C shows sample locations in Canal No. 1.

Sediment sampling locations downgradient of the NCBC base include samples collected below North Outfall 4 (WL001 through WL021 and WL032 through WL066); below North Outfall 3 (WM001 through WM005); and below North Outfall 1 (C1003 through C1006). Sediment samples TC001, TC002, and TC003 through TC010 were obtained from Turkey Creek (TC001 and TC002 are upgradient of the confluence with North Outfalls 1 and 3 and are considered background locations). Ten (BB001 through BB010) and seven (BC001 through BC007) sediment samples were obtained from Bernard Bayou and Brickyard Creek, respectively. Figure 4-1 shows the locations of the WL001 through WL010, WM001 through WM005, C1003 through C1006, TC001 through TC010, BB001 through BB005, and BC001 through BC005. Figure 3-4 in Appendix C shows the locations of samples BB006 through BB010 and Figure 3-5 in Appendix C shows the locations of samples BC006 and BC007.

Additional sediment sampling was also conducted in March 1999 to support the fish tissue sampling program. BIO-SD-1 through BIO-SD-8 were collected

between March 16-19, 1999, and analyzed for dioxin congeners using USEPA Method 8290.

4.3.4 Fish Fish tissue samples were collected during two sampling rounds conducted in March and August 1999. Sampling methodologies and a summary of the fish samples obtained during these events are provided in two Ecological Sampling Services reports prepared by C^2 Environmental Services and included in Appendix B. Both whole body and fish fillet samples were obtained during the fish sampling program; however, only whole body samples were evaluated in this screening level ERA as these best represent exposures to piscivorous wildlife. The fillet fish data were collected specifically for the Human Health Risk Assessment.

Sampling locations are depicted in Appendix B figures and include Outfall 3 (BIO-1), Canal No. 1 (BIO-2), Turkey Creek (BIO-3, BIO-4, and BIO-5), Bernard Bayou (BIO-6) and Brickyard Creek (BIO-7 and BIO-8). In addition, a two-toed amphiuma (*Amphiuma means*), an amphibian, collected downgradient of Outfall 3 in the Turkey Creek floodplain was sampled during the August 1999 sampling event. Table F-1 in Appendix F provides a summary of the tissue samples collected during this program.

4.4 SCREENING LEVEL EXPOSURE ASSESSMENT. The purpose of the screening level ecological exposure assessment is to conservatively estimate the contaminant concentrations that ecological receptors would likely encounter. Because this ERA is focussed on a single contaminant, contaminant data were not summarized statistically to derive these exposure estimates; rather all validated analytical results were evaluated separately. It was assumed that the dioxin analytical results obtained from individual sampling locations are representative of the exposures encountered throughout the section of habitat until the next sampling location is encountered. This approach was considered to provide a more informative picture of potential ecological impacts throughout the stormwater conveyance ditches and Canal No. 1 located on the NCBC base and in downgradient areas associated with Outfalls 1, 3, and 4, Turkey Creek, Bernard Bayou and Brickyard Creek. The contaminant pathway model (Figure 4-2) provides a summary of the potential exposure pathways that exist for each group of receptors.

4.4.1 Aquatic Receptors Direct contact is the primary route of aquatic organism exposure to dioxin in surface water, sediment, and following groundwater discharge. Exposure concentrations for aquatic receptors are equal to the surface water, groundwater, and sediment concentrations detected at the individual sampling locations. Sediment data were carbon-normalized (i.e., divided by TOC [in kg C/kg]) to allow direct comparison to the derived sediment screening benchmark.

4.4.2 Semi-Aquatic Wildlife Receptors Exposure routes for semi-aquatic wildlife receptors include direct contact and incidental ingestion of surface water and sediment and ingestion of contaminated food. The actual amount of dioxin that a wildlife receptor would be exposed to (i.e., ingestion dose in micrograms per kilogram [µg/kg] body weight-day) depends on a number of factors including dietary preferences, the amount of food ingested per day

relative to its body weight, and foraging range. For the purposes of this screening level ERA, it was assumed that all representative wildlife species consume only fish and that the particular receptor's foraging needs could be entirely satisfied at each evaluated sampling location. Although this is highly unlikely, this conservative approach is considered appropriate for an initial screening of potential ecological risks (USEPA, 1997b).

Tissue concentrations of fish prey were obtained from fish tissue data collected during the Phases I and II sampling program. Consequently, bioaccumulation factors to estimate concentrations in prey items based on surface water or sediment analytical results were not required. Fish tissue data were used in conjunction with receptor-specific exposure parameters to quantify food chain exposures. Wildlife exposures were evaluated at all sampling locations where fish tissue data are available, representative semi-aquatic wildlife species were identified for evaluation based on potential presence in the Gulfport area, potential sensitivity to dioxin exposure, and piscivorous dietary preferences. The mink (*Mustela vison*), great blue heron (*Ardea herodias*), and eastern belted kingfisher (*Ceryle alcyon*) were selected for evaluating worst case exposures to dioxin by semi-aquatic wildlife in the vicinity of NCBC Gulfport. Exposure assumptions (including body weight, food ingestion rates) for these representative wildlife receptors are provided in Table G-1 in Appendix G. As noted above, the exposure parameters selected are based on conservative assumptions. It was assumed that these receptors consume only fish (the prey type with the highest anticipated dioxin body burdens). In addition, body weights are based on data for females due to the focus on reproductive endpoints (particularly to eggs and embryos). Although direct exposure to sediment and surface water via the incidental ingestion and drinking water consumption pathways was not assessed in this ERA, exposures related to the food chain bioaccumulation generally far outweigh contributions from other pathways (USEPA, 1993a, 1993b, and 1993c).

4.5 SCREENING LEVEL ECOLOGICAL EFFECTS ASSESSMENT. The ecological effects assessment presents the rationale for selecting the measurement endpoints that were used to evaluate the assessment endpoints identified in Table 4-1 and discussed in the problem formulation. The methods used for identifying and characterizing screening level ecological effects for aquatic receptors and semi-aquatic wildlife are described in the following subsections.

To simplify the screening process, and due to the limited toxicological data for many of the dioxin congeners, all dioxin congeners were evaluated jointly by multiplying individual congeneric concentrations by specific TEFs and summing these values to derive a TEQ (USEPA, 1989b). These TEQs express the concentrations of individual dioxin congeners in terms of the toxicity of 2,3,7,8-TCDD.

4.5.1 Aquatic Receptors As discussed previously, aquatic receptors include fish, aquatic macroinvertebrates, pelagic zooplankton and phytoplankton, aquatic vascular plants, and amphibians. Although fish species, which are the most sensitive aquatic receptors to dioxin, were assumed to occur at all on-base locations where surface water or sediment samples were obtained, this is a conservative assumption as many of the grass-lined drainage ditches

found at the NCBC facility contain water episodically and are incapable of supporting fish.

4.5.1.1 Surface Water There are several good compilations of TCDD toxicity information (USEPA, 1993a and Eisler, 1986) and these were reviewed prior to selecting a surface water screening benchmark. The selected benchmark is based on a lowest observed adverse effect level (LOAEL) derived from a 71-day exposure study with juvenile fathead minnow (*Pimephales promelas*) (Cook and others, 1991). Mortality and general pathology was evaluated for 61 days following the exposure period. A LOAEL of 49 picograms per liter (pg/ℓ) was obtained from this study and this appears to be the lowest effect concentration for fish species. A no observed adverse effect level (NOAEL) was derived by dividing this value by a 10-fold extrapolation factor resulting in a surface water benchmark of 4.9 pg/ℓ. This value is considered protective of direct exposures to fish and other aquatic life (including plants and amphibians) and was compared to the location-specific TCDD TEQs developed as discussed previously. USEPA (1993b and 1993c) has developed a surface water benchmark for TCDD based on protection of sensitive wildlife species (0.0096 pg/ℓ); however, this benchmark is not applicable to areas where insufficient forage for piscivorous wildlife exists. Although applicable to the downgradient areas that contain fish, this ERA evaluated exposures to these wildlife directly using site-specific fish tissue data thus avoiding potentially large uncertainties regarding the bioavailability and uptake potential of this contaminant.

4.5.1.2 Groundwater Although sediment transport is considered the primary migration pathway from the dioxin source area (Site 8) and downgradient ecological habitat, the surface water benchmark (i.e., 4.9 pg/ℓ) was also compared to TCDD TEQs obtained for each groundwater sampling location.

4.5.1.3 Sediment Few sediment screening benchmarks are available for evaluating the effects of direct exposure to dioxin contaminated sediment by aquatic organisms. Although the primary focus of this assessment (i.e., the assessment endpoints) pertains to wildlife exposures to contaminated fish tissue, a sediment benchmark was developed to evaluate available sediment data particularly for the on-base drainage ditches where wildlife exposures are unlikely. Equilibrium partitioning assumptions (USEPA, 1988 and DiToro and others, 1991) were employed to derive a sediment benchmark for the screening level ERA. This approach assumes that the toxicity of sediment-borne contaminants can be better correlated with the interstitial (i.e., pore water) rather than whole sediment concentration. Secondly, that the interstitial water concentration is controlled by partitioning between the solid matrix and aqueous phase; moreover, the affinity of a nonpolar hydrophobic contaminant (such as TCDD) to the solid matrix is correlated to the organic carbon content of the sediment (USEPA, 1988). With these assumptions, a sediment benchmark can be derived by multiplying a concentration in the interstitial water that is protective of ecological receptors by the organic carbon partition coefficient (K_{oc}). The TCDD K_{ow} was estimated using an average of various measured or estimated values reported in the literature. Using the derived Koc (5,800 liter per gram organic carbon [ℓ/goc]) and the water quality benchmark discussed above (4.9 pg/ℓ), a

carbon-normalized sediment concentration of 29 ng/goc was derived. The sediment screening benchmark was established as the lower 95 percent confidence interval of this value (2.5 ng/goc) (Table G-2 in Appendix G). This number was compared to the carbon-normalized sediment TCDD TEQs to determine whether potential effects to sensitive fish could occur from exposure to sediment.

4.5.1.4 Fish Fish appear to be the most sensitive aquatic species, with exposure to fish eggs before or shortly after fertilization (USEPA, 1993a) the most sensitive endpoint. Of the fish species tested, the most sensitive are the rainbow trout (*Onchorhynchus mykiss*) and the northern pike (*Esox lucius*), in which effects were observed at concentrations of less than 0.001 micrograms (μg) TCDD/L and less than 0.0001 μg TCDD/ℓ, respectively (Helder 1980, 1981, and 1982). The potential for the bioaccumulation of TCDD also appears to be the greatest in fish species. For example, bioconcentration factors (BCFs) of up to 13,000 have been reported in the literature (USEPA, 1984). In addition to bioconcentration from water, TCDD is know to biomagnify in the food chain. Top predatory species, such as piscivorous fish, are most susceptible to high-level exposure as a result of biomagnification.

Table G-3 summarizes available threshold effects data of TCDD in fish eggs; these data are presented graphically in Figure G-1. A NOAEL of 34 pg TCDD/g accumulation in fish eggs was established following a comprehensive review of laboratory and epidemiological studies (USEPA, 1993a). Assuming a 40 percent maternal transfer, this corresponds to a threshold concentration of 85 pg TCDD/g in adult fish.

4.5.2 Semi-aquatic Wildlife The derivation of wildlife screening benchmarks was based on establishing a safe dietary intake assuming that the representative wildlife receptors (i.e., mink, great blue heron, and kingfisher) consume only contaminated fish. Table G-4 summarizes available ingestion toxicological information for wildlife receptors that were used in developing an acceptable fish tissue level for each of the representative wildlife receptors (i.e., mink, great blue heron, and belted kingfisher). Table G-1 in Appendix G presents the derivation of fish tissue TCDD body burdens that are not anticipated to adversely effect reproduction in these receptors.

The screening benchmarks for wildlife are 0.53 pg TCDD/g fish (based on protection of mink from reproductive effects) and 5.2 pg TCDD/g fish (based on protection of kingfisher from reproductive effects (Table G-1). The benchmark for the kingfisher was slightly lower than that for the great blue heron (5.9 pg TCDD/g fish) and the more protective kingfisher value was employed in the subsequent screening of fish tissue TCDD TEQs for effects on birds.

4.6 SCREENING LEVEL RISK CHARACTERIZATION. This section discusses how risks are characterized for ecological receptors exposed to contaminated surface water, sediment, groundwater and fish at NCBC Gulfport. A comparison of exposure information with the appropriate concentration-response toxicity data is the basis for the risk characterization.

4.6.1 Aquatic Receptors Risks to aquatic receptors from exposure to surface water, sediment, groundwater, and tissue residues were characterized based on a comparison of TCDD TEQs derived for these media at each sampled location with aquatic toxicity benchmarks. The results of these comparisons are presented separately for surface water, groundwater, sediment, and tissue residues (fish) and listed in the following paragraphs.

4.6.1.1 Surface Water Screening level risks to aquatic receptors from exposure to dioxin at NCBC Gulfport were characterized based on comparison of TCDD TEQs estimated at each surface water sampling location to the derived surface water screening benchmark (i.e., 4.9 pg/ℓ). Results of this comparison are provided in Table 4-2. Risk ratios (i.e., Hazard Quotients [HQs]) are presented graphically in Figures H-1 and H-2 (On-base drainage areas, and off-base and canal, respectively).

TCDD TEQs exceed the surface water benchmark at six locations (C1001, D1001, D2003, D2006, D3005, and D3007) with HQs ranging from 1.35 (D3005) to 8.2 (D2003). The TCDD TEQ exceedance at C1001 in Canal No. 1 poses a potential concern to sensitive fish species that may occur there. In addition, aquatic organisms could be affected at any of the identified ditch locations if aquatic habitat exists sufficiently long during the season to support small fish species. The sporadic nature of the benchmark exceedances, the low magnitude of the HQs, and uncertainties concerning whether sensitive species would actually be exposed at these locations suggest that these risks would be relatively minor.

4.6.1.2 Groundwater The surface water benchmark was also conservatively compared to TCDD TEQs estimated for groundwater samples collected from NCBC Gulfport. Although ecological receptors are not exposed to directly to base groundwater, exposures could occur following discharge to surface water bodies (e.g., Turkey Creek). This screening level assessment of groundwater is conservative because it assumes that no attenuation (e.g., chemical degradation, soil binding retention, or dilution) occurs. Results of this comparison are provided in Table 3-2. Risk ratios (i.e., HQs) are presented graphically in Figures H-3 through H-5 (GPT wells, L and R4/R5 wells, R8 wells, respectively).

TCDD TEQs exceed the surface water benchmark at 16 groundwater locations including GPT-04-06, GPT-04-07, GPT-04-11, GPT-04-13, L4001, and L4002 (Drainage Area 4); GPT-05-04, GPT-05-05, GPT-05-06, GPT-05-12, GPT-05-13, R5015, and GPT-05-14 (Drainage Area 5); GPR-0701 (Drainage Area 7); and R8008 and R8013 (Drainage Area 8). With the exception of GPT-05-14 (HQ is 16.5) and GPT-0701 (HQ is 10.5), all surface water benchmark exceedances are less than 10. Given the magnitude of these HQs and considering the distance between these wells and the most proximate surface water bodies (at least a mile), these screening results suggest that the groundwater migration pathway is unlikely to be a significant contributor to potential ecological risks in off-base aquatic habitats.

Table 4-2
Summary of Surface Water and Groundwater Hazard Quotients[1,2]

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of
Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Area[3]	Number of Samples	Number of Samples Exceeding WQB	Sample Locations with HQs >=1 and < 10	Sample Locations with HQs >= 10 and < 100	Sample Locations with HQs >= 100
Surface Water					
Canal 1	1	1	C1001	—	—
D1	6	1	D1001	—	—
D2	2	2	D2003, D2006	—	—
D3	3	2	D3005, D3007	—	—
D5	4	0	—	—	—
Turkey Creek	2	0	—	—	—
Bernard Bayou	1	0	—	—	—
Brickyard Creek	1	0	—	—	—
WM	1	0	—	—	—
Groundwater					
D1	2	0	—	—	—
D2	1	0	—	—	—
D3	2	0	—	—	—
D4	27	6	GPT-04-06, GPT-04-07, GPT-04-11, GPT-04-13, L4001, L4002	—	—
D5	28	7	GPT-05-04, GPT-05-05, GPT-05-06, GPT-05-12, GPT-05-13, R5015	GPT-05-14	—
D7	1	1	—	GPT-07-01	—
D8	31	2	R8008, R8013	—	—

[1] Surface water HQs were derived as explained in the text. A surface water quality benchmark (SWQB), equivalent to 4.9 pg/ℓ, was derived based on a Lowest Observed Adverse Effect Level for mortality and pathological effects to the fathead minnow (Cook and others, 1991). Surface water/groundwater locations where the estimated HQ values do not exceed one are considered to pose no threat to aquatic life. The magnitude of the HQs is presumed to correlate with the likelihood of adverse effects for HQs in excess of one.

[2] HQs and TCDD TEQs are presented in Figures H–1 through H–5 in Appendix H.

[3] Exposure areas as described in the text. Canal 1 and Areas D1, D2, D3, D4, D5, D6, D7, and D8 are located on the NCBC Gulfport facility; the remaining areas are downgradient. The areas located on the facility as well as WM do not represent perennial aquatic habitat, rather they convey water during the wet season and following precipitation events only. Risks to piscivorous wildlife were estimated separately for those areas that perennially support an aquatic community.

Notes: WQB = water quality benchmark.
HQ = Hazard Quotient.
> = greater than.
< = less than.
— = no data.
pg/ℓ = picograms per liter.
NCBC = Naval Construction Battalion Center.

4.6.1.3 Sediment Screening level risks to aquatic receptors from exposure to dioxin at NCBC Gulfport were characterized based on comparison of carbon-normalized TCDD TEQs estimated at each sediment sampling location to the derived sediment screening benchmark (i.e., 2.5 ng TCDD/goc). Results of this comparison are provided in Table 4-3. Risk ratios (i.e., HQs) are presented graphically in Figures H-6 through H-17 (Area D1, Area D2, Areas D3/D4, Area D5, Area D6, Canal, Off-base Area downgradient of Outfall 3, Off-base Area downgradient of Outfall 4, Turkey Creek, Bernard Bayou, and Brickyard Creek, respectively).

Carbon-normalized TCDD TEQs exceed the sediment screening benchmark at 72 locations with the majority of the exceedances occurring in Drainage Areas D1, D2, and in the off-base area downgradient of North Outfall 3 (13, 8, and 40 exceedances, respectively). No benchmark exceedances were identified in Canal No. 1, Drainage Area D6, or in the Off-base area downgradient of North Outfall 4. Although the majority of the benchmark exceedances fell between 1 and 10, risk ratios exceeded 10 at 12 locations including D1018 and D1019 (Drainage Area D1); D2001, D2002, D2003, D2009, D2010, D2011, and D2012 (Drainage Area D2); D5001 (Drainage Area 5); and WL010 and WL015 (Off-base area downgradient of Outfall 3). Hazard Quotients for these locations ranged from 12.9 (D1018) to 797 (D5001).

Based on these screening results, exposure to dioxin-contaminated sediment in the cypress swamp downgradient of the North Outfall 4 and several of the on-base drainage ditches could adversely affect sensitive aquatic receptors if they were to occur in these areas.

4.6.1.4 Fish Tissue Residue Table F-2, presents a summary of the dioxin analysis results for whole fish samples collected during the two fish sampling events. The following information is provided for whole body fish sample: sampling date, species, trophic level, concentrations of 2,3,7,8-TCDD and 1,2,3,7,8-pentachlorodibenzo-p-dioxin, TEQ, and lipid percentage. Replicate results were averaged and in some cases, the whole body residues were estimated by adding the weight-normalized carcass and fillet tissue concentration results. Table F-1 of Appendix F provides a summary of the types of species obtained at each of the sampling areas. Appendix B provides fish sampling methodologies.

The development of the fish tissue residue benchmark is discussed in Subsection 4.5.1. This screening benchmark (85 pg TCDD/g) is considered protective of reproductive endpoints associated with egg sac disease and fry mortality. As shown in Table F-2, the highest TCDD TEQ tissue concentration (10.4 pg TCDD/g) was detected in the amphibian, two-toed amphiuma. The highest TEQ concentration detected in a fish species was only 7.36 TCDD TEQ/g (obtained from a gizzard shad sample collected from BIO-2 on August 26, 1999; the replicate sample had a TCDD TEQ residue of 5.26 pg/g). The highest detected TCDD TEQ tissue residue is over an order of magnitude below the screening benchmark. Based on these tissue residue data, there is no indication that fish or amphibian populations in aquatic habitats downgradient of the NCBC source area are at risk from dioxin exposure.

Table 4-3
Summary of Sediment Hazard Quotients[1,2]

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of
Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Area[3]	Number of Samples	Number of Samples Exceeding SQB	Sample Locations with HQs >=1 and < 10	Sample Locations with HQs >= 10 and < 100	Sample Locations with HQs >= 100
Canal 1	5	0	—	—	—
D1	21	13	D1001, D1002, D1003, D1007, D1009, D1010, D1011, D1012, D1013, D1014, D1021	D1018, D1019	—
D2	16	8	D2013	D2001, D2002, D2003, D2009, D2010, D2011, D2012	—
D3/D4	11	1	D4002	—	—
D5	24	4	D5012, D5020, D5034	—	D5001
D6	6	0	—	—	—
Turkey Creek	9	1	TC004	—	—
Bernard Bayou	10	3	BB005, BB006, BB008	—	—
Brickyard Creek	7	2	BC005, BC007	—	—
WL	52	40	WL001, WL002, WL003, WL004, WL005, WL006, WL007, WL008, WL012, WL013, WL014, WL016, WL017, WL018, WL019, WL020, WL021, WL032, WL033, WL034, WL035, WL041, WL046, WL047, WL048, WL050, WL051, WL052, WL053, WL055, WL057, WL058, WL059, WL060, WL062, WL064, WL065, WL066	WL010	WL015
WM	5	0	—	—	—

[1] Sediment HQs were derived as explained in the text. A sediment quality benchmark (SQB) of 2.51 ng/goc was estimated using equilibrium partitioning assumptions (U.S. Environmental Protection Agency, 1988) based on protection of fish (but not piscivorous wildlife). The 95 percent lower confidence interval of the SQB, expressed in units of nanograms per gram organic carbon, was compared to carbon-normalized TCDD Toxicity Equivalent Quotients (TEQs). Sediment locations where the estimated HQ values do not exceed one are considered to pose no threat to aquatic life. The magnitude of the HQs is presumed to correlate with the likelihood of adverse effects for HQs in excess of one.

[2] HQs and TCDD TEQs are presented in Figures H–6 through H–17 in Appendix H.

[3] Exposure areas as described in the text. Areas C, D1, D2, D3, D4, D5, and D6 are located on the NCBC Gulfport facility; the remaining areas are downgradient. The areas located on the facility as well as WL and WM do not represent perennial aquatic habitat, rather they convey water during the wet season and following precipitation events only. Risks to piscivorous wildlife were estimated separately for those areas that perennially support an aquatic community.

Notes: HQ = Hazard Quotient.
> = greater than.
< = less than.
— = no data.
TCDD = tetrachlorodibenzo-p-dioxin.
NCBC = Naval Construction Battalion Center.

4.6.2 Semi-aquatic Wildlife Development of the screening fish tissue residue benchmarks protective of reproductive effects in piscivorous mammals and birds (0.53 and 5.2 pg TCDD TEQ/g, respectively) is discussed in Subsection 4.4.2. These benchmarks were compared to the fish tissue residue TCDD TEQ results and HQs derived for each receptor group. Figure 4-3 summarizes the wildlife HQ results for each fish tissue sample. No TCDD TEQ tissue residue results for the primary/secondary trophic level exceeded the wildlife screening benchmark in Phase I; however, residue TCDD TEQs at BIO-2, BIO-5, and BIO-8 did so during the second round of sampling. HQs at these three locations were 12.0, 4.0, and 4.1, respectively. The majority of the bottom feeder trophic level samples collected during both sampling rounds contained TCDD TEQs that exceeded the mink-based residue screening benchmark (at locations BIO-4, BIO-6, and BIO-8 during the first round and BIO-2, BIO-5, and BIO-8 during the second round). HQs for bottom feeders ranged from 4.0 (BIO-8, Phase II) to 7.1 (BIO-6, Phase I). In the Phase I samples, TCDD TEQ tissue residues for tertiary trophic level at BIO-2, BIO-5, and BIO-8 exceeded the mink-based residue screening benchmark. In Phase II, tissue residues at BIO-2 and BIO-8 exceeded the wildlife screening benchmark. HQs in excess of one for the tertiary trophic level ranged from 2.6 (BIO-8, Phase II) to 6.5 (BIO-8, Phase I). Finally, the TCDD TEQ for the amphiuma collected in the off-base area downgradient of Outfall 3 exceeded the mink-based wildlife residue screening benchmark by 20 times.

Figure 4-4 presents a summary of the HQs for avifauna. Only the primary/secondary trophic level at BIO-2 (Phase II) and the tissue residue in the amphiuma (downgradient of Outfall 3) exceeded the kingfisher-based residue screening benchmark. These HQs are 1.2 and 2.0, respectively.

Although risks to piscivorous birds appear to be minimal, these screening level results suggest that sensitive mammalian receptors that feed primarily on fish in aquatic habitat downgradient of NCBC Gulfport could experience significant reproductive effects.

4.7 SCREENING LEVEL UNCERTAINTY ANALYSIS. The objective of the screening level uncertainty analysis is to discuss the assumptions of the ERA process that may influence the results and conclusions of the assessment. Befitting a screening level analysis, various conservative assumptions were employed throughout the ERA to ensure that potential impacts were not overlooked. The findings that the benchmarks evaluated in this assessment were exceeded should be construed as indicating that a potential for ecological effect exists not that these impacts are actually occurring. These results should be viewed in the context of the identified uncertainties to determine the proper course of action to determine whether TCDD remediation to protect ecological receptors is warranted. The principal risk uncertainties germane to interpreting these screening level findings include the following.

- In the absence of site-specific toxicological data, guidance values and literature information were used to estimate ecological risks in the screening level ERA. Use of these benchmarks contributes substantially to the risk uncertainties because they may not be entirely applicable to the conditions at NCBC Gulfport.

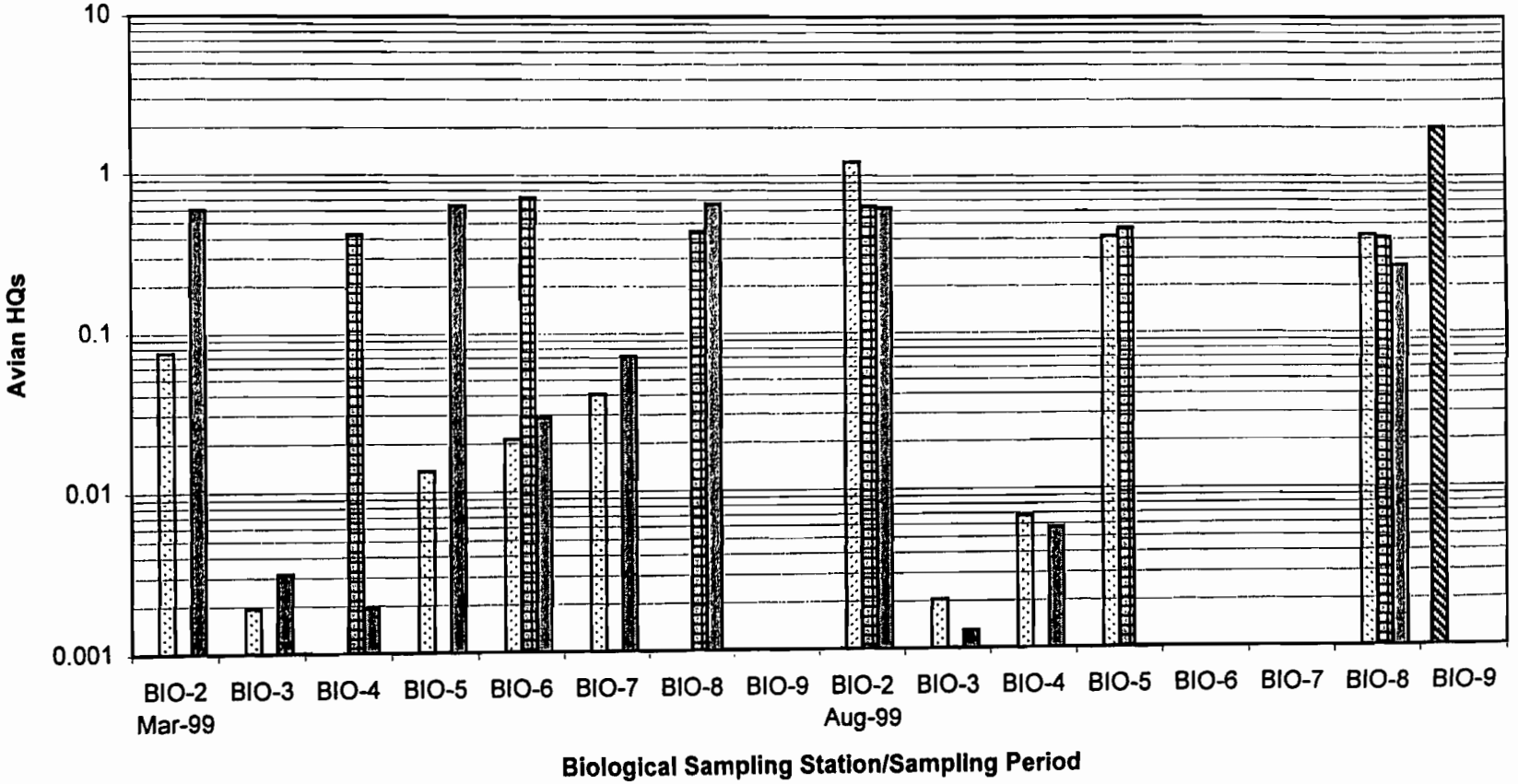

FIGURE 4-3
MAMMALIAN HAZARD QUOTIENTS BY SAMPLING STATION AND FISH TROPHIC LEVEL

HUMAN HEALTH RISK ASSESSMENT AND SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT OF DIOXINS AND FURANS ASSOCIATED WITH FORMER HERBICIDE ORANGE STORAGE

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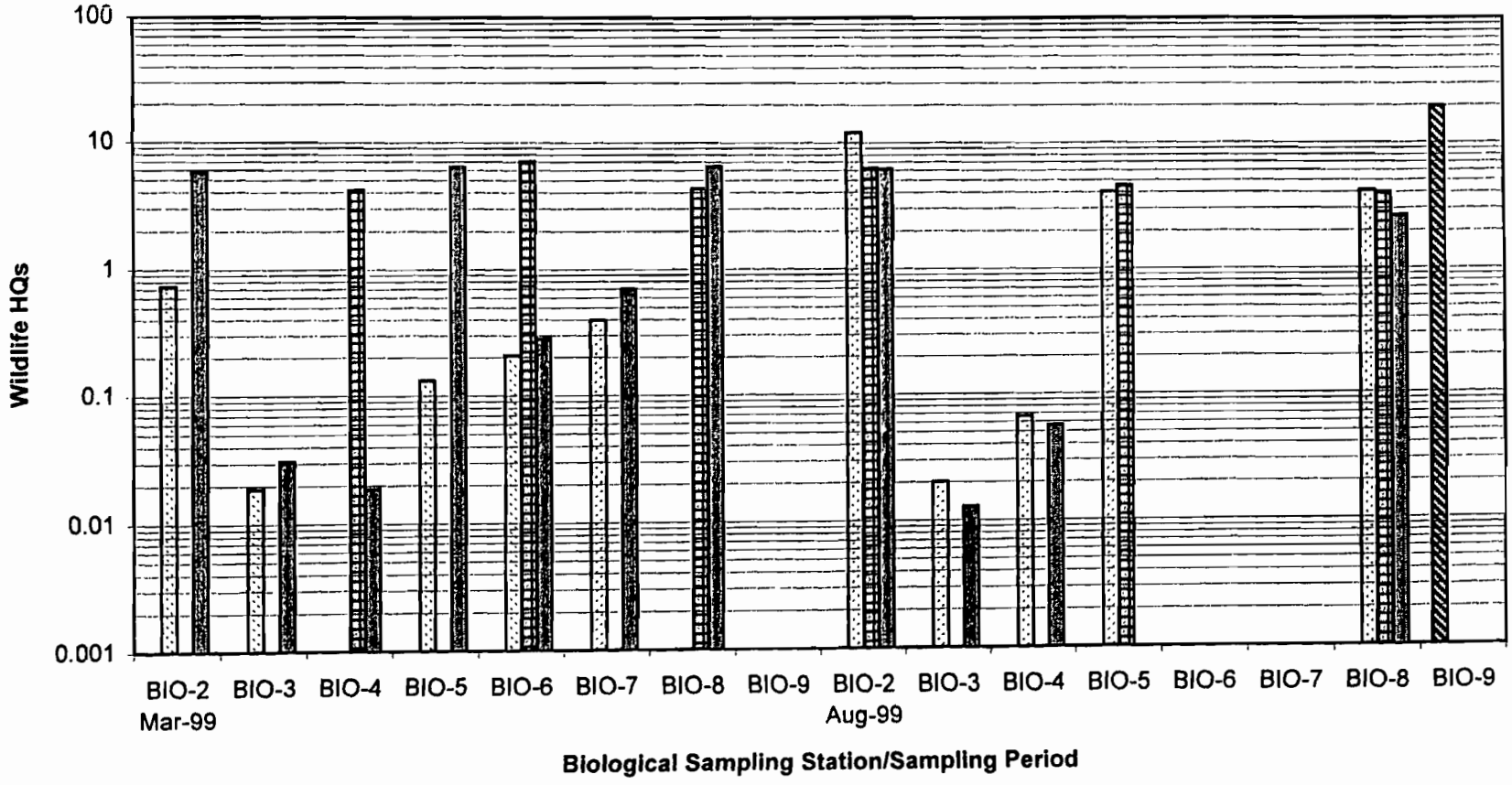

FIGURE 4-4
AVIAN HAZARD QUOTIENTS BY SAMPLING STATION AND FISH TROPHIC LEVEL

HUMAN HEALTH RISK ASSESSMENT AND SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT OF DIOXINS AND FURANS ASSOCIATED WITH FORMER HERBICIDE ORANGE STORAGE

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- Extrapolation of literature derived toxicological information from laboratory organisms to wildlife receptors assumes that species are similar with respect to absorption, metabolism, distribution, and elimination of dioxins.

- For all but the most sedentary of ecological organisms, the evaluation of risks at individual locations is conservative because mobile organisms will be exposed to a range of TCDD concentrations. Benchmark exceedances noted at individual locations are unlikely to translate to either individual- or population-level effects.

- TEQs were used to both simplify the ERA process and out of necessity as toxicological data for appropriate receptors is lacking for many of the dioxin congeners. However, the sensitivity of different receptors to specific congeners will likely differ. In addition, the USEPA (1989b) TEFs employed in this screening level ERA were derived from induction of cytochrome P4501A1 in laboratory mammals or mammalian cell lines. Questions remain concerning the exact relationship between P450 induction potential and in vivo toxicity of polychlorinated biphenyls (PCBs), polychlorinated dibenzofurans (PCDFs), and PCDDs as well as the validity of extrapolations from mammalian systems to non-mammalian species (such as fish and other aquatic receptors).

- Although the conservative sediment screening benchmark (protective of fish) was exceeded regularly throughout the study area, the review of fish tissue residue data indicated that fish populations are unlikely to be impacted. The conclusions based on the fish tissue residue approach appear to be more robust, but the lack of agreement raises the level of uncertainty in the conclusions.

- The presence of sensitive mammalian receptors, such as the mink, in down-gradient dioxin affected areas is unknown. Mink was selected as a receptor in this screening level ERA because existing literature suggests that it is one of the most sensitive species with regard to dioxin exposure. Potential risks may have been overestimated if sensitive organisms do not occur in these habitats. Moreover, mammalian and avian receptors probably experience differential foraging success among different fish species and may not consume individual trophic levels or larger fish within a category. Although some individual fish of all trophic levels had TCDD TEQ residues that exceeded the conservative benchmarks, exposures to fish with elevated residues may be infrequent.

- The benchmarks derived for wildlife and avifauna assume that the representative receptors subsist entirely on fish prey and that their foraging is limited to contaminated areas. This assumption likely results in potential risks being overestimated in this ERA.

4.8 SUMMARY AND RECOMMENDATIONS OF SCREENING LEVEL ECOLOGICAL RISKS. Potential risks for ecological receptors were evaluated in surface water,

groundwater, sediment, and fish tissue. The results of the screening level ERA for NCBC Gulfport are summarized in Table 4-4.

Table 4-4
Summary of Screening Level ERA Results

Human Health Risk Assessment and Screening Level Ecological Risk Assessment of
Dioxins and Furans Associated with Former Herbicide Orange Storage
Naval Construction Battalion Center
Gulfport, Mississippi

Media	Receptor	Assessment Endpoint[1]	Risks Predicted?
Groundwater and Surface Water	Fish	Probability of a 10 percent or greater contaminant-related reduction in fish populations.	No risks likely associated with groundwater discharge; potential risks predicted in surface water based on comparison of derived TCDD TEQs to water criterion.
Sediment	Fish	Probability of a 10 percent or greater contaminant-related reduction in fish populations.	Potential risks predicted in sediment based on comparison of derived TCDD TEQs to the sediment benchmark.
Fish	Fish	Probability of a 10 percent or greater contaminant-related reduction in fish populations.	No
Fish	Semi-aquatic wildlife	Probability of a 10 percent or greater contaminant-related reduction in piscivorous mammal or bird populations.	Potential risks predicted for piscivorous wildlife, and to a lesser extent birds, that consume contaminated aquatic prey items.

[1] Screening level assessment of potential risks to aquatic receptors considered all receptor categories (including fish, macroinvertebrates, aquatic plants, and amphibians). However, the assessment focussed on fish species, which were determined to be the most sensitive aquatic species.

Notes: ERA = ecological risk assessment.
TCDD = tetrachlorodibenzo-p-dioxin.
TEQ = toxicity equivalency quotient.

Risks associated with groundwater migration appear to be minimal and only a few exceedances of the conservative surface water benchmark were identified. However, the sediment screening benchmark was exceeded consistently at both on- and off-base locations. Although fish tissue residues are not predicted to adversely affect fish populations, levels were elevated enough to represent a potential risk to sensitive mammals (and to a lesser extent birds) that fed primarily on fish from habitats downgradient of the dioxin source area.

Based on USEPA guidance, one of three possible courses of action may be chosen following the screening level ERA. The three possible actions are (1) no further action; (2) conduct a baseline ERA, with one of the first steps being to reevaluate the conservative assumptions used in the screening level ERA; or (3) undertake a remedial action. Based on Navy policy on conducting ERAs, if further action is required after the screening level ERA, the first step is to reevaluate the screening level ERA assumptions; this is Step 3a of the Navy policy.

Based on the results of the screening level ERA, it is recommended that the conservative assumptions of the screening level ERA be reevaluated.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Both the baseline human health risk assessment and the screening level ecological risk assessment have concluded that TCDD TEQs in the some surface soils and sediments at NCBC Gulfport and the surrounding areas are at concentrations that could pose unacceptable risks to receptors. Since the human and ecological risk assessments were designed to evaluate different endpoints, their conclusions and recommendations will be discussed separately.

5.1 HUMAN HEALTH RISK ASSESSMENT. The human health risk assessment evaluated the risks to human receptors both on base and in the surrounding neighborhoods. The only area not evaluated is the swamp area north of Outfall 3. Because of impending litigation concerning this area, it will be evaluated as part of the upcoming Feasibility Study.

There are no unacceptable risks to any off-base receptors evaluated in this risk assessment. A human coming into contact with the ditch sediments does not represent an unacceptable risk, that is a cancer risk greater than 1 in a million lifetime excess cancer risk. Fishing and consumption of fish caught in the ditch system also does not represent an unacceptable cancer risk.

The same is true for many on-base receptors. There are no unacceptable risks in the residential areas on base. Some areas of the base, if they were developed as residential areas, could represent an unacceptable risk to residential receptors. This is especially true of Site 8.

Exposure to some areas of the base, particularly Site 8 and several areas of the ditch system, could represent unacceptable risks to some receptors. Site 8, as it now exists, could pose unacceptable cancer risks to occupational workers if it were opened for unrestricted access. Sediment in the on-base drainage ditches could pose unacceptable risks to residents, trespassers, and occupational workers. On-base surface soil in some areas outside Site 8 could pose unacceptable risks to occupational workers and to residents if they are allowed unrestricted access to industrial areas of the base. These areas will be the focus of the upcoming Feasibility Study.

Samples WL011 through WL020, shown in Figure 3-6 of Appendix C, are not included in the evaluation. These samples are part of the Outfall 3 swamp area delineation. The Outfall 3 area is proposed as a Brownfield site. These samples will be discussed and evaluated in the Brownfield Application according to the procedures established in the *Risk Evaluation Procedures for Voluntary Cleanup and Redevelopment of Brownfield Sites - Subpart II.*

5.2 SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT. The use of a screening level ecological risk assessment, as opposed to a full ecological baseline risk assessment, is consistent with recent USEPA guidance (USEPA, 1997b). The purpose of the assessment was to evaluate actual and potential adverse effects to ecological receptors due to potential dioxin exposure and

determine if a further evaluation was necessary. The screening level ERA results indicated that sediment TCDD TEQs were consistently above screening benchmarks, both on and off base. Fish tissue TCDD TEQ levels, although not predicted to adversely affect fish populations directly, were sufficiently elevated to represent a potential risk to sensitive mammals and birds that feed primarily on fish.

Based on the results of the screening level ERA, it is recommended that the conservative assumptions of the screening level ERA be reevaluated. This reevaluation is Step 3a of the Navy policy, "Refinement of Conservative Exposure Assumptions."

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REFERENCES

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APPENDIX A

APPENDIX A

SURFACE WATER AND SEDIMENT ANALYTICAL RESULTS

PHASE 1 DATA TABLES

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D1001	D1001	D1001	D1002	D1003	D1003
	SAMPLE ID	D1001D1P1	D1001S1P1	D1001D1P3	D1002D1P1	D1003D1P1	D1003S1P1
	DATE / TIME	04/10/97 / 10:40	04/10/97 / 10:40	06/26/97 / 10:20	04/10/97 / 15:00	04/10/97 / 11:10	04/10/97 / 11:10
	DEPTH (ft)	0.00	0.50	0.00	0.00	0.00	0.50
2,3,7,8-TCDD		230 R	0.65 R	58.0	217	118	0.5 U
1,2,3,7,8-PeCDD		7.2 R	0.3 U	2.5	4.1	1.9	0.8 U
1,2,3,4,7,8-HxCDD		17.8 R	0.5 U	4.8	5.8	(0.92)	1.0 U
1,2,3,6,7,8-HxCDD		30.9 R	0.82 R	10.4	10.1	1.9	0.8 U
1,2,3,7,8,9-HxCDD		37.1 R	0.54 R	11.1	11.8	2.5	0.9 U
1,2,3,4,6,7,8-HpCDD		955 R	13.7 R	319	258	41.0	1.5 R
1,2,3,4,6,7,8,9-OCDD		8340	298 R	3190	2450	612	24.3 R
2,3,7,8-TCDF		15.6 R	0.2 U	4.1	15.5	17.5	0.4 U
1,2,3,7,8-PeCDF		2.2 R	0.2 U	0.97	1.2	0.9 U	0.6 U
2,3,4,7,8-PeCDF		2.0 R	0.2 U	0.85	0.95	0.9 U	0.6 U
1,2,3,4,7,8-HxCDF		44.4 R	0.94 R	3.7	11.2	1.8 U	0.7 U
1,2,3,6,7,8-HxCDF		7.3 R	0.29 R	2.5	2.3	0.64 U	0.5 U
2,3,4,6,7,8-HxCDF		10.4 R	0.70 U	5.1	3.0 U	0.75 U	0.7 U
1,2,3,7,8,9-HxCDF		(0.58) R	0.4 U	0.5 U	0.23	1.5 U	0.8 U
1,2,3,4,6,7,8-HpCDF		190 R	11.0 R	47.5	45.2	11.1	0.8 U
1,2,3,4,7,8,9-HpCDF		12.0 R	0.5 U	2.6	3.1	(0.86)	1.0 U
1,2,3,4,6,7,8,9-OCDF		403 R	3.1 R	165	111	27.4	1.0 U
Total TCDD		243	0.65	63.1	---	130	0.5 U
Total PeCDD		32.3	0.88	12.3	---	4.1	0.8 U
Total HxCDD		413	6.4	138	---	14.9	0.9 U
Total HpCDD		2550	35.8	939	---	97.1	2.8
Total TCDF		68.3	0.71	25.7	---	69.5	0.4 U
Total PeCDF		112	6.5	32.2	---	58.0	0.6 U
Total HxCDF		299	19.5	76.3	---	16.3	0.6 U
Total HpCDF		570	28.9	122	---	28.3	0.9 U
Total TEQ		271.431	1.4571	70.9395	230.902	122.401	0.0393

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed
() = Less than Reporting Limit

U = non-detect, R = rejected, EDL = estimated detection limit

For RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D1003	D1004	D1005	D1005	D1006	D1007
	SAMPLE ID	D1003D1P3	D1004D1P1	D1005D1P1	D1005S1P1	D1006D1P1	D1007D1P1
	DATE / TIME	06/26/97 / 11:00	04/10/97 / 10:05	04/10/97 / 09:20	04/10/97 / 09:20	04/09/97 / 14:55	04/10/97 / 08:40
	DEPTH (ft)	0.00	0.00	0.00	0.50	0.00	0.00
2,3,7,8-TCDD		19.5	62.9 R	0.2 U	0.4 U	9.9 R	3.4 R
1,2,3,7,8-PeCDD		0.7 U	7.8 R	0.3 U	0.6 U	0.72 R	0.6 U
1,2,3,4,7,8-HxCDD		0.8 U	18.8 R	0.5 U	0.8 U	0.96 R	(0.68) R
1,2,3,6,7,8-HxCDD		0.71	42.5 R	0.4 U	0.60 R	2.7 R	2.1 R
1,2,3,7,8,9-HxCDD		0.89	43.9 R	0.75 R	1.2 R	2.7 R	2.1 R
1,2,3,4,6,7,8-HpCDD		12.7	1220 R	3.3 R	2.9 R	60.6 R	44.1 R
1,2,3,4,6,7,8,9-OCDD		135	10930	33.2 R	25.6 R	427 R	358 R
2,3,7,8-TCDF		5.2	16.6 R	0.31 R	0.3 U	(1.7)	0.97 R
1,2,3,7,8-PeCDF		0.4 U	2.8 R	0.2 U	0.4 U	0.2 U	0.4 U
2,3,4,7,8-PeCDF		0.4 U	3.4 R	0.2 U	0.4 U	0.2 U	(0.26) R
1,2,3,4,7,8-HxCDF		(0.44)	50.9 R	0.56 U	0.5 U	1.6 R	2.3 R
1,2,3,6,7,8-HxCDF		0.5 U	12.1 R	0.18 U	0.4 U	0.90 R	0.43 U
2,3,4,6,7,8-HxCDF		0.86	11.8 U	0.71 U	0.51 U	1.2 U	0.97 U
1,2,3,7,8,9-HxCDF		0.6 U	(0.97) R	0.3 U	0.6 U	0.3 U	0.7 U
1,2,3,4,6,7,8-HpCDF		2.5	255 R	1.4 U	0.7 U	11.1 R	14.4 R
1,2,3,4,7,8,9-HpCDF		0.8 U	15.1 R	0.40 R	0.9 U	1.1 R	(0.76) R
1,2,3,4,6,7,8,9-OCDF		5.8	552 R	1.9 R	1.1 U	22.4 R	26.1 R
Total TCDD		20.5	80.0	0.64	2.7	11.3	3.4
Total PeCDD		2.0	38.2	0.82	5.7	2.1	(0.48)
Total HxCDD		6.5	445	2.7	0.93	23.2	18.3
Total HpCDD		31.5	3110	6.1	5.6	140	95.1
Total TCDF		5.2	85.6	2.5	7.8	4.1	1.8
Total PeCDF		8.9	149	0.86	0.4 U	7.9	6.8
Total HxCDF		3.9	350	2.0	0.51	18.8	18.5
Total HpCDF		4.2	770	0.40	0.8 U	26.3	42.9
Total TEQ		20.6028	113.6	0.1781	0.2346	12.4934	5.3237

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less th[redacted]eporting Limit

U = non-de[redacted] R = rejected, EDL = estimated detection limit [redacted]r RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D1007	D1008	D1008	D1009	D1010	D1010
	SAMPLE ID	D1007D1P3	D1008D1P1	D1008S1P1	D1009D1P1	D1010D1P1	D1010S1P1
	DATE / TIME	06/26/97 / 09:40	04/09/97 / 13:50	04/09/97 / 13:50	04/09/97 / 13:30	04/09/97 / 11:00	04/09/97 / 11:00
	DEPTH (ft)	0.00	0.00	0.50	0.00	0.00	0.50
2,3,7,8-TCDD		9.8	28.0 R	12.6	40.2 R	41.9 R	25.3
1,2,3,7,8-PeCDD		0.9 U	3.4 R	1.4	3.0 R	9.4 R	7.9
1,2,3,4,7,8-HxCDD		1.3 U	8.4 R	3.8	6.0 R	26.8 R	24.2
1,2,3,6,7,8-HxCDD		1.4	25.7 R	11.2	17.2 R	59.0 R	45.0
1,2,3,7,8,9-HxCDD		1.6	20.2 R	8.5	14.0 R	51.5 R	42.1
1,2,3,4,6,7,8-HpCDD		31.6	707 R	287	466 R	1980 R	1420
1,2,3,4,6,7,8,9-OCDD		326 J	5250 R	2480 J	3700 R	18760	11700
2,3,7,8-TCDF		2.5	3.3	2.1 U	4.9	(21.5)	(2.3)
1,2,3,7,8-PeCDF		0.6 U	1.1 R	0.3 U	1.3 R	4.3 R	3.3
2,3,4,7,8-PeCDF		0.6 U	1.3 R	0.76	0.79 R	3.2 R	3.0
1,2,3,4,7,8-HxCDF		1.3	15.8 R	5.5	11.0 R	27.2 R	41.0
1,2,3,6,7,8-HxCDF		0.7 U	5.5 R	2.0	5.1 R	30.9 R	11.5
2,3,4,6,7,8-HxCDF		0.9 U	6.7 R	2.1	3.6 U	10.2 R	9.3
1,2,3,7,8,9-HxCDF		1.0 U	(0.41) R	0.5 U	(0.41) R	(2.7) R	0.5 U
1,2,3,4,6,7,8-HpCDF		5.6	107 R	66.4	82.7 R	314 R	335
1,2,3,4,7,8,9-HpCDF		1.5 U	7.1 R	5.4	5.0 R	31.1 R	26.2
1,2,3,4,6,7,8,9-OCDF		43.7 J	462 R	221 J	282 R	1300	935
Total TCDD		10.9	33.1	14.8	44.8	52.5	32.4
Total PeCDD		1.4	17.1	1.9	10.5	40.5	21.2
Total HxCDD		11.7	191	93.3	138	477	383
Total HpCDD		74.8	1460	622	997	3760	2830
Total TCDF		3.8	22.5	4.7	21.6	54.4	35.9
Total PeCDF		7.0	50.6	17.8	44.5	108	131
Total HxCDF		7.8	173	86.0	129	438	403
Total HpCDF		16.4	262	214	260	1010	1350
Total TEQ		11.2017	52.929	23.279	57.54	114.706	78.902

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less than Reporting Limit

U = non-detect, R = rejected, EDL = estimated detection limit

For RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D1010	D1011	D1012	D1013	D1013	D1014
	SAMPLE ID	D1010D1P3	D1011D1P1	D1012D1P1	D1013D1P1	D1013S1P1	D1014D1P1
	DATE / TIME	06/26/97 / 10:00	04/09/97 / 10:25	04/09/97 / 09:40	04/09/97 / 08:40	04/09/97 / 08:40	04/09/97 / 09:20
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.50	0.00
2,3,7,8-TCDD		27.0	66.4 R	31.2 R	10.2 R	27.9	112.2 R
1,2,3,7,8-PeCDD		6.1	4.4 R	2.7 R	1.5 R	3.1	5.7 R
1,2,3,4,7,8-HxCDD		18.7	10.4 R	6.5 R	2.7 R	6.8	12.5 R
1,2,3,6,7,8-HxCDD		43.3	28.2 R	17.4 R	7.8 R	20.3	35.1 R
1,2,3,7,8,9-HxCDD		40.3	25.1 R	16.6 R	6.3 R	18.5	31.0 R
1,2,3,4,6,7,8-HpCDD		1410	849 R	498 R	207 R	611	1120 R
1,2,3,4,6,7,8,9-OCDD		16470	6700 R	4100 R	1860 R	5860	10890
2,3,7,8-TCDF		15.1	18.6	5.9	(2.9)	5.6	30.1
1,2,3,7,8-PeCDF		3.4	2.4 R	1.1 R	0.82 R	0.96	2.6 R
2,3,4,7,8-PeCDF		1.9	1.9 R	1.3 R	0.96 R	1.3	2.5 R
1,2,3,4,7,8-HxCDF		18.8	21.5 R	11.5 R	4.9 R	12.9	20.1 R
1,2,3,6,7,8-HxCDF		21.4	11.9 R	6.1 R	2.6 R	4.3	16.8 R
2,3,4,6,7,8-HxCDF		18.5	6.9 R	4.9 R	2.0 U	4.0	7.9 R
1,2,3,7,8,9-HxCDF		2.1	1.0 R	(0.63) R	0.51 R	0.7 U	1.3 R
1,2,3,4,6,7,8-HpCDF		206	153 R	101 R	41.1 R	140	185 R
1,2,3,4,7,8,9-HpCDF		18.4	14.8 R	6.9 R	3.6 R	8.5	14.7 R
1,2,3,4,6,7,8,9-OCDF		1050	660 R	377 R	156 R	476	693
Total TCDD		34.5	77.4	36.6	12.3	30.8	126.5
Total PeCDD		29.2	22.1	9.1	4.7	10.1	29.1
Total HxCDD		361	221	147	56.3	164	310
Total HpCDD		2800	1730	1010	428	1520	2270
Total TCDF		43.4	51.4	17.3	8.8	16.9	79.7
Total PeCDF		78.8	79.2	41.4	18.5	49.3	115
Total HxCDF		310	218	132	54.7	172	284
Total HpCDF		706	570	337	143	486	550
Total TEQ		82.854	99.558	50.774	18.775	51.319	156.69

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less th[illegible]eporting Limit

U = non-de[illegible], R = rejected, EDL = estimated detection limit [illegible]r RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D1014	D1015	D1015	D1016	D1016	D2001
	SAMPLE ID	D1014D1P3	D1015D1P1	D1015D1P2	D1016D1P1	D1016D1P2	D2001D1P1
	DATE / TIME	06/26/97 / 09:20	04/22/97 / 11:10	04/22/97 / 11:11	04/22/97 / 00:00	04/22/97 / 10:21	04/04/97 / 13:55
	DEPTH (ft)	0.00	0.00	0.50	0.00	0.50	0.00
2,3,7,8-TCDD		23.7	95.9 R	95.6	1.4 R	1.3 U	1210 R
1,2,3,7,8-PeCDD		2.4	4.4 R	3.9	(1.1) R	1.5 U	6.6 R
1,2,3,4,7,8-HxCDD		4.7	7.6 R	6.3	3.5 R	3.0	10.1 R
1,2,3,6,7,8-HxCDD		15.8	15.5 R	16.8	5.0 R	6.3	19.8 R
1,2,3,7,8,9-HxCDD		13.6	18.0 R	16.7	7.4 R	6.6	17.7 R
1,2,3,4,6,7,8-HpCDD		454	377 R	424	136 R	148	649 R
1,2,3,4,6,7,8,9-OCDD		4760	3250 R	3240 J	1280 R	1410 J	5680 R
2,3,7,8-TCDF		7.0	14.9 R	15.9	0.6 U	1.2 U	42.5 R
1,2,3,7,8-PeCDF		1.4	0.94 R	1.2 U	0.8 U	1.1 U	2.1 R
2,3,4,7,8-PeCDF		0.98	1.3 R	1.1 U	0.8 U	1.1 U	4.5 R
1,2,3,4,7,8-HxCDF		10.7	5.2 R	7.5	2.2 R	2.0	17.8 R
1,2,3,6,7,8-HxCDF		4.1	3.0 R	4.9	1.4 R	1.8	8.1 R
2,3,4,6,7,8-HxCDF		6.4	3.1 R	5.6	2.1 R	3.3	10.5 R
1,2,3,7,8,9-HxCDF		0.5 U	0.8 U	1.6 U	1.5 U	1.6 U	0.9 U
1,2,3,4,6,7,8-HpCDF		81.9	59.6 R	78.9	26.4 R	21.3	146 R
1,2,3,4,7,8,9-HpCDF		5.5	4.1 R	6.7	(1.3) R	1.6 U	7.4 R
1,2,3,4,6,7,8,9-OCDF		464	156 R	170 J	34.5 R	48.1 J	478 R
Total TCDD		28.3	101	98.7	1.4	1.3 U	1240
Total PeCDD		8.3	25.5	10.1	2.5	1.5 U	32.8
Total HxCDD		133	163	136	54.2	45.8	218
Total HpCDD		1000	876	932	299	308	1630
Total TCDF		20.4	47.6	33.6	2.2	2.3	259
Total PeCDF		36.2	79.3	46.2	12.6	8.8	511
Total HxCDF		126	53.9	120	39.2	22.6	303
Total HpCDF		285	63.7	211	59.9	53.4	436
Total TEQ		42.248	113.34	113.426	7.0615	5.4511	1242.487

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() = Less than Reporting Limit
U = non-detect, R = rejected, EDL = estimated detection limit

For RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D2001	D2001	D2002	D2002	D2003	D2003
	SAMPLE ID	D2001D1P2	D2001D1P3	D2002D1P1	D2002D1P2	D2003D1P1	D2003D1P2
	DATE / TIME	04/04/97 / 13:56	06/24/97 / 14:30	04/04/97 / 13:45	04/04/97 / 13:46	04/04/97 / 15:23	04/04/97 / 15:24
	DEPTH (ft)	0.50	0.00	0.00	0.50	0.00	0.50
2,3,7,8-TCDD		1210	3830	44.5 R	44.7	294 J	259 J
1,2,3,7,8-PeCDD		6.9	18.9	1.4 U	0.9 U	6.8 J	7.7 J
1,2,3,4,7,8-HxCDD		9.8	25.0	(0.86) R	1.0 U	10.5 J	12.3 J
1,2,3,6,7,8-HxCDD		18.6	54.7	3.6 R	4.0	32.4 J	32.2 J
1,2,3,7,8,9-HxCDD		17.3	51.3	2.1 R	2.0	24.9 J	26.6 J
1,2,3,4,6,7,8-HpCDD		681	1690	113 R	113	823	806
1,2,3,4,6,7,8,9-OCDD		5850	15140 J	1050 R	995	6060	6020
2,3,7,8-TCDF		41.8	136	3.3	4.0	19.2 J	15.9 J
1,2,3,7,8-PeCDF		2.4	6.0	1.0 U	0.8 U	2.8 J	2.3 UJ
2,3,4,7,8-PeCDF		4.2	5.0	1.0 U	0.7 U	2.8 J	2.2 UJ
1,2,3,4,7,8-HxCDF		16.4	20.6	2.7 R	2.7	22.1 J	21.3 J
1,2,3,6,7,8-HxCDF		8.0	13.8	(0.43) R	0.5 U	7.7 J	8.4 J
2,3,4,6,7,8-HxCDF		9.6	29.6	(1.4) R	1.3	7.4 J	11.6 J
1,2,3,7,8,9-HxCDF		0.7 U	2.8 U	1.7 U	0.7 U	1.1 UJ	2.1 UJ
1,2,3,4,6,7,8-HpCDF		144	315	31.8 R	31.2	116	143
1,2,3,4,7,8,9-HpCDF		6.9	13.4	(1.7) R	1.7	8.7	11.6
1,2,3,4,6,7,8,9-OCDF		521	1100 J	95 R	92.8	259	251
Total TCDD		1240	3950	46.3	44.7	308	275
Total PeCDD		32.9	145	(0.94)	0.9 U	17.6	26.2
Total HxCDD		203	787	22.2	22.7	253	254
Total HpCDD		1720	5250	209	204	2110	2050
Total TCDF		247	543	13	10.4	62	24.4
Total PeCDF		512	754	22.3	21.5	110	66.2
Total HxCDF		273	607	32.1	30.3	229	190
Total HpCDF		407	872	111	110	362	436
Total TEQ		1242.51	3911.774	48.549	48.6468	327.156	291.557

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U = non-detect, R = rejected, EDL = estimated detection limit

[redacted] RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D2003	D2004	D2004	D2005	D2005	D2005
	SAMPLE ID	D2003D1P3	D2004D1P1	D2004D1P2	D2005D1P1	D2005D1P2	D2005D1P3
	DATE / TIME	06/25/97 / 13:40	04/04/97 / 13:25	04/04/97 / 13:26	04/04/97 / 13:10	04/04/97 / 13:11	06/25/97 / 13:52
	DEPTH (ft)	0.00	0.00	0.50	0.00	0.50	0.00
2,3,7,8-TCDD		283	1.5 R	1.8	4 R	4.3	7.1
1,2,3,7,8-PeCDD		5.1	0.7 U	0.3 U	(0.67) R	0.55	1.3
1,2,3,4,7,8-HxCDD		9.9	1.4 R	1.2	2.2 R	2.1	3.1
1,2,3,6,7,8-HxCDD		29.3	2.7 R	2.7	4.7 R	4.7	9.5
1,2,3,7,8,9-HxCDD		23.4	2.4 R	2.5	4.1 R	4.6	7.7
1,2,3,4,6,7,8-HpCDD		732	70.6 R	74.7	136 R	135	251
1,2,3,4,6,7,8,9-OCDD		5920	563 R	580	1210 R	1210	2380
2,3,7,8-TCDF		16.8	0.4 U	0.2 U	0.4 U	0.2 U	1.1
1,2,3,7,8-PeCDF		2.2	0.5 U	0.2 U	0.5 U	0.2 U	0.41
2,3,4,7,8-PeCDF		2.6	0.4 U	0.2 U	0.5 U	0.2 U	0.57
1,2,3,4,7,8-HxCDF		12.5	2.5 R	2.6	2.1 R	1.9	3.6
1,2,3,6,7,8-HxCDF		6.7	0.58 R	0.65	1.1 R	1.1	1.9
2,3,4,6,7,8-HxCDF		11.2	0.84 U	1.3	1.3 U	2.1	3.7
1,2,3,7,8,9-HxCDF		0.6 U	0.7 U	0.3 U	0.8 U	0.2 U	0.6 U
1,2,3,4,6,7,8-HpCDF		96.5	14.8 R	14.6	31.1 R	30.5	38.8
1,2,3,4,7,8,9-HpCDF		6.2	1.1 R	0.91	2 R	2.0	2.7
1,2,3,4,6,7,8,9-OCDF		160	54.9 R	50.4	134 R	134	151
Total TCDD		303	1.5	1.8	4	4.3	8.3
Total PeCDD		18.3	0.7 U	0.3 U	(0.69)	0.98	4.7
Total HxCDD		232	16.9	8.4	31	31.9	76.8
Total HpCDD		1760	168	194	227	239	576
Total TCDF		46.9	0.75	0.73	2	1.5	5.2
Total PeCDF		106	3.8	2.4	8.7	7.4	13.2
Total HxCDF		190	16.3	20.6	34.9	32.0	62.3
Total HpCDF		262	40.2	39.0	89.2	89.3	122
Total TEQ		312.467	3.9409	4.4275	8.79	9.244	16.5715

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( ) = Less than Reporting Limit

U = non-detect, R = rejected, EDL = estimated detection limit

For RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D2006	D2006	D2007	D2007	D2008	D2008
	SAMPLE ID	D2006D1P1	D2006D1P2	D2007D1P1	D2007D1P2	D2008D1P1	D2008D1P2
	DATE / TIME	04/04/97 / 15:47	04/04/97 / 15:48	04/04/97 / 10:50	04/04/97 / 10:51	04/04/97 / 10:40	04/04/97 / 10:41
	DEPTH (ft)	0.00	0.50	0.00	0.50	0.00	0.50
2,3,7,8-TCDD		0.8 UJ	0.8 UJ	0.3 U	0.2 U	2.8 J	1.6 UJ
1,2,3,7,8-PeCDD		1.3 UJ	0.9 UJ	0.4 U	0.2 U	1.5 UJ	2.0 UJ
1,2,3,4,7,8-HxCDD		1.5 U	1.0 UJ	0.5 U	0.3 U	1.8 UJ	2.6 UJ
1,2,3,6,7,8-HxCDD		1.3 U	0.8 UJ	0.61 R	0.54	3.3 J	3.8 J
1,2,3,7,8,9-HxCDD		1.3 U	0.8 UJ	8.9 R	7.8	2.7 J	3.5 J
1,2,3,4,6,7,8-HpCDD		21.9	19.8	13.8 R	14.0	97.8	92.7
1,2,3,4,6,7,8,9-OCDD		225	213	174 R	174	1220	1130
2,3,7,8-TCDF		0.8 UJ	0.7 UJ	0.2 U	0.2 U	0.8 UJ	1.4 UJ
1,2,3,7,8-PeCDF		0.9 UJ	0.7 UJ	0.3 U	0.2 U	1.0 UJ	1.6 UJ
2,3,4,7,8-PeCDF		0.9 UJ	0.7 UJ	0.3 U	0.2 U	1.0 UJ	1.5 UJ
1,2,3,4,7,8-HxCDF		1.1 UJ	0.8 UJ	0.4 U	0.2 U	2.9 J	3.6 J
1,2,3,6,7,8-HxCDF		0.9 UJ	0.5 UJ	0.3 U	0.1 U	0.95 J	1.4 UJ
2,3,4,6,7,8-HxCDF		1.1 UJ	0.7 UJ	1.3 U	0.38	1.9 J	1.8 UJ
1,2,3,7,8,9-HxCDF		1.2 UJ	0.8 UJ	0.4 U	0.2 U	1.5 UJ	1.9 UJ
1,2,3,4,6,7,8-HpCDF		3.8	6.1	1 R	0.76	21.1	25.2
1,2,3,4,7,8,9-HpCDF		1.7 U	0.9 U	0.5 U	0.3 U	2.2 U	2.4 U
1,2,3,4,6,7,8,9-OCDF		19	15.8	3.7 R	3.4	67.1	63.7
Total TCDD		0.8 U	0.8 U	0.87	0.83	2.8	1.6 U
Total PeCDD		2.5	0.9 U	2.3	2.4	1.6	2.0 U
Total HxCDD		11.9	16.6	15.4	13.9	17.3	21.3
Total HpCDD		56	53.3	13.8	19.6	219	209
Total TCDF		0.8 U	0.7 U	0.2 U	0.2 U	3.9	3.4
Total PeCDF		2.5	2.4	0.3 U	0.2 U	14.3	9.9
Total HxCDF		4.6	3.0	0.69	0.38	31.6	32.8
Total HpCDF		7.3	15.6	1	0.99	71.9	82.9
Total TEQ		0.501	0.4878	1.2767	1.197	6.4511	3.4627

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-det [redacted] = rejected, EDL = estimated detection limit

[redacted] RCL DIOX

[redacted]

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D2008	D2009	D3001	D3001	D3002	D3002
	SAMPLE ID	D2008D1P3	D2009D1P1	D3001D1P1	D3001D1P2	D3002D1P1	D3002D1P2
	DATE / TIME	06/25/97 / 14:20	04/08/97 / 16:00	04/07/97 / 16:05	04/07/97 / 16:06	04/07/97 / 14:50	04/07/97 / 14:51
	DEPTH (ft)	0.00	0.00	0.00	0.50	0.00	0.50
2,3,7,8-TCDD		5.8	427	93.7 R	80.2	(0.33) R	2.7 U
1,2,3,7,8-PeCDD		0.5 U	3.2	4.7 R	4.3	(0.48) R	2.6 U
1,2,3,4,7,8-HxCDD		2.1	4.4	10.5 R	10.1	1.2 R	2.9 U
1,2,3,6,7,8-HxCDD		5.7	10.5	28.0 R	32.7	3.6 R	2.7 U
1,2,3,7,8,9-HxCDD		5.4	10.3	21.8 R	28.1	2.8 R	2.6 U
1,2,3,4,6,7,8-HpCDD		149	325	833 R	943	131 R	144
1,2,3,4,6,7,8,9-OCDD		1610	2900	6460 R	7780	1150 R	1450
2,3,7,8-TCDF		1.5	24.4	3.5 R	6.3	0.3 U	2.7 U
1,2,3,7,8-PeCDF		0.3 U	1.5	3.3 R	5.1	0.4 U	2.2 U
2,3,4,7,8-PeCDF		0.3 U	1.2	3.3 R	4.4	0.4 U	2.1 U
1,2,3,4,7,8-HxCDF		3.3	4.5	32.8 R	25.9	2.4 R	2.3 U
1,2,3,6,7,8-HxCDF		1.7	3.1	18.5 R	19.9	0.72 R	1.9 U
2,3,4,6,7,8-HxCDF		3.1	3.8	13.9 R	21.8	2.0 R	2.3 U
1,2,3,7,8,9-HxCDF		0.5 U	1.1 U	1.2 R	1.3 U	0.7 U	2.6 U
1,2,3,4,6,7,8-HpCDF		29.0	56.4	284 R	264	30.8 R	23.2
1,2,3,4,7,8,9-HpCDF		2.1	3.8	13.4 R	15.2	1.8 R	2.7 U
1,2,3,4,6,7,8,9-OCDF		50.6	165	625 R	887	109 R	183
Total TCDD		7.0	443	100	80.2	(0.33)	2.7 U
Total PeCDD		1.6	16.1	13.9	15.2	(0.48)	2.6 U
Total HxCDD		49.5	122	276	300	29.2	11.3
Total HpCDD		347	913	2080	2340	291	310
Total TCDF		5.4	96.7	43.7	35.5	0.65	2.7 U
Total PeCDF		15.5	131	169	158	4.8	2.1 U
Total HxCDF		45.2	94.3	453	328	36.9	11.9
Total HpCDF		82.7	159	829	773	120	109
Total TEQ		11.581	442.292	129.274	120.174	4.737	3.305

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For RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D3003	D3003	D3004	D3004	D3005	D3005
	SAMPLE ID	D3003D1P1	D3003D1P2	D3004D1P1	D3004D1P2	D3005D1P1	D3005D1P2
	DATE / TIME	04/07/97 / 15:20	04/07/97 / 15:21	04/07/97 / 14:20	04/07/97 / 14:21	04/07/97 / 11:10	04/07/97 / 11:11
	DEPTH (ft)	0.00	0.50	0.00	0.50	0.00	0.50
2,3,7,8-TCDD		7.2 R	6.2 U	0.4 U	15.7 U	4.3 R	4.5
1,2,3,7,8-PeCDD		0.52 R	6.6 U	0.6 U	14.3 U	0.58 R	2.0 U
1,2,3,4,7,8-HxCDD		1.9 R	6.5 U	(0.45) R	12.2 U	1.1 R	2.3 U
1,2,3,6,7,8-HxCDD		5.3 R	(5.3)	0.80 R	11.1 U	3.2 R	4.8
1,2,3,7,8,9-HxCDD		3.8 R	5.7 U	0.94 R	10.7 U	2.6 R	2.0 U
1,2,3,4,6,7,8-HpCDD		263 R	267	29.8 R	56.7	90.0 R	99.8
1,2,3,4,6,7,8,9-OCDD		2610 R	3180	328 R	410	971 R	1080
2,3,7,8-TCDF		0.96 R	0.89	0.3 U	17.5 UJ	1.0 R	1.1
1,2,3,7,8-PeCDF		0.2 UJ	4.8 U	0.4 U	14.5 U	0.3 U	1.5 U
2,3,4,7,8-PeCDF		0.2 U	4.7 U	0.4 U	14.0 U	0.3 U	1.5 U
1,2,3,4,7,8-HxCDF		2.7 R	5.2 U	(0.62) R	11.6 U	2.7 R	3.5
1,2,3,6,7,8-HxCDF		0.67 R	4.2 U	(0.35) R	9.3 U	0.91 R	1.4 U
2,3,4,6,7,8-HxCDF		1.4 UJ	5.2 U	0.7 UJ	11.6 U	1.2 U	1.8 U
1,2,3,7,8,9-HxCDF		0.4 UJ	5.7 U	0.8 UJ	12.8 U	0.5 U	2.0 U
1,2,3,4,6,7,8-HpCDF		48.5 R	42.3	8.5 R	9.0 U	25.0 R	21.0
1,2,3,4,7,8,9-HpCDF		2.0 R	5.9 U	1.0 U	14.0 U	1.3 R	(2.0)
1,2,3,4,6,7,8,9-OCDF		153 R	218	11.6 R	16.1 U	54.1 R	73.3
Total TCDD		7.2	6.2 U	0.4 U	15.7 U	4.3	4.5
Total PeCDD		2.4	6.6 U	0.6 U	14.3 U	4.0	3.8
Total HxCDD		46.6	18.0	9.6	11.3 U	23.8	12.6
Total HpCDD		519	517	83.2	56.7	184	205
Total TCDF		3.4	6.2 U	0.3 U	17.5 U	8.3	7.0
Total PeCDF		10.1	4.8 U	2.3	14.2 U	9.4	3.9
Total HxCDF		5.0	36.2	9.9	11.2 U	33.9	25.1
Total HpCDF		187	170	21.4	11.0 U	75.6	65.6
Total TEQ		14.891	7.11	1.0386	0.977	7.9291	7.8213

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( ) = Less than Reporting Limit

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RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D3006	D3006	D3007	D3007	D3007	D3008
	SAMPLE ID	D3006D1P1	D3006D1P2	D3007D1P1	D3007D1P2	D3007D1P3	D3008D1P3
	DATE / TIME	04/07/97 / 08:40	04/07/97 / 08:41	04/22/97 / 13:10	04/22/97 / 13:11	06/24/97 / 14:00	06/25/97 / 14:30
	DEPTH (ft)	0.00	0.50	0.00	0.50	0.00	0.00
2,3,7,8-TCDD		0.59 R	1.2 U	1.5 R	3.5 U	1.3 U	0.3 U
1,2,3,7,8-PeCDD		0.3 U	1.2 U	1.8 U	3.8 U	2.4	0.3 U
1,2,3,4,7,8-HxCDD		0.4 U	1.3 U	2.3 U	4.5 U	3.5	0.5 U
1,2,3,6,7,8-HxCDD		0.42 R	1.2 U	2.2 R	4.1 U	7.9	0.4 U
1,2,3,7,8,9-HxCDD		0.50 R	1.2 U	2.2 R	4.0 U	9.6	0.4 U
1,2,3,4,6,7,8-HpCDD		8.8 R	10.7	58.9 R	68.0	139	5.5
1,2,3,4,6,7,8,9-OCDD		67.4 R	66.7	537 R	623	1240	102
2,3,7,8-TCDF		0.2 U	1.2 U	1.2 R	3.3 U	1.2 U	0.2 U
1,2,3,7,8-PeCDF		0.2 U	0.9 U	1.1 U	2.8 U	1.2 U	0.2 U
2,3,4,7,8-PeCDF		0.2 U	0.9 U	1.1 U	2.7 U	1.1 U	0.2 U
1,2,3,4,7,8-HxCDF		0.30 R	1.1 U	1.4 R	3.6 U	2.6	0.3 U
1,2,3,6,7,8-HxCDF		0.2 U	0.9 U	(0.90) R	2.9 U	1.9	0.3 U
2,3,4,6,7,8-HxCDF		0.50 U	1.1 U	(1.1) R	3.6 U	2.9	0.61
1,2,3,7,8,9-HxCDF		0.4 U	1.3 U	1.7 U	4.0 U	2.6 U	0.4 U
1,2,3,4,6,7,8-HpCDF		1.7 R	2.0	13.4 R	12.7	33.2	0.86
1,2,3,4,7,8,9-HpCDF		0.5 U	1.3 U	(1.2) R	4.4 U	(2.8)	0.4 U
1,2,3,4,6,7,8,9-OCDF		4.9 R	4.0	26.0 R	41.7	140	2.2
Total TCDD		0.59	1.2 U	1.5	3.5 U	1.3 U	0.3 U
Total PeCDD		0.3 U	1.2 U	2.0	3.8 U	6.3	0.3 U
Total HxCDD		3.1	1.2 U	17.5	4.2 U	54.0	2.3
Total HpCDD		8.8	22.3	117	127	283	13.6
Total TCDF		0.33	1.2 U	2.6	3.3 U	3.7	0.2 U
Total PeCDF		0.82	0.9 U	5.3	2.7 U	12.8	0.2 U
Total HxCDF		1.1	1.1 U	23.0	7.7	17.7	0.61
Total HpCDF		3.2	4.3	37.0	36.7	78.7	0.86
Total TEQ		0.8868	0.1977	3.698	1.4717	7.17	0.2288

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less than Reporting Limit

U = non-detect, R = rejected, EDL = estimated detection limit

For RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D4001	D4001	D4002	D4002	D4002	D4003
	SAMPLE ID	D4001D1P1	D4001D1P2	D4002D1P1	D4002D1P2	D4002D1P3	D4003D1P1
	DATE / TIME	04/07/97 / 10:35	04/07/97 / 10:36	04/07/97 / 09:40	04/07/97 / 09:41	06/26/97 / 12:30	04/07/97 / 09:10
	DEPTH (ft)	0.00	0.50	0.00	0.50	0.00	0.00
2,3,7,8-TCDD		0.5 U	15.8 UJ	0.6 U	7.5 U	1.4 M	0.5 U
1,2,3,7,8-PeCDD		(0.69) R	8.8 U	1.2 U	5.8 U	3.8	0.8 U
1,2,3,4,7,8-HxCDD		2.5 R	7.7 U	(0.99) R	6.2 U	10.1	(1.0) R
1,2,3,6,7,8-HxCDD		4.4 R	7.0 U	1.9 R	5.7 U	21.2	2.4 R
1,2,3,7,8,9-HxCDD		5.9 R	6.8 U	(1.3) R	5.5 U	21.2	1.9 R
1,2,3,4,6,7,8-HpCDD		134 R	151	58.2 R	84.7	703	59.0 R
1,2,3,4,6,7,8,9-OCDD		1380 R	1370	563 R	510	6260	563 R
2,3,7,8-TCDF		0.4 U	12.6 U	0.5 U	8.1 U	3.0	0.4 U
1,2,3,7,8-PeCDF		(0.40) R	7.4 U	0.8 UJ	5.1 U	0.4 U	(0.45) R
2,3,4,7,8-PeCDF		(0.40) R	7.2 U	0.8 UJ	4.9 U	4.3	0.6 U
1,2,3,4,7,8-HxCDF		4.3 R	6.6 U	2.1 R	5.1 U	24.2	2.0 R
1,2,3,6,7,8-HxCDF		1.8 R	5.3 U	1.1 R	4.1 U	9.2	1.2 R
2,3,4,6,7,8-HxCDF		2.1 R	6.5 U	1.4 U	5.1 U	22.5	1.2 U
1,2,3,7,8,9-HxCDF		1.1 U	7.3 U	1.6 U	5.7 U	0.6 U	1.1 U
1,2,3,4,6,7,8-HpCDF		39.4 R	34.9	24.4 R	19.0	224	23.8 R
1,2,3,4,7,8,9-HpCDF		2.0 R	8.0 U	(1.2) R	7.1 U	12.6	(1.3) R
1,2,3,4,6,7,8,9-OCDF		82.5 R	110	47.7 R	63.7	516	47.9 R
Total TCDD		0.5 U	15.8 U	0.6 U	7.5 U	2.3	0.5 U
Total PeCDD		(0.68)	8.8 U	1.2	5.8 U	19.0	1.5
Total HxCDD		53.5	12.5	10.7	5.7 U	252	21.1
Total HpCDD		349	396	153	84.7	2100	151
Total TCDF		1.7	12.6 U	1.1	8.1 U	66.3	1.0
Total PeCDF		13.4	7.3 U	10.3	5.0 U	348	13.6
Total HxCDF		55.6	33.3	40.3	24.8	358	43.3
Total HpCDF		91.4	79.6	64.7	62.9	692	41.5
Total TEQ		5.8815	3.339	2.1877	1.6107	32.762	2.3244

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less than Reporting Limit

U = non-detect R = rejected, EDL = estimated detection limit [redacted]r RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D4003	D5001	D5001	D5002	D5002	D5003
	SAMPLE ID	D4003D1P2	D5001D1P1	D5001D1P3	D5002D1P1	D5002D1P3	D5003D1P1
	DATE / TIME	04/07/97 / 09:11	04/08/97 / 13:05	06/24/97 / 09:00	04/08/97 / 13:20	06/24/97 / 13:20	04/08/97 / 10:15
	DEPTH (ft)	0.50	0.00	0.00	0.00	0.00	0.00
2,3,7,8-TCDD		0.6 U	5.3 R	17.4	0.7 R	0.6 U	0.2 U
1,2,3,7,8-PeCDD		0.8 U	47.6 R	164	14.5 R	9.2	0.2 U
1,2,3,4,7,8-HxCDD		1.6	83.4 R	311	22.1 R	12.9	0.3 U
1,2,3,6,7,8-HxCDD		3.5	41.1 R	135	41.8 R	21.6	0.3 U
1,2,3,7,8,9-HxCDD		3.8	27.9 R	169	42.1 R	23.8	0.50 R
1,2,3,4,6,7,8-HpCDD		102	498 R	1540	511 R	256	8.3 R
1,2,3,4,6,7,8,9-OCDD		1010	1470 R	4320	2870	1770	80.4 R
2,3,7,8-TCDF		0.94	0.6 U	52.5	0.62 R	0.6 U	0.57 R
1,2,3,7,8-PeCDF		0.5 U	46.4 R	96.2	1.4 R	0.5 U	0.2 U
2,3,4,7,8-PeCDF		0.5 U	93.7 R	193	0.95 R	0.5 U	0.50 R
1,2,3,4,7,8-HxCDF		3.1	46340	8310	14.5 R	4.7	7.2 R
1,2,3,6,7,8-HxCDF		1.1	536 R	1010	5.9 R	3.2	0.56 R
2,3,4,6,7,8-HxCDF		1.5	560 R	2350	5.0 R	5.2	1.3 R
1,2,3,7,8,9-HxCDF		0.8 U	26.7 R	67.6	0.2 U	1.3 U	0.3 U
1,2,3,4,6,7,8-HpCDF		19.9	2810 R	5270	76.4 R	44.7	4.0 R
1,2,3,4,7,8,9-HpCDF		1.9	1420 R	4340	5.3 R	3.8	0.58 R
1,2,3,4,6,7,8,9-OCDF		69.1	5880 R	13480	121 R	278	5.2 U
Total TCDD		0.6 U	26.5	160	2.4	0.6 U	0.2 U
Total PeCDD		0.8 U	64.1	641	31.9	14.7	0.2 U
Total HxCDD		34.1	503	1880	225	139	2.6
Total HpCDD		286	1030	2850	1020	544	17.6
Total TCDF		0.94	1300	512	5.8	2.7	3.7
Total PeCDF		10.7	10290	8960	29.8	4.7	13.5
Total HxCDF		24.7	17840	27240	119	61.7	20.1
Total HpCDF		63.3	4920	16280	202	100	10.2
Total TEQ		3.8711	4894.41	1570.52	30.615	16.833	1.4722

Values represent total concentrations unless noted < =Not detected at indicated reporting limit --- =Not analyzed

U = non-detect, R = rejected, EDL = estimated detection limit

For RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D5003	D5004	D5004	D5004	D5005	D5005
	SAMPLE ID	D5003D1P2	D5004D1P1	D5004D1P2	D5004S1P1	D5005D1P1	D5005D1P2
	DATE / TIME	04/08/97 / 10:06	04/08/97 / 15:10	04/08/97 / 15:01	04/08/97 / 15:10	04/07/97 / 14:40	04/07/97 / 14:41
	DEPTH (ft)	0.50	0.00	0.25	0.50	0.00	0.50
2,3,7,8-TCDD		0.9 U	0.1 U	1.2 U	0.4 U	16.9 R	(14.6)
1,2,3,7,8-PeCDD		0.9 U	0.24 R	1.1 U	0.5 U	1.5 R	15.0 U
1,2,3,4,7,8-HxCDD		0.8 U	0.27 R	1.0 U	0.8 U	3.0 R	11.7 U
1,2,3,6,7,8-HxCDD		0.7 U	0.74 R	0.9 U	1.1	8.3 R	10.7 U
1,2,3,7,8,9-HxCDD		0.7 U	1.9 R	0.9 U	2.1	5.4 R	10.3 U
1,2,3,4,6,7,8-HpCDD		10.0 J	10.8 R	11.0	8.2	180 R	164
1,2,3,4,6,7,8,9-OCDD		79.3 J	119 R	118	65.8	1410 R	1290
2,3,7,8-TCDF		0.9 U	0.1 U	1.3 U	0.9 U	2.6 R	2.7
1,2,3,7,8-PeCDF		0.8 U	0.1 U	0.9 U	0.4 U	0.7 U	11.2 U
2,3,4,7,8-PeCDF		0.8 U	0.1 U	0.9 U	0.4 U	0.7 U	10.9 U
1,2,3,4,7,8-HxCDF		6.1	0.47 R	0.8 U	0.6 U	7.4 R	10.3 U
1,2,3,6,7,8-HxCDF		0.5 U	0.1 U	0.6 U	0.5 U	2.7 R	8.3 U
2,3,4,6,7,8-HxCDF		2.2	0.51 R	0.8 U	0.6 U	2.3 R	10.3 U
1,2,3,7,8,9-HxCDF		0.7 U	0.2 U	0.9 U	0.7 U	1.1 U	11.4 U
1,2,3,4,6,7,8-HpCDF		5.0	0.98 R	1.6	1.3	38.2 R	32.8
1,2,3,4,7,8,9-HpCDF		0.7 U	0.2 U	0.8 U	1.0 U	2.9 R	11.5 U
1,2,3,4,6,7,8,9-OCDF		6.6 J	2.2 U	3.6	1.4	156 R	150
Total TCDD		0.9 U	0.30	1.2 U	1.8	16.9	(14.6)
Total PeCDD		0.9 U	0.24	1.1 U	0.89	1.3	15.0 U
Total HxCDD		0.7 U	6.7	0.9 U	7.3	46.4	19.7
Total HpCDD		19.7	20.8	22.0	18.5	349	306
Total TCDF		4.7	7.7	1.3 U	14.2	6.0	13.8 U
Total PeCDF		10.9	1.4	0.9 U	1.0	16.3	11.1 U
Total HxCDF		15.3	2.7	0.8 U	1.5	75.4	46.1
Total HpCDF		11.0	2.7	4.3	1.3	106	73.8
Total TEQ		1.0659	0.7458	---	0.4822	24.597	18.278

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less th[illegible]eporting Limit

U = non-detect, R = rejected, EDL = estimated detection limit [illegible]r RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D5006	D5006	D5007	D5007	D5007	D5008
	SAMPLE ID	D5006D1P1	D5006D1P2	D5007D1P1	D5007S1P1	D5007D1P3	D5008D1P1
	DATE / TIME	04/08/97 / 09:35	04/08/97 / 09:06	04/08/97 / 08:50	04/08/97 / 15:25	06/24/97 / 09:45	04/07/97 / 14:30
	DEPTH (ft)	0.00	0.50	0.00	0.50	0.00	0.00
2,3,7,8-TCDD		0.2 U	1.8 U	7.4 R	4.0	0.9 U	0.44 R
1,2,3,7,8-PeCDD		0.3 U	1.5 U	6.3 R	3.8	1.0 U	0.2 U
1,2,3,4,7,8-HxCDD		(0.31) R	1.4 U	15.0 R	7.5	1.6 UJ	0.45 R
1,2,3,6,7,8-HxCDD		0.62 R	1.3 U	41.5 R	20.9	1.7 J	1.4 R
1,2,3,7,8,9-HxCDD		0.44 R	1.3 U	40.8 R	17.5	1.4 UJ	1.4 R
1,2,3,4,6,7,8-HpCDD		13.7 R	13.7 J	1220 R	657	33.1	44.6 R
1,2,3,4,6,7,8,9-OCDD		134 R	141 J	10460 R	5550	441	460 R
2,3,7,8-TCDF		0.2 U	1.7 U	3.8 R	1.2	(0.34)	0.1 U
1,2,3,7,8-PeCDF		0.30 R	1.3 U	1.8 R	(0.90)	0.9 U	0.2 U
2,3,4,7,8-PeCDF		0.48 R	1.2 U	2.5 R	(1.1)	0.8 U	0.1 U
1,2,3,4,7,8-HxCDF		21.2 R	18.7	61.7 R	31.9	5.8 J	2.6 R
1,2,3,6,7,8-HxCDF		0.93 R	0.9 U	9.2 R	4.4	1.2 UJ	0.38 R
2,3,4,6,7,8-HxCDF		1.7 R	2.2	10.6 R	4.9	1.4 UJ	0.66 U
1,2,3,7,8,9-HxCDF		0.3 U	1.3 U	0.44 R	2.1 U	1.6 UJ	0.2 U
1,2,3,4,6,7,8-HpCDF		5.7 R	6.3	178 R	90.5	9.0	6.3 R
1,2,3,4,7,8,9-HpCDF		1.0 R	1.3 U	16.8 R	3.2 U	2.0 U	0.5 R
1,2,3,4,6,7,8,9-OCDF		8.9 R	8.2 J	657 R	268	23.3	17.2 R
Total TCDD		0.2 U	1.8 U	14.1	4.0	0.9 U	0.44
Total PeCDD		0.39	1.5 U	18.9	8.7	1.0 U	0.43
Total HxCDD		4.4	1.3 U	267	131	4.0	10.5
Total HpCDD		27.2	28.8	2170	1190	39.2	133
Total TCDF		2.5	13.1	41.9	11.2	0.8 U	1.8
Total PeCDF		16.7	14.5	87.6	45.6	9.8	3.1
Total HxCDF		31.8	19.7	316	149	28.3	11.5
Total HpCDF		16.3	19.5	645	90.5	27.6	20.5
Total TEQ		3.1219	2.4392	55.459	28.618	1.6693	2.0542

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less than Reporting Limit

U = non-detect, R = rejected, EDL = estimated detection limit

For RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D5008	D5009	D5009	D5009	D5010	D5010
	SAMPLE ID	D5008D1P2	D5009D1P1	D5009D1P2	D5009D1P3	D5010D1P1	D5010D1P2
	DATE / TIME	04/07/97 / 14:31	04/07/97 / 13:50	04/07/97 / 13:51	06/24/97 / 10:00	04/07/97 / 13:25	04/07/97 / 13:26
	DEPTH (ft)	0.50	0.00	0.50	0.00	0.00	0.50
2,3,7,8-TCDD		1.5 U	0.7 R	0.4 U	0.3 U	0.38 R	0.6 U
1,2,3,7,8-PeCDD		1.6 U	(0.35) R	0.3 U	0.4 U	0.2 U	0.4 U
1,2,3,4,7,8-HxCDD		1.4 U	0.94 R	0.83	0.8 U	(0.25) R	0.5 U
1,2,3,6,7,8-HxCDD		1.3 U	2.4 R	2.3	0.7 U	0.50 R	0.5 U
1,2,3,7,8,9-HxCDD		1.2 U	2.2 R	2.2	0.7 U	0.51 R	0.5 U
1,2,3,4,6,7,8-HpCDD		39.0	69.0 R	62.6	11.2	13.3 R	12.3
1,2,3,4,6,7,8,9-OCDD		456	580 R	551	170	179 R	173
2,3,7,8-TCDF		1.6 U	0.46 R	0.5 U	0.3 U	0.39 R	0.6 U
1,2,3,7,8-PeCDF		1.2 U	0.3 U	0.3 U	0.3 U	(0.17) R	0.4 U
2,3,4,7,8-PeCDF		1.2 U	0.3 U	0.3 U	0.3 U	0.2 U	0.4 U
1,2,3,4,7,8-HxCDF		1.4 U	11.0 R	10.4	2.2	0.71 R	0.74
1,2,3,6,7,8-HxCDF		1.1 U	0.77 R	0.80	0.5 U	0.2 U	0.4 U
2,3,4,6,7,8-HxCDF		1.4 U	1.6 U	1.8 U	0.7 U	0.59 R	0.77 U
1,2,3,7,8,9-HxCDF		1.6 U	0.4 U	0.4 U	0.7 U	0.3 U	0.6 U
1,2,3,4,6,7,8-HpCDF		7.2	11.8 R	13.4	2.8	2.0 R	2.4 U
1,2,3,4,7,8,9-HpCDF		1.5 U	1.4 R	2.1 U	1.1 U	0.3 U	0.6 U
1,2,3,4,6,7,8,9-OCDF		23.5	32.3 R	28.1	8.1	8.4 R	7.7 U
Total TCDD		1.5 U	0.69	0.4 U	0.39	0.38	0.6 U
Total PeCDD		1.6 U	0.45	0.3 U	0.4 U	0.2 U	0.4 U
Total HxCDD		3.6	13.9	10.0	3.2	2.4	0.5 U
Total HpCDD		127	137	125	25.9	25.5	21.7
Total TCDF		1.6 U	0.46	1.1	5.1	0.71	0.6 U
Total PeCDF		2.2	7.9	6.8	19.2	0.68	1.2
Total HxCDF		4.8	26.1	24.2	2.0	3.3	3.2
Total HpCDF		7.2	39.8	13.4	2.8	6.4	2.4
Total TEQ		0.9415	4.0863	2.9921	0.5381	1.0239	0.37

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less th[illegible]eporting Limit

U = non-detect, R = rejected, EDL = estimated detection limit [illegible]r RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D5011	D5011	D5011	D5012	D5012	D5012
	SAMPLE ID	D5011D1P1	D5011D1P2	D5011D1P3	D5012D1P1	D5012D1P2	D5012D1P3
	DATE / TIME	04/07/97 / 10:56	04/07/97 / 10:57	06/24/97 / 10:15	04/07/97 / 10:45	04/07/97 / 10:46	06/24/97 / 13:45
	DEPTH (ft)	0.00	0.50	0.00	0.00	0.50	0.00
2,3,7,8-TCDD		4.2 R	3.5	4.3	5.5 R	2.1 U	6.2
1,2,3,7,8-PeCDD		1.9 R	1.0 U	0.7 U	2.2 R	2.0 U	3.7
1,2,3,4,7,8-HxCDD		3.3 R	3.2	3.2	5.6 R	5.7	9.1
1,2,3,6,7,8-HxCDD		11.0 R	10.4	10.4	15.9 R	12.2	20.8
1,2,3,7,8,9-HxCDD		11.8 R	11.5	9.6	15.1 R	16.5	21.8
1,2,3,4,6,7,8-HpCDD		342 R	316	267	484 R	460	570
1,2,3,4,6,7,8,9-OCDD		3700 R	3530	3710 J	5030 R	4870	6390
2,3,7,8-TCDF		1.8	2.2	1.2 U	(1.2) R	1.5	2.2
1,2,3,7,8-PeCDF		0.79 R	0.7 U	0.5 U	0.5 U	1.6 U	1.2
2,3,4,7,8-PeCDF		1.3 R	0.7 U	0.5 U	1.3 R	1.6 U	1.8
1,2,3,4,7,8-HxCDF		30.9 R	25.3	5.9	40.8 R	37.0	11.0
1,2,3,6,7,8-HxCDF		3.5 R	3.6	2.8	4.5 R	1.5 U	4.7
2,3,4,6,7,8-HxCDF		3.6 R	3.8 U	5.3	4.3 R	1.9 U	8.0
1,2,3,7,8,9-HxCDF		(0.21) R	1.0 U	1.3 U	(0,37) R	2.1 U	1.1 U
1,2,3,4,6,7,8-HpCDF		47.8 R	42.7	38.7	58.3 R	57.7	79.1
1,2,3,4,7,8,9-HpCDF		5.4 R	4.5	3.6	11.2 R	4.8	7.8
1,2,3,4,6,7,8,9-OCDF		162 R	151	137 J	210 R	190	582
Total TCDD		5.3	3.5	5.9	6.4	2.1 U	6.2
Total PeCDD		2.3	1.0 U	2.7	5.7	2.0 U	5.9
Total HxCDD		72.7	68.2	75.9	111	89.3	150
Total HpCDD		641	592	667	947	908	1250
Total TCDF		9.7	24.9	10.6	14.8	26.3	14.7
Total PeCDF		39.8	17.9	25.1	52.1	33.3	35.8
Total HxCDF		103	86.2	83.6	116	55.7	130
Total HpCDF		169	161	117	216	62.5	234
Total TEQ		20.2645	16.433	14.96	26.802	17.575	30.311

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

() = Less than Reporting Limit

U = non-detect, R = rejected, EDL = estimated detection limit

For RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D5013	D5013	D5013	D5014	D5014	D5015
	SAMPLE ID	D5013D1P1	D5013D1P2	D5013S1P1	D5014D1P1	D5014D1P2	D5015D1P1
	DATE / TIME	04/07/97 / 09:45	04/07/97 / 09:46	04/08/97 / 15:45	04/07/97 / 09:10	04/07/97 / 09:11	04/07/97 / 08:40
	DEPTH (ft)	0.00	0.50	0.00	0.00	0.50	0.00
2,3,7,8-TCDD		5.2 R	6.9 U	0.3 U	5.4 R	11.2 U	8.3 R
1,2,3,7,8-PeCDD		2.8 R	6.2 U	0.4 U	3.2 R	7.0 U	5.2 R
1,2,3,4,7,8-HxCDD		4.4 R	6.6 U	0.99	6.3 R	6.9 U	12.2 R
1,2,3,6,7,8-HxCDD		13.6 R	10.3	3.0	17.7 R	15.9	30.8 R
1,2,3,7,8,9-HxCDD		12.8 R	9.6	4.0	16.6 R	19.2	32.5 R
1,2,3,4,6,7,8-HpCDD		329 R	335	66.3	497 R	440	928 R
1,2,3,4,6,7,8,9-OCDD		2960 R	2890	547	4830 R	4420	9130 R
2,3,7,8-TCDF		1.3 R	1.5	0.51	1.9 R	5.2 U	4.7 U
1,2,3,7,8-PeCDF		1.7 R	4.6 U	0.3 U	1.9 R	5.5 U	2.4 R
2,3,4,7,8-PeCDF		1.4 R	4.4 U	0.3 U	2.3 R	5.3 U	2.7 R
1,2,3,4,7,8-HxCDF		19.2 R	14.6	1.3	23.3 R	19.1	33.9 R
1,2,3,6,7,8-HxCDF		4.0 R	4.4 U	0.70	4.3 R	5.0 U	8.4 R
2,3,4,6,7,8-HxCDF		4.1 R	5.4 U	0.76	4.0 R	6.2 U	8.0 R
1,2,3,7,8,9-HxCDF		0.89 R	6.0 U	0.5 U	1.0 R	6.9 U	0.67 R
1,2,3,4,6,7,8-HpCDF		42.7 R	32.5	8.7	60.4 R	52.9	120 R
1,2,3,4,7,8,9-HpCDF		5.3 R	5.9 U	0.7 U	6.3 R	6.0 U	12.4 R
1,2,3,4,6,7,8,9-OCDF		131 R	120	20.9	263 R	220	480 R
Total TCDD		7.0	6.9 U	1.9	7.2	11.2 U	17.4
Total PeCDD		8.2	6.2 U	2.3	6.3	7.0 U	27.0
Total HxCDD		91.4	10.3	23.8	105	35.1	243
Total HpCDD		625	654	132	806	723	1950
Total TCDF		21.9	20.2	7.2	18.5	11.7 U	34.2
Total PeCDF		28.8	14.3	5.5	36.0	57.3	69.7
Total HxCDF		88.7	71.6	14.5	112	90.4	207
Total HpCDF		143	112	24.0	202	183	428
Total TEQ		20.275	10.285	2.4439	26.485	14.989	45.231

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-det[redacted] R = rejected, EDL = estimated detection limit

[redacted] RCL DIOX

[redacted]

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D6004	D6004	D6005	D6005	D6005	D6006
	SAMPLE ID	D6004D1P1	D6004D1P2	D6005D1P1	D6005D1P2	D6005D1P3	D6006D1P1
	DATE / TIME	04/08/97 / 10:20	04/08/97 / 10:01	04/08/97 / 10:50	04/08/97 / 10:01	06/25/97 / 15:00	04/08/97 / 13:50
	DEPTH (ft)	0.00	0.50	0.00	0.50	0.00	0.00
2,3,7,8-TCDD		0.3 U	0.5 U	0.5 U	3.7 U	0.7 U	0.52 R
1,2,3,7,8-PeCDD		0.6 U	0.5 U	2.7 R	3.0 U	3.6	5.1 R
1,2,3,4,7,8-HxCDD		0.87 R	0.5 U	6.6 R	5.9	7.6	8.5 R
1,2,3,6,7,8-HxCDD		1.4 R	1.8	17.0 R	18.6	23.9	17.0 R
1,2,3,7,8,9-HxCDD		2.1 R	1.8	13.9 R	14.2	18.5	17.6 R
1,2,3,4,6,7,8-HpCDD		29.8 R	32.0	311 R	332 J	480	359 R
1,2,3,4,6,7,8,9-OCDD		271 R	285	1950 R	2160	3740	3220 R
2,3,7,8-TCDF		0.37 R	0.4 U	1.2	3.7 U	1.7	1.2 R
1,2,3,7,8-PeCDF		0.4 U	0.4 U	1.3 R	2.6 U	1.5	0.85 R
2,3,4,7,8-PeCDF		0.4 U	0.4 U	1.3 R	2.5 U	1.9	1.3 R
1,2,3,4,7,8-HxCDF		0.85 R	0.4 U	12.2 R	7.9	17.9	14.3 R
1,2,3,6,7,8-HxCDF		0.34 R	0.3 U	3.4 R	4.8	4.8	3.5 R
2,3,4,6,7,8-HxCDF		0.70 R	0.4 U	4.1 R	3.9	8.0	4.8 R
1,2,3,7,8,9-HxCDF		0.4 U	0.4 U	(0.40) R	2.3 U	1.1 U	0.5 U
1,2,3,4,6,7,8-HpCDF		5.7 R	5.0	48.1 R	43.7	63.9	84.2 R
1,2,3,4,7,8,9-HpCDF		(0.43) R	0.5 U	3.3 R	3.0	4.1	5.5 R
1,2,3,4,6,7,8,9-OCDF		8.3 R	9.5	64.7 R	76.0	159	258 R
Total TCDD		0.3 U	0.61	0.5 U	3.7 U	0.84	0.52
Total PeCDD		0.6 U	0.5 U	7.3	3.0 U	4.7	14.6
Total HxCDD		12.5	9.6	121	105	170	143
Total HpCDD		72.9	70.3	724	704	1370	761
Total TCDF		2.6	1.7	6.6	3.7 U	10.0	13.8
Total PeCDF		1.9	2.0	33.6	16.0	42.4	49.6
Total HxCDF		10.1	6.0	110	77.3	130	110
Total HpCDF		13.6	13.1	119	110	164	263
Total TEQ		1.3016	1.0245	13.5837	11.553	20.444	18.4175

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( ) = Less than Reporting Limit

U = non-detect, R = rejected, EDL = estimated detection limit

For RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D6006	EE04D	EE04D	EE04D	EE04U	EE04U
	SAMPLE ID	D6006D1P2	EE04DD1P1	EE04DD1P2	EE04DD1P3	EE04UD1P1	EE04UD1P2
	DATE / TIME	04/08/97 / 13:01	04/22/97 / 16:30	04/22/97 / 16:31	06/26/97 / 11:20	04/22/97 / 16:30	04/22/97 / 16:31
	DEPTH (ft)	0.50	0.00	0.50	0.00	0.00	0.50
2,3,7,8-TCDD		1.3 U	2.7 R	2.3	7.8	39.8 R	45.2
1,2,3,7,8-PeCDD		4.8	1.2 R	1.3 U	0.4 U	3.8 R	4.2 U
1,2,3,4,7,8-HxCDD		6.7	2.1 R	2.6	1.3	10.8 R	7.8
1,2,3,6,7,8-HxCDD		17.9	7.6 R	9.1	3.8	26.0 R	19.1
1,2,3,7,8,9-HxCDD		17.0	7.9 R	7.8	3.6	24.5 R	23.4
1,2,3,4,6,7,8-HpCDD		393	172 R	212	114	725 R	805
1,2,3,4,6,7,8,9-OCDD		3470	1590 R	1740	1110	6810 R	7200
2,3,7,8-TCDF		1.1 U	0.4 U	1.3 U	3.4	10.7 R	12.0
1,2,3,7,8-PeCDF		1.1 U	0.62 R	1.0 U	0.3 U	1.5 R	3.6 U
2,3,4,7,8-PeCDF		1.0 U	0.82 R	0.9 U	0.3 U	1.7 R	3.4 U
1,2,3,4,7,8-HxCDF		12.2	1.9 R	3.1	2.5	13.0 R	12.7
1,2,3,6,7,8-HxCDF		3.9	0.73 R	1.4	1.4	8.1 R	9.4
2,3,4,6,7,8-HxCDF		6.7	(0.88) R	2.6	2.1	5.6 R	5.9 U
1,2,3,7,8,9-HxCDF		1.3 U	1.1 U	1.6 U	0.4 U	1.5 U	6.1 U
1,2,3,4,6,7,8-HpCDF		75.5	17.0 R	24.2	25.8	172 R	186
1,2,3,4,7,8,9-HpCDF		7.9	(1.1) R	1.9 U	2.3	10.9 R	14.9
1,2,3,4,6,7,8,9-OCDF		312	68.3 R	78.0	112	530 R	567
Total TCDD		1.3 U	9.9	8.8	8.4	46.2	45.2
Total PeCDD		4.8	18.2	8.4	1.7	27.0	9.2
Total HxCDD		117	129	107	28.7	238	172
Total HpCDD		789	413	478	228	1540	1680
Total TCDF		2.0	0.4 U	1.3 U	8.6	38.9	12.0
Total PeCDF		39.2	17.1	7.9	10.0	70.4	58.8
Total HxCDF		96.1	13.2	39.1	34.7	208	94.1
Total HpCDF		247	17.0	85.9	88.6	653	737
Total TEQ		17.386	9.4113	9.14	12.253	68.914	71.466

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less th[redacted]eporting Limit

U = non-dete[redacted], R = rejected, EDL = estimated detection limit [redacted]r RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	EE05D	EE05D	EE05U	EE05U	EE07D	EE07D
	SAMPLE ID	EE05DD1P1	EE05DD1P2	EE05UD1P1	EE05UD1P2	EE07DD1P1	EE07DD1P2
	DATE / TIME	04/23/97 / 10:50	04/23/97 / 10:51	04/23/97 / 11:15	04/23/97 / 11:16	04/22/97 / 16:00	04/22/97 / 16:01
	DEPTH (ft)	0.00	0.50	0.00	0.50	0.00	0.50
2,3,7,8-TCDD		44.4 R	42.4	182 R	197	0.7 U	3.2 U
1,2,3,7,8-PeCDD		1.8 R	2.8	6.8 R	6.9	2.9 R	2.5 U
1,2,3,4,7,8-HxCDD		4.6 R	3.0	11.7 R	10.6	5.6 R	3.9
1,2,3,6,7,8-HxCDD		9.5 R	9.0	29.6 R	29.1	9.0 R	8.3
1,2,3,7,8,9-HxCDD		11.3 R	9.2	29.8 R	24.1	11.5 R	10.1
1,2,3,4,6,7,8-HpCDD		241 R	244	721 R	734	131 R	158
1,2,3,4,6,7,8,9-OCDD		1860 R	1990	5200 R	5750	987 R	1130
2,3,7,8-TCDF		8.2 R	10.1	39.5 R	42.3	0.5 U	3.0 U
1,2,3,7,8-PeCDF		0.79 R	1.1 U	0.7 U	3.2	(0.54) R	2.0 U
2,3,4,7,8-PeCDF		0.82 R	1.1 U	2.8 R	2.4	0.7 U	1.9 U
1,2,3,4,7,8-HxCDF		7.5 R	8.6	20.3 R	19.1	2.8 R	2.5
1,2,3,6,7,8-HxCDF		3.2 R	3.1	9.3 R	10.1	1.6 R	1.8 U
2,3,4,6,7,8-HxCDF		4.2 R	6.0	8.4 R	14.6	1.6 R	2.3 U
1,2,3,7,8,9-HxCDF		1.0 U	1.8 U	1.1 U	1.3 U	1.1 U	2.5 U
1,2,3,4,6,7,8-HpCDF		54.8 R	44.9	160 R	128	35.2 R	30.0
1,2,3,4,7,8,9-HpCDF		4.3 R	2.4 U	9.9 R	9.4	1.9 R	2.8 U
1,2,3,4,6,7,8,9-OCDF		94.7 R	107	279 P	339	57.2 R	76.9
Total TCDD		47.4	42.4	197	215	0.7 U	3.2 U
Total PeCDD		6.7	7.3	38.5	24.6	2.6	2.5 U
Total HxCDD		93.2	72.7	282	255	70.6	44.1
Total HpCDD		514	548	1640	1660	273	312
Total TCDF		23.2	21.5	114	117	1.9	3.0 U
Total PeCDF		41.6	43.7	161	150	13.2	8.5
Total HxCDF		76.5	60.8	232	218	42.1	7.6
Total HpCDF		143	119	433	349	88.7	30.0
Total TEQ		55.5552	53.686	216.048	231.603	7.4122	5.5669

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() = Less than Reporting Limit

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For RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	EE07U	EE07U	EE13D	EE13D	EE13U	EE13U
	SAMPLE ID	EE07UD1P1	EE07UD1P2	EE13DD1P1	EE13DD1P2	EE13UD1P1	EE13UD1P2
	DATE / TIME	04/22/97 / 16:00	04/22/97 / 16:01	04/22/97 / 15:35	04/22/97 / 15:36	04/22/97 / 15:35	04/22/97 / 15:36
	DEPTH (ft)	0.00	0.50	0.00	0.50	0.00	0.50
2,3,7,8-TCDD		18.9 R	18.4	5.0 R	5.1	6.3 R	4.3
1,2,3,7,8-PeCDD		4.1 R	4.0	1.4 U	0.9 U	0.69 R	3.1 U
1,2,3,4,7,8-HxCDD		10.1 R	6.9	1.6 U	1.0 U	1.8 R	3.7 U
1,2,3,6,7,8-HxCDD		21.1 R	22.8	1.5 R	0.9 U	4.4 R	4.4
1,2,3,7,8,9-HxCDD		20.4 R	19.5	1.5 U	0.9 U	4.6 R	4.3
1,2,3,4,6,7,8-HpCDD		619 R	671	36.8 R	41.6	111 R	116 J
1,2,3,4,6,7,8,9-OCDD		6560 R	7540	357 R	379	1030 R	1170
2,3,7,8-TCDF		12.8 R	13.8	(0.84) R	3.0	2.0 R	3.3 U
1,2,3,7,8-PeCDF		1.8 R	2.5	1.0 U	0.7 U	0.3 U	2.5 U
2,3,4,7,8-PeCDF		1.8 R	1.9	1.0 U	0.7 U	0.3 U	2.5 U
1,2,3,4,7,8-HxCDF		11.9 R	11.6	1.1 U	0.9 U	1.9 R	3.0 U
1,2,3,6,7,8-HxCDF		11.3 R	11.4	0.8 U	0.7 U	1.3 R	2.4 U
2,3,4,6,7,8-HxCDF		5.7 R	11.6	1.2 U	0.9 U	1.2 R	3.0 U
1,2,3,7,8,9-HxCDF		1.1 U	0.9 U	1.3 U	1.0 U	0.5 U	3.3 U
1,2,3,4,6,7,8-HpCDF		134 R	120	9.4 R	8.3	26.8 R	21.9
1,2,3,4,7,8,9-HpCDF		9.6 R	10.0	1.8 U	1.0 U	2.1 R	3.5 U
1,2,3,4,6,7,8,9-OCDF		283 R	3.0	60.3 R	69.3	78.7 R	103
Total TCDD		20.1	20.0	5.0	5.1	7.0	4.3
Total PeCDD		11.6	13.3	1.4 U	0.9 U	2.9	3.1 U
Total HxCDD		193	168	9.3	4.2	40.4	4.3
Total HpCDD		1350	1420	117	132	241	251
Total TCDF		24.7	29.2	(0.84)	3.0	5.2	3.3 U
Total PeCDF		68.2	54.9	6.1	3.6	11.3	11.0
Total HxCDF		229	206	11.8	7.2	36.9	12.9
Total HpCDF		368	130	44.6	45.2	89.9	82.3
Total TEQ		45.739	47.095	6.1133	6.3473	10.8727	7.822

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

() = Less th[redacted] Reporting Limit

U = non-de[redacted] R = rejected, EDL = estimated detection limit [redacted]r RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	EEN1D	EEN1D	EEN1U	EEN1U	EEN2D	EEN2D
	SAMPLE ID	EEN1DD1P1	EEN1DD1P2	EEN1UD1P1	EEN1UD1P2	EEN2DD1P1	EEN2DD1P2
	DATE / TIME	04/23/97 / 15:15	04/23/97 / 15:16	04/23/97 / 15:22	04/23/97 / 15:23	04/23/97 / 14:25	04/23/97 / 14:26
	DEPTH (ft)	0.00	0.50	0.00	0.50	0.00	0.50
2,3,7,8-TCDD		259 R	243	453 R	439	575 R	637
1,2,3,7,8-PeCDD		4.2 R	7.1	23.0 R	26.3	8.2 R	7.7
1,2,3,4,7,8-HxCDD		2.5 U	3.8 U	2.9 R	3.8	15.2 R	13.1
1,2,3,6,7,8-HxCDD		4.0 R	4.9	9.5 R	11.0	43.3 R	40.7
1,2,3,7,8,9-HxCDD		2.4 R	3.4 U	7.9 R	8.0	37.3 R	31.9
1,2,3,4,6,7,8-HpCDD		60.4 R	67.6	122 R	123	2040 R	2160
1,2,3,4,6,7,8,9-OCDD		516 R	572	833 R	885	14260 R	15970
2,3,7,8-TCDF		46.6 R	49.3	74.7 R	75.1	45.6 R	42.5
1,2,3,7,8-PeCDF		1.4 U	1.9 U	1.5 R	4.1	2.8 R	3.0
2,3,4,7,8-PeCDF		1.4 U	1.9 U	3.4 R	4.8	3.4 R	2.8
1,2,3,4,7,8-HxCDF		4.4 R	2.9 U	7.4 R	9.4	43.1 R	1.5 U
1,2,3,6,7,8-HxCDF		2.1 R	2.4 U	1.4 R	2.8	5.6 R	5.7
2,3,4,6,7,8-HxCDF		4.0 R	2.9 U	4.9 R	1.5 U	5.0 R	10.0
1,2,3,7,8,9-HxCDF		2.1 U	3.2 U	1.0 U	1.6 U	3.7 U	1.6 U
1,2,3,4,6,7,8-HpCDF		23.3 R	16.6	31.2 R	25.0	150 R	124
1,2,3,4,7,8,9-HpCDF		2.5 U	4.2 U	4.3 R	4.3	13.1 R	8.8 M
1,2,3,4,6,7,8,9-OCDF		62.0 R	70.6	72.1 R	77.6	461 R	599
Total TCDD		285	256	524	492	593	670
Total PeCDD		7.2	11.8	56.4	55.5	37.4	21.2
Total HxCDD		37.9	38.3	111	112	862	787
Total HpCDD		159	179	323	328	10290	10750
Total TCDF		149	133	302	286	188	174
Total PeCDF		134	121	305	284	269	257
Total HxCDF		32.2	15.3	56.4	57.4	229	218
Total HpCDF		74.8	55.8	84.7	66.1	695	124
Total TEQ		268.865	253.4546	479.6251	468.2506	637.202	696.287

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, R = rejected, EDL = estimated detection limit

For RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	EEN2U	EEN2U	L8001	L8002	L8003	L8004
	SAMPLE ID	EEN2UD1P1	EEN2UD1P2	L8001S1P1	L8002S1P1	L8003S1P1	L8004S1P1
	DATE / TIME	04/23/97 / 14:45	04/23/97 / 14:46	04/09/97 / 09:00	04/09/97 / 11:05	04/10/97 / 10:40	04/10/97 / 09:55
	DEPTH (ft)	0.00	0.50	0.00	0.00	0.00	0.00
2,3,7,8-TCDD		980 R	1020	1.2	0.70	1.3 R	0.5 U
1,2,3,7,8-PeCDD		13.8 R	13.8	0.6 U	0.4 U	0.5 U	0.6 U
1,2,3,4,7,8-HxCDD		14.9 R	10.6	1.1 U	(0.48)	0.9 U	1.0 U
1,2,3,6,7,8-HxCDD		26.0 R	25.0	0.9 U	0.69	0.6 U	0.7 U
1,2,3,7,8,9-HxCDD		31.8 R	24.3	1.0 U	0.97	0.7 U	0.8 U
1,2,3,4,6,7,8-HpCDD		694 R	706	7.5	20.7	12.9 R	9.0 R
1,2,3,4,6,7,8,9-OCDD		5410 R	6180	642	447	169 R	110 R
2,3,7,8-TCDF		73.8 R	78.1	0.3 U	0.2 U	0.4 U	0.4 U
1,2,3,7,8-PeCDF		3.4 R	3.0	0.5 U	0.3 U	0.5 U	0.5 U
2,3,4,7,8-PeCDF		3.3 R	2.7	0.5 U	0.3 U	0.5 U	0.5 U
1,2,3,4,7,8-HxCDF		24.8 R	25.1	0.6 U	0.59	(0.46) R	0.7 U
1,2,3,6,7,8-HxCDF		5.6 R	5.4	0.5 U	0.3 U	0.4 U	0.5 U
2,3,4,6,7,8-HxCDF		7.4 R	10.9	0.7 U	(0.37)	0.44 U	0.53 U
1,2,3,7,8,9-HxCDF		1.3 U	2.0 U	0.7 U	0.4 U	0.6 U	0.8 U
1,2,3,4,6,7,8-HpCDF		116 R	92.3	0.9 U	3.5	4.2 R	3.1 R
1,2,3,4,7,8,9-HpCDF		9.0 R	7.4	1.2 U	0.6 U	0.8 U	1.0 U
1,2,3,4,6,7,8,9-OCDF		204 R	263	1.3 U	4.9	7.2 R	5.2 R
Total TCDD		1040	1080	1.6	0.70	1.3	0.5 U
Total PeCDD		58.6	50.7	0.6 U	0.4 U	0.5 U	0.6 U
Total HxCDD		339	290	(0.89)	7.5	2.3	1.4
Total HpCDD		1820	1910	7.5	46.9	28.5	19.7
Total TCDF		291	310	0.3 U	0.36	0.4 U	0.4 U
Total PeCDF		339	311	(0.47)	1.9	5.9	1.0
Total HxCDF		178	161	0.6 U	3.8	2.8	1.9
Total HpCDF		359	284	1.0 U	3.5	4.2	7.6
Total TEQ		1020.954	1060.84	1.917	1.7039	1.6932	0.2362

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less than Reporting Limit

U = non-detect R = rejected, EDL = estimated detection limit RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	L8005	L8006	L8007	L8007	L8008	L8008
	SAMPLE ID	L8005S1P1	L8006S1P1	L8007S1P1	L8007S1P2	L8008S1P1	L8008S1P2
	DATE / TIME	04/09/97 / 10:15	04/09/97 / 15:40	04/23/97 / 09:25	04/23/97 / 09:26	04/23/97 / 09:55	04/23/97 / 09:56
	DEPTH (ft)	0.00	0.00	0.00	0.50	0.00	0.50
2,3,7,8-TCDD		0.45	102	0.4 U	1.6 U	3.0 R	2.5
1,2,3,7,8-PeCDD		0.66	25.9	0.5 U	1.5 U	0.55 R	1.2 U
1,2,3,4,7,8-HxCDD		1.2	2.0	0.84 R	2.5 U	0.89 R	1.9 U
1,2,3,6,7,8-HxCDD		2.6	5.9	1.2 R	1.9 U	1.3 R	1.5 U
1,2,3,7,8,9-HxCDD		3.1	2.7	1.7 R	2.1 U	1.6 R	1.6 U
1,2,3,4,6,7,8-HpCDD		58.2	52.5	32.8 R	35.1	50.6 R	53.9
1,2,3,4,6,7,8,9-OCDD		474	746	271 R	268	498 R	496
2,3,7,8-TCDF		0.1 U	4.8	0.3 U	1.4 U	0.37 R	0.9 U
1,2,3,7,8-PeCDF		0.2 U	0.2 U	0.4 U	1.1 U	0.3 U	0.8 U
2,3,4,7,8-PeCDF		0.42	1.7	0.4 U	1.1 U	0.30 R	0.8 U
1,2,3,4,7,8-HxCDF		2.9	0.3 U	2.6 R	3.0	1.9 R	2.3
1,2,3,6,7,8-HxCDF		0.80	0.2 U	0.40 R	1.2 U	0.48 R	1.0 U
2,3,4,6,7,8-HxCDF		1.3	0.3 U	<0.89 EDL	1.5 U	<1.0 EDL	1.2 U
1,2,3,7,8,9-HxCDF		0.3 U	0.3 U	0.5 U	1.7 U	0.4 U	1.3 U
1,2,3,4,6,7,8-HpCDF		25.0	7.7	7.0 R	6.8	9.6 R	9.2
1,2,3,4,7,8,9-HpCDF		1.4	0.6 U	0.54 R	2.2 U	0.70 R	1.6 U
1,2,3,4,6,7,8,9-OCDF		41.2	10.1	11.9 R	16.7	25.1 R	28.9
Total TCDD		0.88	262	0.4 U	1.6 U	3.0	2.5
Total PeCDD		1.9	257	0.97	1.9	1.1	1.2 U
Total HxCDD		30.8	210	11.7	5.1	21.5	7.6
Total HpCDD		140	138	63.5	68.7	203	227
Total TCDF		1.6	227	1.4	1.4 U	2.2	1.6
Total PeCDF		11.5	226	5.1	3.2	5.6	8.7
Total HxCDF		29.5	22.6	10.3	10.3	11.9	9.8
Total HpCDF		64.1	20.9	7.5	6.8	32.2	29.2
Total TEQ		3.5412	118.6981	1.3603	1.0037	5.2111	3.8859

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, R = rejected, EDL = estimated detection limit

For RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	L8009	L8010	L8011	L8012	L8013	L8013
	SAMPLE ID	L8009S1P1	L8010S1P1	L8011S1P1	L8012S1P1	L8013S1P1	L8013S1P2
	DATE / TIME	04/10/97 / 11:15	04/09/97 / 16:30	04/09/97 / 13:50	04/09/97 / 15:05	04/25/97 / 10:05	04/25/97 / 10:06
	DEPTH (ft)	0.00	0.00	0.75	0.00	0.00	0.50
2,3,7,8-TCDD		0.97 R	1.0	0.71	3.3	1.7	2.7 U
1,2,3,7,8-PeCDD		0.5 U	0.4 U	0.3 U	0.3 U	0.8 U	2.1 U
1,2,3,4,7,8-HxCDD		0.7 U	0.9 U	0.6 U	0.5 U	1.1 U	2.8 U
1,2,3,6,7,8-HxCDD		2.5 R	0.7 U	0.5 U	2.2	(0.60)	2.6 U
1,2,3,7,8,9-HxCDD		1.8	0.7 U	0.5 U	1.6	1.0 U	2.5 U
1,2,3,4,6,7,8-HpCDD		67.2 R	1.7	2.9	67.8	12.5 R	12.2
1,2,3,4,6,7,8,9-OCDD		694 R	16.5	176	631	293 R	345
2,3,7,8-TCDF		0.3 U	0.40	0.2 U	0.2 U	0.4 U	2.7 U
1,2,3,7,8-PeCDF		0.4 U	0.3 U	0.3 U	0.2 U	0.5 U	2.0 U
2,3,4,7,8-PeCDF		0.4 U	0.3 U	0.3 U	0.2 U	0.5 U	1.9 U
1,2,3,4,7,8-HxCDF		2.3 R	0.5 U	0.4 U	0.3 U	2.9 R	2.2 U
1,2,3,6,7,8-HxCDF		0.75 R	0.4 U	0.3 U	0.35	0.69 R	1.8 U
2,3,4,6,7,8-HxCDF		1.0 U	(0.48)	0.4 U	0.64	2.4 R	2.2 U
1,2,3,7,8,9-HxCDF		0.6 U	0.6 U	0.4 U	0.3 U	0.8 U	2.4 U
1,2,3,4,6,7,8-HpCDF		18.3 R	6.4	0.6 U	7.1	8.2 R	8.6
1,2,3,4,7,8,9-HpCDF		1.0	1.3 U	0.8 U	0.5 U	1.2 U	3.5 U
1,2,3,4,6,7,8,9-OCDF		43.3 R	1.9 U	0.9 U	13.9	7.5 R	3.8 U
Total TCDD		1.6	1.0	0.71	3.3	1.7	2.7 U
Total PeCDD		1.0	0.69	0.3 U	0.47	0.8 U	2.1 U
Total HxCDD		23.6	1.8	0.5 U	23.7	2.3	2.6 U
Total HpCDD		207	4.5	5.9	341	29.5	12.2
Total TCDF		0.84	1.0	0.2 U	0.71	2.1	2.7 U
Total PeCDF		7.2	1.2	0.3 U	10.0	30.8	28.9
Total HxCDF		20.0	7.5	0.4 U	10.9	28.9	9.9
Total HpCDF		57.7	6.4	0.7 U	7.1	9.9	8.6
Total TEQ		3.3073	1.1855	0.915	5.1729	2.8665	0.553

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less th[illegible]eporting Limit

U = non-dete[illegible] R = rejected, EDL = estimated detection limit [illegible] RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	L8014	L8015	L8016	L8016	L8017	L8017
	SAMPLE ID	L8014S1P1	L8015S1P1	L8016S1P1	L8016S1P2	L8017S1P1	L8017S1P2
	DATE / TIME	04/10/97 / 14:35	04/09/97 / 14:15	04/24/97 / 15:10	04/24/97 / 15:11	04/23/97 / 14:35	04/23/97 / 14:36
	DEPTH (ft)	0.00	0.00	0.00	0.50	0.00	0.50
2,3,7,8-TCDD		160 R	0.60	81.0 R	83.5	3.8 R	5.0
1,2,3,7,8-PeCDD		3.5 R	0.4 U	(0.53) R	0.3 U	0.72 R	1.2 U
1,2,3,4,7,8-HxCDD		7.3 R	0.7 U	0.94 R	0.99	1.3 R	1.4 U
1,2,3,6,7,8-HxCDD		17.0 R	0.98	1.4 R	1.5	3.0 R	2.9
1,2,3,7,8,9-HxCDD		14.9 R	0.93	2.3 R	2.0	2.6 R	2.9
1,2,3,4,6,7,8-HpCDD		464 R	17.7	51.2 R	53.8 J	72.4 R	79.7
1,2,3,4,6,7,8,9-OCDD		3960 R	202	451 R	463 J	659 R	696
2,3,7,8-TCDF		4.6 R	0.32	1.3 R	1.4	0.55 R	0.8 U
1,2,3,7,8-PeCDF		0.87 R	0.3 U	0.5 U	0.3 U	0.50 R	0.9 U
2,3,4,7,8-PeCDF		0.95 R	0.37	0.5 U	0.3 U	0.65 R	0.9 U
1,2,3,4,7,8-HxCDF		17.6 R	1.1	0.99 R	1.00	5.6 R	1.0 U
1,2,3,6,7,8-HxCDF		5.8 R	0.65	0.3 U	0.3 U	2.4 R	2.2
2,3,4,6,7,8-HxCDF		9.6 R	1.1	<0.74 EDL	0.85	2.9 R	4.0
1,2,3,7,8,9-HxCDF		0.8 U	0.4 U	0.6 U	0.4 U	0.3 U	1.0 U
1,2,3,4,6,7,8-HpCDF		232 R	11.1	6.5 R	4.7	39.7 R	41.2
1,2,3,4,7,8,9-HpCDF		7.9 R	0.8 U	0.7 U	0.4 U	1.9 R	1.3 U
1,2,3,4,6,7,8,9-OCDF		426 R	12.4	16.8 R	20.2 J	52.3 R	64.5
Total TCDD		167	0.87	93.1	83.5	3.8	5.0
Total PeCDD		8.8	0.48	1.3	1.5	1.4	1.2 U
Total HxCDD		149	6.9	33.9	31.9	28.8	23.9
Total HpCDD		835	31.8	303	294	166	189
Total TCDF		21.2	3.9	4.9	3.3	4.2	0.8 U
Total PeCDF		68.1	21.4	10.5	11.9	28.0	32.4
Total HxCDF		227	20.9	3.9	2.1	54.7	50.9
Total HpCDF		568	11.1	6.5	16.7	95.7	98.9
Total TEQ		181.3735	1.7954	93.0028	85.3422	8.1963	8.1695

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less than Reporting Limit

U = non-detect, R = rejected, EDL = estimated detection limit

For RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	L8018	L8018	L8019	L8019	L8020	L8020
	SAMPLE ID	L8018S1P1	L8018S1P2	L8019S1P1	L8019S1P2	L8020S1P1	L8020S1P2
	DATE / TIME	04/24/97 / 11:55	04/24/97 / 11:56	04/22/97 / 15:00	04/22/97 / 15:01	04/23/97 / 13:00	04/23/97 / 13:01
	DEPTH (ft)	0.00	0.50	0.00	0.50	0.00	0.50
2,3,7,8-TCDD		37.2 R	35.7	(0.86) R	0.74	0.46 R	0.88
1,2,3,7,8-PeCDD		3.5 R	1.3 U	1.8 U	0.4 U	0.4 U	0.3 U
1,2,3,4,7,8-HxCDD		6.0 R	6.7	2.2 U	0.7 U	0.5 U	0.5 U
1,2,3,6,7,8-HxCDD		17.6 R	18.8	2.0 R	1.8	0.4 U	0.4 U
1,2,3,7,8,9-HxCDD		14.1 R	12.0	2.5 R	2.2	0.60 R	0.4 U
1,2,3,4,6,7,8-HpCDD		567 R	583	52.7 R	50.9	7.2 R	7.0
1,2,3,4,6,7,8,9-OCDD		4280 R	4520	576 R	595	317 R	311
2,3,7,8-TCDF		2.3 R	4.0	0.8 U	0.4 U	0.3 U	0.3 U
1,2,3,7,8-PeCDF		1.4 R	1.1 U	1.1 U	0.3 U	0.3 U	0.3 U
2,3,4,7,8-PeCDF		2.7 R	2.5	1.1 U	0.3 U	0.3 U	0.3 U
1,2,3,4,7,8-HxCDF		26.9 R	21.0	(1.1) R	1.4	0.60 R	0.80
1,2,3,6,7,8-HxCDF		6.7 R	5.5	(0.54) R	0.46	0.3 U	0.3 U
2,3,4,6,7,8-HxCDF		9.0 R	8.1	(0.85) R	1.4 U	0.61 R	0.93
1,2,3,7,8,9-HxCDF		1.5 U	1.7 U	1.5 U	0.6 U	0.4 U	0.4 U
1,2,3,4,6,7,8-HpCDF		161 R	134	22.1 R	23.7	2.7 R	3.3
1,2,3,4,7,8,9-HpCDF		6.7 R	9.1	2.3 U	0.99	0.5 U	0.5 U
1,2,3,4,6,7,8,9-OCDF		44[illegible] R	501	41.7 R	37.7	1.7 R	2.1
Total TCDD		38.3	35.7	(0.86)	0.74	0.46	0.88
Total PeCDD		11.4	11.7	1.8 U	0.4 U	0.4 U	0.3 U
Total HxCDD		165	147	20.5	21.1	1.5	0.4 U
Total HpCDD		1280	1290	164	158	15.9	19.3
Total TCDF		25.3	17.6	3.3	5.0	0.55	1.5
Total PeCDF		115	97.8	3.6	7.4	7.9	6.7
Total HxCDF		226	186	19.9	20.2	6.7	7.4
Total HpCDF		567	496	31.0	53.3	5.2	5.7
Total TEQ		60.697	56.842	2.9247	2.7146	1.0587	1.4691

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less than Reporting Limit

U = non-detect R = rejected, EDL = estimated detection limit [illegible] RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D5015	D5015	D5016	D5016	D5017	D5017
	SAMPLE ID	D5015D1P2	D5015D1P3	D5016D1P1	D5016D1P2	D5017D1P1	D5017D1P2
	DATE / TIME	04/07/97 / 08:41	06/24/97 / 10:30	04/08/97 / 15:05	04/08/97 / 15:06	04/08/97 / 15:35	04/08/97 / 15:06
	DEPTH (ft)	0.50	0.00	0.00	0.50	0.00	0.50
2,3,7,8-TCDD		5.2 U	5.1	1.1 R	0.8 U	2.4 R	2.7
1,2,3,7,8-PeCDD		6.4 U	3.0	1.2 R	0.9 U	(1.2) R	0.8 U
1,2,3,4,7,8-HxCDD		11.0	7.8	1.4 R	1.3	(2.4) R	2.9
1,2,3,6,7,8-HxCDD		32.1	17.3	4.4 R	4.7	8.0 R	9.4
1,2,3,7,8,9-HxCDD		38.6	20.1	4.5 R	4.5	7.3 R	6.9
1,2,3,4,6,7,8-HpCDD		868	526	129 R	140	239 R	273 J
1,2,3,4,6,7,8,9-OCDD		9070 J	6420	992 R	1050	2310 R	2580
2,3,7,8-TCDF		5.2 U	2.7	1.8 R	1.7	0.78 R	0.7 U
1,2,3,7,8-PeCDF		5.2 U	1.3	0.56 R	0.7 U	(0.84) R	0.6 U
2,3,4,7,8-PeCDF		5.0 U	1.5	0.90 R	0.6 U	(1.1) R	0.6 U
1,2,3,4,7,8-HxCDF		27.8	8.3	2.5 R	2.5	29.7 R	28.2
1,2,3,6,7,8-HxCDF		9.7	5.3	1.1 R	1.1	2.5 R	3.1
2,3,4,6,7,8-HxCDF		8.2 U	8.7	1.4 U	2.1	3.8 R	5.0
1,2,3,7,8,9-HxCDF		4.5 U	1.0 U	0.4 U	0.8 U	2.4 U	0.7 U
1,2,3,4,6,7,8-HpCDF		114	95.3	30.3 R	25.9	45.2 R	44.2
1,2,3,4,7,8,9-HpCDF		12.7 U	7.0	1.3 R	1.2	4.2 R	5.9
1,2,3,4,6,7,8,9-OCDF		259 J	433	98.2 R	77.9	90.8 R	123
Total TCDD		18.0	10.9	4.0	0.8 U	2.4	2.7
Total PeCDD		92.4	17.7	10.2	3.3	4.6	0.8 U
Total HxCDD		218	177	52.2	33.5	74.2	65.9
Total HpCDD		1560	1190	301	302	808	804
Total TCDF		18.2	14.0	13.4	8.1	12.6	4.5
Total PeCDF		96.8	41.3	14.5	12.9	65.6	16.9
Total HxCDF		156	161	40.1	34.7	97.2	98.9
Total HpCDF		358	256	83.5	74.8	137	148
Total TEQ		31.069	27.571	6.4148	4.5889	14.3248	14.184

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed
() = Less than Reporting Limit
U = non-detect, R = rejected, EDL = estimated detection limit

For RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	D6001	D6001	D6002	D6002	D6003	D6003
	SAMPLE ID	D6001D1P1	D6001D1P2	D6002D1P1	D6002D1P2	D6003D1P1	D6003D1P2
	DATE / TIME	04/08/97 / 08:50	04/08/97 / 08:01	04/08/97 / 09:15	04/08/97 / 09:06	04/08/97 / 13:05	04/08/97 / 13:06
	DEPTH (ft)	0.00	0.50	0.00	0.50	0.00	0.50
2,3,7,8-TCDD		0.2 U	0.3 U	0.1 U	0.3 U	0.49 R	0.7 U
1,2,3,7,8-PeCDD		0.3 U	0.3 U	0.2 U	0.3 U	1.6 R	0.8 U
1,2,3,4,7,8-HxCDD		0.52 R	0.48	0.43 R	0.3 U	3.2 R	3.0
1,2,3,6,7,8-HxCDD		1.6 R	1.3	0.58 R	0.63	6.4 R	6.4
1,2,3,7,8,9-HxCDD		1.6 R	1.6	1.1 R	1.0	7.2 R	5.7
1,2,3,4,6,7,8-HpCDD		39.8 R	39.8	12.3 R	13.1	185 R	211
1,2,3,4,6,7,8,9-OCDD		388 R	399	457 R	471	2050 R	2210
2,3,7,8-TCDF		0.2 U	0.2 U	0.1 U	0.2 U	0.96 R	0.6 U
1,2,3,7,8-PeCDF		0.2 U	0.2 U	0.1 U	0.2 U	0.70 R	0.6 U
2,3,4,7,8-PeCDF		0.2 U	0.2 U	0.1 U	0.2 U	0.70 R	0.6 U
1,2,3,4,7,8-HxCDF		1.4 R	1.4	2.2 R	2.1	3.9 R	2.5
1,2,3,6,7,8-HxCDF		0.38 R	0.34	0.23 R	0.2 U	1.7 R	1.5
2,3,4,6,7,8-HxCDF		0.71 R	1.2	0.44 R	0.61	2.1 R	2.6
1,2,3,7,8,9-HxCDF		0.3 U	0.3 U	0.2 U	0.3 U	0.5 U	0.7 U
1,2,3,4,6,7,8-HpCDF		8.3 R	7.7	1.4 R	1.8	37.6 R	33.6
1,2,3,4,7,8,9-HpCDF		0.63 R	0.56	0.39 R	0.54	2.3 R	3.0
1,2,3,4,6,7,8,9-OCDF		23.9 R	27.5	3.4 U	3.4	84.6 R	97.6
Total TCDD		1.6	1.8	0.1 U	0.3 U	1.0	0.7 U
Total PeCDD		0.76	0.84	0.2 U	0.3 U	3.4	0.8 U
Total HxCDD		12.4	7.4	5.3	2.3	73.2	55.3
Total HpCDD		80.2	82.1	29.4	31.1	609	610
Total TCDF		0.51	1.5	0.75	0.71	4.6	2.4
Total PeCDF		3.6	2.0	0.64	4.2	19.6	13.1
Total HxCDF		11.3	10.0	3.2	0.44	58.1	34.5
Total HpCDF		21.9	21.8	3.6	4.0	108	104
Total TEQ		1.5202	1.5391	1.0959	1.0628	8.6046	6.9536

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, R = rejected, EDL = estimated detection limit or RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	L8021	L8021	L8022	L8022	L8023	L8023
	SAMPLE ID	L8021S1P1	L8021S1P2	L8022S1P1	L8022S1P2	L8023S1P1	L8023S1P2
	DATE / TIME	04/24/97 / 09:30	04/24/97 / 09:36	04/24/97 / 14:35	04/24/97 / 14:36	04/24/97 / 10:05	04/24/97 / 10:06
	DEPTH (ft)	0.00	0.50	0.00	0.50	0.00	0.50
2,3,7,8-TCDD		67.7 R	62.4	4.9 R	4.6	39.6 R	38.5
1,2,3,7,8-PeCDD		0.76 R	0.9 U	0.82 R	0.72	1.9 R	1.8
1,2,3,4,7,8-HxCDD		1.2 R	(1.1)	1.9 R	1.6	4.6 R	3.6
1,2,3,6,7,8-HxCDD		2.8 R	2.9	4.5 R	4.6	12.9 R	12.9
1,2,3,7,8,9-HxCDD		2.9 R	3.0	4.7 R	4.2	9.1 R	7.7
1,2,3,4,6,7,8-HpCDD		72.6 R	78.0 J	121 R	127 J	337 R	340
1,2,3,4,6,7,8,9-OCDD		704 R	735 J	1290 R	1280	2490 R	2570
2,3,7,8-TCDF		1.9 R	2.1	0.80 R	0.4 U	1.7 R	2.9
1,2,3,7,8-PeCDF		0.5 U	0.7 U	0.6 U	0.3 U	0.5 U	0.8 U
2,3,4,7,8-PeCDF		0.53 R	1.0	0.6 U	0.63	0.91 R	0.8 U
1,2,3,4,7,8-HxCDF		3.0 R	2.7	5.8 R	5.2	12.8 R	10.7
1,2,3,6,7,8-HxCDF		1.5 R	1.5	1.5 R	1.7	2.8 R	3.1
2,3,4,6,7,8-HxCDF		2.2 U	1.5	2.2 U	2.5	4.9 R	3.8
1,2,3,7,8,9-HxCDF		0.8 U	1.1 U	0.8 U	0.5 U	0.7 U	1.2 U
1,2,3,4,6,7,8-HpCDF		34.2 R	25.3	38.7 R	31.3	108 R	85.7
1,2,3,4,7,8,9-HpCDF		1.0 R	(1.0)	2.3 R	2.4	4.9 R	5.9
1,2,3,4,6,7,8,9-OCDF		47.7 R	57.2 J	84.0 R	83.8	292 R	320
Total TCDD		69.7	64.4	6.4	5.9	41.2	38.5
Total PeCDD		1.8	3.0	2.6	3.4	6.0	4.1
Total HxCDD		37.8	33.0	62.7	52.1	94.1	82.2
Total HpCDD		229	238	337	353	650	669
Total TCDF		10.8	7.2	2.2	1.2	6.7	6.9
Total PeCDF		36.0	38.1	14.2	11.0	31.4	25.3
Total HxCDF		49.2	41.9	44.8	40.4	124	107
Total HpCDF		77.1	60.0	120	100	381	326
Total TEQ		71.5047	66.2152	10.224	10.2258	53.236	51.076

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

() = Less than Reporting Limit

U = non-detect, R = rejected, EDL = estimated detection limit

For RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	L8024	L8024	L8025	L8025	L8026	L8026
	SAMPLE ID	L8024S1P1	L8024S1P2	L8025S1P1	L8025S1P2	L8026S1P1	L8026S1P2
	DATE / TIME	04/24/97 / 10:30	04/24/97 / 10:31	04/24/97 / 15:50	04/24/97 / 15:51	04/23/97 / 13:35	04/23/97 / 13:36
	DEPTH (ft)	0.00	0.50	0.00	0.50	0.00	0.50
2,3,7,8-TCDD		8.7 R	7.5	66.0 R	63.0	163 R	174
1,2,3,7,8-PeCDD		1.4 U	0.5 U	3.3 R	2.9	1.7 R	2.1 J
1,2,3,4,7,8-HxCDD		1.6 U	0.7 U	6.6 R	6.0	2.0 R	3.0
1,2,3,6,7,8-HxCDD		1.5 R	1.5	43.5 R	43.8	3.6 R	4.5
1,2,3,7,8,9-HxCDD		1.6 R	1.2	15.1 R	13.2	3.8 R	5.2
1,2,3,4,6,7,8-HpCDD		35.8 R	38.3 J	1920 R	2070	106 R	116
1,2,3,4,6,7,8,9-OCDD		291 R	309 J	22180 R	14400	881 R	874
2,3,7,8-TCDF		0.8 U	0.6 U	8.5 R	8.7	8.7 R	10.4
1,2,3,7,8-PeCDF		1.1 U	0.5 U	0.8 U	0.4 U	0.69 R	1.0 J
2,3,4,7,8-PeCDF		1.1 U	0.5 U	0.8 U	0.4 U	1.4 R	1.5 J
1,2,3,4,7,8-HxCDF		3.1 R	2.8	26.6 R	22.6	4.8 R	5.1
1,2,3,6,7,8-HxCDF		0.98 R	0.79	3.3 R	3.7	2.1 R	2.4
2,3,4,6,7,8-HxCDF		1.5 U	1.0	4.1 R	0.6 U	3.1 R	1.1 U
1,2,3,7,8,9-HxCDF		1.3 U	0.7 U	1.0 U	0.7 U	<0.5 R	1.3 U
1,2,3,4,6,7,8-HpCDF		14.8 R	11.8	319 R	255	22.9 R	21.4
1,2,3,4,7,8,9-HpCDF		1.4 U	0.7 U	14.6 R	13.8	1.0 R	1.8
1,2,3,4,6,7,8,9-OCDF		22.4 R	24.8 J	1070 R	1230	45.4 R	59.4
Total TCDD		8.7	7.5	71.6	67.3	171	182
Total PeCDD		1.4 U	0.5 U	7.0	8.0	5.3	10.1
Total HxCDD		14.5	11.9	227	204	42.0	45.3
Total HpCDD		99.3	105	3630	3890	250	289
Total TCDF		6.7	6.1	47.7	37.4	59.6	54.8
Total PeCDF		24.4	22.1	112	97.9	155	127
Total HxCDF		26.3	23.7	333	289	75.3	67.9
Total HpCDF		37.0	29.6	1550	1250	70.0	64.8
Total TEQ		10.2374	9.0638	124.206	113.268	169.6199	181.2354

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-de[redacted] R = rejected, EDL = estimated detection limit [redacted] r RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	L8027	L8027	L8028	L8028	L8029	L8029
	SAMPLE ID	L8027S1P1	L8027S1P2	L8028S1P1	L8028S1P2	L8029S1P1	L8029S1P2
	DATE / TIME	04/25/97 / 14:35	04/25/97 / 14:36	04/22/97 / 15:30	04/22/97 / 15:31	04/25/97 / 15:30	04/25/97 / 15:31
	DEPTH (ft)	0.00	0.50	0.00	0.50	0.00	0.50
2,3,7,8-TCDD		2.0 R	2.0	0.7 U	1.0 U	5.7 R	6.1
1,2,3,7,8-PeCDD		0.6 U	0.3 U	1.1 U	0.9 U	0.8 U	0.86
1,2,3,4,7,8-HxCDD		1.5 R	1.2	1.6 U	1.5 U	3.5 R	2.8
1,2,3,6,7,8-HxCDD		2.9 R	2.8	1.2 U	1.1 U	8.1 R	7.9
1,2,3,7,8,9-HxCDD		2.4 R	2.6	1.4 U	1.2 U	5.6 R	5.2
1,2,3,4,6,7,8-HpCDD		74.0 R	80.3	17.0 R	16.9	219 R	244
1,2,3,4,6,7,8,9-OCDD		549 R	585	197 R	201	1670 R	1850
2,3,7,8-TCDF		0.70	1.2	0.5 U	0.9 U	0.4 U	0.58
1,2,3,7,8-PeCDF		0.4 U	0.3 U	0.6 U	0.7 U	0.5 U	0.1 U
2,3,4,7,8-PeCDF		0.64 R	0.3 U	0.6 U	0.7 U	0.5 U	0.65
1,2,3,4,7,8-HxCDF		3.7 R	3.2	0.99 R	1.2 U	8.9 R	7.9
1,2,3,6,7,8-HxCDF		1.0 R	0.3 U	(0.61) R	0.9 U	3.2 R	3.0
2,3,4,6,7,8-HxCDF		2.5 R	2.2 U	1.2 R	1.2 U	5.9 R	0.2 U
1,2,3,7,8,9-HxCDF		0.6 U	0.4 U	1.2 U	1.2 U	1.1 U	0.2 U
1,2,3,4,6,7,8-HpCDF		21.5 R	22.7	4.4 R	4.4	94.1 R	102
1,2,3,4,7,8,9-HpCDF		1.4 R	0.88	1.7 U	1.4 U	3.3	2.7
1,2,3,4,6,7,8,9-OCDF		32.9 R	32.8	6.7 R	6.7	167 R	168
Total TCDD		2.8	1.6	0.7 U	1.0 U	5.7	6.1
Total PeCDD		0.74	2.3	1.1 U	0.9 U	4.5	1.4
Total HxCDD		26.0	25.4	1.9	1.7	69.5	63.9
Total HpCDD		151	163	36.5	21.1	562	608
Total TCDF		2.4	5.0	6.3	7.5	3.6	6.1
Total PeCDF		16.7	16.0	36.3	8.5	43.6	42.0
Total HxCDF		37.6	29.4	24.3	19.0	124	110
Total HpCDF		56.3	56.6	11.6	11.6	241	251
Total TEQ		5.3409	4.7566	0.6978	0.4207	14.221	15.098

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less than Reporting Limit

U = non-detect, R = rejected, EDL = estimated detection limit

For RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	L8030	L8030	L8031	L8031	L8032	L8032
	SAMPLE ID	L8030S1P1	L8030S1P2	L8031S1P1	L8031S1P2	L8032S1P1	L8032S1P2
	DATE / TIME	04/25/97 / 15:05	04/25/97 / 15:06	04/22/97 / 16:10	04/22/97 / 16:11	04/23/97 / 14:15	04/23/97 / 14:16
	DEPTH (ft)	0.00	0.50	0.00	0.50	0.00	0.50
2,3,7,8-TCDD		0.6 U	0.78	3.5 R	3.6	51.2 R	56.2
1,2,3,7,8-PeCDD		0.8 U	0.54	5.8 R	5.1	(0.53) R	2.9 U
1,2,3,4,7,8-HxCDD		1.9 R	1.7	14.1 R	14.1	0.93 R	3.9 U
1,2,3,6,7,8-HxCDD		10.2 R	9.9	26.5 R	28.2	2.2 R	3.0 U
1,2,3,7,8,9-HxCDD		4.2 R	3.5	32.4 R	31.8	2.1 R	3.3 U
1,2,3,4,6,7,8-HpCDD		431 R	486	857 R	977	76.2 R	79.6
1,2,3,4,6,7,8,9-OCDD		4780 R	5200	8300 R	7710	892 R	985
2,3,7,8-TCDF		0.4 U	0.2 U	1.4 R	1.5	1.5 R	4.0 U
1,2,3,7,8-PeCDF		0.5 U	0.2 U	2.6 R	1.6	0.4 U	2.3 U
2,3,4,7,8-PeCDF		0.5 U	0.2 U	2.1 R	2.2	0.4 U	2.3 U
1,2,3,4,7,8-HxCDF		15.5 R	15.5	29.4 R	27.8	2.3 R	2.7 U
1,2,3,6,7,8-HxCDF		1.3 R	1.4	11.5 R	11.9	(0.36) R	2.0 U
2,3,4,6,7,8-HxCDF		2.5 R	2.3 U	14.6 R	15.3	<0.82 EDL	2.3 U
1,2,3,7,8,9-HxCDF		0.9 U	0.3 U	(0.58) R	0.7 U	0.6 U	2.7 U
1,2,3,4,6,7,8-HpCDF		108 R	111	210 R	214	18.2 R	20.4
1,2,3,4,7,8,9-HpCDF		5.6 R	5.6	13.0 R	13.9	1.2 R	3.1 U
1,2,3,4,6,7,8,9-OCDF		802 R	875	384 R	400	57.4 R	101
Total TCDD		0.6 U	0.78	4.8	3.6	54.1	56.2
Total PeCDD		0.8 U	0.54	30.3	25.6	(0.44)	2.9 U
Total HxCDD		47.3	42.4	318	296	22.7	18.2
Total HpCDD		706	790	2110	2220	186	203
Total TCDF		0.4 U	0.88	15.7	25.5	7.8	4.0 U
Total PeCDF		8.0	6.5	108	94.6	15.4	7.9
Total HxCDF		93.7	93.0	353	343	16.6	6.1
Total HpCDF		714	692	578	555	67.0	68.8
Total TEQ		14.588	16.351	40.112	40.549	54.3094	58.286

Values represent total concentrations unless noted < =Not detected at indicated reporting limit --- =Not analyzed

( ) =Less th[illegible] Reporting Limit

U =non-det[illegible], R =rejected, EDL =estimated detection limit [illegible]r RCL DIOX

TABLE 1

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	L8033	L8033
	SAMPLE ID	L8033S1P1	L8033S1P2
	DATE / TIME	04/25/97 / 15:55	04/25/97 / 15:56
	DEPTH (ft)	0.00	0.50
2,3,7,8-TCDD		2.0 R	2.4
1,2,3,7,8-PeCDD		1.2	1.2 J
1,2,3,4,7,8-HxCDD		2.9 R	2.6
1,2,3,6,7,8-HxCDD		9.7 R	10.2
1,2,3,7,8,9-HxCDD		8.1 R	7.3
1,2,3,4,6,7,8-HpCDD		193 R	216
1,2,3,4,6,7,8,9-OCDD		1200 R	1320
2,3,7,8-TCDF		0.3 U	0.88
1,2,3,7,8-PeCDF		0.53 R	0.1 U
2,3,4,7,8-PeCDF		0.47	0.56
1,2,3,4,7,8-HxCDF		8.8 R	8.2
1,2,3,6,7,8-HxCDF		2.8 R	3.0
2,3,4,6,7,8-HxCDF		6.2 R	5.8
1,2,3,7,8,9-HxCDF		0.5 U	0.2 U
1,2,3,4,6,7,8-HpCDF		97.1 R	104
1,2,3,4,7,8,9-HpCDF		3.0	2.9
1,2,3,4,6,7,8,9-OCDF		133 R	134
Total TCDD		2.0	2.4
Total PeCDD		7.0	5.2
Total HxCDD		69.2	65.2
Total HpCDD		377	412
Total TCDF		5.7	6.0
Total PeCDF		39.6	15.8
Total HxCDF		112	107
Total HpCDF		234	232
Total TEQ		10.9755	11.761

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, R = rejected, EDL = estimated detection limit

For RCL DIOX

TABLE 2

OFF-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	BB001	BB001	BB002	BB002	BB003	BB003
	SAMPLE ID	BB001D1P1	BB001D1P2	BB002D1P1	BB002D1P2	BB003D1P1	BB003D1P2
	DATE / TIME	05/16/97 / 12:47	05/16/97 / 12:48	05/16/97 / 13:25	05/16/97 / 13:26	05/16/97 / 14:05	05/16/97 / 14:06
	DEPTH (ft)	0.00	0.50	0.00	0.50	0.00	0.50
2,3,7,8-TCDD		0.7 U	0.3 U	0.9 U	0.68	1.1 R	1.3
1,2,3,7,8-PeCDD		0.9 U	0.4 U	1.1 U	0.7 U	1.5 R	1.7
1,2,3,4,7,8-HxCDD		(0.83) R	0.75	2.2 R	2.2	5.3 R	5.6
1,2,3,6,7,8-HxCDD		3.3 R	2.6	5.0 R	5.4	18.8 R	20.4
1,2,3,7,8,9-HxCDD		7.2 R	6.8	9.1 R	8.8	23.8 R	22.9
1,2,3,4,6,7,8-HpCDD		102 R	98.7	273 R	290	693 R	807
1,2,3,4,6,7,8,9-OCDD		1530 R	1570	2720 R	2880	9890 R	10350
2,3,7,8-TCDF		0.5 U	0.3 U	0.7 U	(0.31)	(0.78) R	1.6
1,2,3,7,8-PeCDF		0.7 U	0.3 U	0.8 U	0.5 U	0.91 R	0.7 U
2,3,4,7,8-PeCDF		0.7 U	0.3 U	0.7 U	0.5 U	1.3 R	0.7 U
1,2,3,4,7,8-HxCDF		1.1 R	1.0	1.7 R	1.6	9.5 R	11.0
1,2,3,6,7,8-HxCDF		0.53 R	0.36	0.64 R	0.72	3.6 R	4.5
2,3,4,6,7,8-HxCDF		0.98 R	0.91	1.6 R	1.5	7.4 R	7.0
1,2,3,7,8,9-HxCDF		0.7 U	0.4 U	0.8 U	0.6 U	0.8 U	0.9 U
1,2,3,4,6,7,8-HpCDF		10.7 R	10.6	28.3 R	22.5	143 R	126
1,2,3,4,7,8,9-HpCDF		(0.85) R	0.96	2.0 R	1.9	11.7 R	12.9
1,2,3,4,6,7,8,9-OCDF		34.6 R	36.8	79.5 R	97.2	465 R	609
Total TCDD		21.6	18.2	16.2	16.8	39.3	37.9
Total PeCDD		26.4	28.5	14.4	13.4	32.5	15.2
Total HxCDD		143	142	150	151	221	239
Total HpCDD		235	228	1340	1460	1410	1870
Total TCDF		0.61	0.55	0.92	0.91	6.9	1.6
Total PeCDF		1.7	2.6	3.3	3.8	26.9	23.2
Total HxCDF		14.5	12.9	28.1	28.5	135	169
Total HpCDF		32.5	32.1	96.8	80.2	476	499
Total TEQ		4.0941	3.9514	7.8565	8.8542	28.2955	29.868

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less than Reporting Limit

U = non-detect R = rejected, EDL = estimated detection limit

TABLE 2

OFF-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	BB004	BB004	BB005	BB005	BC001	BC001
	SAMPLE ID	BB004D1P1	BB004D1P2	BB005D1P1	BB005D1P2	BC001D1P1	BC001D1P2
	DATE / TIME	05/16/97 / 15:24	05/16/97 / 15:25	05/16/97 / 15:38	05/16/97 / 15:39	04/29/97 / 09:30	04/29/97 / 09:31
	DEPTH (ft)	0.00	0.50	0.00	0.50	0.00	0.50
2,3,7,8-TCDD		0.6 U	0.3 U	(0.62) R	3.6 U	0.9 U	0.3 UJ
1,2,3,7,8-PeCDD		0.8 U	0.4 U	3.3 R	5.6 U	1.3 U	0.4 U
1,2,3,4,7,8-HxCDD		1.2 R	1.1	9.7 R	5.2 U	1.6 U	0.6 U
1,2,3,6,7,8-HxCDD		6.5 R	6.9	47.7 R	36.2	1.1 U	1.6 J
1,2,3,7,8,9-HxCDD		4.2 R	4.1	28.7 R	22.4	1.3 U	1.6
1,2,3,4,6,7,8-HpCDD		210 R	225	1510 R	1530	51.3 R	49.9
1,2,3,4,6,7,8,9-OCDD		2450 R	2610	18850 R	18990	411 R	452
2,3,7,8-TCDF		0.67 R	0.3 U	2.9 R	3.2 U	0.7 U	0.3 UJ
1,2,3,7,8-PeCDF		0.6 U	0.3 U	2.9 R	3.8 U	0.9 U	0.3 U
2,3,4,7,8-PeCDF		0.6 U	0.3 U	3.9 R	3.6 U	0.9 U	0.3 U
1,2,3,4,7,8-HxCDF		5.0 R	5.1	33.4 R	34.5	2.9 R	2.5 J
1,2,3,6,7,8-HxCDF		2.0 R	2.4	14.7 R	18.7	0.8 U	0.69
2,3,4,6,7,8-HxCDF		3.5 R	3.4	26.3 R	21.1	1.1 U	1.3
1,2,3,7,8,9-HxCDF		0.6 U	0.4 U	(1.4) R	4.8 U	1.2 U	0.5 U
1,2,3,4,6,7,8-HpCDF		82.5 R	70.5	568 R	442	10.2 R	10.8
1,2,3,4,7,8,9-HpCDF		6.0 R	5.7	38.9 R	17.9	1.9 U	0.97
1,2,3,4,6,7,8,9-OCDF		217 R	262	1550 R	2160	24.3 R	31.0
Total TCDD		3.5	3.2	38.1	22.2	0.9 U	0.3 U
Total PeCDD		1.4	1.7	48.7	47.1	1.3 U	2.5
Total HxCDD		54.6	53.4	389	178	9.3	10.8
Total HpCDD		444	481	3260	3430	103	103
Total TCDF		0.57	0.67	19.6	3.2 U	0.7 U	1.4
Total PeCDF		10.5	9.8	81.4	73.9	2.3	1.4
Total HxCDF		84.9	86.9	596	546	15.7	10.1
Total HpCDF		289	259	2120	1690	34.7	23.2
Total TEQ		7.959	8.184	62.414	54.339	1.3403	1.8687

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

() = Less than Reporting Limit

U = non-detect, R = rejected, EDL = estimated detection limit

TABLE 2

OFF-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	BC002	BC002	BC003	BC004	BC005	C1001
	SAMPLE ID	BC002D1P1	BC002D1P2	BC003D1P1	BC004D1P1	BC005D1P1	C1001D1P1
	DATE / TIME	04/29/97 / 10:45	04/29/97 / 10:46	05/19/97 / 12:00	05/19/97 / 11:30	05/19/97 / 11:00	04/23/97 / 09:00
	DEPTH (ft)	0.00	0.50	0.00	0.00	0.00	0.00
2,3,7,8-TCDD		0.4 U	0.3 U	0.8 U	0.60	9.6 U	0.6 U
1,2,3,7,8-PeCDD		0.7 U	0.3 U	2.3	2.1	16.5 U	3.8 R
1,2,3,4,7,8-HxCDD		1.0 U	0.5 U	4.2	4.9	13.0 U	3.8 R
1,2,3,6,7,8-HxCDD		1.4 R	1.6	14.4	14.3	11.9 U	6.2 R
1,2,3,7,8,9-HxCDD		0.8 U	0.4 U	11.5	17.1	11.5 U	8.1 R
1,2,3,4,6,7,8-HpCDD		26.3 R	26.7	440	402	86.0	92.6 R
1,2,3,4,6,7,8,9-OCDD		192 R	174	5740	4740	1880	762 R
2,3,7,8-TCDF		0.3 U	0.3 U	2.6	3.3	7.9 U	0.5 U
1,2,3,7,8-PeCDF		0.4 U	0.2 U	2.3	1.9	10.3 U	0.6 U
2,3,4,7,8-PeCDF		0.5 U	0.35	1.8	2.2	10.0 U	0.6 U
1,2,3,4,7,8-HxCDF		1.4 R	1.2	10.6	8.8	9.5 U	6.4 R
1,2,3,6,7,8-HxCDF		0.4 U	0.3 U	5.5	4.1	7.7 U	1.4 R
2,3,4,6,7,8-HxCDF		0.6 U	0.4 U	5.7	6.0	9.5 U	2.2 R
1,2,3,7,8,9-HxCDF		0.7 U	0.5 U	0.9 U	0.6 U	10.5 U	1.0 U
1,2,3,4,6,7,8-HpCDF		3.9 R	4.7	72.2	62.2	15.8	25.5 R
1,2,3,4,7,8,9-HpCDF		1.1 U	0.6 U	5.4	4.3	12.8 U	1.9 R
1,2,3,4,6,7,8,9-OCDF		6.6 R	8.3	482	281	25.5 U	50.1 R
Total TCDD		0.4 U	0.3 U	3.8	9.8	9.6 U	0.85
Total PeCDD		0.7 U	0.3 U	13.6	18.2	16.5 U	5.8
Total HxCDD		3.2	3.7	85.7	173	12.1 U	46.7
Total HpCDD		46.6	45.9	665	721	182	176
Total TCDF		0.3 U	0.3 U	20.7	21.9	7.9 U	3.8
Total PeCDF		1.2	2.7	43.1	46.0	10.1 U	13.8
Total HxCDF		6.2	7.5	105	105	9.2 U	45.5
Total HpCDF		15.0	14.4	209	189	15.8	27.5
Total TEQ		0.7806	0.9513	19.013	18.401	2.898	6.7221

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-det[illegible] R = rejected, EDL = estimated detection limit

TABLE 2

OFF-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	C1001	C1002	C1002	C1003	C1003	C1005
	SAMPLE ID	C1001D1P2	C1002D1P1	C1002D1P2	C1003D1P1	C1003D1P2	C1005D1P1
	DATE / TIME	04/23/97 / 09:01	04/24/97 / 09:30	04/24/97 / 09:31	04/22/97 / 13:45	04/22/97 / 13:46	04/23/97 / 10:45
	DEPTH (ft)	0.50	0.00	0.50	0.00	0.50	0.00
2,3,7,8-TCDD		0.4 U	3.1 R	4.5 U	4.1 R	5.5	1.0 R
1,2,3,7,8-PeCDD		1.9	0.85 R	3.3 U	1.3 R	0.8 U	1.1 U
1,2,3,4,7,8-HxCDD		2.9	1.4 R	4.0 U	3.4 R	3.0	1.4 U
1,2,3,6,7,8-HxCDD		6.0	3.2 R	3.7 U	7.1 R	7.4	1.2 R
1,2,3,7,8,9-HxCDD		6.0	5.1 R	3.6 U	8.0 R	6.8	2.2 R
1,2,3,4,6,7,8-HpCDD		98.2	86.6 R	85.8 J	195 R	208	40.4 R
1,2,3,4,6,7,8,9-OCDD		749	1150 R	1340 J	1760 R	1860	392 R
2,3,7,8-TCDF		0.59	0.78 R	4.5 U	1.8 R	2.2	0.5 U
1,2,3,7,8-PeCDF		0.3 U	0.5 U	3.0 U	0.4 U	0.6 U	0.6 U
2,3,4,7,8-PeCDF		0.3 U	0.5 U	2.9 U	0.69 R	0.6 U	0.6 U
1,2,3,4,7,8-HxCDF		5.6	14.2 R	17.8	4.2 R	4.3	1.3 R
1,2,3,6,7,8-HxCDF		1.6	1.1 R	2.9 U	2.4 R	2.3	(0.52) R
2,3,4,6,7,8-HxCDF		0.74	1.4 U	3.6 U	1.7 R	3.2	0.95 R
1,2,3,7,8,9-HxCDF		0.6 U	0.8 U	4.0 U	0.9 U	1.2 U	1.0 U
1,2,3,4,6,7,8-HpCDF		22.2	19.4 R	14.3	32.8 R	32.2	6.0 R
1,2,3,4,7,8,9-HpCDF		2.0	2.0 R	3.6 U	2.4 R	2.8	1.3 U
1,2,3,4,6,7,8,9-OCDF		51.6	29.7 R	49 ? J	79.2 R	83.2	18.6 R
Total TCDD		0.4 U	6.3	4.5 U	1.2	5.5	1.0
Total PeCDD		1.7	1.7	3.3 U	0.83	1.4	1.1 U
Total HxCDD		37.4	31.0	20.1	69.7	58.1	18.0
Total HpCDD		184	181	186	521	474	162
Total TCDF		3.3	9.1	4.5 U	5.3	11.0	0.5 U
Total PeCDF		7.4	30.7	5.7	18.9	12.4	3.5
Total HxCDF		30.8	32.5	27.5	50.2	46.0	10.7
Total HpCDF		22.2	47.8	46.7	113	93.3	22.4
Total TEQ		5.3176	8.3627	4.1707	12.0962	12.7932	2.4916

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

() = Less than Reporting Limit

U = non-detect, R = rejected, EDL = estimated detection limit

TABLE 2

OFF-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	C1005	C1006	C1006	TC001	TC001	TC002
	SAMPLE ID	C1005D1P2	C1006D1P1	C1006D1P2	TC001D1P1	TC001D1P2	TC002D1P1
	DATE / TIME	04/23/97 / 10:46	04/23/97 / 13:30	04/23/97 / 13:31	04/25/97 / 15:30	04/25/97 / 15:31	04/25/97 / 15:30
	DEPTH (ft)	0.50	0.00	0.50	0.00	0.50	0.00
2,3,7,8-TCDD		0.86	0.6 U	0.3 U	0.4 U	0.2 U	0.3 U
1,2,3,7,8-PeCDD		0.3 U	1.0 U	0.3 U	0.62 R	0.2 U	0.4 U
1,2,3,4,7,8-HxCDD		(0.46)	1.0 U	0.4 U	1.2 R	0.72	0.6 U
1,2,3,6,7,8-HxCDD		1.2	0.8 U	0.4 U	1.8 R	1.6	0.5 U
1,2,3,7,8,9-HxCDD		1.6	1.3 R	1.4	8.2 R	8.1	2.6 R
1,2,3,4,6,7,8-HpCDD		41.6	11.9 R	13.1	48.8 R	51.2	11.5 R
1,2,3,4,6,7,8,9-OCDD		413	142 R	151	614 R	632	143 R
2,3,7,8-TCDF		0.4 U	0.4 U	0.3 U	0.3 U	0.2 U	0.2 U
1,2,3,7,8-PeCDF		0.3 U	0.6 U	0.2 U	0.4 U	0.2 U	0.3 U
2,3,4,7,8-PeCDF		0.3 U	0.6 U	0.2 U	0.4 U	0.2 U	0.3 U
1,2,3,4,7,8-HxCDF		0.4 U	0.7 U	1.1	0.6 U	0.2 U	0.4 U
1,2,3,6,7,8-HxCDF		0.4 U	0.6 U	0.3 U	(0.17) R	0.25	0.3 U
2,3,4,6,7,8-HxCDF		0.4 U	0.8 U	0.4 U	<0.54 EDL	0.37 U	<0.64 EDL
1,2,3,7,8,9-HxCDF		0.5 U	0.9 U	0.4 U	0.7 U	0.2 U	0.5 U
1,2,3,4,6,7,8-HpCDF		5.2	2.5 R	2.8	0.8 U	0.2 U	0.58 R
1,2,3,4,7,8,9-HpCDF		0.77	1.2 U	1.0	1.1 U	0.3 U	0.7 U
1,2,3,4,6,7,8,9-OCDF		18.?	5.0 R	7.0	1.2 U	0.3 U	(0.69) R
Total TCDD		0.86	0.6 U	0.3 U	10.2	10.2	0.64
Total PeCDD		1.1	1.0 U	0.84	26.1	23.8	1.3
Total HxCDD		16.0	9.7	5.8	174	144	17.8
Total HpCDD		170	24.2	27.3	229	232	29.7
Total TCDF		0.97	0.4 U	0.3 U	0.48	1.3	0.2 U
Total PeCDF		1.9	0.6 U	7.0	0.4 U	0.2 U	0.3 U
Total HxCDF		7.1	1.1	5.9	(0.54)	0.62	0.64
Total HpCDF		5.2	7.1	8.0	0.9 U	0.3 U	(0.58)
Total TEQ		2.0935	0.421	0.577	2.549	2.211	0.52449

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less than Reporting Limit

U = non-de[redacted] R = rejected, EDL = estimated detection limit

TABLE 2

OFF-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	TC002	TC004	TC005	TC006	TC007	TC008
	SAMPLE ID	TC002D1P2	TC004D1P1	TC005D1P1	TC006D1P1	TC007D1P1	TC008D1P1
	DATE / TIME	04/25/97 / 15:31	04/28/97 / 14:20	04/28/97 / 11:00	05/14/97 / 14:30	05/14/97 / 15:15	05/14/97 / 15:30
	DEPTH (ft)	0.50	0.00	0.00	0.00	0.00	0.00
2,3,7,8-TCDD		0.3 U	0.73 R	0.3 U	0.9 U	0.4 U	0.8 U
1,2,3,7,8-PeCDD		0.2 U	2.1 R	0.4 U	1.3 U	0.5 U	1.1 U
1,2,3,4,7,8-HxCDD		0.3 U	4.4 R	0.66 R	1.5 U	0.63	1.4 U
1,2,3,6,7,8-HxCDD		0.2 U	7.9 R	0.87 R	1.4 U	2.1	1.2 U
1,2,3,7,8,9-HxCDD		2.3	39.0 R	2.4 R	3.4	12.8	3.8
1,2,3,4,6,7,8-HpCDD		12.4	208 R	26.0 R	29.6	121	65.2
1,2,3,4,6,7,8,9-OCDD		152	2080 R	947 R	407	3550	674
2,3,7,8-TCDF		0.2 U	0.4 U	0.2 U	0.7 U	0.4 U	0.6 U
1,2,3,7,8-PeCDF		0.2 U	0.4 U	0.3 U	0.9 U	0.4 U	0.8 U
2,3,4,7,8-PeCDF		0.2 U	0.4 U	0.3 U	0.8 U	0.4 U	0.7 U
1,2,3,4,7,8-HxCDF		0.2 U	0.6 U	0.33 R	1.1 U	0.59	0.9 U
1,2,3,6,7,8-HxCDF		0.2 U	1.2 R	0.2 U	0.9 U	0.4 U	0.7 U
2,3,4,6,7,8-HxCDF		0.37 U	0.77 R	0.50 R	1.1 U	0.72	0.9 U
1,2,3,7,8,9-HxCDF		0.2 U	0.7 U	0.4 U	1.2 U	0.5 U	1.0 U
1,2,3,4,6,7,8-HpCDF		0.50	0.8 U	0.83 R	2.6	1.3	6.7 U
1,2,3,4,7,8,9-HpCDF		0.3 U	1.1 U	0.6 U	1.6 U	0.7 U	1.4 U
1,2,3,4,6,7,8,9-OCDF		0.3 U	1.2 U	0.91 R	3.0 U	2.4	26.6 U
Total TCDD		1.2	177	8.6	12.3	7.5	87.2
Total PeCDD		3.0	479	4.1	8.0	6.6	48.3
Total HxCDD		11.9	2450	9.7	63.4	74.1	89.9
Total HpCDD		29.8	1710	64.3	92.3	242	258
Total TCDF		0.2 U	1.5	17.2	0.7 U	0.4 U	1.4
Total PeCDF		0.2 U	0.4 U	0.73	0.9 U	0.46	1.2
Total HxCDF		0.66	2.0	1.4	1.1 U	1.9	8.2
Total HpCDF		1.4	(0.80)	1.7	2.6	1.8	20.1
Total TEQ		0.511	11.267	1.69221	1.069	6.4594	1.706

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( ) = Less than Reporting Limit

U = non-detect, R = rejected, EDL = estimated detection limit

TABLE 2

OFF-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	TC009	TC009	TC010	TC010	WL001	WL001
	SAMPLE ID	TC009D1P1	TC009D1P2	TC010D1P1	TC010D1P2	WL001D1P1	WL001D1P2
	DATE / TIME	05/16/97 / 09:35	05/16/97 / 09:36	05/16/97 / 09:58	05/16/97 / 09:59	05/16/97 / 14:00	05/16/97 / 14:01
	DEPTH (ft)	0.00	0.50	0.00	0.50	0.00	0.50
2,3,7,8-TCDD		1.4 R	1.0	0.9 U	0.3 U	12.1 R	11.7
1,2,3,7,8-PeCDD		0.9 U	0.7 U	1.2 U	0.4 U	0.8 U	0.8 U
1,2,3,4,7,8-HxCDD		(0.95) R	(0.78)	1.2 U	0.5 U	1.4 R	1.4
1,2,3,6,7,8-HxCDD		2.9 R	2.3	1.1 U	0.4 U	4.3 R	3.6
1,2,3,7,8,9-HxCDD		7.7 R	7.6	1.0 R	1.2	3.6 R	4.1
1,2,3,4,6,7,8-HpCDD		101 R	101	13.1 R	11.9	119 R	110
1,2,3,4,6,7,8,9-OCDD		1530 R	1590	277 R	290	1080 R	1060
2,3,7,8-TCDF		0.87 R	0.50	0.7 U	0.3 U	5.4 R	4.7
1,2,3,7,8-PeCDF		0.7 U	0.5 U	0.9 U	0.3 U	0.6 U	0.6 U
2,3,4,7,8-PeCDF		0.7 U	0.5 U	0.9 U	0.3 U	0.6 U	0.6 U
1,2,3,4,7,8-HxCDF		2.0 R	2.0	0.9 U	0.3 U	2.1 R	2.2
1,2,3,6,7,8-HxCDF		1.0 R	1.2	0.7 U	0.3 U	1.7 R	1.6
2,3,4,6,7,8-HxCDF		1.8 R	1.5	0.9 U	0.45	2.3 R	2.5
1,2,3,7,8,9-HxCDF		0.9 U	0.7 U	1.0 U	0.4 U	0.7 U	0.7 U
1,2,3,4,6,7,8-HpCDF		13.6 R	13.5	(0.66) R	0.42	28.9 R	32.1
1,2,3,4,7,8,9-HpCDF		1.4 R	1.0 U	1.3 U	0.6 U	2.3 R	1.8
1,2,3,4,6,7,8,9-OCDF		33.5 R	36.4	(1.8) R	1.9	102 R	94.0
Total TCDD		16.6	8.7	(0.78)	0.82	14.0	13.3
Total PeCDD		5.9	10.1	1.2 U	0.81	4.1	1.8
Total HxCDD		75.8	66.8	9.7	9.7	32.7	32.2
Total HpCDD		232	233	30.0	28.5	238	218
Total TCDF		0.87	1.2	0.7 U	0.3 U	10.8	5.9
Total PeCDF		3.2	2.5	0.9 U	0.3 U	16.7	15.8
Total HxCDF		20.7	19.4	(0.67)	0.45	42.9	37.8
Total HpCDF		39.2	25.1	1.7	1.5	93.2	93.3
Total TEQ		5.8455	5.3594	0.5164	0.5801	16.864	16.303

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TABLE 2

OFF-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	WL002	WL002	WL002	WL003	WL003	WL004
	SAMPLE ID	WL002D1P1	WL002D1P2	WL002D1P3	WL003D1P1	WL003D1P2	WL004D1P1
	DATE / TIME	05/16/97 / 14:20	05/16/97 / 14:21	06/26/97 / 13:10	05/16/97 / 14:39	05/16/97 / 14:41	05/16/97 / 15:00
	DEPTH (ft)	0.00	0.50	0.00	0.00	0.50	0.00
2,3,7,8-TCDD		69.3 R	66.8	70.3	56.6 R	54.9	137.7 R
1,2,3,7,8-PeCDD		4.2 R	3.7	3.4	2.6 R	2.2	5.8 R
1,2,3,4,7,8-HxCDD		8.6 R	9.0	9.0	3.7 R	4.0	11.6 R
1,2,3,6,7,8-HxCDD		27.1 R	25.8	20.4	10.7 R	10.7	31.5 R
1,2,3,7,8,9-HxCDD		24.4 R	24.6	21.7	10.0 R	9.9	29.4 R
1,2,3,4,6,7,8-HpCDD		746 R	772	586	275 R	284	849 R
1,2,3,4,6,7,8,9-OCDD		6650 R	7210	5250	2120 R	2240	7000 R
2,3,7,8-TCDF		26.6 R	29.9	30.5	27.3 R	26.7	50.8 R
1,2,3,7,8-PeCDF		2.9 R	2.3	2.4	1.2 R	0.80	2.8 R
2,3,4,7,8-PeCDF		1.7 R	1.9	1.6	0.88 R	1.0	2.5 R
1,2,3,4,7,8-HxCDF		10.7 R	10.4	8.4	4.5 R	4.7	12.4 R
1,2,3,6,7,8-HxCDF		11.4 R	10.6	7.9	4.2 R	4.5	14.5 R
2,3,4,6,7,8-HxCDF		11.9 R	11.2	10.6	5.3 R	5.2	14.6 R
1,2,3,7,8,9-HxCDF		1.9 U	1.1 U	0.6 U	0.8 U	(0.27)	(0.54) R
1,2,3,4,6,7,8-HpCDF		133 R	137	136	59.6 R	58.7	157 R
1,2,3,4,7,8,9-HpCDF		11.1 R	11.6	8.1	5.2 R	4.2	12.7 R
1,2,3,4,6,7,8,9-OCDF		451 R	538	383	190 R	212	524 R
Total TCDD		76.9	69.1	81.6	61.6	62.3	157.1
Total PeCDD		27.2	21.5	25.7	13.3	13.3	37.7
Total HxCDD		216	207	188	80.1	85.2	254
Total HpCDD		1500	1600	1200	533	551	1690
Total TCDF		64.3	56.0	60.7	51.8	55.9	123
Total PeCDF		82.2	74.4	81.9	47.9	48.8	127
Total HxCDF		220	208	178	93.6	93.3	232
Total HpCDF		436	447	390	185	59.3	503
Total TEQ		99.067	98.819	96.71	70.678	69.058	176.235

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TABLE 2

OFF-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	WL004	WL005	WL006	WL007	WL008	WL009
	SAMPLE ID	WL004D1P2	WL005D1P1	WL006D1P1	WL007D1P1	WL008D1P1	WL009D1P1
	DATE / TIME	05/16/97 / 15:01	05/17/97 / 10:45	05/17/97 / 10:45	05/17/97 / 10:55	05/17/97 / 10:55	05/17/97 / 11:10
	DEPTH (ft)	0.50	0.00	0.00	0.00	0.00	0.00
2,3,7,8-TCDD		133	136	109	176	212	0.4 U
1,2,3,7,8-PeCDD		5.2	4.4	4.6	7.2	6.5	0.5 U
1,2,3,4,7,8-HxCDD		11.8	9.0	9.2	15.9	12.1	0.8 U
1,2,3,6,7,8-HxCDD		31.9	24.8	27.0	42.9	33.1	0.86
1,2,3,7,8,9-HxCDD		28.7	21.9	17.0	33.3	20.4	6.2
1,2,3,4,6,7,8-HpCDD		883	626	745	1170	809	45.3
1,2,3,4,6,7,8,9-OCDD		7610	5130	8610 J	10980 J	6840 J	932
2,3,7,8-TCDF		49.8	66.1	40.7	55.6	77.2	0.3 U
1,2,3,7,8-PeCDF		2.3	5.3	2.3	3.4	3.2	0.4 U
2,3,4,7,8-PeCDF		2.2	5.4	3.9	3.7	3.2	0.4 U
1,2,3,4,7,8-HxCDF		13.3	31.7	22.0	22.7	15.9	0.5 U
1,2,3,6,7,8-HxCDF		14.5	17.7	12.3	16.2	14.7	0.4 U
2,3,4,6,7,8-HxCDF		15.2	17.9	11.9	9.4	12.5	0.62 U
1,2,3,7,8,9-HxCDF		1.1	0.89	0.98	0.98	0.84	0.5 U
1,2,3,4,6,7,8-HpCDF		162	246	289	218	169	1.00
1,2,3,4,7,8,9-HpCDF		11.9	14.9	13.5	17.7	10.8	0.7 U
1,2,3,4,6,7,8,9-OCDF		623	801	1690 J	1220 J	1950 J	1.0 U
Total TCDD		150	153	125	198	236	3.6
Total PeCDD		39.9	7.8	19.6	27.8	22.3	4.7
Total HxCDD		258	167	142	243	158	30.1
Total HpCDD		1880	1030	1000	1700	937	86.6
Total TCDF		120	194	110	134	195	3.4
Total PeCDF		125	224	110	146	177	0.67
Total HxCDF		270	349	263	341	292	0.62
Total HpCDF		514	600	757	701	501	1.0
Total TEQ		172.247	174.964	148.248	227.575	254.362	2.101

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TABLE 2

OFF-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	WL010	WM001	WM001	WM002	WM002	WM003
	SAMPLE ID	WL010D1P1	WM001D1P1	WM001D1P2	WM002D1P1	WM002D1P2	WM003D1P1
	DATE / TIME	05/17/97 / 11:05	04/23/97 / 15:30	04/23/97 / 15:31	04/24/97 / 11:00	04/24/97 / 11:01	04/23/97 / 14:30
	DEPTH (ft)	0.00	0.00	0.50	0.00	0.50	0.00
2,3,7,8-TCDD		8.4	4.8 R	5.3	6.7 R	6.4	0.5 U
1,2,3,7,8-PeCDD		1.0 U	0.9 U	0.7 U	1.1 R	1.9	0.9 U
1,2,3,4,7,8-HxCDD		1.1	3.3 R	1.2 U	3.3 R	2.8	1.1 U
1,2,3,6,7,8-HxCDD		3.3	6.9 R	7.0	7.2 R	7.6	0.8 U
1,2,3,7,8,9-HxCDD		3.5	7.3 R	6.3	8.6 R	7.2	4.1 R
1,2,3,4,6,7,8-HpCDD		72.2	194 R	201	190 R	212	27.3 R
1,2,3,4,6,7,8,9-OCDD		581	1710 R	1740	1580 R	1840	418 R
2,3,7,8-TCDF		3.3	1.5 R	1.0 U	(1.3) R	1.9	0.3 U
1,2,3,7,8-PeCDF		0.7 U	0.5 U	0.6 U	0.44 R	0.70	0.5 U
2,3,4,7,8-PeCDF		0.7 U	0.5 U	0.6 U	0.78 R	0.85	0.5 U
1,2,3,4,7,8-HxCDF		1.7	8.0 R	7.0	5.6 R	5.3	0.7 U
1,2,3,6,7,8-HxCDF		0.6 U	1.9 R	2.1	2.4 R	2.5	0.5 U
2,3,4,6,7,8-HxCDF		1.8 U	2.0 R	3.6	0.6 U	2.2	0.7 U
1,2,3,7,8,9-HxCDF		0.8 U	0.7 U	1.0 U	0.6 U	0.7 U	0.8 U
1,2,3,4,6,7,8-HpCDF		14.1	53.6 R	44.7	49.6 R	42.3	2.4 R
1,2,3,4,7,8,9-HpCDF		1.0 U	3.5 R	3.5	2.8 R	3.6	1.1 U
1,2,3,4,6,7,8,9-OCDF		57.6	152 R	164	106 R	156	4.1 R
Total TCDD		8.4	5.5	5.3	10.1	8.0	0.89
Total PeCDD		1.6	2.5	0.7 U	7.2	6.9	17.2
Total HxCDD		20.9	63.5	44.1	75.4	63.7	108
Total HpCDD		146	447	478	426	445	116
Total TCDF		5.6	8.6	4.3	9.0	3.6	0.49
Total PeCDF		11.0	21.5	13.8	21.6	17.1	0.81
Total HxCDF		23.7	62.8	56.8	67.3	60.7	1.6
Total HpCDF		46.0	181	164	131	133	6.8
Total TEQ		11.1916	12.263	12.296	14.612	15.335	1.1291

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TABLE 2

OFF-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(soil/sediment)

Date: 10/03/97

CONSTITUENT (Units in ng/kg)	SITE	WM003	WM004	WM004	WM005	WM005
	SAMPLE ID	WM003D1P2	WM004D1P1	WM004D1P2	WM005D1P1	WM005D1P2
	DATE / TIME	04/23/97 / 14:31	04/24/97 / 14:30	04/24/97 / 14:31	04/24/97 / 15:15	04/24/97 / 15:16
	DEPTH (ft)	0.50	0.00	0.50	0.00	0.50
2,3,7,8-TCDD		0.6 U	0.56 R	0.8 U	0.49 R	2.2 U
1,2,3,7,8-PeCDD		0.5 U	0.3 U	0.8 U	0.3 U	2.1 U
1,2,3,4,7,8-HxCDD		0.8 U	0.35 R	1.0 U	0.56 R	2.5 U
1,2,3,6,7,8-HxCDD		0.7 U	0.52 R	0.9 U	1.4 R	2.3 U
1,2,3,7,8,9-HxCDD		3.3	0.68 R	0.9 U	6.1 R	4.5
1,2,3,4,6,7,8-HpCDD		29.4	12.9 R	13.0	44.8 R	49.0
1,2,3,4,6,7,8,9-OCDD		439	109 R	122	847 R	926 J
2,3,7,8-TCDF		0.6 U	0.2 U	0.8 U	0.42 R	2.0 U
1,2,3,7,8-PeCDF		0.4 U	0.2 U	0.7 U	0.2 U	1.7 U
2,3,4,7,8-PeCDF		0.4 U	0.2 U	0.7 U	0.2 U	1.7 U
1,2,3,4,7,8-HxCDF		0.7 U	0.45 R	0.9 U	0.31 R	2.0 U
1,2,3,6,7,8-HxCDF		0.6 U	0.22 R	0.7 U	0.23 R	1.6 U
2,3,4,6,7,8-HxCDF		0.7 U	<0.43 EDL	0.9 U	<0.58 EDL	2.0 U
1,2,3,7,8,9-HxCDF		0.8 U	0.3 U	1.0 U	0.3 U	2.2 U
1,2,3,4,6,7,8-HpCDF		2.4	3.5 R	3.1	2.3 R	2.3
1,2,3,4,7,8,9-HpCDF		0.9 U	0.4 U	1.0 U	0.5 U	2.3 U
1,2,3,4,6,7,8,9-OCDF		4.0	5.8 R	7.1	4.2 R	6.0 J
Total TCDD		4.3	0.2 U	0.8 U	5.1	4.9
Total PeCDD		10.6	0.3 U	0.8 U	5.1	2.1 U
Total HxCDD		88.8	7.7	3.5	52.2	8.0
Total HpCDD		128	27.6	29.1	94.6	101
Total TCDF		0.6 U	0.2 U	0.8 U	1.1	2.0 U
Total PeCDF		0.4 U	1.4	0.7 U	0.62	1.7 U
Total HxCDF		1.6 M	4.5	2.1	4.3	1.9 U
Total HpCDF		5.7 M	3.5	8.7	3.9	5.2
Total TEQ		1.091	1.0608	0.2901	2.7142	1.895

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TABLE 3

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in pg/L)	SITE	D1001	D1001	D1003	D1003	D1005	D1005
	SAMPLE ID	D1001W1P1	D1001W1P3	D1003W1P1	D1003W1D1	D1005W1P1	D1005W1P2
	DATE	04/10/97	06/26/97	04/10/97	04/10/97	04/10/97	04/10/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
2,3,7,8-TCDD		1.7 U	6.6	3.0 U	3.8 U	2.6 R	26.3 U
1,2,3,7,8-PeCDD		2.5 U	3.1 U	4.3 U	5.7 U	3.5 U	16.2 U
1,2,3,4,7,8-HxCDD		3.1 U	4.9 U	4.6 U	5.7 U	4.1 U	15.9 U
1,2,3,6,7,8-HxCDD		2.9 U	4.1 U	3.6 U	4.5 U	3.3 U	12.4 U
1,2,3,7,8,9-HxCDD		2.8 U	4.3 U	3.9 U	5.0 U	3.6 U	13.6 U
1,2,3,4,6,7,8-HpCDD		4.1 U	6.8	5.0 U	6.7 U	16.3 R	14.3 U
1,2,3,4,6,7,8,9-OCDD		29.2	43.6	8.7 U	12.4 U	105 R	88.5 U
2,3,7,8-TCDF		1.5 U	3.2 U	2.1 U	2.9 U	1.9 U	17.6 U
1,2,3,7,8-PeCDF		1.8 U	2.4 U	2.7 U	3.6 U	2.1 U	13.2 U
2,3,4,7,8-PeCDF		1.8 U	2.6 U	2.6 U	3.6 U	2.0 U	13.0 U
1,2,3,4,7,8-HxCDF		2.3 U	3.7 U	2.6 U	3.4 U	2.5 U	12.1 U
1,2,3,6,7,8-HxCDF		1.9 U	3.0 U	2.0 U	2.6 U	1.9 U	9.1 U
2,3,4,6,7,8-HxCDF		3.2	4.8 U	2.6 U	4.1 R	4.6 U	12.1 U
1,2,3,7,8,9-HxCDF		2.6 U	4.5 U	2.9 U	3.8 U	2.8 U	13.6 U
1,2,3,4,6,7,8-HpCDF		2.3 U	3.7 U	3.0 U	4.1 U	6.9 R	12.2 U
1,2,3,4,7,8,9-HpCDF		3.6 U	5.2 U	4.3 U	5.8 U	3.9 U	16.5 U
1,2,3,4,6,7,8,9-OCDF		4.6 U	6.4 U	6.4 U	9.1 U	25.6 R	23.4
Total TCDD		1.7 U	6.6	3.0 U	3.8 U	2.6	26.3 U
Total PeCDD		2.5 U	3.1 U	4.3 U	5.7 U	3.5 U	16.2 U
Total HxCDD		2.9 U	4.4 U	4.0 U	5.0 U	3.6 U	13.8 U
Total HpCDD		4.1 U	14.4	5.0 U	6.7 U	38.1	20.7
Total TCDF		1.5 U	3.2 U	2.1 U	2.9 U	1.9 U	17.6 U
Total PeCDF		(1.6)	2.5 U	2.7 U	3.6 U	2.0 U	13.1 U
Total HxCDF		3.2	4.8	2.5 U	4.1	8.8	11.5 U
Total HpCDF		2.8 U	4.3 U	3.5 U	4.8 U	6.9	14.0 U
Total TEQ		0.3492	6.7116	0	0.41	2.9626	0.0234

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TABLE 3

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in pg/L)	SITE	D1008	D1010	D1013	D2003	D2003	D2006
	SAMPLE ID	D1008W1P1	D1010W1P1	D1013W1P1	D2003W1P1	D2003W1P2	D2006W1P1
	DATE	04/09/97	04/09/97	04/09/97	04/04/97	04/04/97	04/04/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		1.8 U	1.9 U	1.7 U	6.1 R	8.7 U	4.5 R
1,2,3,7,8-PeCDD		2.8 U	2.7 U	2.4 U	20.3 R	21.1	9.8 R
1,2,3,4,7,8-HxCDD		3.3 U	3.3 U	2.9 U	16.4 R	7.5 U	10 R
1,2,3,6,7,8-HxCDD		3.0 U	3.0 U	2.7 U	11.8 R	20.8	11.1 R
1,2,3,7,8,9-HxCDD		2.9 U	2.9 U	2.6 U	20.2 R	20.5	10.8 R
1,2,3,4,6,7,8-HpCDD		6.8	5.3	4.1	90.4 R	114	7.6 R
1,2,3,4,6,7,8,9-OCDD		46.9	32.2	25.6	599 R	700	24.6 R
2,3,7,8-TCDF		1.6 U	1.7 U	1.5 U	9.1 R	7.2 U	5.9 R
1,2,3,7,8-PeCDF		2.0 U	1.9 U	1.7 U	19 R	23.8	8.7 R
2,3,4,7,8-PeCDF		1.9 U	1.9 U	1.7 U	16.6 R	22.4	12.4 R
1,2,3,4,7,8-HxCDF		2.7 U	2.4 U	2.1 U	22.6 R	29.4	14.3 R
1,2,3,6,7,8-HxCDF		2.1 U	1.9 U	1.7 U	19.4 R	18.6	13 R
2,3,4,6,7,8-HxCDF		3.7	3.2	3.5	22 R	26.7	14.7 R
1,2,3,7,8,9-HxCDF		2.9 U	2.6 U	2.3 U	25.3 R	32.9	17.4 R
1,2,3,4,6,7,8-HpCDF		2.4 U	2.2 U	1.9 U	26.1 R	27.8	11.6 R
1,2,3,4,7,8,9-HpCDF		3.8 U	3.4 U	3.0 U	19.3 R	30.7	8 R
1,2,3,4,6,7,8,9-OCDF		4.6 U	4.5 U	3.7 U	47.2 R	86.8	31.5 R
Total TCDD		1.8 U	1.9 U	1.7 U	6.1	8.7 U	4.5
Total PeCDD		2.8 U	2.7 U	2.4 U	20.3	21.1	9.8
Total HxCDD		3.1 U	3.0 U	2.7 U	20.2	41.3	21.9
Total HpCDD		6.8	15.1	8.3	164	201	7.6
Total TCDF		1.6 U	1.7 U	1.5 U	9.1	7.2 U	5.9
Total PeCDF		2.0 U	1.9 U	1.7 U	19	46.2	21.2
Total HxCDF		3.7	3.2	3.5	89.4	100	59.4
Total HpCDF		2.9 U	2.7 U	2.4 U	64.6	77.7	19.6
Total TEQ		0.4849	0.4052	0.4166	42.1842	40.3418	26.0831

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U = non-de[redacted] R = rejected

TABLE 3

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in pg/L)	SITE	D2006	D2006	D2006	D3003	D3003	D3005
	SAMPLE ID	D2006W1D1	D2006W1P2	D2006W1D2	D3003W1P1	D3003W1P2	D3005W1P1
	DATE	04/04/97	04/04/97	04/04/97	04/07/97	04/07/97	04/07/97
	RESULT TYPE	Duplicate 1	Primary	Duplicate 1	Primary	Primary	Primary
2,3,7,8-TCDD		5.3 U	7.8	5.6 U	1.2 U	15.6 U	2.7 U
1,2,3,7,8-PeCDD		9.2 U	18.8	5.8 U	1.7 U	12.5 U	4.2 U
1,2,3,4,7,8-HxCDD		12.6 U	13.1	5.7 U	2.1 U	13.9 U	5.7 U
1,2,3,6,7,8-HxCDD		(3.2) R	13.3	5.2 U	2.0 U	12.7 U	14.0 R
1,2,3,7,8,9-HxCDD		11.4 U	13.4	5.1 U	1.9 U	12.3 U	9.7 R
1,2,3,4,6,7,8-HpCDD		16.9 U	16.6	6.1 U	24.7 R	12.3 U	290 R
1,2,3,4,6,7,8,9-OCDD		37.9 R	41.2	29.5	191 R	187 J	2160 R
2,3,7,8-TCDF		4.0 U	8.7	4.8 U	1.0 U	14.5 U	2.3 U
1,2,3,7,8-PeCDF		6.4 U	16.7	4.6 U	1.2 U	10.1 U	2.7 U
2,3,4,7,8-PeCDF		6.2 U	13.6	4.4 U	1.2 U	9.8 U	2.7 U
1,2,3,4,7,8-HxCDF		9.0 U	13.9	4.1 U	1.6 U	11.6 U	7.1 R
1,2,3,6,7,8-HxCDF		6.8 U	14.3	3.3 U	1.3 U	9.3 U	2.8 U
2,3,4,6,7,8-HxCDF		9.2 U	15.3	8.3	3.0 R	11.5 U	4.8 R
1,2,3,7,8,9-HxCDF		9.9 U	20.5	4.5 U	1.8 U	12.8 U	3.9 U
1,2,3,4,6,7,8-HpCDF		(7.2) R	11.1	3.6 U	4.5 R	8.0 U	44.6 R
1,2,3,4,7,8,9-HpCDF		12.7 U	16.7	5.6 U	2.4 U	12.5 U	5.5 U
1,2,3,4,6,7,8,9-OCDF		30.0 U	43.7	17.0	12.0 R	10.7 U	155 R
Total TCDD		5.3 U	7.8	5.6 U	1.2 U	15.6 U	2.7 U
Total PeCDD		9.2 U	18.8	5.8 U	1.7 U	12.5 U	4.2 U
Total HxCDD		(3.2)	26.5	5.3 U	2.7	13.0 U	71.0
Total HpCDD		16.9 U	16.6	6.1 U	24.7	25.1	606
Total TCDF		4.0 U	8.7	4.8 U	1.0 U	14.5 U	2.3 U
Total PeCDF		6.3 U	30.4	4.5 U	1.2 U	9.9 U	11.1
Total HxCDF		8.5 U	64.0	8.3	5.1	11.2 U	72.3
Total HpCDF		(7.2)	16.7	4.4 U	13.1	9.8 U	127
Total TEQ		0.4299	36.6139	0.8765	0.795	0.187	9.221

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TABLE 3

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in pg/L)	SITE	D3005	D3007	D3007	D5004	D5004	D5007
	SAMPLE ID	D3005W1P2	D3007W1P3	D3007W1D3	D5004W1P2	D5004W1P1	D5007W1P2
	DATE	04/07/97	06/24/97	06/24/97	04/08/97	04/08/97	04/08/97
	RESULT TYPE	Primary	Primary	Duplicate 1	Primary	Primary	Primary
2,3,7,8-TCDD		11.6 U	1.9 U	4.3	7.6 U	1.7 U	6.1 U
1,2,3,7,8-PeCDD		10.1 U	2.1 U	3.9	5.5 U	3.3 U	5.1 U
1,2,3,4,7,8-HxCDD		11.3 U	2.9 U	7.4	8.3 U	3.8 U	7.7 U
1,2,3,6,7,8-HxCDD		10.4 U	2.7 U	10.2	7.6 U	5.5 R	7.0 U
1,2,3,7,8,9-HxCDD		10.0 U	2.6 U	12.3	7.3 U	6.0 R	6.8 U
1,2,3,4,6,7,8-HpCDD		286	39.9	163	51.6	48.8 R	89.4
1,2,3,4,6,7,8,9-OCDD		2000 J	291	992	408	398 R	563
2,3,7,8-TCDF		11.6 U	1.9 U	2.1 U	7.7 U	1.2 U	6.0 U
1,2,3,7,8-PeCDF		7.8 U	1.6 U	1.9 U	4.8 U	2.0 U	4.5 U
2,3,4,7,8-PeCDF		7.5 U	1.5 U	1.8 U	4.6 U	1.9 U	4.4 U
1,2,3,4,7,8-HxCDF		10.6	2.6 U	4.4	7.6 U	3.6 R	10.3
1,2,3,6,7,8-HxCDF		7.2 U	2.1 U	3.2	6.1 U	(1.5) R	5.3 U
2,3,4,6,7,8-HxCDF		8.9 U	4.1 U	7.3 U	7.5 U	3.7 U	6.6 U
1,2,3,7,8,9-HxCDF		9.8 U	2.8 U	3.5 U	8.3 U	2.4 U	7.3 U
1,2,3,4,6,7,8-HpCDF		46.9	9.6	30.0	6.6 U	7.5 R	14.2
1,2,3,4,7,8,9-HpCDF		10.3 U	3.4 U	5.5	10.3 U	3.4 U	9.2 U
1,2,3,4,6,7,8,9-OCDF		218 J	23.1	57.4	11.4 U	16.2 R	40.3
Total TCDD		14.2	1.9 U	4.3	7.6 U	1.7 U	6.1 U
Total PeCDD		10.1 U	2.1 U	3.6	5.5 U	3.3 U	5.1 U
Total HxCDD		53.9	6.0	22.8	7.7 U	31.1	19.9
Total HpCDD		592	59.6	316	76.7	119	168
Total TCDF		11.6 U	1.9 U	2.1 U	7.7 U	4.0	6.0 U
Total PeCDF		7.6 U	1.6 U	4.6	4.7 U	1.9 U	4.4 U
Total HxCDF		48.6	3.1	5.5	7.3 U	21.2	24.8
Total HpCDF		146	19.4	69.8	14.8	15.5	14.2
Total TEQ		6.607	0.8091	13.0344	0.924	2.6372	2.6693

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TABLE 3

ON-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in pg/L)	SITE	D5007	D5009	D5009	D5013
	SAMPLE ID	D5007W1P1	D5009W1P1	D5009W1P3	D5013W1P1
	DATE	04/08/97	04/07/97	06/24/97	04/07/97
	RESULT TYPE	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		2.2 U	2.7 U	(3.2)	4.5 U
1,2,3,7,8-PeCDD		3.6 U	4.5 U	4.0 U	7.3 U
1,2,3,4,7,8-HxCDD		4.7 U	4.8 U	6.8 U	7.0 U
1,2,3,6,7,8-HxCDD		3.7 U	3.8 U	6.2 U	5.5 U
1,2,3,7,8,9-HxCDD		4.1 U	4.1 U	6.0 U	6.1 U
1,2,3,4,6,7,8-HpCDD		71.0 R	50.9 R	17.3	35.9 R
1,2,3,4,6,7,8,9-OCDD		497 R	469 R	219	279 R
2,3,7,8-TCDF		2.7 R	1.9 U	3.8 U	3.9 R
1,2,3,7,8-PeCDF		2.3 U	3.0 U	3.1 U	4.7 U
2,3,4,7,8-PeCDF		2.3 U	2.9 U	3.0 U	4.6 U
1,2,3,4,7,8-HxCDF		10.1 R	11.4 R	5.4 U	8.8 R
1,2,3,6,7,8-HxCDF		(1.7) R	2.2 U	4.3 U	3.3 U
2,3,4,6,7,8-HxCDF		5.6 U	6.7 U	5.3 U	7.4 R
1,2,3,7,8,9-HxCDF		3.2 U	3.2 U	5.9 U	4.9 U
1,2,3,4,6,7,8-HpCDF		14.9 R	14.4 R	6.0	7.9 R
1,2,3,4,7,8,9-HpCDF		4.4 U	4.4 U	6.8 U	6.7 U
1,2,3,4,6,7,8.9-OCDF		24.8 R	26.1 R	(7.3)	22.7 R
Total TCDD		2.2 U	2.7 U	(3.2)	4.5 U
Total PeCDD		6.0	4.5 U	4.0 U	7.3 U
Total HxCDD		41.7	13.5	6.3 U	8.0
Total HpCDD		146	114	27.0	69.4
Total TCDF		2.7	2.9	3.8 U	3.6
Total PeCDF		19.5	17.8	3.1 U	16.0
Total HxCDF		44.5	37.5	(3.6)	23.1
Total HpCDF		29.6	14.4	12.1	7.9
Total TEQ		2.8308	2.2881	3.6593	2.7497

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TABLE 4

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 07/08/98

CONSTITUENT (Units in ug/L)	SITE	GPT-04-04	GPT-04-04	GPT-04-05	GPT-04-06	GPT-04-07
	SAMPLE ID	GPT44G1P1	GPT44G1D1	GPT45G1P1	GPT46G1P1	GPT47G1P1
	DATE	05/19/97	05/19/97	05/19/97	05/20/97	05/20/97
	RESULT TYPE	Primary	Duplicate 1	Primary	Primary	Primary
Chloromethane		10 U	10 U	10 U	10 U	10 U
Bromomethane		10 U	10 U	10 U	10 U	10 U
Vinyl chloride		10 U	10 U	37	10 U	10 U
Chloroethane		10 U	10 U	10 U	10 U	10 U
Methylene chloride		10 U	10 U	10 U	10 U	10 U
Acetone		10 U	10 U	10 U	10 U	10 U
Carbon disulfide		10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene		10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane		10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)		10 U	10 U	180	10 U	10 U
Chloroform		10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane		10 U	10 U	10 U	10 U	10 U
2-Butanone		10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane		10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride		10 U	10 U	10 U	10 U	10 U
Bromodichloromethane		10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane		10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U
Trichloroethene		10 U	10 U	4.7 J	10 U	10 U
Dibromochloromethane		10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane		10 U	10 U	10 U	10 U	10 U
Benzene		10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U
Bromoform		10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone		10 U	10 U	10 U	10 U	10 U
2-Hexanone		10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

For RCL VC[illegible] Limit 2 is used for results comparison

TABLE 4

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 07/08/98

CONSTITUENT (Units in ug/L)	SITE	GPT-04-04	GPT-04-04	GPT-04-05	GPT-04-06	GPT-04-07
	SAMPLE ID	GPT44G1P1	GPT44G1D1	GPT45G1P1	GPT46G1P1	GPT47G1P1
	DATE	05/19/97	05/19/97	05/19/97	05/20/97	05/20/97
	RESULT TYPE	Primary	Duplicate 1	Primary	Primary	Primary
Tetrachloroethene		10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane		10 U	10 U	10 U	10 U	10 U
Toluene		10 U	10 U	10 U	10 U	10 U
Chlorobenzene		10 U	10 U	10 U	10 U	10 U
Ethylbenzene		10 U	10 U	10 U	10 U	10 U
Styrene		10 U	10 U	10 U	10 U	10 U
Xylenes (total)		10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

For RCL VOA Limit 2 is used for results comparison

TABLE 4

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 07/08/98

CONSTITUENT (Units in ug/L)	SITE	GPT-05-04	GPT-05-05	GPT-05-06
	SAMPLE ID	GPT54G1P1	GPT55G1P1	GPT56G1P1
	DATE	05/20/97	05/20/97	05/20/97
	RESULT TYPE	Primary	Primary	Primary
Chloromethane		10 U	10 U	10 U
Bromomethane		10 U	10 U	10 U
Vinyl chloride		10 U	10 U	10 U
Chloroethane		10 U	10 U	10 U
Methylene chloride		10 U	10 U	10 U
Acetone		10 U	10 U	10 U
Carbon disulfide		10 U	10 U	10 U
1,1-Dichloroethene		10 U	10 U	10 U
1,1-Dichloroethane		10 U	10 U	10 U
1,2-Dichloroethene (total)		10 U	10 U	10 U
Chloroform		10 U	10 U	10 U
1,2-Dichloroethane		10 U	10 U	10 U
2-Butanone		10 U	10 U	10 U
1,1,1-Trichloroethane		10 U	10 U	10 U
Carbon tetrachloride		10 U	10 U	10 U
Bromodichloromethane		10 U	10 U	10 U
1,2-Dichloropropane		10 U	10 U	10 U
cis-1,3-Dichloropropene		10 U	10 U	10 U
Trichloroethene		10 U	10 U	10 U
Dibromochloromethane		10 U	10 U	10 U
1,1,2-Trichloroethane		10 U	10 U	10 U
Benzene		10 U	10 U	10 U
trans-1,3-Dichloropropene		10 U	10 U	10 U
Bromoform		10 U	10 U	10 U
4-Methyl-2-pentanone		10 U	10 U	10 U
2-Hexanone		10 U	10 U	10 U

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For RCL VO[illegible] Limit 2 is used for results comparison

TABLE 4

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 07/08/98

CONSTITUENT (Units in ug/L)	SITE	GPT-05-04	GPT-05-05	GPT-05-06
	SAMPLE ID	GPT54G1P1	GPT55G1P1	GPT56G1P1
	DATE	05/20/97	05/20/97	05/20/97
	RESULT TYPE	Primary	Primary	Primary
Tetrachloroethene		10 U	10 U	10 U
1,1,2,2-Tetrachloroethane		10 U	10 U	10 U
Toluene		10 U	10 U	10 U
Chlorobenzene		10 U	10 U	10 U
Ethylbenzene		10 U	10 U	10 U
Styrene		10 U	10 U	10 U
Xylenes (total)		10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

For RCL VOA Limit 2 is used for results comparison

TABLE 4

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001W1P1	D1003W1P1	D1005W1P1	D1008W1P1	D1010W1P1	D1013W1P1
	DATE	04/10/97	04/10/97	04/10/97	04/09/97	04/09/97	04/09/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Chloromethane		10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane		10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride		10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride		10 U	10 U	10 U	10 U	10 U	10 U
Acetone		10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide		10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene		10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)		10 U	10 U	10 U	10 U	10 U	10 U
Chloroform		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone		10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride		10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane		10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene		10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane		10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Benzene		10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U
Bromoform		10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone		10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL VOA

TABLE 4

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001W1P1	D1003W1P1	D1005W1P1	D1008W1P1	D1010W1P1	D1013W1P1
	DATE	04/10/97	04/10/97	04/10/97	04/09/97	04/09/97	04/09/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Tetrachloroethene		10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Toluene		10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene		10 U	10 U	10 U	10 U	10 U	10 U
Styrene		10 U	10 U	10 U	10 U	10 U	10 U
Xylenes (total)		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

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TABLE 4

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D2003	D2006	D2006	D3003	D3005	D5004
	SAMPLE ID	D2003W1P1	D2006W1P1	D2006W1D1	D3003W1P1	D3005W1P1	D5004W1P1
	DATE	04/05/97	04/05/97	04/05/97	04/07/97	04/07/97	04/08/97
	RESULT TYPE	Primary	Primary	Duplicate 1	Primary	Primary	Primary
Chloromethane		10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane		10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride		10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride		10 U	10 U	10 U	10 U	10 U	10 U
Acetone		10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide		10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene		10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)		10 U	10 U	10 U	10 U	10 U	10 U
Chloroform		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone		10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride		10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane		10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene		10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane		10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Benzene		10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U
Bromoform		10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone		10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL VOA

TABLE 4

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D2003	D2006	D2006	D3003	D3005	D5004
	SAMPLE ID	D2003W1P1	D2006W1P1	D2006W1D1	D3003W1P1	D3005W1P1	D5004W1P1
	DATE	04/05/97	04/05/97	04/05/97	04/07/97	04/07/97	04/08/97
	RESULT TYPE	Primary	Primary	Duplicate 1	Primary	Primary	Primary
Tetrachloroethene		10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Toluene		10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene		10 U	10 U	10 U	10 U	10 U	10 U
Styrene		10 U	10 U	10 U	10 U	10 U	10 U
Xylenes (total)		10 U	10 U	10 U	10 U	10 U	10 U

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TABLE 4

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D5007	D5009	D5013
	SAMPLE ID	D5007W1P1	D5009W1P1	D5013W1P1
	DATE	04/08/97	04/07/97	04/07/97
	RESULT TYPE	Primary	Primary	Primary
Chloromethane		10 U	10 U	10 U
Bromomethane		10 U	10 U	10 U
Vinyl chloride		10 U	10 U	10 U
Chloroethane		10 U	10 U	10 U
Methylene Chloride		10 U	10 U	10 U
Acetone		10 U	10 U	10 U
Carbon disulfide		10 U	10 U	10 U
1,1-Dichloroethene		10 U	10 U	10 U
1,1-Dichloroethane		10 U	2 J	10 U
1,2-Dichloroethene (total)		10 U	10 U	10 U
Chloroform		10 U	10 U	10 U
1,2-Dichloroethane		10 U	10 U	10 U
2-Butanone		10 U	10 U	10 U
1,1,1-Trichloroethane		10 U	10 U	10 U
Carbon tetrachloride		10 U	10 U	10 U
Bromodichloromethane		10 U	10 U	10 U
1,2-Dichloropropane		10 U	10 U	10 U
cis-1,3-Dichloropropene		10 U	10 U	10 U
Trichloroethene		10 U	10 U	10 U
Dibromochloromethane		10 U	10 U	10 U
1,1,2-Trichloroethane		10 U	10 U	10 U
Benzene		10 U	10 U	10 U
trans-1,3-Dichloropropene		10 U	10 U	10 U
Bromoform		10 U	10 U	10 U
4-Methyl-2-pentanone		10 U	10 U	10 U
2-Hexanone		10 U	10 U	10 U

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U = non-det[illegible] J = estimated For RCL VOA

TABLE 4

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D5007	D5009	D5013
	SAMPLE ID	D5007W1P1	D5009W1P1	D5013W1P1
	DATE	04/08/97	04/07/97	04/07/97
	RESULT TYPE	Primary	Primary	Primary
Tetrachloroethene		10 U	10 U	10 U
1,1,2,2-Tetrachloroethane		10 U	10 U	10 U
Toluene		10 U	10 U	10 U
Chlorobenzene		10 U	10 U	10 U
Ethylbenzene		10 U	10 U	10 U
Styrene		10 U	10 U	10 U
Xylenes (total)		10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL VOA

TABLE 5

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001W1P1	D1003W1P1	D1005W1P1	D1008W1P1	D1010W1P1	D1013W1P1
	DATE	04/10/97	04/10/97	04/10/97	04/09/97	04/09/97	04/09/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Phenol		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-chloroethyl)ether		10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)		10 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosodinpropylamine		10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Isophorone		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-chloroethoxy)methane		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene		10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene		10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene		10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol		25 U	25 U	25 U	25 U	25 U	25 U

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U = non-de[redacted] J = estimated For RCL SVOA

TABLE 5

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001W1P1	D1003W1P1	D1005W1P1	D1008W1P1	D1010W1P1	D1013W1P1
	DATE	04/10/97	04/10/97	04/10/97	04/09/97	04/09/97	04/09/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2-Chloronaphthalene		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
Dimethylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene		10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene		10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
Acenaphthene		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol		25 U	25 U	25 U	25 U	25 U	25 U
4-Nitrophenol		25 U	25 U	25 U	25 U	25 U	25 U
Dibenzofuran		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene		10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether		10 U	10 U	10 U	10 U	10 U	10 U
Fluorene		10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol		25 U	25 U	25 U	25 U	25 U	25 U
N-Nitrosodiphenylamine (1)		10 U	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol		25 U	25 U	25 U	25 U	25 U	25 U
Phenanthrene		10 U	10 U	10 U	10 U	10 U	10 U
Anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Carbazole		10 U	10 U	10 U	10 U	10 U	10 U
Di-n-Butylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Pyrene		10 U	10 U	10 U	10 U	10 U	10 U

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U = non-detect, J = estimated For RCL SVOA

TABLE 5

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001W1P1	D1003W1P1	D1005W1P1	D1008W1P1	D1010W1P1	D1013W1P1
	DATE	04/10/97	04/10/97	04/10/97	04/09/97	04/09/97	04/09/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Butylbenzylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Chrysene		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-ethylhexyl)Phthalate		10 U	10 U	10 U	10 U	10 U	10 U
Di-n-octylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene		10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene		10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene		10 U	10 U	10 U	10 U	10 U	10 U

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TABLE 5

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D2003	D2006	D2006	D3003	D3005	D5004
	SAMPLE ID	D2003W1P1	D2006W1P1	D2006W1D1	D3003W1P1	D3005W1P1	D5004W1P1
	DATE	04/05/97	04/05/97	04/05/97	04/07/97	04/07/97	04/08/97
	RESULT TYPE	Primary	Primary	Duplicate 1	Primary	Primary	Primary
Phenol		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-chloroethyl)ether		10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)		10 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosodinpropylamine		10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Isophorone		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-chloroethoxy)methane		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene		10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene		10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene		10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol		25 U	25 U	25 U	25 U	25 U	25 U

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TABLE 5

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D2003	D2006	D2006	D3003	D3005	D5004
	SAMPLE ID	D2003W1P1	D2006W1P1	D2006W1D1	D3003W1P1	D3005W1P1	D5004W1P1
	DATE	04/05/97	04/05/97	04/05/97	04/07/97	04/07/97	04/08/97
	RESULT TYPE	Primary	Primary	Duplicate 1	Primary	Primary	Primary
2-Chloronaphthalene		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
Dimethylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene		10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene		10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
Acenaphthene		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol		25 U	25 U	25 U	25 U	25 U	25 U
4-Nitrophenol		25 U	25 U	25 U	25 U	25 U	25 U
Dibenzofuran		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene		10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether		10 U	10 U	10 U	10 U	10 U	10 U
Fluorene		10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol		25 U	25 U	25 U	25 U	25 U	25 U
N-Nitrosodiphenylamine (1)		10 U	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol		25 U	25 U	25 U	25 U	25 U	25 U
Phenanthrene		10 U	10 U	10 U	10 U	10 U	10 U
Anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Carbazole		10 U	10 U	10 U	10 U	10 U	10 U
Di-n-Butylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Pyrene		10 U	10 U	10 U	10 U	10 U	10 U

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TABLE 5

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D2003	D2006	D2006	D3003	D3005	D5004
	SAMPLE ID	D2003W1P1	D2006W1P1	D2006W1D1	D3003W1P1	D3005W1P1	D5004W1P1
	DATE	04/05/97	04/05/97	04/05/97	04/07/97	04/07/97	04/08/97
	RESULT TYPE	Primary	Primary	Duplicate 1	Primary	Primary	Primary
Butylbenzylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Chrysene		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-ethylhexyl)Phthalate		10 U	10 U	10 U	10 U	10 U	10 U
Di-n-octylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene		10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene		10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL SVOA

TABLE 5

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D5007	D5009	D5013
	SAMPLE ID	D5007W1P1	D5009W1P1	D5013W1P1
	DATE	04/08/97	04/07/97	04/07/97
	RESULT TYPE	Primary	Primary	Primary
Phenol		10 U	10 U	10 U
bis(2-chloroethyl)ether		10 U	10 U	10 U
2-Chlorophenol		10 U	10 U	10 U
1,3-Dichlorobenzene		10 U	10 U	10 U
1,4-Dichlorobenzene		10 U	10 U	10 U
1,2-Dichlorobenzene		10 U	10 U	10 U
2-Methylphenol		10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)		10 U	10 U	10 U
N-Nitrosodinpropylamine		10 U	10 U	10 U
4-Methylphenol		10 U	10 U	10 U
Hexachloroethane		10 U	10 U	10 U
Nitrobenzene		10 U	10 U	10 U
Isophorone		10 U	10 U	10 U
2-Nitrophenol		10 U	10 U	10 U
2,4-Dimethylphenol		10 U	10 U	10 U
bis(2-chloroethoxy)methane		10 U	10 U	10 U
2,4-Dichlorophenol		10 U	10 U	10 U
1,2,4-Trichlorobenzene		10 U	10 U	10 U
Naphthalene		10 U	10 U	10 U
4-Chloroaniline		10 U	10 U	10 U
Hexachlorobutadiene		10 U	10 U	10 U
4-Chloro-3-Methylphenol		10 U	10 U	10 U
2-Methylnaphthalene		10 U	10 U	10 U
Hexachlorocyclopentadiene		10 U	10 U	10 U
2,4,6-Trichlorophenol		10 U	10 U	10 U
2,4,5-Trichlorophenol		25 U	25 U	25 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL SVOA

TABLE 5

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D5007	D5009	D5013
	SAMPLE ID	D5007W1P1	D5009W1P1	D5013W1P1
	DATE	04/08/97	04/07/97	04/07/97
	RESULT TYPE	Primary	Primary	Primary
2-Chloronaphthalene		10 U	10 U	10 U
2-Nitroaniline		25 U	25 U	25 U
Dimethylphthalate		10 U	10 U	10 U
Acenaphthylene		10 U	10 U	10 U
2,6-Dinitrotoluene		10 U	10 U	10 U
3-Nitroaniline		25 U	25 U	25 U
Acenaphthene		10 U	10 U	10 U
2,4-Dinitrophenol		25 U	25 U	25 U
4-Nitrophenol		25 U	25 U	25 U
Dibenzofuran		10 U	10 U	10 U
2,4-Dinitrotoluene		10 U	10 U	10 U
Diethylphthalate		10 U	10 U	10 U
4-Chlorophenyl-phenylether		10 U	10 U	10 U
Fluorene		10 U	10 U	10 U
4-Nitroaniline		25 U	25 U	25 U
4,6-Dinitro-2-methylphenol		25 U	25 U	25 U
N-Nitrosodiphenylamine (1)		10 U	10 U	10 U
4-Bromophenyl-phenylether		10 U	10 U	10 U
Hexachlorobenzene		10 U	10 U	10 U
Pentachlorophenol		25 U	25 U	25 U
Phenanthrene		10 U	10 U	10 U
Anthracene		10 U	10 U	10 U
Carbazole		10 U	10 U	10 U
Di-n-Butylphthalate		10 U	10 U	10 U
Fluoranthene		10 U	10 U	10 U
Pyrene		10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL SVOA

TABLE 5

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D5007	D5009	D5013
	SAMPLE ID	D5007W1P1	D5009W1P1	D5013W1P1
	DATE	04/08/97	04/07/97	04/07/97
	RESULT TYPE	Primary	Primary	Primary
Butylbenzylphthalate		10 U	10 U	10 U
3,3'-Dichlorobenzidine		10 U	10 U	10 U
Benzo(a)Anthracene		10 U	10 U	10 U
Chrysene		10 U	10 U	10 U
bis(2-ethylhexyl)Phthalate		10 U	10 U	10 U
Di-n-octylphthalate		10 U	10 U	10 U
Benzo(b)fluoranthene		10 U	10 U	10 U
Benzo(k)fluoranthene		10 U	10 U	10 U
Benzo(a)pyrene		10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene		10 U	10 U	10 U
Dibenzo(a,h)anthracene		10 U	10 U	10 U
Benzo(g,h,i)perylene		10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL SVOA

TABLE 6

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001W1P1	D1003W1P1	D1005W1P1	D1008W1P1	D1010W1P1	D1013W1P1
	DATE	04/10/97	04/10/97	04/10/97	04/09/97	04/09/97	04/09/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
alpha-BHC		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
beta-BHC		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
delta-BHC		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
gamma-BHC(Lindane)		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
Heptachlor		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
Aldrin		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
Heptachlor epoxide		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
Endosulfan I		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
Dieldrin		0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDE		0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ
Endrin		0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ
Endosulfan II		0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDD		0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ
Endosulfan sulfate		0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDT		0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ
Methoxychlor		0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
Endrin ketone		0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ
Endrin aldehyde		0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ
alpha-Chlordane		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
gamma-Chlordane		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
Toxaphene		5 UJ	5 U	5 U	5 UJ	5 UJ	5 UJ
Aroclor-1016		1 UJ	1 U	1 U	1 UJ	1 UJ	1 UJ
Aroclor-1221		2 UJ	2 U	2 U	2 UJ	2 UJ	2 UJ
Aroclor-1232		1 UJ	1 U	1 U	1 UJ	1 UJ	1 UJ
Aroclor-1242		1 UJ	1 U	1 U	1 UJ	1 UJ	1 UJ
Aroclor-1248		1 UJ	1 U	1 U	1 UJ	1 UJ	1 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, For RCL PCB

TABLE 6

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001W1P1	D1003W1P1	D1[illegible]W1P1	D1008W1P1	D1010W1P1	D1013W1P1
	DATE	04/10/97	04/10/97	04/10/97	04/09/97	04/09/97	04/09/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Aroclor-1254		1 UJ	1 U	1 U	1 UJ	1 UJ	1 UJ
Aroclor-1260		1 UJ	1 U	1 U	1 UJ	1 UJ	1 UJ

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U = non-de[illegible], J = estimated, For RCL PCB

TABLE 6

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D2003	D2006	D2006	D3003	D3005	D5004
	SAMPLE ID	D2003W1P1	D2006W1P1	D2006W1D1	D3003W1P1	D3005W1P1	D5004W1P1
	DATE	04/05/97	04/05/97	04/05/97	04/07/97	04/07/97	04/08/97
	RESULT TYPE	Primary	Primary	Duplicate 1	Primary	Primary	Primary
alpha-BHC		0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 UJ
beta-BHC		0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 UJ
delta-BHC		0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 UJ
gamma-BHC(Lindane)		0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 UJ
Heptachlor		0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 UJ
Aldrin		0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 UJ
Heptachlor epoxide		0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 UJ
Endosulfan I		0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 UJ
Dieldrin		0.1 UJ	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ
4,4'-DDE		0.1 UJ	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ
Endrin		0.1 UJ	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ
Endosulfan II		0.1 UJ	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ
4,4'-DDD		0.1 UJ	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ
Endosulfan sulfate		0.1 UJ	0.0051 NJ	0.1 UJ	0.1 U	0.1 U	0.1 UJ
4,4'-DDT		0.1 UJ	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ
Methoxychlor		0.5 UJ	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 UJ
Endrin ketone		0.1 UJ	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ
Endrin aldehyde		0.1 UJ	0.1 U	0.027 J	0.1 U	0.1 U	0.1 UJ
alpha-Chlordane		0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 UJ
gamma-Chlordane		0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 UJ
Toxaphene		5 UJ	5 U	5 UJ	5 U	5 U	5 UJ
Aroclor-1016		1 UJ	1 U	1 UJ	1 U	1 U	1 UJ
Aroclor-1221		2 UJ	2 U	2 UJ	2 U	2 U	2 UJ
Aroclor-1232		1 UJ	1 U	1 UJ	1 U	1 U	1 UJ
Aroclor-1242		1 UJ	1 U	1 UJ	1 U	1 U	1 UJ
Aroclor-1248		1 UJ	1 U	1 UJ	1 U	1 U	1 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, For RCL PCB

TABLE 6

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D2003	D2006	D2006	D3003	D3005	D5004
	SAMPLE ID	D2003W1P1	D2006W1P1	D2006W1D1	D3003W1P1	D3005W1P1	D5004W1P1
	DATE	04/05/97	04/05/97	04/05/97	04/07/97	04/07/97	04/08/97
	RESULT TYPE	Primary	Primary	Duplicate 1	Primary	Primary	Primary
Aroclor-1254		1 UJ	1 U	1 UJ	1 U	1 U	1 UJ
Aroclor-1260		1 UJ	1 U	1 UJ	1 U	1 U	1 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-de[redacted] J = estimated, For RCL PCB

TABLE 6

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D5007	D5009	D5013
	SAMPLE ID	D5007W1P1	D5009W1P1	D5013W1P1
	DATE	04/08/97	04/07/97	04/07/97
	RESULT TYPE	Primary	Primary	Primary
alpha-BHC		0.05 UJ	0.05 U	0.05 UJ
beta-BHC		0.05 UJ	0.05 U	0.05 UJ
delta-BHC		0.05 UJ	0.05 U	0.05 UJ
gamma-BHC(Lindane)		0.05 UJ	0.05 U	0.05 UJ
Heptachlor		0.05 UJ	0.05 U	0.05 UJ
Aldrin		0.05 UJ	0.05 U	0.05 UJ
Heptachlor epoxide		0.05 UJ	0.05 U	0.05 UJ
Endosulfan I		0.05 UJ	0.05 U	0.05 UJ
Dieldrin		0.1 UJ	0.1 U	0.1 UJ
4,4'-DDE		0.1 UJ	0.1 U	0.1 UJ
Endrin		0.1 UJ	0.1 U	0.1 UJ
Endosulfan II		0.1 UJ	0.1 U	0.1 UJ
4,4'-DDD		0.1 UJ	0.1 U	0.1 UJ
Endosulfan sulfate		0.1 UJ	0.1 U	0.1 UJ
4,4'-DDT		0.1 UJ	0.1 U	0.1 UJ
Methoxychlor		0.5 UJ	0.5 U	0.5 UJ
Endrin ketone		0.1 UJ	0.1 U	0.1 UJ
Endrin aldehyde		0.1 UJ	0.1 U	0.1 UJ
alpha-Chlordane		0.05 UJ	0.05 U	0.05 UJ
gamma-Chlordane		0.05 UJ	0.05 U	0.05 UJ
Toxaphene		5 UJ	5 U	5 UJ
Aroclor-1016		1 UJ	1 U	1 UJ
Aroclor-1221		2 UJ	2 U	2 UJ
Aroclor-1232		1 UJ	1 U	1 UJ
Aroclor-1242		1 UJ	1 U	1 UJ
Aroclor-1248		1 UJ	1 U	1 UJ

Values represent total concentrations unless noted < =Not detected at indicated reporting limit --- =Not analyzed

U=non-detect, J=estimated, For RCL PCB

TABLE 6

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D5007	D5009	D5013
	SAMPLE ID	D5007W1P1	D5009W1P1	D5013W1P1
	DATE	04/08/97	04/07/97	04/07/97
	RESULT TYPE	Primary	Primary	Primary
Aroclor-1254		1 UJ	1 U	1 UJ
Aroclor-1260		1 UJ	1 U	1 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-de[illegible] J = estimated, For RCL PCB

TABLE 7

ON-BASE DELINEATION
HERBICIDE RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001W1P1	D1003W1P1	D1005W1P1	D1008W1P1	D1010W1P1	D1013W1P1
	DATE	04/10/97	04/10/97	04/10/97	04/09/97	04/09/97	04/09/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,4-D		4 U	4 U	4 U	4 U	4 U	4 U
2,4,5-TP (Silvex)		1 U	1 U	1 U	1 U	1 U	1 U
2,4,5-T		1 U	1 U	1 U	1 U	1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, For RCL HERB

TABLE 7

ON-BASE DELINEATION
HERBICIDE RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D2003	D2006	D2006	D3003	D3005	D5004
	SAMPLE ID	D2003W1P1	D2006W1P1	D2006W1D1	D3003W1P1	D3005W1P1	D5004W1P1
	DATE	04/05/97	04/05/97	04/05/97	04/07/97	04/07/97	04/08/97
	RESULT TYPE	Primary	Primary	Duplicate 1	Primary	Primary	Primary
2,4-D		4 U	4 U	4 U	4 U	4 U	4 U
2,4,5-TP (Silvex)		1 U	1 U	1 U	1 U	1 U	1 U
2,4,5-T		1 U	1 U	1 U	1 U	1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-de[redacted] J = estimated, For RCL HERB

TABLE 7

ON-BASE DELINEATION
HERBICIDE RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	D5007	D5009	D5013
	SAMPLE ID	D5007W1P1	D5009W1P1	D5013W1P1
	DATE	04/08/97	04/07/97	04/07/97
	RESULT TYPE	Primary	Primary	Primary
2,4-D		4 U	4 U	4 U
2,4,5-TP (Silvex)		1 U	1 U	1 U
2,4,5-T		1 U	1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, For RCL HERB

TABLE 8

OFF-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in pg/L)	SITE	BB003	BB003	BC003	C1001	C1001	TC002
	SAMPLE ID	BB003W1P1	BB003W1P2	BC003W1P1	C1001W1P1	C1001W1D1	TC002W1P1
	DATE	05/16/97	05/16/97	05/19/97	04/23/97	04/23/97	04/25/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Duplicate 1	Primary
2,3,7,8-TCDD		6.1 U	4.8 U	1.5 U	(4.1) R	3.9 U	9.1 U
1,2,3,7,8-PeCDD		7.8 U	5.6 U	1.7 U	22.1 R	(4.6) R	14.1 U
1,2,3,4,7,8-HxCDD		7.7 U	6.1 U	2.1 U	16.6 R	4.8 R	14.7 U
1,2,3,6,7,8-HxCDD		7.1 U	4.3 U	1.5 U	22.1 R	6.4 R	11.5 U
1,2,3,7,8,9-HxCDD		6.8 U	4.7 U	1.7 U	29.6 R	8.9 R	13.2 U
1,2,3,4,6,7,8-HpCDD		21.7 R	23.5	7.7	297 R	74.2 R	14.9 U
1,2,3,4,6,7,8,9-OCDD		262 R	266	74.6 U	2100 R	506 R	160 R
2,3,7,8-TCDF		4.9 U	3.7 U	1.2 U	6.7 R	2.6 U	6.7 U
1,2,3,7,8-PeCDF		5.8 U	4.5 U	1.3 U	11.8 R	3.7 U	8.2 U
2,3,4,7,8-PeCDF		5.7 U	4.3 U	1.2 U	8.6 R	3.7 U	8.2 U
1,2,3,4,7,8-HxCDF		5.6 U	3.9 U	1.5 U	18.0 R	5.6 R	9.2 U
1,2,3,6,7,8-HxCDF		4.5 U	2.8 U	1.0 U	12.9 R	3.3 R	6.8 U
2,3,4,6,7,8-HxCDF		5.6 U	5.5	3.0 U	19.2 R	3.3 U	9.9 U
1,2,3,7,8,9-HxCDF		6.2 U	4.0 U	1.5 U	7.3 R	4.4 R	11.2 U
1,2,3,4,6,7,8-HpCDF		6.1 R	10.5	3.0	78.5 R	19.9 R	10.4 U
1,2,3,4,7,8,9-HpCDF		7.4 U	4.4 U	1.8 U	(9.1) R	(3.0)	14.4 U
1,2,3,4,6,7,8,9-OCDF		25.0	22.8	5.5	130 R	34.2 R	14.1 U
Total TCDD		6.1 U	4.8 U	1.5 U	(4.1)	3.9 U	9.1 U
Total PeCDD		7.8 U	5.6 U	1.7 U	22.1	(4.6)	14.1 U
Total HxCDD		7.2 U	4.9 U	1.7 U	101	31.3	13.0 U
Total HpCDD		50.8	51.5	16.2	574	132	14.9 U
Total TCDF		4.9 U	3.7 U	1.2 U	10.1	2.6 U	6.7 U
Total PeCDF		5.8 U	4.4 U	1.3 U	29.8	3.7 U	8.2 U
Total HxCDF		5.4 U	5.5	3.0	124	24.9	9.0 U
Total HpCDF		16.7	26.1	5.8	199	49.1	12.1 U
Total TEQ		0.565	1.1788	0.1125	39.356	7.1512	0.16

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less than Reporting Limit

U = non-detect, J = estimated, R = rejected For RCL DIOX

TABLE 8

OFF-BASE DELINEATION
DIOXIN RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in pg/L)	SITE	TC002	TC006	TC006	WM002	WM002
	SAMPLE ID	TC002W1P2	TC006W1P1	TC006W1D1	WM002W1P1	WM002W1P2
	DATE	04/25/97	05/14/97	05/14/97	04/24/97	04/24/97
	RESULT TYPE	Primary	Primary	Duplicate 1	Primary	Primary
2,3,7,8-TCDD		5.3 U	5.8 U	2.2 U	4.7 U	4.8 U
1,2,3,7,8-PeCDD		4.5 U	7.2 U	2.4 U	8.2 U	5.1 U
1,2,3,4,7,8-HxCDD		6.6 U	7.2 U	2.6 U	8.7 U	6.8 U
1,2,3,6,7,8-HxCDD		5.6 U	5.2 U	1.9 U	6.8 U	6.2 U
1,2,3,7,8,9-HxCDD		5.7 U	5.6 U	2.0 U	7.8 U	6.0 U
1,2,3,4,6,7,8-HpCDD		11.5	6.8 U	8.2	8.5 U	6.2 U
1,2,3,4,6,7,8,9-OCDD		174	85.6	80.2	12.4 U	29.3 U
2,3,7,8-TCDF		5.1 U	4.3 U	1.7 U	3.6 U	4.8 U
1,2,3,7,8-PeCDF		3.5 U	5.0 U	1.8 U	4.7 U	4.5 U
2,3,4,7,8-PeCDF		3.7 U	4.8 U	1.8 U	4.8 U	4.3 U
1,2,3,4,7,8-HxCDF		5.1 U	5.2 U	1.8 U	5.6 U	5.4 U
1,2,3,6,7,8-HxCDF		4.2 U	3.7 U	1.3 U	4.2 U	4.3 U
2,3,4,6,7,8-HxCDF		5.4 U	5.0 U	3.7	6.0 U	5.4 U
1,2,3,7,8,9-HxCDF		6.2 U	5.3 U	1.9 U	6.8 U	5.9 U
1,2,3,4,6,7,8-HpCDF		5.5 U	4.8 U	1.7 U	5.9 U	3.9 U
1,2,3,4,7,8,9-HpCDF		7.6 U	6.0 U	2.2 U	8.2 U	6.0 U
1,2,3,4,6,7,8,9-OCDF		9.5 U	6.5 U	2.3 U	9.5 U	7.0 U
Total TCDD		5.3 U	5.8 U	2.2 U	4.7 U	4.8 U
Total PeCDD		4.5 U	7.2 U	2.4 U	8.2 U	5.1 U
Total HxCDD		5.9 U	5.9 U	2.1 U	7.7 U	6.3 U
Total HpCDD		11.5	6.8 U	16.1	8.5 U	6.2 U
Total TCDF		5.1 U	4.3 U	1.7 U	3.6 U	4.8 U
Total PeCDF		3.6 U	4.9 U	1.8 U	4.8 U	4.4 U
Total HxCDF		5.1 U	4.7 U	3.7	5.5 U	5.2 U
Total HpCDF		6.3 U	5.4 U	1.9 U	6.8 U	4.7 U
Total TEQ		0.289	0.0856	0.5322	0	0

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, R = rejected For RCL DIOX

TABLE 9

OFF-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003W1P1	BC003W1P1	C1001W1P1	C1001W1D1	TC002W1P1	TC006W1P1
	DATE	05/16/97	05/19/97	04/23/97	04/23/97	04/25/97	05/14/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Chloromethane		10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane		10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride		10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride		10 U	10 U	10 U	10 U	10 U	10 U
Acetone		10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide		10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene		10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)		10 U	10 U	10 U	10 U	10 U	10 U
Chloroform		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone		10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride		10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane		10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene		10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane		10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Benzene		10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U
Bromoform		10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone		10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-de[redacted] J = estimated, For RCL VOA

TABLE 9

OFF-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003W1P1	BC003W1P1	C1001W1P1	C1001W1D1	TC002W1P1	TC006W1P1
	DATE	05/16/97	05/19/97	04/23/97	04/23/97	04/25/97	05/14/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Tetrachloroethene		10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Toluene		10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene		10 U	10 U	10 U	10 U	10 U	10 U
Styrene		10 U	10 U	10 U	10 U	10 U	10 U
Xylenes (total)		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, For RCL VOA

TABLE 9

OFF-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	TC006	WM002
	SAMPLE ID	TC006W1D1	WM002W1P1
	DATE	05/14/97	04/24/97
	RESULT TYPE	Duplicate 1	Primary
Chloromethane		10 U	10 U
Bromomethane		10 U	10 U
Vinyl chloride		10 U	10 U
Chloroethane		10 U	10 U
Methylene Chloride		10 U	10 U
Acetone		10 U	10 U
Carbon disulfide		10 U	10 U
1,1-Dichloroethene		10 U	10 U
1,1-Dichloroethane		10 U	10 U
1,2-Dichloroethene (total)		10 U	10 U
Chloroform		10 U	10 U
1,2-Dichloroethane		10 U	10 U
2-Butanone		10 U	10 U
1,1,1-Trichloroethane		10 U	10 U
Carbon tetrachloride		10 U	10 U
Bromodichloromethane		10 U	10 U
1,2-Dichloropropane		10 U	10 U
cis-1,3-Dichloropropene		10 U	10 U
Trichloroethene		10 U	10 U
Dibromochloromethane		10 U	10 U
1,1,2-Trichloroethane		10 U	10 U
Benzene		10 U	10 U
trans-1,3-Dichloropropene		10 U	10 U
Bromoform		10 U	10 U
4-Methyl-2-pentanone		10 U	10 U
2-Hexanone		10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-de[redacted] J = estimated, For RCL VOA

TABLE 9

OFF-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	TC006	WM002
	SAMPLE ID	TC006W1D1	WM002W1P1
	DATE	05/14/97	04/24/97
	RESULT TYPE	Duplicate 1	Primary
Tetrachloroethene		10 U	10 U
1,1,2,2-Tetrachloroethane		10 U	10 U
Toluene		10 U	10 U
Chlorobenzene		10 U	10 U
Ethylbenzene		10 U	10 U
Styrene		10 U	10 U
Xylenes (total)		10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, For RCL VOA

TABLE 10

OFF-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003W1P1	BC003W1P1	C1001W1P1	C1001W1D1	TC002W1P1	TC006W1P1
	DATE	05/16/97	05/19/97	04/23/97	04/23/97	04/25/97	05/14/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Phenol		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-chloroethyl)ether		10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)		10 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosodinpropylamine		10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Isophorone		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-chloroethoxy)methane		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene		10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene		10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene		10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol		25 U	25 U	25 U	25 U	25 U	25 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-de[redacted] J = estimated, For RCL SVOA

TABLE 10

OFF-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003W1P1	BC003W1P1	C1001W1P1	C1001W1D1	TC002W1P1	TC006W1P1
	DATE	05/16/97	05/19/97	04/23/97	04/23/97	04/25/97	05/14/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
2-Chloronaphthalene		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
Dimethylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene		10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene		10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
Acenaphthene		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol		25 U	25 U	25 U	25 U	25 U	25 U
4-Nitrophenol		25 UJ	25 UJ	25 U	25 U	25 U	25 UJ
Dibenzofuran		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene		10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether		10 U	10 U	10 U	10 U	10 U	10 U
Fluorene		10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol		25 U	25 U	25 U	25 U	25 U	25 U
N-Nitrosodiphenylamine (1)		10 U	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol		25 U	25 U	25 U	25 U	25 U	25 U
Phenanthrene		10 U	10 U	10 U	10 U	10 U	10 U
Anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Carbazole		10 U	10 U	10 U	10 U	10 U	10 U
Di-n-Butylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Pyrene		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, For RCL SVOA

TABLE 10

OFF-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003W1P1	BC003W1P1	C1001W1P1	C1001W1D1	TC002W1P1	TC006W1P1
	DATE	05/16/97	05/19/97	04/23/97	04/23/97	04/25/97	05/14/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Butylbenzylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Chrysene		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-ethylhexyl)Phthalate		10 U	10 U	10 U	10 U	10 U	10 U
Di-n-octylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene		10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene		10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-de[illegible], J = estimated, For RCL SVOA

TABLE 10

OFF-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	TC006	WM002
	SAMPLE ID	TC006W1D1	WM002W1P1
	DATE	05/14/97	04/24/97
	RESULT TYPE	Duplicate 1	Primary
Phenol		10 U	10 U
bis(2-chloroethyl)ether		10 U	10 U
2-Chlorophenol		10 U	10 U
1,3-Dichlorobenzene		10 U	10 U
1,4-Dichlorobenzene		10 U	10 U
1,2-Dichlorobenzene		10 U	10 U
2-Methylphenol		10 U	10 U
2,2'-oxybis(1-Chloropropane)		10 U	10 U
N-Nitrosodinpropylamine		10 U	10 U
4-Methylphenol		10 U	10 U
Hexachloroethane		10 U	10 U
Nitrobenzene		10 U	10 U
Isophorone		10 U	10 U
2-Nitrophenol		10 U	10 U
2,4-Dimethylphenol		10 U	10 U
bis(2-chloroethoxy)methane		10 U	10 U
2,4-Dichlorophenol		10 U	10 U
1,2,4-Trichlorobenzene		10 U	10 U
Naphthalene		10 U	10 U
4-Chloroaniline		10 U	10 U
Hexachlorobutadiene		10 U	10 U
4-Chloro-3-Methylphenol		10 U	10 U
2-Methylnaphthalene		10 U	10 U
Hexachlorocyclopentadiene		10 U	10 U
2,4,6-Trichlorophenol		10 U	10 U
2,4,5-Trichlorophenol		25 U	25 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, For RCL SVOA

TABLE 10

OFF-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	TC006	WM002
	SAMPLE ID	TC006W1D1	WM002W1P1
	DATE	05/14/97	04/24/97
	RESULT TYPE	Duplicate 1	Primary
2-Chloronaphthalene		10 U	10 U
2-Nitroaniline		25 U	25 U
Dimethylphthalate		10 U	10 U
Acenaphthylene		10 U	10 U
2,6-Dinitrotoluene		10 U	10 U
3-Nitroaniline		25 U	25 U
Acenaphthene		10 U	10 U
2,4-Dinitrophenol		25 U	25 U
4-Nitrophenol		25 UJ	25 U
Dibenzofuran		10 U	10 U
2,4-Dinitrotoluene		10 U	10 U
Diethylphthalate		10 U	10 U
4-Chlorophenyl-phenylether		10 U	10 U
Fluorene		10 U	10 U
4-Nitroaniline		25 U	25 U
4,6-Dinitro-2-methylphenol		25 U	25 U
N-Nitrosodiphenylamine (1)		10 U	10 U
4-Bromophenyl-phenylether		10 U	10 U
Hexachlorobenzene		10 U	10 U
Pentachlorophenol		25 U	25 U
Phenanthrene		10 U	10 U
Anthracene		10 U	10 U
Carbazole		10 U	10 U
Di-n-Butylphthalate		10 U	10 U
Fluoranthene		10 U	10 U
Pyrene		10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, For RCL SVOA

TABLE 10

OFF-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	TC006	WM002
	SAMPLE ID	TC006W1D1	WM002W1P1
	DATE	05/14/97	04/24/97
	RESULT TYPE	Duplicate 1	Primary
Butylbenzylphthalate		10 U	10 U
3,3'-Dichlorobenzidine		10 U	10 U
Benzo(a)Anthracene		10 U	10 U
Chrysene		10 U	10 U
bis(2-ethylhexyl)Phthalate		10 U	10 U
Di-n-octylphthalate		10 U	10 U
Benzo(b)fluoranthene		10 U	10 U
Benzo(k)fluoranthene		10 U	10 U
Benzo(a)pyrene		10 U	10 U
Indeno(1,2,3-cd)pyrene		10 U	10 U
Dibenzo(a,h)anthracene		10 U	10 U
Benzo(g,h,i)perylene		10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, For RCL SVOA

TABLE 11

OFF-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003W1P1	BC003W1P1	C1001W1P1	C1001W1D1	TC002W1P1	TC006W1P1
	DATE	05/16/97	05/19/97	04/23/97	04/23/97	04/25/97	05/14/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
alpha-BHC		0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U
beta-BHC		0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U
delta-BHC		0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U
gamma-BHC(Lindane)		0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U
Heptachlor		0.05 U	0.05 UJ	0.05 UJ	0.026 J	0.05 UJ	0.05 U
Aldrin		0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U
Heptachlor epoxide		0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U
Endosulfan I		0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U
Dieldrin		0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
4,4'-DDE		0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
Endrin		0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
Endosulfan II		0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
4,4'-DDD		0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
Endosulfan sulfate		0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
4,4'-DDT		0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
Methoxychlor		0.5 U	0.5 UJ	0.5 UJ	0.031 NJ	0.5 UJ	0.5 U
Endrin ketone		0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
Endrin aldehyde		0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
alpha-Chlordane		0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U
gamma-Chlordane		0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U
Toxaphene		5 U	5 UJ	5 UJ	5 UJ	5 UJ	5 U
Aroclor-1016		1 U	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Aroclor-1221		2 U	2 UJ	2 UJ	2 UJ	2 UJ	2 U
Aroclor-1232		1 U	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Aroclor-1242		1 U	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Aroclor-1248		1 U	1 UJ	1 UJ	1 UJ	1 UJ	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-de[illegible], J = estimated, For RCL PCB

TABLE 11

OFF-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003W1P1	BC003W1P1	C1001W1P1	C1001W1D1	TC002W1P1	TC006W1P1
	DATE	05/16/97	05/19/97	04/23/97	04/23/97	04/25/97	05/14/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Aroclor-1254		1 U	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Aroclor-1260		1 U	1 UJ	1 UJ	1 UJ	1 UJ	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, For RCL PCB

TABLE 11

OFF-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	TC006	WM002
	SAMPLE ID	TC006W1D1	WM002W1P1
	DATE	05/14/97	04/24/97
	RESULT TYPE	Duplicate 1	Primary
alpha-BHC		0.05 U	0.05 UJ
beta-BHC		0.05 U	0.05 UJ
delta-BHC		0.05 U	0.05 UJ
gamma-BHC(Lindane)		0.05 U	0.05 UJ
Heptachlor		0.05 U	0.05 UJ
Aldrin		0.05 U	0.05 UJ
Heptachlor epoxide		0.05 U	0.05 UJ
Endosulfan I		0.05 U	0.05 UJ
Dieldrin		0.1 U	0.1 UJ
4,4'-DDE		0.1 U	0.1 UJ
Endrin		0.1 U	0.1 UJ
Endosulfan II		0.1 U	0.1 UJ
4,4'-DDD		0.1 U	0.1 UJ
Endosulfan sulfate		0.1 U	0.1 UJ
4,4'-DDT		0.1 U	0.1 UJ
Methoxychlor		0.5 U	0.5 UJ
Endrin ketone		0.1 U	0.1 UJ
Endrin aldehyde		0.1 U	0.1 UJ
alpha-Chlordane		0.05 U	0.05 UJ
gamma-Chlordane		0.05 U	0.05 UJ
Toxaphene		5 U	5 UJ
Aroclor-1016		1 U	1 UJ
Aroclor-1221		2 U	2 UJ
Aroclor-1232		1 U	1 UJ
Aroclor-1242		1 U	1 UJ
Aroclor-1248		1 U	1 UJ

Values represent total concentrations unless noted < =Not detected at indicated reporting limit --- =Not analyzed

U=non-de[redacted] J=estimated, For RCL PCB

TABLE 11

OFF-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	TC006	WM002
	SAMPLE ID	TC006W1D1	WM002W1P1
	DATE	05/14/97	04/24/97
	RESULT TYPE	Duplicate 1	Primary
Aroclor-1254		1 U	1 UJ
Aroclor-1260		1 U	1 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, For RCL PCB

TABLE 12

OFF-BASE DELINEATION
HERBICIDE RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003W1P1	BC003W1P1	C1001W1P1	C1001W1D1	TC002W1P1	TC006W1P1
	DATE	05/16/97	05/19/97	04/23/97	04/23/97	04/25/97	05/14/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
2,4-D		4 U	4 U	4 UJ	4 UJ	4 UJ	4 U
2,4,5-TP (Silvex)		1 U	1 U	1 UJ	1 U	1 U	1 U
2,4,5-T		1 U	1 U	1 UJ	1 U	1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, For RCL HERB

TABLE 12

OFF-BASE DELINEATION
HERBICIDE RESULTS
NCBC GULFPORT
(water)

Date: 10/03/97

CONSTITUENT (Units in ug/L)	SITE	TC006	WM002
	SAMPLE ID	TC006W1D1	WM002W1P1
	DATE	05/14/97	04/24/97
	RESULT TYPE	Duplicate 1	Primary
2,4-D		4 U	4 UJ
2,4,5-TP (Silvex)		1 U	1 U
2,4,5-T		1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, For RCL HERB

PHASE 2 DATA TABLES

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ng/kg)	SITE	D1001	D1001	D1002	D1003	D1003	D1006
	SAMPLE ID	D1001D1P3	D1001D1D3	D1002D1P1	D1003D1P1	D1003D1D1	D1006D1P1
	DATE / TIME	06/26/97 / 10:20	06/26/97 / 10:20	04/10/97 / 15:00	04/10/97 / 11:10	04/10/97 / 11:10	04/09/97 / 14:55
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Duplicate 1	Primary	Primary	Duplicate 1	Primary
2,3,7,8-TCDD		58.0	54.7	217	118	150	9.9
1,2,3,7,8-PeCDD		2.6	2.9	4.1	1.9	3.2	0.72
1,2,3,4,7,8-HxCDD		4.8	4.0	5.8	(0.92)	1.1	0.96
1,2,3,6,7,8-HxCDD		10.4	9.1	10.1	1.9	2.6	2.7
1,2,3,7,8,9-HxCDD		11.1	8.1	11.8	2.5	3.3	2.7
1,2,3,4,6,7,8-HpCDD		319	292	258	41.0	46.6	60.6
1,2,3,4,6,7,8,9-OCDD		3190	2680	2450	612	674	427
2,3,7,8-TCDF		4.1	3.6	16.6	17.5	22.5	(1.7)
1,2,3,7,8-PeCDF		0.97	0.4 U	1.2	0.9 U	(0.66)	0.2 U
2,3,4,7,8-PeCDF		0.85	0.4 U	0.95	0.9 U	0.76	0.2 U
1,2,3,4,7,8-HxCDF		3.7	4.3	11.2	1.8 U	1.9 U	1.6
1,2,3,6,7,8-HxCDF		2.5	2.5	2.3	0.64 U	0.50 U	0.90
2,3,4,6,7,8-HxCDF		5.1	4.7	3.0 U	0.75 U	1.5 U	1.2 U
1,2,3,7,8,9-HxCDF		0.5 U	0.6 U	0.23	1.5 U	0.7 U	0.3 U
1,2,3,4,6,7,8-HpCDF		47.5	47.3	45.2	11.1	12.9	11.1
1,2,3,4,7,8,9-HpCDF		2.6	2.7	3.1	(0.86)	(0.75)	1.1
1,2,3,4,6,7,8,9-OCDF		165	158	111	27.4	28.9	22.4
Total TCDD		63.1	54.7	---	130	163	11.3
Total PeCDD		12.3	17.7	---	4.1	11.0	2.1
Total HxCDD		138	100	---	14.9	31.0	23.2
Total HpCDD		939	783	---	97.1	114	140
Total TCDF		25.7	20.9	---	69.5	80.6	4.1
Total PeCDF		32.2	18.2	---	58.0	57.6	7.9
Total HxCDF		76.3	73.0	---	16.3	20.3	18.8
Total HpCDF		122	133	---	28.3	33.9	26.3
Total TEQ		70.9	66.0	231	122	156	12.5

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

() = Less than Reporting Limit

U = non-detect, J = estimated For RCL DIOX EDL = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ng/kg)	SITE	D1007	D1008	D1008	D1009	D1010	D1010
	SAMPLE ID	D1007D1P3	D1008D1P1	D1008S1P1	D1009D1P1	D1010S1P1	D1010D1P3
	DATE / TIME	06/26/97 / 09:40	04/09/97 / 13:50	04/09/97 / 13:50	04/09/97 / 13:30	04/09/97 / 11:00	06/26/97 / 10:00
	DEPTH (ft)	0.00	0.00	0.50	0.00	0.50	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		9.8	28.0	12.6	40.2	25.3	27.0
1,2,3,7,8-PeCDD		0.9 U	3.4	1.4	3.0	7.9	6.1
1,2,3,4,7,8-HxCDD		1.3 U	8.4	3.8	6.0	24.2	18.7
1,2,3,6,7,8-HxCDD		1.4	25.7	11.2	17.2	45.0	43.3
1,2,3,7,8,9-HxCDD		1.6	20.2	8.5	14.0	42.1	40.3
1,2,3,4,6,7,8-HpCDD		31.6	707	287	466	1420	1410
1,2,3,4,6,7,8,9-OCDD		326 J	5250	2480 J	3700	11700	16470
2,3,7,8-TCDF		2.5	3.3	2.1 U	4.9	(2.3)	15.1
1,2,3,7,8-PeCDF		0.6 U	1.1	0.3 U	1.3	3.3	3.4
2,3,4,7,8-PeCDF		0.6 U	1.3	0.76	0.79	3.0	1.9
1,2,3,4,7,8-HxCDF		1.3	15.8	5.5	11.0	41.0	18.8
1,2,3,6,7,8-HxCDF		0.7 U	5.5	2.0	5.1	11.6	21.4
2,3,4,6,7,8-HxCDF		0.9 U	6.7	2.1	3.6 U	9.3	18.5
1,2,3,7,8,9-HxCDF		1.0 U	(0.41)	0.5 U	(0.41)	0.5 U	2.1
1,2,3,4,6,7,8-HpCDF		5.6	107	66.4	82.7	335	206
1,2,3,4,7,8,9-HpCDF		1.5 U	7.1	5.4	5.0	26.2	18.4
1,2,3,4,6,7,8,9-OCDF		23.7 J	462	221 J	282	935	1050
Total TCDD		10.9	33.1	14.8	44.8	32.4	34.5
Total PeCDD		1.4	17.1	1.9	10.5	21.2	29.2
Total HxCDD		11.7	191	93.3	138	383	361
Total HpCDD		74.8	1460	622	997	2830	2800
Total TCDF		3.8	22.5	4.7	21.6	35.9	43.4
Total PeCDF		7.0	50.6	17.8	44.5	131	78.8
Total HxCDF		7.8	173	86.0	129	403	310
Total HpCDF		16.4	262	214	260	1350	706
Total TEQ		11.2 J	52.9	23.3 J	57.5	78.9	82.8

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less th[redacted]porting Limit

U = non-detect, J = estimated For RCL DIOX [redacted] EDL = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

	SITE	D1011	D1012	D1013	D1013	D1014	D1015
	SAMPLE ID	D1011D1P1	D1012D1P1	D1013D1P1	D1013S1P1	D1014D1P3	D1015D1P2
CONSTITUENT (Units in ng/kg)	DATE / TIME	04/09/97 / 10:25	04/09/97 / 09:40	04/09/97 / 08:40	04/09/97 / 08:40	06/26/97 / 09:20	04/22/97 / 11:11
	DEPTH (ft)	0.00	0.00	0.00	0.50	0.00	0.50
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		67.7	31.2	10.2	27.9	23.7	95.6
1,2,3,7,8-PeCDD		4.4	2.7	1.5	3.1	2.4	3.9
1,2,3,4,7,8-HxCDD		10.4	6.5	2.7	6.8	4.7	6.3
1,2,3,6,7,8-HxCDD		28.2	17.4	7.8	20.3	15.8	16.8
1,2,3,7,8,9-HxCDD		25.1	16.6	6.3	18.5	13.6	16.7
1,2,3,4,6,7,8-HpCDD		849	498	207	611	454	424
1,2,3,4,6,7,8,9-OCDD		6700	4100	1860	5860	4760	3240 J
2,3,7,8-TCDF		18.6	5.9	(2.9)	5.6	7.0	15.9
1,2,3,7,8-PeCDF		2.4	1.1	0.82	0.96	1.4	1.2 U
2,3,4,7,8-PeCDF		1.9	1.3	0.96	1.3	0.98	1.1 U
1,2,3,4,7,8-HxCDF		21.5	11.5	4.9	12.9	10.7	7.5
1,2,3,6,7,8-HxCDF		11.9	6.1	2.6	4.3	4.1	4.9
2,3,4,6,7,8-HxCDF		6.9 U	4.9	2.0 U	4.0	6.4	5.6
1,2,3,7,8,9-HxCDF		1.0	(0.63)	0.51	0.7 U	0.5 U	1.6 U
1,2,3,4,6,7,8-HpCDF		153	101	41.1	140	81.9	78.9
1,2,3,4,7,8,9-HpCDF		14.8	6.9	3.6	8.5	5.5	6.7
1,2,3,4,6,7,8,9-OCDF		660	377	156	476	384	170 J
Total TCDD		79.0	36.6	12.3	30.8	28.3	98.7
Total PeCDD		22.1	9.1	4.7	10.1	8.3	10.1
Total HxCDD		221	147	56.3	164	133	136
Total HpCDD		1730	1010	428	1520	1000	932
Total TCDF		51.4	17.3	8.8	16.9	20.4	33.6
Total PeCDF		79.2	41.4	18.5	49.3	36.2	46.2
Total HxCDF		218	132	54.7	172	126	120
Total HpCDF		570	337	143	486	285	211
Total TEQ		100	50.7	18.8	51.3	42.2	113 J

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less than Reporting Limit

U = non-detect, J = estimated For RCL DIOX

EDL = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ng/kg)	SITE	D1015	D1016	D1017	D1017	D1018	D1019
	SAMPLE ID	D1015D1D2	D1016D1P2	D1017D2P1	D1017D2D1	D1018D2P1	D1019D2P1
	DATE / TIME	04/22/97 / 11:11	04/22/97 / 10:21	10/09/97 / 10:45	10/09/97 / 10:45	10/09/97 / 10:35	10/09/97 / 09:12
	DEPTH (ft)	0.50	0.50	0.00	0.00	0.00	0.00
	RESULT TYPE	Duplicate 1	Primary	Primary	Duplicate 1	Primary	Primary
2,3,7,8-TCDD		80.3	1.3 U	16.4	19.8	1.3	3.5
1,2,3,7,8-PeCDD		3.2	1.5 U	5.8	6.4	1.7	9.7
1,2,3,4,7,8-HxCDD		4.7	3.0	14.3	17	5.3	24.2
1,2,3,6,7,8-HxCDD		14.1	6.3	55	64.3	10.5	53
1,2,3,7,8,9-HxCDD		14.2	6.6	38.2	44	10.9 J	50.7
1,2,3,4,6,7,8-HpCDD		369	148	2270	2680	371	1900 J
1,2,3,4,6,7,8,9-OCDD		2700 J	1410 J	2000 J	2000 J	3040 J	18240 J
2,3,7,8-TCDF		11.7	1.2 U	2	2.4	0.8 U	2.6
1,2,3,7,8-PeCDF		0.5 U	1.1 U	1.2	1.4	0.63	5
2,3,4,7,8-PeCDF		0.5 U	1.1 U	2.2	2.7	0.78	5.2
1,2,3,4,7,8-HxCDF		5.7	2.0	12.9	16.7 J	2.6 U	41.3 J
1,2,3,6,7,8-HxCDF		4.0	1.8	4.6	5.6	2.2	18.5
2,3,4,6,7,8-HxCDF		4.3	3.3	10.9 J	11.8 J	4.5 U	25.8 J
1,2,3,7,8,9-HxCDF		0.8 U	1.6 U	0.4 U	0.2 U	0.2 U	0.97
1,2,3,4,6,7,8-HpCDF		64.3	21.3	74.3	88.9	56.8	320 J
1,2,3,4,7,8,9-HpCDF		4.9	1.6 U	5.5	6.5	2.9	18 J
1,2,3,4,6,7,8,9-OCDF		141 J	48.1 J	177	222	156 J	1050 J
Total TCDD		85.6	1.3 U	21.2	24.4	2.7	15.3
Total PeCDD		17.2	1.5 U	29.5	41.2	9	50.9
Total HxCDD		113	45.8	534	624	147	736
Total HpCDD		814	308	4750	5560	1490	7250
Total TCDF		26.7	2.3	23.1	24.5	9.1	58
Total PeCDF		56.9	8.8	69.3	80.4	24.9	189
Total HxCDF		103	22.6	202	220	66.9	532
Total HpCDF		161	53.4	216	258	166	793
Total TEQ		95.0 J	5.45 J	59.9 J	70.6 J	13.0 J	74.6 J

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL DIOX EDL = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ng/kg)	SITE	D1020	D1021	D1022	D1023	D2001	D2001
	SAMPLE ID	D1020D2P1	D1021D2P1	D1022D2P1	D1023D2P1	D2001D1P3	D2001D1D3
	DATE / TIME	10/09/97 / 10:05	10/09/97 / 11:10	10/09/97 / 11:55	10/09/97 / 11:45	06/24/97 / 14:30	06/24/97 / 14:30
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Duplicate 1
2,3,7,8-TCDD		0.2 U	0.4 U	10.2	0.3 U	3830	3910
1,2,3,7,8-PeCDD		0.3 U	2.7	5.6	0.4 U	18.9	18.6
1,2,3,4,7,8-HxCDD		0.47	11.4	14.1	(0.19)	25.0	25.8
1,2,3,6,7,8-HxCDD		0.6	20.4	27	0.41	54.7	59.7
1,2,3,7,8,9-HxCDD		0.95	22.7 J	31.1 J	(0.26)	51.3	54.0
1,2,3,4,6,7,8-HpCDD		7.7	642	769	5.6	1690	1790
1,2,3,4,6,7,8,9-OCDD		88.4	4550	7550	62.6	15140 J	16020
2,3,7,8-TCDF		0.43	0.91 U	2.3	0.59 U	136	144
1,2,3,7,8-PeCDF		0.3 U	1.6	1.7	0.3 U	6.0	5.6
2,3,4,7,8-PeCDF		0.34	1.5	2	0.3 U	5.0	5.6
1,2,3,4,7,8-HxCDF		0.81 U	7.5 J	9.8 J	0.37 U	20.6	21.1
1,2,3,6,7,8-HxCDF		0.54 U	12.9	8.1	0.32	13.8	17.1
2,3,4,6,7,8-HxCDF		1.1 U	19.3 J	12.5 J	0.53 U	29.6	17.7
1,2,3,7,8,9-HxCDF		0.36	0.72	0.89	0.3 U	2.8 U	2.5 U
1,2,3,4,6,7,8-HpCDF		2.3	325	152	2.9 U	315	336
1,2,3,4,7,8,9-HpCDF		0.6	19.5	9.6	0.3 U	13.4	16.2
1,2,3,4,6,7,8,9-OCDF		4.4 U	536	355	3.9 U	1100 J	1060
Total TCDD		0.2 U	0.62	18.6	0.3 U	3950	4040
Total PeCDD		0.3 U	9.2	18.9	(0.11)	145	149
Total HxCDD		3.4	180	263	2	787	772
Total HpCDD		17.6	1140	1650	11.8	5250	5120
Total TCDF		0.95	10.1	21.5	0.6	543	574
Total PeCDF		0.78	60.8	55.9	1.3	754	773
Total HxCDF		6.1	300	207	3.5	607	657
Total HpCDF		5	690	460	5.7	872	951
Total TEQ		0.645	26.6 J	41.9 J	0.237	3910 J	3990

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

() = Less than Reporting Limit

U = non-detect, J = estimated For RCL DIOX

EDL = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ng/kg)	SITE	D2002	D2003	D2004	D2005	D2006	D2006
	SAMPLE ID	D2002D1P2	D2003D1P3	D2004D1P2	D2005D1P3	D2006D1P2	D2006D1D2
	DATE / TIME	04/04/97 / 13:46	06/25/97 / 13:40	04/04/97 / 13:26	06/25/97 / 13:52	04/04/97 / 15:48	04/04/97 / 15:48
	DEPTH (ft)	0.50	0.00	0.50	0.00	0.50	0.50
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Duplicate 1
2,3,7,8-TCDD		44.7	283	1.8	7.1	0.8 UJ	0.2 U
1,2,3,7,8-PeCDD		0.9 U	5.1	0.3 U	1.3	0.9 UJ	0.3 U
1,2,3,4,7,8-HxCDD		1.0 U	9.9	1.2	3.1	1.0 UJ	0.3 U
1,2,3,6,7,8-HxCDD		4.0	29.3	2.7	9.5	0.8 UJ	0.64
1,2,3,7,8,9-HxCDD		2.0	23.4	2.5	7.7	0.8 UJ	1.0
1,2,3,4,6,7,8-HpCDD		113	732	74.7	251	19.8	19.8
1,2,3,4,6,7,8,9-OCDD		995	5920	580	2380	213	207
2,3,7,8-TCDF		4.0	16.8	0.2 U	1.1	0.7 UJ	0.2 U
1,2,3,7,8-PeCDF		0.8 U	2.2	0.2 U	0.41	0.7 UJ	0.2 U
2,3,4,7,8-PeCDF		0.7 U	2.6	0.2 U	0.57	0.7 UJ	0.2 U
1,2,3,4,7,8-HxCDF		2.7	12.5	2.6	3.6	0.8 UJ	0.59
1,2,3,6,7,8-HxCDF		0.5 U	6.7	0.65	1.9	0.5 UJ	0.25
2,3,4,6,7,8-HxCDF		1.3	11.2	1.3	3.7	0.7 UJ	0.64
1,2,3,7,8,9-HxCDF		0.7 U	0.6 U	0.3 U	0.6 U	0.8 UJ	0.2 U
1,2,3,4,6,7,8-HpCDF		31.2	96.5	14.6	38.8	6.1	5.3
1,2,3,4,7,8,9-HpCDF		1.7	6.2	0.91	2.7	0.9 U	0.3 U
1,2,3,4,6,7,8,9-OCDF		92.8	260	50.4	151	15.8	13.7
Total TCDD		44.7	303	1.8	8.3	0.8 U	0.2 U
Total PeCDD		0.9 U	18.3	0.3 U	4.7	0.9 U	0.81
Total HxCDD		22.7	232	8.4	76.8	16.6	10.6
Total HpCDD		204	1760	194	576	53.3	43.0
Total TCDF		10.4	46.9	0.73	5.2	0.7 U	0.50
Total PeCDF		21.5	106	2.4	13.2	2.4	3.4
Total HxCDF		30.3	190	20.6	62.3	3.0	6.6
Total HpCDF		110	262	39.0	122	15.6	12.9
Total TEQ		48.6	312	4.43	16.6	0.488	0.774

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL DIOX EDL = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

	SITE	D2007	D2008	D2009	D2010	D2011	D2012
	SAMPLE ID	D2007D1P2	D2008D1P3	D2009D1P1	D2010D2P1	D2011D2P1	D2012D2P1
CONSTITUENT (Units in ng/kg)	DATE / TIME	04/04/97 / 10:51	06/25/97 / 14:20	04/08/97 / 16:00	10/10/97 / 14:53	10/10/97 / 15:15	10/10/97 / 15:30
	DEPTH (ft)	0.50	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		0.2 U	5.8	427	468	404	757
1,2,3,7,8-PeCDD		0.2 U	0.5 U	3.2	3	6.5	13.2
1,2,3,4,7,8-HxCDD		0.3 U	2.1	4.4	5.7	14.2	29.5
1,2,3,6,7,8-HxCDD		0.54	5.7	10.5	13.4	40.8	76.3
1,2,3,7,8,9-HxCDD		7.8	5.4	10.3	11.8 J	32.8 J	63.6 J
1,2,3,4,6,7,8-HpCDD		14.0	149	325	522	1270	1930
1,2,3,4,6,7,8,9-OCDD		174	1610	2900	4950	2000 J	1990 J
2,3,7,8-TCDF		0.2 U	1.5	24.4	18.5	29	31.7
1,2,3,7,8-PeCDF		0.2 U	0.3 U	1.5	0.87	2.5	4.8
2,3,4,7,8-PeCDF		0.2 U	0.3 U	1.2	1	3.1	5.5
1,2,3,4,7,8-HxCDF		0.2 U	3.3	4.5	7 J	9.4 J	18.5 J
1,2,3,6,7,8-HxCDF		0.1 U	1.7	3.1	3.7	8.5	15.2
2,3,4,6,7,8-HxCDF		0.38	3.1	3.8	7 J	11.5	18.1 J
1,2,3,7,8,9-HxCDF		0.2 U	0.5 U	1.1 U	1.1 U	0.44	0.61
1,2,3,4,6,7,8-HpCDF		0.76	29.0	56.4	147	189	350
1,2,3,4,7,8,9-HpCDF		0.3 U	2.1	3.8	5.8	10.1	20.4
1,2,3,4,6,7,8,9-OCDF		3.4	90.0	165	315	370	732
Total TCDD		0.83	7.0	443	482	420	802
Total PeCDD		2.4	1.6	16.1	9.9	33.2	58.8
Total HxCDD		13.9	49.5	122	167	518	623
Total HpCDD		19.6	347	913	1450	5640	4630
Total TCDF		0.2 U	5.4	96.7	43.7	97.7	143
Total PeCDF		0.2 U	15.5	131	102	210	271
Total HxCDF		0.38	45.2	94.3	166	291	490
Total HpCDF		0.99	82.7	159	470	556	1010
Total TEQ		1.20	11.6	442	489	441 J	818 J

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL DIOX

EDL = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ng/kg)	SITE	D2012	D2013	D2031	D2032	D2033	D3001
	SAMPLE ID	D2012D2D1	D2013D2P1	D2031D2P1	D2032D2P1	D2033D2P1	D3001D1P2
	DATE / TIME	10/10/97 / 15:30	10/10/97 / 15:50	11/07/97 / 10:30	11/07/97 / 11:00	11/07/97 / 11:30	04/07/97 / 16:06
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.50
	RESULT TYPE	Duplicate 1	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		555	2.1	1110 J	196	649 J	80.2
1,2,3,7,8-PeCDD		16.1	0.9 U	28.8	ND	28.2	4.3
1,2,3,4,7,8-HxCDD		37.9	1.5 U	65.8	92.3	57.9 J	10.1
1,2,3,6,7,8-HxCDD		96.4	1.8	163	241	130	32.7
1,2,3,7,8,9-HxCDD		80 J	1.6	87.1 J	137 J	115 J	28.1
1,2,3,4,6,7,8-HpCDD		2280	48.6	4060 J	6710 J	3320 J	943
1,2,3,4,6,7,8,9-OCDD		1990 J	331	33520 J	54570 J	21900 J	7780
2,3,7,8-TCDF		28.9	0.6 U	28.1	28.6	72.5	6.3
1,2,3,7,8-PeCDF		5.4	0.6 U	12.5	10.6	8.7	5.1
2,3,4,7,8-PeCDF		6	0.6 U	14.1	11.2	8.5	4.4
1,2,3,4,7,8-HxCDF		26.7 J	0.9 U	127 J	222 J	34.5 J	25.9
1,2,3,6,7,8-HxCDF		18.7	0.7 U	39.7	48.1	36.7 J	19.9
2,3,4,6,7,8-HxCDF		20.8 J	0.9 U	63.8 J	97.3 J	53.4	21.8
1,2,3,7,8,9-HxCDF		1.1	1 U	0.9 U	1.1 U	16.1 J	1.3 U
1,2,3,4,6,7,8-HpCDF		390	6.3	698	1120 J	684	264
1,2,3,4,7,8,9-HpCDF		22.5	1.3 U	39.4	54.8	31.8	15.2
1,2,3,4,6,7,8,9-OCDF		766	16.9	1190	3090 J	1120	887
Total TCDD		588	2.1	1190	221	696	80.2
Total PeCDD		66.8	0.9 U	121	126	132	15.2
Total HxCDD		770	4.4	1380	1640	1320	300
Total HpCDD		5260	118	15030	14710	7280	2340
Total TCDF		118	0.5 U	167	113	224	35.5
Total PeCDF		280	2	511	416	510	158
Total HxCDF		586	7.6	1170	1120	878	328
Total HpCDF		1110	11.3	2060	1170	1470	773
Total TEQ		627 J	3.32	1270 J	441 J	783 J	120

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

ND = Not D[redacted]ed

U = non-detect, J = estimated For RCL DIOX [redacted] EDL = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ng/kg)	SITE	D3002	D3002	D3003	D3004	D3005	D3006
	SAMPLE ID	D3002D1P2	D3002D1D2	D3003D1P2	D3004D1P2	D3005D1P2	D3006D1P2
	DATE / TIME	04/07/97 / 14:51	04/07/97 / 14:51	04/07/97 / 15:21	04/07/97 / 14:21	04/07/97 / 11:11	04/07/97 / 08:41
	DEPTH (ft)	0.50	0.50	0.50	0.50	0.50	0.50
	RESULT TYPE	Primary	Duplicate 1	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		2.7 U	1.6 U	6.2 U	15.7 U	4.5	1.2 U
1,2,3,7,8-PeCDD		2.6 U	1.7 U	6.6 U	14.3 U	2.0 U	1.2 U
1,2,3,4,7,8-HxCDD		2.9 U	2.0 U	6.5 U	12.2 U	2.3 U	1.3 U
1,2,3,6,7,8-HxCDD		2.7 U	1.8 U	(5.3)	11.1 U	4.8	1.2 U
1,2,3,7,8,9-HxCDD		2.6 U	2.4	5.7 U	10.7 U	2.0 U	1.2 U
1,2,3,4,6,7,8-HpCDD		144	148	267	56.7	99.8	10.7
1,2,3,4,6,7,8,9-OCDD		1450	1440	3180	410	1080	66.7
2,3,7,8-TCDF		2.7 U	1.6 U	0.89	17.5 UJ	1.1	1.2 U
1,2,3,7,8-PeCDF		2.2 U	1.3 U	4.8 U	14.5 U	1.5 U	0.9 U
2,3,4,7,8-PeCDF		2.1 U	1.3 U	4.7 U	14.0 U	1.5 U	0.9 U
1,2,3,4,7,8-HxCDF		2.3 U	1.6 U	5.2 U	11.6 U	3.5	1.1 U
1,2,3,6,7,8-HxCDF		1.9 U	1.3 U	4.2 U	9.3 U	1.4 U	0.9 U
2,3,4,6,7,8-HxCDF		2.3 U	1.6 U	5.2 U	11.6 U	1.8 U	1.1 U
1,2,3,7,8,9-HxCDF		2.6 U	1.8 U	5.7 U	12.8 U	2.0 U	1.3 U
1,2,3,4,6,7,8-HpCDF		23.2	18.6	42.3	9.0 U	21.0	2.0
1,2,3,4,7,8,9-HpCDF		2.7 U	2.0 U	5.9 U	14.0 U	(2.0)	1.3 U
1,2,3,4,6,7,8,9-OCDF		183	202	218	16.1 U	73.3	4.0
Total TCDD		2.7 U	1.6 U	6.2 U	15.7 U	4.5	1.2 U
Total PeCDD		2.6 U	1.7 U	6.6 U	14.3 U	3.8	1.2 U
Total HxCDD		11.3	22.0	18.0	11.3 U	12.6	1.2 U
Total HpCDD		310	308	517	56.7	205	22.3
Total TCDF		2.7 U	1.6 U	6.2 U	17.5 U	7.0	1.2 U
Total PeCDF		2.1 U	6.4	4.8 U	14.2 U	3.9	0.9 U
Total HxCDF		11.9	28.5	36.2	11.2 U	25.1	1.1 U
Total HpCDF		109	77.5	170	11.0 U	65.6	4.3
Total TEQ		3.30	3.56	7.11	0.977	7.82	0.198

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less than Reporting Limit

U = non-detect, J = estimated For RCL DIOX

EDL = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ng/kg)	SITE	D3007	D3008	D4001	D4002	D4003	D5001
	SAMPLE ID	D3007D1P3	D3008D1P3	D4001D1P2	D4002D1P3	D4003D1P2	D5001D1P3
	DATE / TIME	06/24/97 / 14:00	06/25/97 / 14:30	04/07/97 / 10:36	06/26/97 / 12:30	04/07/97 / 09:11	06/24/97 / 09:00
	DEPTH (ft)	0.00	0.00	0.50	0.00	0.50	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		1.3 U	0.3 U	15.8 UJ	1.4	0.6 U	17.4
1,2,3,7,8-PeCDD		2.4	0.3 U	8.8 U	3.8	0.8 U	164
1,2,3,4,7,8-HxCDD		3.5	0.5 U	7.7 U	10.1	1.6	311
1,2,3,6,7,8-HxCDD		7.9	0.4 U	7.0 U	21.2	3.5	135
1,2,3,7,8,9-HxCDD		9.6	0.4 U	6.8 U	21.2	3.8	169
1,2,3,4,6,7,8-HpCDD		139	5.6	151	703	102	1540
1,2,3,4,6,7,8,9-OCDD		1240	102	1370	6260	1010	4320
2,3,7,8-TCDF		1.2 U	0.2 U	12.6 U	3.0	0.94	52.5
1,2,3,7,8-PeCDF		1.2 U	0.2 U	7.4 U	0.4 U	0.5 U	96.2
2,3,4,7,8-PeCDF		1.1 U	0.2 U	7.2 U	4.3	0.5 U	193
1,2,3,4,7,8-HxCDF		2.6	0.3 U	6.6 U	24.2	3.1	8310
1,2,3,6,7,8-HxCDF		1.9	0.3 U	5.3 U	9.2	1.1	1010
2,3,4,6,7,8-HxCDF		2.9	0.61	6.5 U	22.5	1.5	2350
1,2,3,7,8,9-HxCDF		2.6 U	0.4 U	7.3 U	0.6 U	0.8 U	67.6
1,2,3,4,6,7,8-HpCDF		33.2	0.86	34.9	224	19.9	5270
1,2,3,4,7,8,9-HpCDF		(2.8)	0.4 U	8.0 U	12.6	1.9	4340
1,2,3,4,6,7,8,9-OCDF		140	2.2	110	516	69.1	13480
Total TCDD		1.3 U	0.3 U	15.8 U	2.3	0.6 U	160
Total PeCDD		6.3	0.3 U	8.8 U	19.0	0.8 U	641
Total HxCDD		54.0	2.3	12.5	252	34.1	1880
Total HpCDD		283	13.6	396	2100	286	2850
Total TCDF		3.7	0.2 U	12.6 U	66.3	0.94	512
Total PeCDF		12.8	0.2 U	7.3 U	348	10.7	8960
Total HxCDF		17.7	0.61	33.3	358	24.7	27240
Total HpCDF		78.7	0.86	79.6	692	63.3	16280
Total TEQ		7.17	0.229	3.34	32.8	3.87	1670

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less tha[redacted]porting Limit

U = non-detect, J = estimated For RCL DIOX [redacted] EDL = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ng/kg)	SITE	D5002	D5003	D5004	D5004	D5005	D5006
	SAMPLE ID	D5002D1P3	D5003D1P2	D5004D1P2	D5004S1P1	D5005D1P2	D5006D1P2
	DATE / TIME	06/24/97 / 13:20	04/08/97 / 10:06	04/08/97 / 15:01	04/08/97 / 15:10	04/07/97 / 14:41	04/08/97 / 09:36
	DEPTH (ft)	0.00	0.50	0.25	0.50	0.50	0.50
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		0.6 U	0.9 U	1.2 U	0.4 U	(14.6)	1.8 U
1,2,3,7,8-PeCDD		9.2	0.9 U	1.1 U	0.5 U	15.0 U	1.6 U
1,2,3,4,7,8-HxCDD		12.9	0.8 U	1.0 U	0.8 U	11.7 U	1.4 U
1,2,3,6,7,8-HxCDD		21.6	0.7 U	0.9 U	1.1	10.7 U	1.3 U
1,2,3,7,8,9-HxCDD		23.8	0.7 U	0.9 U	2.1	10.3 U	1.3 U
1,2,3,4,6,7,8-HpCDD		256	10.0 J	11.0	8.2	164	13.7 J
1,2,3,4,6,7,8,9-OCDD		1770	79.3 J	118	65.8	1290	141 J
2,3,7,8-TCDF		0.6 U	0.9 U	1.3 U	0.9 U	2.7	1.7 U
1,2,3,7,8-PeCDF		0.5 U	0.8 U	0.9 U	0.4 U	11.2 U	1.3 U
2,3,4,7,8-PeCDF		0.5 U	0.8 U	0.9 U	0.4 U	10.9 U	1.2 U
1,2,3,4,7,8-HxCDF		4.7	6.1	0.8 U	0.6 U	10.3 U	18.7
1,2,3,6,7,8-HxCDF		3.2	0.6 U	0.6 U	0.5 U	8.3 U	0.9 U
2,3,4,6,7,8-HxCDF		5.2	2.2	0.8 U	0.6 U	10.3 U	2.2
1,2,3,7,8,9-HxCDF		1.3 U	0.7 U	0.9 U	0.7 U	11.4 U	1.3 U
1,2,3,4,6,7,8-HpCDF		44.7	5.0	1.6	1.3	32.8	6.3
1,2,3,4,7,8,9-HpCDF		3.8	0.7 U	0.8 U	1.0 U	11.5 U	1.3 U
1,2,3,4,6,7,8,9-OCDF		278	6.6 J	3.6	1.4	150	8.2 J
Total TCDD		0.6 U	0.9 U	1.2 U	1.8	(14.6)	1.8 U
Total PeCDD		14.7	0.9 U	1.1 U	0.89	15.0 U	1.5 U
Total HxCDD		139	0.7 U	0.9 U	7.3	19.7	1.3 U
Total HpCDD		544	19.7	22.0	18.5	306	28.8
Total TCDF		2.7	4.7	1.3 U	14.2	13.8 U	13.1
Total PeCDF		4.7	10.9	0.9 U	1.0	11.1 U	14.5
Total HxCDF		61.7	15.3	0.8 U	1.5	46.1	19.7
Total HpCDF		100	11.0	4.3	1.3	73.8	19.5
Total TEQ		16.8	1.07 J	0.248	0.482	18.3	2.44 J

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less than Reporting Limit

U = non-detect, J = estimated For RCL DIOX

EDL = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

	SITE	D5007	D5007	D5008	D5009	D5010	D5011
	SAMPLE ID	D5007S1P1	D5007D1P3	D5008D1P2	D5009D1P2	D5010D1P2	D5011D1P2
CONSTITUENT (Units in ng/kg)	DATE / TIME	04/08/97 / 15:25	06/24/97 / 09:45	04/07/97 / 14:31	04/07/97 / 13:51	04/07/97 / 13:26	04/07/97 / 10:57
	DEPTH (ft)	0.50	0.00	0.50	0.50	0.50	0.50
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		4.0	0.9 U	1.5 U	0.4 U	0.6 U	3.5
1,2,3,7,8-PeCDD		3.8	1.0 U	1.6 U	0.3 U	0.4 U	1.0 U
1,2,3,4,7,8-HxCDD		7.5	1.6 UJ	1.4 U	0.83	0.5 U	3.2
1,2,3,6,7,8-HxCDD		20.8	1.7 J	1.3 U	2.3	0.5 U	10.4
1,2,3,7,8,9-HxCDD		17.5	1.4 UJ	1.2 U	2.2	0.5 U	11.5
1,2,3,4,6,7,8-HpCDD		657	33.1	39.0	62.6	12.3	316
1,2,3,4,6,7,8,9-OCDD		5550	441	456	551	173	3530
2,3,7,8-TCDF		1.2	(0.34)	1.6 U	0.5 U	0.6 U	2.2
1,2,3,7,8-PeCDF		(0.90)	0.9 U	1.2 U	0.3 U	0.4 U	0.7 U
2,3,4,7,8-PeCDF		(1.1)	0.8 U	1.2 U	0.3 U	0.4 U	0.7 U
1,2,3,4,7,8-HxCDF		31.9	5.8 J	1.4 U	10.4	0.74	25.3
1,2,3,6,7,8-HxCDF		4.4	1.2 UJ	1.1 U	0.80	0.4 U	3.6
2,3,4,6,7,8-HxCDF		4.9	1.4 UJ	1.4 U	1.8 U	0.77 U	3.8 U
1,2,3,7,8,9-HxCDF		2.1 U	1.6 UJ	1.6 U	0.4 U	0.6 U	1.0 U
1,2,3,4,6,7,8-HpCDF		90.5	9.0	7.2	13.4	2.4 U	42.7
1,2,3,4,7,8,9-HpCDF		3.2 U	2.0 U	1.5 U	2.1 U	0.6 U	4.5
1,2,3,4,6,7,8,9-OCDF		268	23.3	23.5	28.1	7.7 U	151
Total TCDD		4.0	0.9 U	1.5 U	0.4 U	0.6 U	3.5
Total PeCDD		8.7	1.0 U	1.6 U	0.3 U	0.4 U	1.0 U
Total HxCDD		131	4.0	3.6	10.0	0.5 U	68.2
Total HpCDD		1190	39.2	127	125	21.7	592
Total TCDF		11.2	0.8 U	1.6 U	1.1	0.6 U	24.9
Total PeCDF		45.6	9.8	2.2	6.8	1.2	17.9
Total HxCDF		149	28.3	4.8	24.2	3.2	86.2
Total HpCDF		90.5	27.6	7.2	13.4	2.4	161
Total TEQ		28.6	1.67 J	0.842	2.99	0.370	16.4

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less tha[redacted]porting Limit

U = non-detect, J = estimated For RCL DIOX [redacted] EDL = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ng/kg)	SITE	D5011	D5012	D5013	D5013	D5014	D5015
	SAMPLE ID	D5011D1D2	D5012D1P3	D5013D1P2	D5013S1P1	D5014D1P2	D5015D1P2
	DATE / TIME	04/07/97 / 10:57	06/24/97 / 13:45	04/07/97 / 09:46	04/08/97 / 15:45	04/07/97 / 09:11	04/07/97 / 08:41
	DEPTH (ft)	0.50	0.00	0.50	0.00	0.50	0.50
	RESULT TYPE	Duplicate 1	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		18.3 U	6.2	6.9 U	0.3 U	11.2 U	5.2 U
1,2,3,7,8-PeCDD		7.8 U	3.7	6.2 U	0.4 U	7.0 U	6.4 U
1,2,3,4,7,8-HxCDD		8.0 U	9.1	6.6 U	0.99	6.9 U	11.0
1,2,3,6,7,8-HxCDD		7.3 U	20.8	10.3	3.0	15.9	32.1
1,2,3,7,8,9-HxCDD		7.0 U	21.8	9.6	4.0	19.2	38.6
1,2,3,4,6,7,8-HpCDD		457 J	670	335	66.3	440	868
1,2,3,4,6,7,8,9-OCDD		4800 J	6390	2890	547	4420	9070 J
2,3,7,8-TCDF		34.3 U	2.2	1.5	0.51	5.2 U	5.2 U
1,2,3,7,8-PeCDF		8.6 U	1.2	4.6 U	0.3 U	5.5 U	5.2 U
2,3,4,7,8-PeCDF		8.3 U	1.8	4.4 U	0.3 U	5.3 U	5.0 U
1,2,3,4,7,8-HxCDF		34.7	11.0	14.6	1.3	19.1	27.8
1,2,3,6,7,8-HxCDF		6.3 U	4.7	4.4 U	0.70	5.0 U	9.7
2,3,4,6,7,8-HxCDF		7.8 U	8.0	5.4 U	0.76	6.2 U	8.2 U
1,2,3,7,8,9-HxCDF		8.6 U	1.1 U	6.0 U	0.5 U	6.9 U	4.5 U
1,2,3,4,6,7,8-HpCDF		5.5 U	79.1	32.5	8.7	52.9	114
1,2,3,4,7,8,9-HpCDF		8.6 U	7.8	5.9 U	0.7 U	6.0 U	12.7 U
1,2,3,4,6,7,8,9-OCDF		617 J	582	120	20.9	220	259 J
Total TCDD		18.3 U	6.2	6.9 U	1.9	11.2 U	18.0
Total PeCDD		7.8 U	5.9	6.2 U	2.3	7.0 U	92.4
Total HxCDD		52.8	150	10.3	23.8	35.1	218
Total HpCDD		812	1250	654	132	723	1560
Total TCDF		34.3 U	14.7	20.2	7.2	11.7 U	18.2
Total PeCDF		109	35.8	14.3	5.5	57.3	96.8
Total HxCDF		71.3	130	71.6	14.5	90.4	156
Total HpCDF		115	234	112	24.0	183	358
Total TEQ		13.5 J	30.3	10.3	2.44	15.0	31.1 J

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL DIOX

EDL = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ng/kg)	SITE	D5016	D5017	D5018	D5019	D5020	D5021
	SAMPLE ID	D5016D1P2	D5017D1P2	D5018D2P1	D5019D2P1	D5020D2P1	D5021D2P1
	DATE / TIME	04/08/97 / 15:06	04/08/97 / 15:06	10/10/97 / 08:35	10/10/97 / 10:45	10/10/97 / 09:15	10/10/97 / 09:45
	DEPTH (ft)	0.50	0.50	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		0.8 U	2.7	4.9	3.1	2.6	7.9
1,2,3,7,8-PeCDD		0.9 U	0.8 U	1.4	2	2.6	3.7
1,2,3,4,7,8-HxCDD		1.3	2.9	1.3	5	7.6	11.1
1,2,3,6,7,8-HxCDD		4.7	9.4	3.7	13.1	17.5	26.3
1,2,3,7,8,9-HxCDD		4.5	6.9	3	12.3	16.6	30.9
1,2,3,4,6,7,8-HpCDD		140	273 J	103	387	512	796
1,2,3,4,6,7,8,9-OCDD		1050	2580	1110	3900	3850	2000 J
2,3,7,8-TCDF		1.7	0.7 U	1.8	1.1	1.6	4.1
1,2,3,7,8-PeCDF		0.7 U	0.6 U	2.1	0.6 U	1.2	1.9
2,3,4,7,8-PeCDF		0.6 U	0.6 U	1.7	0.95	1.9	2.2
1,2,3,4,7,8-HxCDF		2.5	28.2	8.6 J	47.7 J	8.3 J	8 J
1,2,3,6,7,8-HxCDF		1.1	3.1	2.6	2.7	5.2	8.6
2,3,4,6,7,8-HxCDF		2.1	5.0	2.9 J	5.9	7.9 J	6.2
1,2,3,7,8,9-HxCDF		0.8 U	0.7 U	0.26	0.8 U	0.37	0.83
1,2,3,4,6,7,8-HpCDF		25.9	44.2	35.3	74.1	120	146
1,2,3,4,7,8,9-HpCDF		1.2	5.9	3	5.4	9.7	11.7
1,2,3,4,6,7,8,9-OCDF		77.9	123	60.1	177	292	379
Total TCDD		0.8 U	2.7	7.8	3.1	4.4	20.4
Total PeCDD		3.3	0.8 U	3.7	6	8.3	14.4
Total HxCDD		33.5	65.9	32.1	95.9	115	254
Total HpCDD		302	804	228	828	911	1700
Total TCDF		8.1	4.5	15.1	11.1	21.3	30.8
Total PeCDF		12.9	16.9	16.4	32.3	69.8	63.5
Total HxCDF		34.7	98.8	35.5	104	186	206
Total HpCDF		74.8	148	87.2	242	386	161
Total TEQ		4.59	14.2 J	12.0 J	22.0 J	22.0 J	32.0 J

Values represent total concentrations unless noted < = Not detected at indicated reporting limit — = Not analyzed

U = non-detect, J = estimated For RCL DIOX

EDL = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ng/kg)	SITE	D5027	D5030	D5032	D5033	D5034	D5035
	SAMPLE ID	D5027DPP1	D5030DPP1	D5032D2P1	D5033D2P1	D5034D2P1	D5035D2P1
	DATE / TIME	08/01/97 / 12:00	08/01/97 / 12:00	10/10/97 / 08:35	10/10/97 / 10:45	10/10/97 / 09:15	10/10/97 / 09:45
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		0.17 U	8.4	4.9	3.1	2.6	7.9
1,2,3,7,8-PeCDD		1.9	106	1.4	2	2.6	3.7
1,2,3,4,7,8-HxCDD		4.4	184	1.3	5	7.6	11.1
1,2,3,6,7,8-HxCDD		3	78.3	3.7	13.1	17.5	26.3
1,2,3,7,8,9-HxCDD		2.8	92.4	3	12.3	16.6	30.9
1,2,3,4,6,7,8-HpCDD		35.5	851	103	387	512	796
1,2,3,4,6,7,8,9-OCDD		186	2610	1110	3900	3850	2000 J
2,3,7,8-TCDF		2.8	9.5 J	1.8	1.1	1.6	4.1
1,2,3,7,8-PeCDF		2.1 U	2.1 U	2.1	0.6 U	1.2	1.9
2,3,4,7,8-PeCDF		7.2	110	1.7	0.95	1.9	2.2
1,2,3,4,7,8-HxCDF		107	5260	8.6 J	47.7 J	8.3 J	8 J
1,2,3,6,7,8-HxCDF		24.6	508	2.6	2.7	5.2	8.6
2,3,4,6,7,8-HxCDF		96.3	1150	2.9 J	5.9	7.9 J	6.2
1,2,3,7,8,9-HxCDF		399 J	19490 J	0.26	0.8 U	0.37	0.83
1,2,3,4,6,7,8-HpCDF		228	5070	35.3	74.1	120	146
1,2,3,4,7,8,9-HpCDF		67.4	3410	3	5.4	9.7	11.7
1,2,3,4,6,7,8,9-OCDF		289	11770	60.1	177	292	379
Total TCDD		3.2	102	7.8	3.1	4.4	20.4
Total PeCDD		3.6	395	3.7	6	8.3	14.4
Total HxCDD		50.4	1130	32.1	95.9	115	254
Total HpCDD		74.5	1700	228	828	911	1700
Total TCDF		287 J	898 J	15.1	11.1	21.3	30.8
Total PeCDF		1070 J	9380 J	16.4	32.3	69.8	63.5
Total HxCDF		1400 J	14680 J	35.5	104	186	206
Total HpCDF		605	14770 J	87.2	242	386	161
Total TEQ		72.3 J	2900 J	11.6 J	22.1 J	22.0 J	32.5 J

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL DIOX

EDL = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ng/kg)	SITE	D6001	D6002	D6002	D6003	D6004	D6005
	SAMPLE ID	D6001D1P2	D6002D1P2	D6002D1D2	D6003D1P2	D6004D1P2	D6005D1P3
	DATE / TIME	04/08/97 / 08:01	04/08/97 / 09:06	04/08/97 / 09:06	04/08/97 / 13:06	04/08/97 / 10:01	06/25/97 / 15:00
	DEPTH (ft)	0.50	0.50	0.50	0.50	0.50	0.00
	RESULT TYPE	Primary	Primary	Duplicate 1	Primary	Primary	Primary
2,3,7,8-TCDD		0.3 U	0.3 U	0.5 U	0.7 U	0.5 U	0.7 U
1,2,3,7,8-PeCDD		0.3 U	0.3 U	0.5 U	0.8 U	0.5 U	3.6
1,2,3,4,7,8-HxCDD		0.48	0.3 U	0.4 U	3.0	0.5 U	7.6
1,2,3,6,7,8-HxCDD		1.3	0.63	0.4 U	6.4	1.8	23.9
1,2,3,7,8,9-HxCDD		1.6	1.0	0.4 U	5.7	1.8	18.5
1,2,3,4,6,7,8-HpCDD		39.8	13.1	13.4	211	32.0	480
1,2,3,4,6,7,8,9-OCDD		399	471	642	2210	285	3740
2,3,7,8-TCDF		0.2 U	0.2 U	0.5 U	0.6 U	0.4 U	1.7
1,2,3,7,8-PeCDF		0.2 U	0.2 U	0.4 U	0.6 U	0.4 U	1.5
2,3,4,7,8-PeCDF		0.2 U	0.2 U	0.4 U	0.6 U	0.4 U	1.9
1,2,3,4,7,8-HxCDF		1.4	2.1	0.3 U	2.5	0.4 U	17.9
1,2,3,6,7,8-HxCDF		0.34	0.2 U	0.3 U	1.5	0.3 U	4.8
2,3,4,6,7,8-HxCDF		1.2	0.61	0.3 U	2.6	0.4 U	8.0
1,2,3,7,8,9-HxCDF		0.3 U	0.3 U	0.4 U	0.7 U	0.4 U	1.1 U
1,2,3,4,6,7,8-HpCDF		7.7	1.8	1.3	33.6	5.0	63.9
1,2,3,4,7,8,9-HpCDF		0.56	0.54	0.5 U	3.0	0.5 U	4.1
1,2,3,4,6,7,8,9-OCDF		27.5	3.4	3.9	97.6	9.5	159
Total TCDD		1.8	0.3 U	0.5 U	0.7 U	0.61	0.84
Total PeCDD		0.84	0.3 U	0.6 U	0.8 U	0.5 U	4.7
Total HxCDD		7.4	2.3	3.9	56.3	8.6	170
Total HpCDD		82.1	31.1	33.8	610	70.3	1370
Total TCDF		1.5	0.71	0.5 U	2.4	1.7	10.0
Total PeCDF		2.0	4.2	0.4 U	13.1	2.0	42.4
Total HxCDF		10.0	0.44	0.3 U	34.6	6.0	130
Total HpCDF		21.8	4.0	2.6	104	13.1	164
Total TEQ		1.64	1.06	0.793	6.95	1.02	20.4

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL DIOX L = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ng/kg)	SITE	D6006	L8001	L8002	L8005	L8006	L8007
	SAMPLE ID	D6006D1P2	L8001S1P1	L8002S1P1	L8005S1P1	L8006S1P1	L8007S1P2
	DATE / TIME	04/08/97 / 13:01	04/09/97 / 09:00	04/09/97 / 11:05	04/09/97 / 10:15	04/09/97 / 15:40	04/23/97 / 09:26
	DEPTH (ft)	0.50	0.00	0.00	0.00	0.00	0.50
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		1.3 U	1.2	0.70	0.45	102	1.6 U
1,2,3,7,8-PeCDD		4.8	0.6 U	0.4 U	0.66	25.9	1.5 U
1,2,3,4,7,8-HxCDD		6.7	1.1 U	(0.48)	1.2	2.0	2.5 U
1,2,3,6,7,8-HxCDD		17.9	0.9 U	0.69	2.6	5.9	1.9 U
1,2,3,7,8,9-HxCDD		17.0	1.0 U	0.97	3.1	2.7	2.1 U
1,2,3,4,6,7,8-HpCDD		393	7.5	20.7	58.2	52.5	35.1
1,2,3,4,6,7,8,9-OCDD		3470	642	447	474	746	268
2,3,7,8-TCDF		1.1 U	0.3 U	0.2 U	0.1 U	4.8	1.4 U
1,2,3,7,8-PeCDF		1.1 U	0.5 U	0.3 U	0.2 U	0.2 U	1.1 U
2,3,4,7,8-PeCDF		1.0 U	0.5 U	0.3 U	0.42	1.7	1.1 U
1,2,3,4,7,8-HxCDF		12.2	0.6 U	0.59	2.9	0.3 U	3.0
1,2,3,6,7,8-HxCDF		3.9	0.5 U	0.3 U	0.80	0.2 U	1.2 U
2,3,4,6,7,8-HxCDF		6.7	0.7 U	(0.37)	1.3	0.3 U	1.5 U
1,2,3,7,8,9-HxCDF		1.3 U	0.7 U	0.4 U	0.3 U	0.3 U	1.7 U
1,2,3,4,6,7,8-HpCDF		75.5	0.9 U	3.5	25.0	7.7	6.8
1,2,3,4,7,8,9-HpCDF		7.9	1.2 U	0.6 U	1.4	0.6 U	2.2 U
1,2,3,4,6,7,8,9-OCDF		312	1.3 U	4.9	41.2	10.1	16.7
Total TCDD		1.3 U	1.6	0.70	0.88	262	1.6 U
Total PeCDD		4.8	0.6 U	0.4 U	1.9	257	1.9
Total HxCDD		117	(0.89)	7.5	30.8	210	5.1
Total HpCDD		789	7.5	46.9	140	138	68.7
Total TCDF		2.0	0.3 U	0.36	1.6	227	1.4 U
Total PeCDF		39.2	(0.47)	1.9	11.5	226	3.2
Total HxCDF		96.1	0.6 U	3.8	29.5	22.6	10.3
Total HpCDF		247	1.0 U	3.5	64.1	20.9	6.8
Total TEQ		17.4	1.92	1.70	3.64	119	1.00

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

() = Less than Reporting Limit

U = non-detect, J = estimated For RCL DIOX

EDL = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ng/kg)	SITE	L8008	L8010	L8011	L8012	L8013	L8013
	SAMPLE ID	L8008S1P2	L8010S1P1	L8011S1P1	L8012S1P1	L8013S1P2	L8013S1D2
	DATE / TIME	04/23/97 / 09:56	04/09/97 / 16:30	04/09/97 / 13:50	04/09/97 / 15:05	04/25/97 / 10:06	04/25/97 / 10:06
	DEPTH (ft)	0.50	0.00	0.75	0.00	0.50	0.50
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Duplicate 1
2,3,7,8-TCDD		2.5	1.0	0.71	3.3	2.7 U	1.7
1,2,3,7,8-PeCDD		1.2 U	0.4 U	0.3 U	0.3 U	2.1 U	0.1 U
1,2,3,4,7,8-HxCDD		1.9 U	0.9 U	0.6 U	0.5 U	2.8 U	0.2 U
1,2,3,6,7,8-HxCDD		1.5 U	0.7 U	0.5 U	2.2	2.6 U	0.59
1,2,3,7,8,9-HxCDD		1.6 U	0.7 U	0.5 U	1.6	2.5 U	0.38
1,2,3,4,6,7,8-HpCDD		53.9	1.7	2.9	67.8	12.2	13.7
1,2,3,4,6,7,8,9-OCDD		496	16.5	176	631	345	335
2,3,7,8-TCDF		0.9 U	0.40	0.2 U	0.2 U	2.7 U	0.71
1,2,3,7,8-PeCDF		0.8 U	0.3 U	0.3 U	0.2 U	2.0 U	0.1 U
2,3,4,7,8-PeCDF		0.8 U	0.3 U	0.3 U	0.2 U	1.9 U	0.46
1,2,3,4,7,8-HxCDF		2.3	0.5 U	0.4 U	0.3 U	2.2 U	2.8
1,2,3,6,7,8-HxCDF		1.0 U	0.4 U	0.3 U	0.35	1.8 U	0.71
2,3,4,6,7,8-HxCDF		1.2 U	(0.48)	0.4 U	0.64	2.2 U	2.6
1,2,3,7,8,9-HxCDF		1.3 U	0.6 U	0.4 U	0.3 U	2.4 U	0.2 U
1,2,3,4,6,7,8-HpCDF		9.2	6.4	0.6 U	7.1	8.6	11.0
1,2,3,4,7,8,9-HpCDF		1.6 U	1.3 U	0.8 U	0.5 U	3.5 U	0.2 U
1,2,3,4,6,7,8,9-OCDF		28.9	1.9 U	0.9 U	13.9	3.8 U	9.5
Total TCDD		2.5	1.0	0.71	3.3	2.7 U	1.7
Total PeCDD		1.2 U	0.69	0.3 U	0.47	2.1 U	1.3
Total HxCDD		7.6	1.8	0.5 U	23.7	2.6 U	3.2
Total HpCDD		227	4.5	5.9	341	12.2	29.4
Total TCDF		1.6	1.0	0.2 U	0.71	2.7 U	4.1
Total PeCDF		8.7	1.2	0.3 U	10.0	28.9	33.8
Total HxCDF		9.8	7.5	0.4 U	10.9	9.9	29.2
Total HpCDF		29.2	6.4	0.7 U	7.1	8.6	22.0
Total TEQ		3.89	1.19	0.915	5.17	0.553	3.30

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

() = Less th[illegible]eporting Limit

U = non-detect, J = estimated For RCL DIOX [illegible] EDL = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ng/kg)	SITE	L8015	L8016	L8017	L8018	L8019	L8020
	SAMPLE ID	L8015S1P1	L8016S1P2	L8017S1P2	L8018S1P2	L8019S1P2	L8020S1P2
	DATE / TIME	04/09/97 / 14:15	04/24/97 / 15:11	04/23/97 / 14:36	04/24/97 / 11:56	04/22/97 / 15:01	04/23/97 / 13:01
	DEPTH (ft)	0.00	0.50	0.50	0.50	0.50	0.50
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		0.60	83.5	5.0	35.7	0.74	0.88
1,2,3,7,8-PeCDD		0.4 U	0.3 U	1.2 U	1.3 U	0.4 U	0.3 U
1,2,3,4,7,8-HxCDD		0.7 U	0.99	1.4 U	6.7	0.7 U	0.5 U
1,2,3,6,7,8-HxCDD		0.98	1.5	2.9	18.8	1.8	0.4 U
1,2,3,7,8,9-HxCDD		0.93	2.0	2.9	12.0	2.2	0.4 U
1,2,3,4,6,7,8-HpCDD		17.7	53.8 J	79.7	583	50.9	7.0
1,2,3,4,6,7,8,9-OCDD		202	463 J	696	4520	595	311
2,3,7,8-TCDF		0.32	1.4	0.8 U	4.0	0.4 U	0.3 U
1,2,3,7,8-PeCDF		0.3 U	0.3 U	0.9 U	1.1 U	0.3 U	0.3 U
2,3,4,7,8-PeCDF		0.37	0.3 U	0.9 U	2.5	0.3 U	0.3 U
1,2,3,4,7,8-HxCDF		1.1	1.00	1.0 U	21.0	1.4	0.80
1,2,3,6,7,8-HxCDF		0.66	0.3 U	2.2	5.5	0.46	0.3 U
2,3,4,6,7,8-HxCDF		1.1	0.85	4.0	8.1	1.4 U	0.93
1,2,3,7,8,9-HxCDF		0.4 U	0.4 U	1.0 U	1.7 U	0.6 U	0.4 U
1,2,3,4,6,7,8-HpCDF		11.1	4.7	41.2	134	23.7	3.3
1,2,3,4,7,8,9-HpCDF		0.8 U	0.4 U	1.3 U	9.1	0.99	0.5 U
1,2,3,4,6,7,8,9-OCDF		12.4	20.2 J	64.5	501	37.7	2.1
Total TCDD		0.87	83.5	5.0	35.7	0.74	0.88
Total PeCDD		0.48	1.5	1.2 U	11.7	0.4 U	0.3 U
Total HxCDD		6.9	31.9	23.9	147	21.1	0.4 U
Total HpCDD		31.8	294	189	1290	158	19.3
Total TCDF		3.9	3.3	0.8 U	17.6	5.0	1.5
Total PeCDF		21.4	11.9	32.4	97.8	7.4	6.7
Total HxCDF		20.9	2.1	50.9	188	20.2	7.4
Total HpCDF		11.1	16.7	98.9	496	53.3	5.7
Total TEQ		1.80	85.3 J	8.20	56.8	2.71	1.47

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EDL = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ng/kg)	SITE	L8020	L8021	L8022	L8023	L8024	L8025
	SAMPLE ID	L8020S1D2	L8021S1P2	L8022S1P2	L8023S1P2	L8024S1P2	L8025S1P2
	DATE / TIME	04/23/97 / 13:01	04/24/97 / 09:36	04/24/97 / 14:36	04/24/97 / 10:06	04/24/97 / 10:31	04/24/97 / 15:51
	DEPTH (ft)	0.50	0.50	0.50	0.50	0.50	0.50
	RESULT TYPE	Duplicate 1	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		0.56	62.4	4.6	38.5	7.5	63.0
1,2,3,7,8-PeCDD		0.5 U	0.9 U	0.72	1.8	0.5 U	2.9
1,2,3,4,7,8-HxCDD		0.7 U	(1.1)	1.6	3.6	0.7 U	6.0
1,2,3,6,7,8-HxCDD		0.6 U	2.9	4.6	12.9	1.5	43.8
1,2,3,7,8,9-HxCDD		0.6 U	3.0	4.2	7.7	1.2	13.2
1,2,3,4,6,7,8-HpCDD		6.8	78.0 J	127 J	340	38.3 J	2070
1,2,3,4,6,7,8,9-OCDD		282	735 J	1280	2570	309 J	14400
2,3,7,8-TCDF		0.4 U	2.1	0.4 U	2.9	0.6 U	8.7
1,2,3,7,8-PeCDF		0.4 U	0.7 U	0.3 U	0.8 U	0.5 U	0.4 U
2,3,4,7,8-PeCDF		0.4 U	1.0	0.63	0.8 U	0.5 U	0.4 U
1,2,3,4,7,8-HxCDF		0.5 U	2.7	5.2	10.7	2.8	22.6
1,2,3,6,7,8-HxCDF		0.4 U	1.5	1.7	3.1	0.79	3.7
2,3,4,6,7,8-HxCDF		0.5 U	1.5	2.5	3.8	1.0	0.6 U
1,2,3,7,8,9-HxCDF		0.6 U	1.1 U	0.5 U	1.2 U	0.7 U	0.7 U
1,2,3,4,6,7,8-HpCDF		2.8	25.3	31.3	85.7	11.8	255
1,2,3,4,7,8,9-HpCDF		0.6 U	(1.0)	2.4	5.9	0.7 U	13.8
1,2,3,4,6,7,8,9-OCDF		2.2	57.2 J	83.8	320	24.8 J	1230
Total TCDD		0.56	64.4	5.9	38.5	7.5	67.3
Total PeCDD		0.5 U	3.0	3.4	4.1	0.5 U	8.0
Total HxCDD		0.82	33.0	52.1	82.2	11.8	204
Total HpCDD		16.0	238	353	669	105	3890
Total TCDF		1.4	7.2	1.2	6.9	6.1	37.4
Total PeCDF		4.8	38.1	11.0	25.3	22.1	97.9
Total HxCDF		5.0	41.9	40.4	107	23.7	289
Total HpCDF		2.7	60.0	100	326	29.6	1250
Total TEQ		0.940	66.2 J	10.2 J	51.1	9.06 J	113

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( ) = Less th[redacted]porting Limit

U = non-detect, J = estimated For RCL DIOX [redacted] EDL = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ng/kg)	SITE	L8026	L8027	L8028	L8029	L8030	L8031
	SAMPLE ID	L8026S1P2	L8027S1P2	L8028S1P2	L8029S1P2	L8030S1P2	L8031S1P2
	DATE / TIME	04/23/97 / 13:36	04/25/97 / 14:36	04/22/97 / 15:31	04/25/97 / 15:31	04/25/97 / 15:06	04/22/97 / 16:11
	DEPTH (ft)	0.50	0.50	0.50	0.50	0.50	0.50
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		174	2.0	1.0 U	6.1	0.78	3.6
1,2,3,7,8-PeCDD		2.1 J	0.3 U	0.9 U	0.86	0.54	5.1
1,2,3,4,7,8-HxCDD		3.0	1.2	1.5 U	2.8	1.7	14.1
1,2,3,6,7,8-HxCDD		4.6	2.8	1.1 U	7.9	8.9	28.2
1,2,3,7,8,9-HxCDD		5.2	2.6	1.2 U	5.2	3.5	31.8
1,2,3,4,6,7,8-HpCDD		116	80.3	16.9	244	486	977
1,2,3,4,6,7,8,9-OCDD		874	585	201	1850	5200	7710
2,3,7,8-TCDF		10.4	1.2	0.9 U	0.58	0.2 U	1.5
1,2,3,7,8-PeCDF		1.0 J	0.3 U	0.7 U	0.1 U	0.2 U	1.6
2,3,4,7,8-PeCDF		1.5 J	0.3 U	0.7 U	0.66	0.2 U	2.2
1,2,3,4,7,8-HxCDF		5.1	3.2	1.2 U	7.9	15.5	27.8
1,2,3,6,7,8-HxCDF		2.4	0.3 U	0.9 U	3.0	1.4	11.9
2,3,4,6,7,8-HxCDF		1.1 U	2.2 U	1.2 U	0.2 U	2.3 U	15.3
1,2,3,7,8,9-HxCDF		1.3 U	0.4 U	1.2 U	0.2 U	0.3 U	0.7 U
1,2,3,4,6,7,8-HpCDF		21.4	22.7	4.4	102	111	214
1,2,3,4,7,8,9-HpCDF		1.8	0.88	1.4 U	2.7	5.6	13.9
1,2,3,4,6,7,8,9-OCDF		59.4	32.8	6.7	168	875	400
Total TCDD		182	1.6	1.0 U	6.1	0.78	3.6
Total PeCDD		10.1	2.3	0.9 U	1.4	0.54	25.6
Total HxCDD		45.3	25.4	1.7	63.9	42.4	298
Total HpCDD		289	163	21.1	608	790	2220
Total TCDF		54.8	5.0	7.5	6.1	0.88	25.5
Total PeCDF		127	16.0	8.5	42.0	6.5	94.6
Total HxCDF		67.9	29.4	19.0	110	93.0	343
Total HpCDF		64.8	56.6	11.6	251	692	555
Total TEQ		181 J	4.76	0.421	15.1	16.4	40.5

Values represent total concentrations unless noted < = Not detected at indicated reporting limit — = Not analyzed

U = non-detect, J = estimated For RCL DIOX

EDL = estimated detection limit

TABLE 1

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

	SITE	L8031	L8032	L8033
	SAMPLE ID	L803161D2	L803261P2	L803361P2
CONSTITUENT (Units in ng/kg)	DATE / TIME	04/22/97 / 16:11	04/23/97 / 14:16	04/25/97 / 15:56
	DEPTH (ft)	0.50	0.50	0.50
	RESULT TYPE	Duplicate 1	Primary	Primary
2,3,7,8-TCDD		4.2	56.2	2.4
1,2,3,7,8-PeCDD		6.6	2.9 U	1.2 J
1,2,3,4,7,8-HxCDD		16.0	3.9 U	2.6
1,2,3,6,7,8-HxCDD		31.7	3.0 U	10.2
1,2,3,7,8,9-HxCDD		36.2	3.3 U	7.3
1,2,3,4,6,7,8-HpCDD		1070	79.6	216
1,2,3,4,6,7,8,9-OCDD		7830	985	1320
2,3,7,8-TCDF		1.7	4.0 U	0.88
1,2,3,7,8-PeCDF		1.9	2.3 U	0.1 U
2,3,4,7,8-PeCDF		2.6	2.3 U	0.56
1,2,3,4,7,8-HxCDF		17.5	2.7 U	8.2
1,2,3,6,7,8-HxCDF		13.2	2.0 U	3.0
2,3,4,6,7,8-HxCDF		17.3	2.3 U	5.8
1,2,3,7,8,9-HxCDF		(0.38)	2.7 U	0.2 U
1,2,3,4,6,7,8-HpCDF		242	20.4	104
1,2,3,4,7,8,9-HpCDF		15.3	3.1 U	2.9
1,2,3,4,6,7,8,9-OCDF		471	101	134
Total TCDD		5.6	56.2	2.4
Total PeCDD		28.5	2.9 U	5.2
Total HxCDD		343	18.2	65.2
Total HpCDD		2210	203	412
Total TCDF		31.6	4.0 U	6.0
Total PeCDF		117	7.9	15.8
Total HxCDF		386	6.1	107
Total HpCDF		596	68.8	232
Total TEQ		43.9	58.3	11.8

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

() = Less th porting Limit

U = non-detect, J = estimated For RCL DIOX EDL = estimated detection limit

TABLE 2

ON-BASE DELINEATION
VOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001D1P1	D1003D1P1	D1005D1P1	D1008D1P1	D1010D1P1	D1013D1P1
	DATE / TIME	04/10/97 / 10:40	04/10/97 / 11:10	04/10/97 / 09:20	04/09/97 / 13:50	04/09/97 / 11:00	04/09/97 / 08:40
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Chloromethane		18 U	14 U	13 U	18 U	19 U	14 U
Bromomethane		18 U	14 U	13 U	18 U	19 U	14 U
Vinyl chloride		18 U	14 U	13 U	18 U	19 U	14 U
Chloroethane		18 U	14 U	13 U	18 U	19 U	14 U
Methylene chloride		18 U	14 U	13 U	18 U	19 U	14 U
Acetone		13 J	11 J	13 U	19	140	24
Carbon disulfide		18 U	14 U	13 U	18 U	19 U	14 U
1,1-Dichloroethene		18 U	14 U	13 U	18 U	19 U	14 U
1,1-Dichloroethane		18 U	14 U	13 U	18 U	19 U	14 U
1,2-Dichloroethene (total)		18 U	14 U	13 U	18 U	19 U	14 U
Chloroform		18 U	14 U	13 U	18 U	19 U	14 U
1,2-Dichloroethane		18 U	14 U	13 U	18 U	19 U	14 U
2-Butanone		18 U	14 U	13 U	18 U	35	14 U
1,1,1-Trichloroethane		18 U	14 U	13 U	18 U	19 U	14 U
Carbon tetrachloride		18 U	14 U	13 U	18 U	19 U	14 U
Bromodichloromethane		18 U	14 U	13 U	18 U	19 U	14 U
1,2-Dichloropropane		18 U	14 U	13 U	18 U	19 U	14 U
cis-1,3-Dichloropropene		18 U	14 U	13 U	18 U	19 U	14 U
Trichloroethene		18 U	14 U	13 U	18 U	19 U	14 U
Dibromochloromethane		18 U	14 U	13 U	18 U	19 U	14 U
1,1,2-Trichloroethane		18 U	14 U	13 U	18 U	19 U	14 U
Benzene		18 U	14 U	13 U	18 U	19 U	14 U
trans-1,3-Dichloropropene		18 U	14 U	13 U	18 U	19 U	14 U
Bromoform		18 U	14 U	13 U	18 U	19 U	14 U
4-Methyl-2-pentanone		18 U	14 U	13 U	18 U	19 U	14 U
2-Hexanone		18 U	14 U	13 U	18 U	19 U	14 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL VOA UJ = estimated quantitation limit

TABLE 2

ON-BASE DELINEATION
VOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001D1P1	D1003D1P1	D1005D1P1	D1008D1P1	D1010D1P1	D1013D1P1
CONSTITUENT (Units in ug/kg)	DATE / TIME	04/10/97 / 10:40	04/10/97 / 11:10	04/10/97 / 09:20	04/09/97 / 13:50	04/09/97 / 11:00	04/09/97 / 08:40
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Tetrachloroethene		18 U	14 U	13 U	18 U	19 U	14 U
1,1,2,2-Tetrachloroethane		18 U	14 U	13 U	18 U	19 U	14 U
Toluene		18 U	14 U	13 U	18 U	19 U	14 U
Chlorobenzene		18 U	14 U	13 U	18 U	19 U	14 U
Ethylbenzene		18 U	14 U	13 U	18 U	19 U	14 U
Styrene		18 U	14 U	13 U	18 U	19 U	14 U
Xylenes (total)		18 U	14 U	13 U	18 U	19 U	14 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL VOA

= estimated quantitation limit

TABLE 2

ON-BASE DELINEATION
VOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D1015	D2003	D2006	D2006	D3003	D3005
	SAMPLE ID	D1015D1P1	D2003D1P1	D2006D1P1	D2006D1D1	D3003D1P1	D3005D1P1
	DATE / TIME	04/22/97 / 11:10	04/05/97 / 10:00	04/05/97 / 10:20	04/05/97 / 10:20	04/07/97 / 15:20	04/07/97 / 11:10
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Chloromethane		20 U	14 U	12 U	12 U	13 U	13 U
Bromomethane		20 U	14 U	12 U	12 U	13 U	13 U
Vinyl chloride		20 U	14 U	12 U	12 U	13 U	13 U
Chloroethane		20 U	14 U	12 U	12 U	13 U	13 U
Methylene chloride		20 U	14 U	12 U	12 U	13 U	13 U
Acetone		270 J	15	12 U	12 U	10 J	13 U
Carbon disulfide		20 U	14 U	12 U	12 U	13 U	13 U
1,1-Dichloroethene		20 U	14 U	12 U	12 U	13 U	13 U
1,1-Dichloroethane		20 U	14 U	12 U	12 U	13 U	13 U
1,2-Dichloroethene (total)		20 U	14 U	12 U	12 U	13 U	13 U
Chloroform		20 U	14 U	12 U	12 U	13 U	13 U
1,2-Dichloroethane		20 U	14 U	12 U	12 U	13 U	13 U
2-Butanone		40 J	14 U	12 U	12 U	13 U	13 U
1,1,1-Trichloroethane		20 UJ	14 U	12 U	12 U	13 U	13 U
Carbon tetrachloride		20 UJ	14 U	12 U	12 U	13 U	13 U
Bromodichloromethane		20 UJ	14 U	12 U	12 U	13 U	13 U
1,2-Dichloropropane		20 UJ	14 U	12 U	12 U	13 U	13 U
cis-1,3-Dichloropropene		20 UJ	14 U	12 U	12 U	13 U	13 U
Trichloroethene		20 UJ	14 U	12 U	12 U	13 U	13 U
Dibromochloromethane		20 UJ	14 U	12 U	12 U	13 U	13 U
1,1,2-Trichloroethane		20 UJ	14 U	12 U	12 U	13 U	13 U
Benzene		20 UJ	14 U	12 U	12 U	13 U	13 U
trans-1,3-Dichloropropene		20 UJ	14 U	12 U	12 U	13 U	13 U
Bromoform		20 UJ	14 U	12 U	12 U	13 U	13 U
4-Methyl-2-pentanone		20 UJ	14 U	12 U	12 U	13 U	13 U
2-Hexanone		20 UJ	14 U	12 U	12 U	13 U	13 U

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UJ = estimated quantitation limit

TABLE 2

ON-BASE DELINEATION
VOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D1015	D2003	D2006	D2006	D3003	D3005
	SAMPLE ID	D1015D1P1	D2003D1P1	D2006D1P1	D2006D1D1	D3003D1P1	D3005D1P1
	DATE / TIME	04/22/97 / 11:10	04/05/97 / 10:00	04/05/97 / 10:20	04/05/97 / 10:20	04/07/97 / 15:20	04/07/97 / 11:10
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Tetrachloroethene		20 UJ	14 U	12 U	12 U	13 U	13 U
1,1,2,2-Tetrachloroethane		20 UJ	14 U	12 U	12 U	13 U	13 U
Toluene		20 UJ	14 U	12 U	12 U	13 U	13 U
Chlorobenzene		20 UJ	14 U	12 U	12 U	13 U	13 U
Ethylbenzene		20 UJ	14 U	12 U	12 U	13 U	13 U
Styrene		20 UJ	14 U	12 U	12 U	13 U	13 U
Xylenes (total)		20 UJ	14 U	12 U	12 U	13 U	13 U

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TABLE 2

ON-BASE DELINEATION
VOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D5004	D5007	D5009	D5013	D5030	L8001
	SAMPLE ID	D5004D1P1	D5007D1P1	D5009D1P1	D5013D1P1	D5030DPP1	L8001S1P1
	DATE / TIME	04/08/97 / 15:10	04/08/97 / 08:50	04/07/97 / 13:50	04/07/97 / 09:46	08/01/97 / 00:00	04/09/97 / 09:00
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Chloromethane		12 U	21 U	12 U	13 U	1500 U	11 U
Bromomethane		12 U	21 U	12 U	13 U	1500 U	11 U
Vinyl chloride		12 U	21 U	12 U	13 U	1500 U	11 U
Chloroethane		12 U	21 U	12 U	13 U	1500 U	11 U
Methylene chloride		12 U	21 U	12 U	13 U	1500 U	11 U
Acetone		12 U	38	12 U	16	1500 UJ	11 U
Carbon disulfide		12 U	21 U	12 U	13 U	1500 U	11 U
1,1-Dichloroethene		12 U	21 U	12 U	13 U	1500 U	11 U
1,1-Dichloroethane		12 U	21 U	12 U	13 U	1500 U	11 U
1,2-Dichloroethene (total)		12 U	21 U	12 U	13 U	1500 U	11 U
Chloroform		12 U	21 U	12 U	13 U	1500 U	11 U
1,2-Dichloroethane		12 U	21 U	12 U	13 U	1500 U	11 U
2-Butanone		12 U	21 U	12 U	13 U	1500 U	11 U
1,1,1-Trichloroethane		12 U	21 U	12 U	13 U	1500 U	11 U
Carbon tetrachloride		12 U	21 U	12 U	13 U	1500 U	11 U
Bromodichloromethane		12 U	21 U	12 U	13 U	1500 U	11 U
1,2-Dichloropropane		12 U	21 U	12 U	13 U	1500 U	11 U
cis-1,3-Dichloropropene		12 U	21 U	12 U	13 U	1500 U	11 U
Trichloroethene		12 U	21 U	12 U	13 U	1500 U	11 U
Dibromochloromethane		12 U	21 U	12 U	13 U	1500 U	11 U
1,1,2-Trichloroethane		12 U	21 U	12 U	13 U	1500 U	11 U
Benzene		12 U	21 U	12 U	13 U	1500 U	11 U
trans-1,3-Dichloropropene		12 U	21 U	12 U	13 U	1500 U	11 U
Bromoform		12 U	21 U	12 U	13 U	1500 UJ	11 U
4-Methyl-2-pentanone		12 U	21 U	12 U	13 U	1500 U	11 U
2-Hexanone		12 U	21 U	12 U	13 U	1500 U	11 U

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U = non-detect, J = estimated For RCL VOA

UJ = estimated quantitation limit

TABLE 2

ON-BASE DELINEATION
VOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D5004	D5007	D5009	D5013	D5030	L8001
	SAMPLE ID	D5004D1P1	D5007D1P1	D5009D1P1	D5013D1P1	D5030DPP1	L8001S1P1
	DATE / TIME	04/08/97 / 15:10	04/08/97 / 08:50	04/07/97 / 13:50	04/07/97 / 09:45	08/01/97 / 00:00	04/09/97 / 09:00
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Tetrachloroethene		12 U	21 U	12 U	13 U	1500 U	11 U
1,1,2,2-Tetrachloroethane		12 U	21 U	12 U	13 U	1500 U	11 U
Toluene		12 U	21 U	12 U	13 U	1500 U	11 U
Chlorobenzene		12 U	21 U	12 U	13 U	1500 U	11 U
Ethylbenzene		12 U	21 U	12 U	13 U	1500 U	11 U
Styrene		12 U	21 U	12 U	13 U	1500 U	11 U
Xylenes (total)		12 U	21 U	12 U	13 U	1500 U	11 U

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TABLE 2

ON-BASE DELINEATION
VOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	L8003	L8005	L8010	L8013	L8013	L8016
	SAMPLE ID	L8003S1P1	L8005S1P1	L8010S1P1	L8013S1P1	L8013S1D1	L8016S1P1
	DATE / TIME	04/10/97 / 10:40	04/09/97 / 10:15	04/09/97 / 16:30	04/25/97 / 10:05	04/25/97 / 10:05	04/24/97 / 16:10
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Duplicate 1	Primary
Chloromethane		11 U	11 U	12 U	10 U	10 U	11 U
Bromomethane		11 U	11 U	12 U	10 U	10 U	11 U
Vinyl chloride		11 U	11 U	12 U	10 U	10 U	11 U
Chloroethane		11 U	11 U	12 U	10 U	10 U	11 U
Methylene chloride		11 U	11 U	12 U	10 U	10 U	11 U
Acetone		11 U	11 U	12 U	10 UJ	10 UJ	11 U
Carbon disulfide		11 U	11 U	12 U	10 U	10 U	11 U
1,1-Dichloroethene		11 U	11 U	12 U	10 U	10 U	11 U
1,1-Dichloroethane		11 U	11 U	12 U	10 U	10 U	11 U
1,2-Dichloroethene (total)		11 U	11 U	12 U	10 U	10 U	11 U
Chloroform		11 U	11 U	12 U	10 U	10 U	11 U
1,2-Dichloroethane		11 U	11 U	12 U	10 U	10 U	11 U
2-Butanone		11 U	11 U	12 U	10 U	10 U	11 U
1,1,1-Trichloroethane		11 U	11 U	12 U	10 U	10 U	11 U
Carbon tetrachloride		11 U	11 U	12 U	10 U	10 U	11 U
Bromodichloromethane		11 U	11 U	12 U	10 U	10 U	11 U
1,2-Dichloropropane		11 U	11 U	12 U	10 U	10 U	11 U
cis-1,3-Dichloropropene		11 U	11 U	12 U	10 U	10 U	11 U
Trichloroethene		11 U	11 U	12 U	10 U	10 U	11 U
Dibromochloromethane		11 U	11 U	12 U	10 U	10 U	11 U
1,1,2-Trichloroethane		11 U	11 U	12 U	10 U	10 U	11 U
Benzene		11 U	11 U	12 U	10 U	10 U	11 U
trans-1,3-Dichloropropene		11 U	11 U	12 U	10 U	10 U	11 U
Bromoform		11 U	11 U	12 U	10 U	10 U	11 U
4-Methyl-2-pentanone		11 U	11 U	12 U	10 U	10 U	11 U
2-Hexanone		11 U	11 U	12 U	10 U	10 U	11 U

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TABLE 2

ON-BASE DELINEATION
VOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	L8003	L8005	L8010	L8013	L8013	L8016
	SAMPLE ID	L8003S1P1	L8005S1P1	L8010S1P1	L8013S1P1	L8013S1D1	L8016S1P1
	DATE / TIME	04/10/97 / 10:40	04/09/97 / 10:15	04/09/97 / 16:30	04/25/97 / 10:06	04/25/97 / 10:06	04/24/97 / 15:10
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Duplicate 1	Primary
Tetrachloroethene		11 U	11 U	12 U	10 U	10 U	3 J
1,1,2,2-Tetrachloroethane		11 U	11 U	12 U	10 U	10 U	4 J
Toluene		11 U	11 U	12 U	10 U	10 U	11 U
Chlorobenzene		11 U	11 U	12 U	10 U	10 U	11 U
Ethylbenzene		11 U	11 U	12 U	10 U	10 U	11 U
Styrene		11 U	11 U	12 U	10 U	10 U	11 U
Xylenes (total)		11 U	11 U	12 U	10 U	10 U	11 U

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TABLE 2

ON-BASE DELINEATION
VOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

	SITE	L8025	L8027
	SAMPLE ID	L8025S1P1	L8027S1P1
CONSTITUENT (Units in ug/kg)	DATE / TIME	04/24/97 / 15:50	04/25/97 / 14:35
	DEPTH (ft)	0.00	0.00
	RESULT TYPE	Primary	Primary
Chloromethane		11 U	11 U
Bromomethane		11 U	11 U
Vinyl chloride		11 U	11 U
Chloroethane		11 U	11 U
Methylene chloride		11 U	11 U
Acetone		11 U	4 J
Carbon disulfide		11 U	11 U
1,1-Dichloroethene		11 U	11 U
1,1-Dichloroethane		11 U	11 U
1,2-Dichloroethene (total)		11 U	11 U
Chloroform		11 U	11 U
1,2-Dichloroethane		11 U	11 U
2-Butanone		11 U	11 U
1,1,1-Trichloroethane		11 U	11 U
Carbon tetrachloride		11 U	11 U
Bromodichloromethane		11 U	11 U
1,2-Dichloropropane		11 U	11 U
cis-1,3-Dichloropropene		11 U	11 U
Trichloroethene		11 U	11 U
Dibromochloromethane		11 U	11 U
1,1,2-Trichloroethane		11 U	11 U
Benzene		11 U	11 U
trans-1,3-Dichloropropene		11 U	11 U
Bromoform		11 U	11 U
4-Methyl-2-pentanone		11 U	11 U
2-Hexanone		11 U	11 U

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TABLE 2

ON-BASE DELINEATION
VOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	L8025	L8027
	SAMPLE ID	L8025S1P1	L8027S1P1
	DATE / TIME	04/24/97 / 15:50	04/25/97 / 14:35
	DEPTH (ft)	0.00	0.00
	RESULT TYPE	Primary	Primary
Tetrachloroethene		3 J	11 U
1,1,2,2-Tetrachloroethane		11 U	11 U
Toluene		11 U	11 U
Chlorobenzene		11 U	11 U
Ethylbenzene		11 U	11 U
Styrene		11 U	11 U
Xylenes (total)		11 U	11 U

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U = non-detected J = estimated For RCL VOA = estimated quantitation limit

TABLE 3

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001D1P1	D1003D1P1	D1005D1P1	D1008D1P1	D1010D1P1	D1013D1P1
CONSTITUENT (Units in ug/kg)	DATE / TIME	04/10/97 / 10:40	04/10/97 / 11:10	04/10/97 / 09:20	04/09/97 / 13:50	04/09/97 / 11:00	04/09/97 / 08:40
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Phenol		580 U	460 U	420 U	610 U	630 U	450 U
bis(2-chloroethyl)ether		580 U	460 U	420 U	610 U	630 U	450 U
2-Chlorophenol		580 U	460 U	420 U	610 U	630 U	450 U
1,3-Dichlorobenzene		580 U	460 U	420 U	610 U	630 U	450 U
1,4-Dichlorobenzene		580 U	460 U	420 U	610 U	630 U	450 U
1,2-Dichlorobenzene		580 U	460 U	420 U	610 U	630 U	450 U
2-Methylphenol		580 U	460 U	420 U	610 U	630 U	450 U
2,2'-oxybis(1-Chloropropane)		580 U	460 U	420 U	610 U	630 U	450 U
N-Nitrosodinpropylamine		580 U	460 U	420 U	610 U	630 U	450 U
4-Methylphenol		580 U	460 U	420 U	610 U	630 U	450 U
Hexachloroethane		580 U	460 U	420 U	610 U	630 U	450 U
Nitrobenzene		580 U	460 U	420 U	610 U	630 U	450 U
Isophorone		580 U	460 U	420 U	610 U	630 U	450 U
2-Nitrophenol		580 U	460 U	420 U	610 U	630 U	450 U
2,4-Dimethylphenol		580 U	460 U	420 U	610 U	630 U	450 U
bis(2-chloroethoxy)methane		580 U	460 U	420 U	610 U	630 U	450 U
2,4-Dichlorophenol		580 U	460 U	420 U	610 U	630 U	450 U
1,2,4-Trichlorobenzene		580 U	460 U	420 U	610 U	630 U	450 U
Naphthalene		580 U	460 U	420 U	610 U	630 U	450 U
4-Chloroaniline		580 U	460 U	420 U	610 U	630 U	450 U
Hexachlorobutadiene		580 U	460 U	420 U	610 U	630 U	450 U
4-Chloro-3-Methylphenol		580 U	460 U	420 U	610 U	630 U	450 U
2-Methylnaphthalene		580 U	460 U	420 U	610 U	630 U	450 U
Hexachlorocyclopentadiene		580 U	460 U	420 U	610 U	630 U	450 U
2,4,6-Trichlorophenol		580 U	460 U	420 U	610 U	630 U	450 U
2,4,5-Trichlorophenol		1400 U	1100 U	1000 U	1500 U	1500 U	1100 U

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TABLE 3

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001D1P1	D1003D1P1	D1005D1P1	D1008D1P1	D1010D1P1	D1013D1P1
	DATE / TIME	04/10/97 / 10:40	04/10/97 / 11:10	04/10/97 / 09:20	04/09/97 / 13:50	04/09/97 / 11:00	04/09/97 / 08:40
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2-Chloronaphthalene		580 U	460 U	420 U	610 U	630 U	450 U
2-Nitroaniline		1400 U	1100 U	1000 U	1500 U	1500 U	1100 U
Dimethylphthalate		580 U	460 U	420 U	610 U	630 U	450 U
Acenaphthylene		580 U	460 U	420 U	610 U	630 U	450 U
2,6-Dinitrotoluene		580 U	460 U	420 U	610 U	630 U	450 U
3-Nitroaniline		1400 U	1100 U	1000 U	1500 U	1500 U	1100 U
Acenaphthene		580 U	460 U	420 U	610 U	630 U	450 U
2,4-Dinitrophenol		1400 U	1100 U	1000 U	1500 U	1500 U	1100 U
4-Nitrophenol		1400 U	1100 U	1000 U	1500 U	1500 U	1100 U
Dibenzofuran		580 U	460 U	420 U	610 U	630 U	450 U
2,4-Dinitrotoluene		580 U	460 U	420 U	610 U	630 U	450 U
Diethylphthalate		580 U	460 U	420 U	610 U	630 U	450 U
4-Chlorophenyl-phenylether		580 U	460 U	420 U	610 U	630 U	450 U
Fluorene		580 U	460 U	420 U	610 U	630 U	450 U
4-Nitroaniline		1400 U	1100 U	1000 U	1500 U	1500 U	1100 U
4,6-Dinitro-2-methylphenol		1400 U	1100 U	1000 U	1500 U	1500 U	1100 U
N-Nitrosodiphenylamine (1)		580 U	460 U	420 U	610 U	630 U	450 U
4-Bromophenyl-phenylether		580 U	460 U	420 U	610 U	630 U	450 U
Hexachlorobenzene		580 U	460 U	420 U	610 U	630 U	450 U
Pentachlorophenol		1400 U	1100 U	1000 U	1500 U	1500 U	1100 U
Phenanthrene		580 U	460 U	420 U	610 U	630 U	450 U
Anthracene		580 U	460 U	420 U	610 U	630 U	450 U
Carbazole		580 U	460 U	420 U	610 U	630 U	450 U
Di-n-Butylphthalate		580 U	460 U	420 U	610 U	630 U	450 U
Fluoranthene		580 U	460 U	420 U	610 U	400 J	450 U
Pyrene		580 U	460 U	420 U	610 U	300 J	450 U

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TABLE 3

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001D1P1	D1003D1P1	D1005D1P1	D1008D1P1	D1010D1P1	D1013D1P1
	DATE / TIME	04/10/97 / 10:40	04/10/97 / 11:10	04/10/97 / 09:20	04/09/97 / 13:50	04/09/97 / 11:00	04/09/97 / 08:40
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Butylbenzylphthalate		580 U	460 U	420 U	610 U	630 U	450 U
3,3'-Dichlorobenzidine		580 U	460 U	420 U	610 U	630 U	450 U
Benzo(a)Anthracene		580 U	460 U	420 U	610 U	630 U	450 U
Chrysene		580 U	460 U	420 U	610 U	630 U	450 U
bis(2-ethylhexyl)Phthalate		100 J	460 U	420 U	320 J	820	74 J
Di-n-octylphthalate		580 U	460 U	420 U	610 U	630 U	450 U
Benzo(b)fluoranthene		580 U	460 U	420 U	610 U	630 U	450 U
Benzo(k)fluoranthene		580 U	460 U	420 U	610 U	630 U	450 U
Benzo(a)pyrene		580 U	460 U	420 U	610 U	630 U	450 U
Indeno(1,2,3-cd)pyrene		580 U	460 U	420 U	610 U	630 U	450 U
Dibenzo(a,h)anthracene		580 U	460 U	420 U	610 U	630 U	450 U
Benzo(g,h,i)perylene		580 U	460 U	420 U	610 U	630 U	450 U

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TABLE 3

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D1015	D2003	D2006	D2006	D3003	D3005
	SAMPLE ID	D1015D1P1	D2003D1P1	D2006D1P1	D2006D1D1	D3003D1P1	D3005D1P1
	DATE / TIME	04/22/97 / 11:10	04/05/97 / 10:00	04/05/97 / 10:20	04/05/97 / 10:20	04/07/97 / 15:20	04/07/97 / 11:10
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Phenol		670 U	460 U	390 U	400 U	430 U	440 U
bis(2-chloroethyl)ether		670 U	460 U	390 U	400 U	430 U	440 U
2-Chlorophenol		670 U	460 U	390 U	400 U	430 U	440 U
1,3-Dichlorobenzene		670 U	460 U	390 U	400 U	430 U	440 U
1,4-Dichlorobenzene		670 U	460 U	390 U	400 U	430 U	440 U
1,2-Dichlorobenzene		670 U	460 U	390 U	400 U	430 U	440 U
2-Methylphenol		670 U	460 U	390 U	400 U	430 U	440 U
2,2'-oxybis(1-Chloropropane)		670 U	460 U	390 U	400 U	430 U	440 U
N-Nitrosodinpropylamine		670 U	460 U	390 U	400 U	430 U	440 U
4-Methylphenol		670 U	460 U	390 U	400 U	430 U	440 U
Hexachloroethane		670 U	460 U	390 U	400 U	430 U	440 U
Nitrobenzene		670 U	460 U	390 U	400 U	430 U	440 U
Isophorone		670 U	460 U	390 U	400 U	430 U	440 U
2-Nitrophenol		670 U	460 U	390 U	400 U	430 U	440 U
2,4-Dimethylphenol		670 U	460 U	390 U	400 U	430 U	440 U
bis(2-chloroethoxy)methane		670 U	460 U	390 U	400 U	430 U	440 U
2,4-Dichlorophenol		670 U	460 U	390 U	400 U	430 U	440 U
1,2,4-Trichlorobenzene		670 U	460 U	390 U	400 U	430 U	440 U
Naphthalene		670 U	460 U	390 U	400 U	430 U	440 U
4-Chloroaniline		670 U	460 U	390 U	400 U	430 U	440 U
Hexachlorobutadiene		670 U	460 U	390 U	400 U	430 U	440 U
4-Chloro-3-Methylphenol		670 U	460 U	390 U	400 U	430 U	440 U
2-Methylnaphthalene		670 U	460 U	390 U	400 U	430 U	440 U
Hexachlorocyclopentadiene		670 U	460 U	390 U	400 U	430 U	440 U
2,4,6-Trichlorophenol		670 U	460 U	390 U	400 U	430 U	440 U
2,4,5-Trichlorophenol		1600 U	1100 U	940 U	970 U	1000 U	1100 U

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TABLE 3

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D1015	D2003	D2006	D2006	D3003	D3005
	SAMPLE ID	D1015D1P1	D2003D1P1	D2006D1P1	D2006D1D1	D3003D1P1	D3005D1P1
	DATE / TIME	04/22/97 / 11:10	04/05/97 / 10:00	04/05/97 / 10:20	04/05/97 / 10:20	04/07/97 / 15:20	04/07/97 / 11:10
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
2-Chloronaphthalene		670 U	460 U	390 U	400 U	430 U	440 U
2-Nitroaniline		1600 U	1100 U	940 U	970 U	1000 U	1100 U
Dimethylphthalate		670 U	460 U	390 U	400 U	430 U	440 U
Acenaphthylene		670 U	460 U	390 U	400 U	430 U	440 U
2,6-Dinitrotoluene		670 U	460 U	390 U	400 U	430 U	440 U
3-Nitroaniline		1600 U	1100 U	940 U	970 U	1000 U	1100 U
Acenaphthene		670 U	460 U	390 U	400 U	430 U	440 U
2,4-Dinitrophenol		1600 U	1100 U	940 U	970 U	1000 U	1100 U
4-Nitrophenol		1600 U	1100 U	940 U	970 U	1000 U	1100 U
Dibenzofuran		670 U	460 U	390 U	400 U	430 U	440 U
2,4-Dinitrotoluene		670 U	460 U	390 U	400 U	430 U	440 U
Diethylphthalate		670 U	460 U	390 U	400 U	430 U	440 U
4-Chlorophenyl-phenylether		670 U	460 U	390 U	400 U	430 U	440 U
Fluorene		670 U	460 U	390 U	400 U	430 U	440 U
4-Nitroaniline		1600 U	1100 U	940 U	970 U	1000 U	1100 U
4,6-Dinitro-2-methylphenol		1600 U	1100 U	940 U	970 U	1000 U	1100 U
N-Nitrosodiphenylamine (1)		670 U	460 U	390 U	400 U	430 U	440 U
4-Bromophenyl-phenylether		670 U	460 U	390 U	400 U	430 U	440 U
Hexachlorobenzene		670 U	460 U	390 U	400 U	430 U	440 U
Pentachlorophenol		1600 U	1100 U	940 U	970 U	1000 U	1100 U
Phenanthrene		670 U	460 U	390 U	400 U	430 U	440 U
Anthracene		670 U	460 U	390 U	400 U	430 U	440 U
Carbazole		670 U	460 U	390 U	400 U	430 U	440 U
Di-n-Butylphthalate		670 U	460 U	390 U	400 U	430 U	440 U
Fluoranthene		670 U	520	48 J	400 U	430 U	200 J
Pyrene		670 U	380 J	41 J	400 U	430 U	140 J

Values represent total concentrations unless noted < = Not detected at indicated reporting limit — = Not analyzed

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UJ = estimated quantitation limit

TABLE 3

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D1015	D2003	D2006	D2006	D3003	D3005
	SAMPLE ID	D1015D1P1	D2003D1P1	D2006D1P1	D2006D1D1	D3003D1P1	D3005D1P1
	DATE / TIME	04/22/97 / 11:10	04/05/97 / 10:00	04/05/97 / 10:20	04/05/97 / 10:20	04/07/97 / 15:20	04/07/97 / 11:10
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Butylbenzylphthalate		670 U	460 U	390 U	400 U	430 U	440 U
3,3'-Dichlorobenzidine		670 U	460 U	390 U	400 U	430 U	440 U
Benzo(a)Anthracene		670 U	140 J	390 U	400 U	430 U	440 U
Chrysene		670 U	310 J	390 U	400 U	430 U	440 U
bis(2-ethylhexyl)Phthalate		730	460 U	390 U	400 U	430 U	440 U
Di-n-octylphthalate		670 U	460 U	390 U	400 U	430 U	440 U
Benzo(b)fluoranthene		670 U	420 J	390 U	93 J	430 U	180 J
Benzo(k)fluoranthene		670 U	98 J	390 U	400 U	430 U	66 J
Benzo(a)pyrene		670 U	460 U	390 U	400 U	430 U	440 U
Indeno(1,2,3-cd)pyrene		670 U	460 U	390 U	400 U	430 U	440 U
Dibenzo(a,h)anthracene		670 U	460 U	390 U	400 U	430 U	440 U
Benzo(g,h,i)perylene		670 U	460 U	390 U	400 U	430 U	440 U

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TABLE 3

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D5004	D5007	D5009	D5013	D5030	L8001
	SAMPLE ID	D5004D1P1	D5007D1P1	D5009D1P1	D5013D1P1	D5030DPP1	L8001S1P1
	DATE / TIME	04/08/97 / 15:10	04/08/97 / 08:50	04/07/97 / 13:50	04/07/97 / 09:45	08/01/97 / 00:00	04/09/97 / 09:00
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Phenol		410 U	680 U	400 U	420 U	4000 U	360 U
bis(2-chloroethyl)ether		410 U	680 U	400 U	420 U	4000 U	360 U
2-Chlorophenol		410 U	680 U	400 U	420 U	4000 U	360 U
1,3-Dichlorobenzene		410 U	680 U	400 U	420 U	4000 U	360 U
1,4-Dichlorobenzene		410 U	680 U	400 U	420 U	4000 U	360 U
1,2-Dichlorobenzene		410 U	680 U	400 U	420 U	4000 U	360 U
2-Methylphenol		410 U	680 U	400 U	420 U	4000 U	360 U
2,2'-oxybis(1-Chloropropane)		410 U	680 U	400 U	420 U	4000 U	360 U
N-Nitrosodinpropylamine		410 U	680 U	400 U	420 U	4000 U	360 U
4-Methylphenol		410 U	680 U	400 U	420 U	4000 U	360 U
Hexachloroethane		410 U	680 U	400 U	420 U	4000 U	360 U
Nitrobenzene		410 U	680 U	400 U	420 U	4000 U	360 U
Isophorone		410 U	680 U	400 U	420 U	4000 U	360 U
2-Nitrophenol		410 U	680 U	400 U	420 U	4000 U	360 U
2,4-Dimethylphenol		410 U	680 U	400 U	420 U	4000 U	360 U
bis(2-chloroethoxy)methane		410 U	680 U	400 U	420 U	4000 U	360 U
2,4-Dichlorophenol		410 U	680 U	400 U	420 U	4000 U	360 U
1,2,4-Trichlorobenzene		410 U	680 U	400 U	420 U	24000	360 U
Naphthalene		410 U	680 U	400 U	420 U	4000 U	360 U
4-Chloroaniline		410 U	680 U	400 U	420 U	4000 U	360 U
Hexachlorobutadiene		410 U	680 U	400 U	420 U	4000 U	360 U
4-Chloro-3-Methylphenol		410 U	680 U	400 U	420 U	4000 U	360 U
2-Methylnaphthalene		410 U	680 U	400 U	420 U	4000 U	360 U
Hexachlorocyclopentadiene		410 U	680 U	400 U	420 U	4000 U	360 U
2,4,6-Trichlorophenol		410 U	680 U	400 U	420 U	4000 U	360 U
2,4,5-Trichlorophenol		1000 U	1600 U	980 U	1000 U	9700 U	870 U

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TABLE 3

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D5004	D5007	D5009	D5013	D5030	L8001
	SAMPLE ID	D5004D1P1	D5007D1P1	D5009D1P1	D5013D1P1	D5030DPP1	L8001S1P1
	DATE / TIME	04/08/97 / 15:10	04/08/97 / 08:50	04/07/97 / 13:50	04/07/97 / 09:46	08/01/97 / 00:00	04/09/97 / 09:00
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2-Chloronaphthalene		410 U	680 U	400 U	420 U	4000 U	360 U
2-Nitroaniline		1000 U	1600 U	980 U	1000 U	9700 U	870 U
Dimethylphthalate		410 U	680 U	400 U	420 U	4000 U	360 U
Acenaphthylene		410 U	680 U	400 U	420 U	4000 U	360 U
2,6-Dinitrotoluene		410 U	680 U	400 U	420 U	4000 U	360 U
3-Nitroaniline		1000 U	1600 U	980 U	1000 U	9700 U	870 U
Acenaphthene		410 U	680 U	400 U	420 U	4000 U	360 U
2,4-Dinitrophenol		1000 U	1600 U	980 U	1000 U	9700 U	870 U
4-Nitrophenol		1000 U	1600 U	980 U	1000 U	9700 UJ	870 U
Dibenzofuran		410 U	680 U	400 U	420 U	4000 U	360 U
2,4-Dinitrotoluene		410 U	680 U	400 U	420 U	4000 U	360 U
Diethylphthalate		410 U	680 U	1300	420 U	4000 U	360 U
4-Chlorophenyl-phenylether		410 U	680 U	400 U	420 U	4000 U	360 U
Fluorene		410 U	680 U	400 U	420 U	4000 U	360 U
4-Nitroaniline		1000 U	1600 U	980 U	1000 U	9700 U	870 U
4,6-Dinitro-2-methylphenol		1000 U	1600 U	980 U	1000 U	9700 U	870 U
N-Nitrosodiphenylamine (1)		410 U	680 U	400 U	420 U	4000 U	360 U
4-Bromophenyl-phenylether		410 U	680 U	400 U	420 U	4000 U	360 U
Hexachlorobenzene		410 U	680 U	400 U	420 U	4000 U	360 U
Pentachlorophenol		1000 U	1600 U	980 U	1000 U	9700 U	870 U
Phenanthrene		410 U	680 U	93 J	420 U	4000 U	360 U
Anthracene		410 U	680 U	400 U	420 U	4000 U	360 U
Carbazole		410 U	680 U	400 U	420 U	4000 U	360 U
Di-n-Butylphthalate		410 U	680 U	400 U	420 U	4000 U	360 U
Fluoranthene		410 U	680 U	420	420 U	4000 U	360 U
Pyrene		410 U	680 U	420	420 U	4000 U	360 U

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TABLE 3

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D5004	D5007	D5009	D5013	D5030	L8001
	SAMPLE ID	D5004D1P1	D5007D1P1	D5009D1P1	D5013D1P1	D5030DPP1	L8001S1P1
	DATE / TIME	04/08/97 / 15:10	04/08/97 / 08:50	04/07/97 / 13:50	04/07/97 / 09:45	08/01/97 / 00:00	04/09/97 / 09:00
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Butylbenzylphthalate		410 U	680 U	400 U	420 U	4000 U	360 U
3,3'-Dichlorobenzidine		410 U	680 U	400 U	420 U	4000 U	360 U
Benzo(a)Anthracene		410 U	680 U	400 U	420 U	4000 U	360 U
Chrysene		410 U	680 U	400 U	420 U	4000 U	360 U
bis(2-ethylhexyl)Phthalate		410 U	170 J	400 U	420 U	4000 U	360 U
Di-n-octylphthalate		410 U	680 U	400 U	420 U	4000 U	360 U
Benzo(b)fluoranthene		410 U	680 U	400 U	420 U	4000 U	360 U
Benzo(k)fluoranthene		410 U	680 U	400 U	420 U	4000 U	360 U
Benzo(a)pyrene		410 U	680 U	400 U	420 U	4000 U	360 U
Indeno(1,2,3-cd)pyrene		410 U	680 U	400 U	420 U	4000 U	360 U
Dibenzo(a,h)anthracene		410 U	680 U	400 U	420 U	4000 U	360 U
Benzo(g,h,i)perylene		410 U	680 U	400 U	420 U	4000 U	360 U

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UJ = estimated quantitation limit

TABLE 3

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	L8003	L8005	L8010	L8013	L8013	L8016
	SAMPLE ID	L8003S1P1	L8005S1P1	L8010S1P1	L8013S1P1	L8013S1D1	L8016S1P1
	DATE / TIME	04/10/97 / 10:40	04/09/97 / 10:15	04/09/97 / 16:30	04/25/97 / 10:05	04/25/97 / 10:05	04/24/97 / 16:10
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Duplicate 1	Primary
Phenol		350 U	360 U	360 U	350 U	350 U	350 U
bis(2-chloroethyl)ether		350 U	360 U	360 U	350 U	350 U	350 U
2-Chlorophenol		350 U	360 U	360 U	350 U	350 U	350 U
1,3-Dichlorobenzene		350 U	360 U	360 U	350 U	350 U	350 U
1,4-Dichlorobenzene		350 U	360 U	360 U	350 U	350 U	350 U
1,2-Dichlorobenzene		350 U	360 U	360 U	350 U	350 U	350 U
2-Methylphenol		350 U	360 U	360 U	350 U	350 U	350 U
2,2'-oxybis(1-Chloropropane)		350 U	360 U	360 U	350 U	350 U	350 U
N-Nitrosodinpropylamine		350 U	360 U	360 U	350 U	350 U	350 U
4-Methylphenol		350 U	360 U	360 U	350 U	350 U	350 U
Hexachloroethane		350 U	360 U	360 U	350 U	350 U	350 U
Nitrobenzene		350 U	360 U	360 U	350 U	350 U	350 U
Isophorone		350 U	360 U	360 U	350 U	350 U	350 U
2-Nitrophenol		350 U	360 U	360 U	350 U	350 U	350 U
2,4-Dimethylphenol		350 U	360 U	360 U	350 U	350 U	350 U
bis(2-chloroethoxy)methane		350 U	360 U	360 U	350 U	350 U	350 U
2,4-Dichlorophenol		350 U	360 U	360 U	350 U	350 U	350 U
1,2,4-Trichlorobenzene		350 U	360 U	360 U	350 U	350 U	350 U
Naphthalene		350 U	360 U	360 U	350 U	350 U	350 U
4-Chloroaniline		350 U	360 U	360 U	350 U	350 U	350 U
Hexachlorobutadiene		350 U	360 U	360 U	350 U	350 U	350 U
4-Chloro-3-Methylphenol		350 U	360 U	360 U	350 U	350 U	350 U
2-Methylnaphthalene		350 U	360 U	360 U	350 U	350 U	350 U
Hexachlorocyclopentadiene		350 U	360 U	360 U	350 U	350 U	350 U
2,4,6-Trichlorophenol		350 U	360 U	360 U	350 U	350 U	350 U
2,4,5-Trichlorophenol		840 U	860 U	870 U	840 U	840 U	850 U

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TABLE 3

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	L8003	L8005	L8010	L8013	L8013	L8016
	SAMPLE ID	L8003S1P1	L8005S1P1	L8010S1P1	L8013S1P1	L8013S1D1	L8016S1P1
	DATE / TIME	04/10/97 / 10:40	04/09/97 / 10:15	04/09/97 / 16:30	04/25/97 / 10:05	04/25/97 / 10:05	04/24/97 / 15:10
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Duplicate 1	Primary
2-Chloronaphthalene		350 U	360 U	360 U	350 U	350 U	350 U
2-Nitroaniline		840 U	860 U	870 U	840 U	840 U	850 U
Dimethylphthalate		350 U	360 U	360 U	350 U	350 U	350 U
Acenaphthylene		350 U	360 U	360 U	350 U	350 U	350 U
2,6-Dinitrotoluene		350 U	360 U	360 U	350 U	350 U	350 U
3-Nitroaniline		840 U	860 U	870 U	840 U	840 U	850 U
Acenaphthene		350 U	360 U	360 U	350 U	350 U	350 U
2,4-Dinitrophenol		840 U	860 U	870 U	840 U	840 U	850 U
4-Nitrophenol		840 U	860 U	870 U	<840 R	840 U	850 U
Dibenzofuran		350 U	360 U	360 U	350 U	350 U	350 U
2,4-Dinitrotoluene		350 U	360 U	360 U	350 U	350 U	350 U
Diethylphthalate		350 U	360 U	360 U	350 U	350 U	350 U
4-Chlorophenyl-phenylether		350 U	360 U	360 U	350 U	350 U	350 U
Fluorene		350 U	360 U	360 U	350 U	350 U	350 U
4-Nitroaniline		840 U	860 U	870 U	840 U	840 U	850 U
4,6-Dinitro-2-methylphenol		840 U	860 U	870 U	840 U	840 U	850 U
N-Nitrosodiphenylamine (1)		350 U	360 U	360 U	350 U	350 U	350 U
4-Bromophenyl-phenylether		350 U	360 U	360 U	350 U	350 U	350 U
Hexachlorobenzene		350 U	360 U	360 U	350 U	350 U	350 U
Pentachlorophenol		840 U	860 U	870 U	<840 R	840 U	850 U
Phenanthrene		350 U	360 U	360 U	350 U	350 U	350 U
Anthracene		350 U	360 U	360 U	350 U	350 U	350 U
Carbazole		350 U	360 U	360 U	350 U	350 U	350 U
Di-n-Butylphthalate		350 U	360 U	360 U	350 U	350 U	350 U
Fluoranthene		350 U	150 J	360 U	350 U	350 U	350 U
Pyrene		350 U	160 J	360 U	350 U	350 U	350 U

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TABLE 3

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	L8003	L8005	L8010	L8013	L8013	L8016
	SAMPLE ID	L8003S1P1	L8005S1P1	L8010S1P1	L8013S1P1	L8013S1D1	L8016S1P1
	DATE / TIME	04/10/97 / 10:40	04/09/97 / 10:15	04/09/97 / 16:30	04/25/97 / 10:06	04/25/97 / 10:05	04/24/97 / 16:10
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Duplicate 1	Primary
Butylbenzylphthalate		350 U	360 U	360 U	350 U	350 U	350 U
3,3'-Dichlorobenzidine		350 U	360 U	360 U	350 U	350 U	350 U
Benzo(a)Anthracene		350 U	360 U	360 U	350 U	350 U	350 U
Chrysene		350 U	360 U	360 U	350 U	350 U	350 U
bis(2-ethylhexyl)Phthalate		350 U	360 U	360 U	350 U	350 U	350 U
Di-n-octylphthalate		350 U	360 U	360 U	350 U	350 U	350 U
Benzo(b)fluoranthene		350 U	360 U	360 U	350 U	350 U	350 U
Benzo(k)fluoranthene		350 U	360 U	360 U	350 U	350 U	350 U
Benzo(a)pyrene		350 U	360 U	360 U	350 U	350 U	350 U
Indeno(1,2,3-cd)pyrene		350 U	360 U	360 U	350 U	350 U	350 U
Dibenzo(a,h)anthracene		350 U	360 U	360 U	350 U	350 U	350 U
Benzo(g,h,i)perylene		350 U	360 U	360 U	350 U	350 U	350 U

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TABLE 3

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	L8025	L8027
	SAMPLE ID	L8025S1P1	L8027S1P1
	DATE / TIME	04/24/97 / 15:50	04/25/97 / 14:35
	DEPTH (ft)	0.00	0.00
	RESULT TYPE	Primary	Primary
Phenol		350 U	350 U
bis(2-chloroethyl)ether		350 U	350 U
2-Chlorophenol		350 U	350 U
1,3-Dichlorobenzene		350 U	350 U
1,4-Dichlorobenzene		350 U	350 U
1,2-Dichlorobenzene		350 U	350 U
2-Methylphenol		350 U	350 U
2,2'-oxybis(1-Chloropropane)		350 U	350 U
N-Nitrosodinpropylamine		350 U	350 U
4-Methylphenol		350 U	350 U
Hexachloroethane		350 U	350 U
Nitrobenzene		350 U	350 U
Isophorone		350 U	350 U
2-Nitrophenol		350 U	350 U
2,4-Dimethylphenol		350 U	350 U
bis(2-chloroethoxy)methane		350 U	350 U
2,4-Dichlorophenol		350 U	350 U
1,2,4-Trichlorobenzene		350 U	350 U
Naphthalene		350 U	350 U
4-Chloroaniline		350 U	350 U
Hexachlorobutadiene		350 U	350 U
4-Chloro-3-Methylphenol		350 U	350 U
2-Methylnaphthalene		350 U	350 U
Hexachlorocyclopentadiene		350 U	350 U
2,4,6-Trichlorophenol		350 U	350 U
2,4,6-Trichlorophenol		860 U	860 U

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U = non-detect, J = estimated, R = rejected UJ = estimated quantitation limit

TABLE 3

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	L8025	L8027
	SAMPLE ID	L8025S1P1	L8027S1P1
	DATE / TIME	04/24/97 / 15:50	04/25/97 / 14:35
	DEPTH (ft)	0.00	0.00
	RESULT TYPE	Primary	Primary
2-Chloronaphthalene		350 U	350 U
2-Nitroaniline		860 U	860 U
Dimethylphthalate		350 U	350 U
Acenaphthylene		350 U	350 U
2,6-Dinitrotoluene		350 U	350 U
3-Nitroaniline		860 U	860 U
Acenaphthene		350 U	350 U
2,4-Dinitrophenol		860 U	860 U
4-Nitrophenol		860 U	860 U
Dibenzofuran		350 U	350 U
2,4-Dinitrotoluene		350 U	350 U
Diethylphthalate		350 U	350 U
4-Chlorophenyl-phenylether		350 U	350 U
Fluorene		350 U	350 U
4-Nitroaniline		860 U	860 U
4,6-Dinitro-2-methylphenol		860 U	860 U
N-Nitrosodiphenylamine (1)		350 U	350 U
4-Bromophenyl-phenylether		350 U	350 U
Hexachlorobenzene		350 U	350 U
Pentachlorophenol		860 U	860 U
Phenanthrene		350 U	350 U
Anthracene		350 U	350 U
Carbazole		350 U	350 U
Di-n-Butylphthalate		350 U	350 U
Fluoranthene		350 U	350 U
Pyrene		350 U	350 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, R = rejected = estimated quantitation limit

TABLE 3

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	L8025	L8027
	SAMPLE ID	L8025S1P1	L8027S1P1
	DATE / TIME	04/24/97 / 15:50	04/25/97 / 14:35
	DEPTH (ft)	0.00	0.00
	RESULT TYPE	Primary	Primary
Butylbenzylphthalate		350 U	350 U
3,3'-Dichlorobenzidine		350 U	350 U
Benzo(a)Anthracene		350 U	350 U
Chrysene		350 U	350 U
bis(2-ethylhexyl)Phthalate		350 U	350 U
Di-n-octylphthalate		350 U	350 U
Benzo(b)fluoranthene		350 U	350 U
Benzo(k)fluoranthene		350 U	350 U
Benzo(a)pyrene		350 U	350 U
Indeno(1,2,3-cd)pyrene		350 U	350 U
Dibenzo(a,h)anthracene		350 U	350 U
Benzo(g,h,i)perylene		350 U	350 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, R = rejected

UJ = estimated quantitation limit

TABLE 4

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001D1P1	D1003D1P1	D1005D1P1	D1008D1P1	D1010D1P1	D1013D1P1
	DATE / TIME	04/10/97 / 10:40	04/10/97 / 11:10	04/10/97 / 09:20	04/09/97 / 13:50	04/09/97 / 11:00	04/09/97 / 08:40
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
alpha-BHC		2.9 U	2.3 U	2.1 U	3.1 U	3.2 UJ	2.3 U
beta-BHC		2.9 U	2.3 U	2.1 U	3.1 U	3.2 UJ	2.3 U
delta-BHC		2.9 U	2.3 U	2.1 U	3.1 U	3.2 UJ	2.3 U
gamma-BHC(Lindane)		2.9 U	2.3 U	2.1 U	3.1 U	3.2 UJ	2.3 U
Heptachlor		2.9 U	2.3 U	2.1 U	3.1 U	3.2 UJ	2.3 U
Aldrin		2.9 U	2.3 U	2.1 U	3.1 U	3.2 UJ	2.3 U
Heptachlor epoxide		2.9 U	2.3 U	2.1 U	3.1 U	3.2 UJ	2.3 U
Endosulfan I		2.9 U	2.3 U	2.1 U	3.1 U	3.2 UJ	2.3 U
Dieldrin		5.8 U	4.7 U	4.3 U	6.1 U	6.4 UJ	4.5 U
4,4'-DDE		12 J	2.4 J	4.3 U	6.1 U	3.6 J	2.3 J
Endrin		5.8 U	4.7 U	4.3 U	6.1 U	6.4 UJ	4.5 U
Endosulfan II		5.8 U	4.7 U	4.3 U	6.1 U	6.4 UJ	4.5 U
4,4'-DDD		5.7 J	0.47 NJ	2.1 J	1 J	9 J	4.8
Endosulfan sulfate		5.8 U	4.7 U	4.3 U	6.1 U	6.4 UJ	4.5 U
4,4'-DDT		5.6 NJ	1 J	4.3 U	6.1 U	6.4 UJ	4.5 U
Methoxychlor		29 U	23 U	21 U	31 U	0.94 NJ	2.2 J
Endrin ketone		5.8 U	4.7 U	4.3 U	6.1 U	6.4 UJ	4.5 U
Endrin aldehyde		5.8 U	0.39 J	4.3 U	6.1 U	6.4 UJ	4.5 U
alpha-Chlordane		0.56 J	0.85 J	2.1 U	1.5 J	5.1 J	7.3
gamma-Chlordane		0.47 NJ	0.94 J	2.1 U	1 J	8.7 J	7.4
Toxaphene		290 U	230 U	210 U	310 U	320 UJ	230 U
Aroclor-1016		58 U	47 U	43 U	61 U	64 UJ	45 U
Aroclor-1221		120 U	94 U	85 U	120 U	130 UJ	91 U
Aroclor-1232		58 U	47 U	43 U	61 U	64 UJ	45 U
Aroclor-1242		58 U	47 U	43 U	61 U	64 UJ	45 U
Aroclor-1248		58 U	47 U	43 U	61 U	64 UJ	45 U

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U = non-detect, J = estimated, NJ = presumptive evidence

= estimated quantitation limit

TABLE 4

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001D1P1	D1003D1P1	D1005D1P1	D1008D1P1	D1010D1P1	D1013D1P1
	DATE / TIME	04/10/97 / 10:40	04/10/97 / 11:10	04/10/97 / 09:20	04/09/97 / 13:50	04/09/97 / 11:00	04/09/97 / 08:40
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Aroclor-1254		58 U	47 U	43 U	61 U	64 UJ	45 U
Aroclor-1260		58 U	47 U	43 U	61 U	64 UJ	45 U

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TABLE 4

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D1015	D2003	D2006	D2006	D3003	D3005
	SAMPLE ID	D1015D1P1	D2003D1P1	D2006D1P1	D2006D1D1	D3003D1P1	D3005D1P1
	DATE / TIME	04/22/97 / 11:10	04/05/97 / 10:00	04/05/97 / 10:20	04/05/97 / 10:20	04/07/97 / 15:20	04/07/97 / 11:10
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
alpha-BHC		3.1 UJ	2.3 UJ	2 UJ	2 U	2.2 U	4.4 U
beta-BHC		3.1 UJ	2.3 UJ	2 UJ	2 U	2.2 U	4.4 U
delta-BHC		3.1 UJ	2.3 UJ	2 UJ	2 U	2.2 U	4.4 U
gamma-BHC(Lindane)		3.1 UJ	2.3 UJ	2 UJ	2 U	2.2 U	4.4 U
Heptachlor		3.1 UJ	2.3 UJ	2 UJ	2 U	2.2 U	4.4 U
Aldrin		3.1 UJ	2.3 UJ	2 UJ	2 U	2.2 U	4.4 U
Heptachlor epoxide		3.1 UJ	2.3 UJ	2 UJ	2 U	2.2 U	4.4 U
Endosulfan I		3.1 UJ	2.3 UJ	2 UJ	2 U	2.2 U	4.4 U
Dieldrin		6.2 UJ	4.7 UJ	26 J	32	4.4 U	0.19 NJ
4,4'-DDE		0.84 J	4.7 J	0.24 NJ	0.73 NJ	32	14
Endrin		6.2 UJ	4.7 UJ	3.9 UJ	4 U	4.4 U	8.9 U
Endosulfan II		1.1 NJ	4.7 UJ	3.9 UJ	4 U	4.4 U	8.9 U
4,4'-DDD		2.4 J	4.7 UJ	20 J	27	6 U	970
Endosulfan sulfate		6.2 UJ	4.7 UJ	3.9 UJ	4 U	4.4 U	8.9 U
4,4'-DDT		6.2 UJ	0.5 NJ	3.9 UJ	0.58 J	13	22
Methoxychlor		31 UJ	23 UJ	20 UJ	20 U	22 U	44 U
Endrin ketone		6.2 UJ	4.7 UJ	3.9 UJ	4 U	0.46 NJ	8.9 U
Endrin aldehyde		6.2 UJ	4.7 UJ	3.9 UJ	4 U	4.4 U	8.9 U
alpha-Chlordane		0.76 J	0.59 NJ	2 UJ	0.35 NJ	0.73 J	7.1
gamma-Chlordane		0.88 J	0.68 NJ	2 UJ	2 U	0.53 NJ	8.1
Toxaphene		310 UJ	230 UJ	200 UJ	200 U	220 U	440 U
Aroclor-1016		62 UJ	47 UJ	39 UJ	40 U	44 U	89 U
Aroclor-1221		120 UJ	93 UJ	79 UJ	81 U	87 U	180 U
Aroclor-1232		62 UJ	47 UJ	39 UJ	40 U	44 U	89 U
Aroclor-1242		62 UJ	47 UJ	39 UJ	40 U	44 U	89 U
Aroclor-1248		62 UJ	47 UJ	39 UJ	40 U	44 U	89 U

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TABLE 4

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D1015	D2003	D2006	D2006	D3003	D3005
	SAMPLE ID	D1015D1P1	D2003D1P1	D2006D1P1	D2006D1D1	D3003D1P1	D3005D1P1
	DATE / TIME	04/22/97 / 11:10	04/05/97 / 10:00	04/05/97 / 10:20	04/05/97 / 10:20	04/07/97 / 15:20	04/07/97 / 11:10
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Aroclor-1254		62 UJ	47 UJ	39 UJ	40 U	44 U	89 U
Aroclor-1260		62 UJ	47 UJ	39 UJ	40 U	44 U	89 U

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TABLE 4

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D5001	D5001	D5001	D5001	D5001	D5004
	SAMPLE ID	D5001D1P1	D5001D1P3	D5001DPP1	D5001DPD1	D5001DPP2	D5004D1P1
	DATE / TIME	04/08/97 / 13:05	06/24/97 / 09:00	08/01/97 / 12:00	08/01/97 / 12:00	08/01/97 / 12:00	04/08/97 / 16:10
	DEPTH (ft)	0.00	0.00	0.00	0.00	1.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
alpha-BHC		---	---	---	---	---	2 UJ
beta-BHC		---	---	---	---	---	2 UJ
delta-BHC		---	---	---	---	---	2 UJ
gamma-BHC(Lindane)		---	---	---	---	---	2 UJ
Heptachlor		---	---	---	---	---	2 UJ
Aldrin		---	---	---	---	---	2 UJ
Heptachlor epoxide		---	---	---	---	---	2 UJ
Endosulfan I		---	---	---	---	---	2 UJ
Dieldrin		---	---	---	---	---	1.3 J
4,4'-DDE		---	---	---	---	---	4.1 UJ
Endrin		---	---	---	---	---	4.1 UJ
Endosulfan II		---	---	---	---	---	4.1 UJ
4,4'-DDD		---	---	---	---	---	4.1 UJ
Endosulfan sulfate		---	---	---	---	---	4.1 UJ
4,4'-DDT		---	---	---	---	---	4.1 UJ
Methoxychlor		---	---	---	---	---	20 UJ
Endrin ketone		---	---	---	---	---	4.1 UJ
Endrin aldehyde		---	---	---	---	---	4.1 UJ
alpha-Chlordane		---	---	---	---	---	2 UJ
gamma-Chlordane		---	---	---	---	---	2 UJ
Toxaphene		---	---	---	---	---	200 UJ
Aroclor-1016		21000 U	20000 U	40000 U	3900 U	8000 U	41 UJ
Aroclor-1221		21000 U	20000 U	40000 U	3900 U	8000 U	82 UJ
Aroclor-1232		21000 U	20000 U	40000 U	3900 U	8000 U	41 UJ
Aroclor-1242		---	---	40000 U	3900 U	8000 U	41 UJ
Aroclor-1248		21000 U	20000 U	40000 U	3900 U	8000 U	41 UJ

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U = non-dete[illegible] J = estimated, NJ = presumptive evidence [illegible] = estimated quantitation limit

TABLE 4

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D5001	D5001	D5001	D5001	D5001	D5004
	SAMPLE ID	D5001D1P1	D5001D1P3	D5001DPP1	D5001DPD1	D5001DPP2	D5004D1P1
	DATE / TIME	04/08/97 / 13:05	06/24/97 / 09:00	08/01/97 / 12:00	08/01/97 / 12:00	08/01/97 / 12:00	04/08/97 / 15:10
	DEPTH (ft)	0.00	0.00	0.00	0.00	1.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Aroclor-1254		42000 U	40000 U	40000 U	3900 U	8000 U	41 UJ
Aroclor-1260		180000	120000	140000 J	15000 J	33000	41 UJ

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TABLE 4

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D5007	D5009	D5013	D5020	D5021	D5023
	SAMPLE ID	D5007D1P1	D5009D1P1	D5013D1P1	D5020DPP1	D5021DPP1	D5023DPP1
	DATE / TIME	04/08/97 / 08:50	04/07/97 / 13:50	04/07/97 / 09:45	08/01/97 / 12:00	08/01/97 / 12:00	08/01/97 / 12:00
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
alpha-BHC		3.4 UJ	2 UJ	2.4 U	---	---	---
beta-BHC		3.4 UJ	2 UJ	2.4 U	---	---	---
delta-BHC		3.4 UJ	2 UJ	2.4 U	---	---	---
gamma-BHC(Lindane)		3.4 UJ	2 UJ	2.4 U	---	---	---
Heptachlor		3.4 UJ	2 UJ	2.4 U	---	---	---
Aldrin		3.4 UJ	2 UJ	2.4 U	---	---	---
Heptachlor epoxide		3.4 UJ	2 UJ	2.4 U	---	---	---
Endosulfan I		0.56 J	2 UJ	2.4 U	---	---	---
Dieldrin		0.19 NJ	4 UJ	4.8 U	---	---	---
4,4'-DDE		6.9 UJ	4 UJ	2 J	---	---	---
Endrin		6.9 UJ	4 UJ	4.8 U	---	---	---
Endosulfan II		6.9 UJ	4 UJ	4.8 U	---	---	---
4,4'-DDD		6.9 UJ	4 UJ	4.8 U	---	---	---
Endosulfan sulfate		6.9 UJ	4 UJ	4.8 U	---	---	---
4,4'-DDT		6.9 UJ	4 UJ	4.8 U	---	---	---
Methoxychlor		0.48 NJ	20 UJ	24 U	---	---	---
Endrin ketone		6.9 UJ	4 UJ	4.8 U	---	---	---
Endrin aldehyde		6.9 UJ	4 UJ	4.8 U	---	---	---
alpha-Chlordane		6.6 J	2 UJ	1.6 J	---	---	---
gamma-Chlordane		6.7 J	2 UJ	1.8 J	---	---	---
Toxaphene		340 UJ	200 UJ	240 U	---	---	---
Aroclor-1016		69 UJ	40 UJ	48 U	40 U	40 U	40 U
Aroclor-1221		140 UJ	81 UJ	95 U	40 U	40 U	40 U
Aroclor-1232		69 UJ	40 UJ	48 U	40 U	40 U	40 U
Aroclor-1242		69 UJ	40 UJ	48 U	40 U	40 U	40 U
Aroclor-1248		69 UJ	40 UJ	48 U	40 U	40 U	40 U

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TABLE 4

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D5007	D5009	D5013	D5020	D5021	D5023
	SAMPLE ID	D5007D1P1	D5009D1P1	D5013D1P1	D5020DPP1	D5021DPP1	D5023DPP1
	DATE / TIME	04/08/97 / 08:50	04/07/97 / 13:50	04/07/97 / 09:45	08/01/97 / 12:00	08/01/97 / 12:00	08/01/97 / 12:00
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Aroclor-1254		69 UJ	40 UJ	48 U	40 U	40 U	40 U
Aroclor-1260		78 J	24 J	48 U	40 U	40 U	40 U

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TABLE 4

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

	SITE	D5026	D5027	D5029	D5030	D5031	L8001
	SAMPLE ID	D5026DPP1	D5027DPP1	D5029DPP1	D5030DPP1	D5031DPP1	L8001S1P1
CONSTITUENT (Units in ug/kg)	DATE / TIME	08/01/97 / 12:00	08/01/97 / 12:00	08/01/97 / 12:00	08/01/97 / 12:00	08/01/97 / 12:00	04/09/97 / 09:00
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
alpha-BHC		---	---	---	200 U	---	1.8 UJ
beta-BHC		---	---	---	200 U	---	1.8 UJ
delta-BHC		---	---	---	200 U	---	1.8 UJ
gamma-BHC(Lindane)		---	---	---	200 U	---	1.8 UJ
Heptachlor		---	---	---	200 U	---	1.8 UJ
Aldrin		---	---	---	200 U	---	0.42 NJ
Heptachlor epoxide		---	---	---	200 U	---	1.8 UJ
Endosulfan I		---	---	---	160 NJ	---	1.8 UJ
Dieldrin		---	---	---	150 NJ	---	3.6 UJ
4,4'-DDE		---	---	---	400 U	---	3.6 UJ
Endrin		---	---	---	400 U	---	3.6 UJ
Endosulfan II		---	---	---	400 U	---	3.6 UJ
4,4'-DDD		---	---	---	400 U	---	3.6 UJ
Endosulfan sulfate		---	---	---	400 U	---	3.6 UJ
4,4'-DDT		---	---	---	400 U	---	0.67 J
Methoxychlor		---	---	---	2000 UJ	---	10 J
Endrin ketone		---	---	---	400 U	---	3.6 UJ
Endrin aldehyde		---	---	---	400 U	---	3.6 UJ
alpha-Chlordane		---	---	---	71 NJ	---	1.8 UJ
gamma-Chlordane		---	---	---	200 U	---	1.8 UJ
Toxaphene		---	---	---	20000 U	---	180 UJ
Aroclor-1016		41 U	7900 U	160 U	4000 U	40 U	36 UJ
Aroclor-1221		41 U	7900 U	160 U	8100 U	40 U	73 UJ
Aroclor-1232		41 U	7900 U	160 U	4000 U	40 U	36 UJ
Aroclor-1242		41 U	7900 U	160 U	4000 U	40 U	36 UJ
Aroclor-1248		41 U	7900 U	160 U	4000 U	40 U	36 UJ

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TABLE 4

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D5026	D5027	D5029	D5030	D5031	L8001
	SAMPLE ID	D5026DPP1	D5027DPP1	D5029DPP1	D5030DPP1	D5031DPP1	L800181P1
	DATE / TIME	08/01/97 / 12:00	08/01/97 / 12:00	08/01/97 / 12:00	08/01/97 / 12:00	08/01/97 / 12:00	04/09/97 / 09:00
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Aroclor-1254		41 U	7900 U	160 U	4000 U	40 U	36 UJ
Aroclor-1260		120	28000	390	150000	40 U	36 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, NJ = presumptive evidence UJ = estimated quantitation limit

TABLE 4

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	L8003	L8006	L8010	L8013	L8013	L8016
	SAMPLE ID	L8003S1P1	L8006S1P1	L8010S1P1	L8013S1P1	L8013S1D1	L8016S1P1
	DATE / TIME	04/10/97 / 10:40	04/09/97 / 10:15	04/09/97 / 16:30	04/25/97 / 10:05	04/25/97 / 10:05	04/24/97 / 15:10
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Duplicate 1	Primary
alpha-BHC		1.8 U	1.8 UJ	1.9 U	1.8 UJ	1.7 U	1.8 UJ
beta-BHC		1.8 U	1.8 UJ	1.9 U	1.8 UJ	1.7 U	1.8 UJ
delta-BHC		1.8 U	1.8 UJ	1.9 U	1.8 UJ	1.7 U	1.8 UJ
gamma-BHC(Lindane)		1.8 U	1.8 UJ	1.9 U	1.8 UJ	1.7 U	1.8 UJ
Heptachlor		1.8 U	1.8 UJ	1.9 U	1.8 UJ	1.7 U	1.8 UJ
Aldrin		1.8 U	1.8 UJ	0.27 NJ	1.8 UJ	1.7 U	1.8 UJ
Heptachlor epoxide		1.8 U	1.8 UJ	1.9 U	1.8 UJ	1.7 U	1.8 UJ
Endosulfan I		1.8 U	0.83 J	1.9 U	1.8 UJ	1.7 U	1.1 NJ
Dieldrin		2.7 NJ	3.6 UJ	3.9 U	3.5 UJ	3.5 U	3.5 UJ
4,4'-DDE		3.5 U	170 D	3.9 U	3.5 UJ	3.5 U	2.8 NJ
Endrin		3.5 U	3.6 UJ	3.9 U	3.5 UJ	3.5 U	3.5 UJ
Endosulfan II		3.5 U	3.6 UJ	3.9 U	3.5 UJ	3.5 U	3.5 UJ
4,4'-DDD		3.5 U	3.6 UJ	3.9 U	3.5 UJ	3.5 U	3.5 UJ
Endosulfan sulfate		3.5 U	3.6 UJ	3.9 U	3.5 UJ	3.5 U	3.5 UJ
4,4'-DDT		6.4	280 D	3.9 U	1.2 J	1.9 J	2.4 J
Methoxychlor		18 U	18 UJ	19 U	18 UJ	17 U	18 UJ
Endrin ketone		3.5 U	3.6 UJ	3.9 U	3.5 UJ	3.5 U	3.5 UJ
Endrin aldehyde		3.5 U	3.6 UJ	3.9 U	3.5 UJ	3.5 U	3.5 UJ
alpha-Chlordane		1.8 U	0.56 J	1.9 U	1.8 UJ	1.7 U	1.8 UJ
gamma-Chlordane		1.8 U	0.33 NJ	1.9 U	1.8 UJ	1.7 U	1.8 UJ
Toxaphene		180 U	180 UJ	190 U	180 UJ	170 U	180 UJ
Aroclor-1016		35 U	36 UJ	39 U	35 UJ	35 U	35 UJ
Aroclor-1221		70 U	72 UJ	78 U	70 UJ	70 U	71 UJ
Aroclor-1232		35 U	36 UJ	39 U	35 UJ	35 U	35 UJ
Aroclor-1242		35 U	36 UJ	39 U	35 UJ	35 U	35 UJ
Aroclor-1248		35 U	36 UJ	39 U	35 UJ	35 U	35 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit — = Not analyzed

U = non-detect, J = estimated, NJ = presumptive evidence = estimated quantitation limit

TABLE 4

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	L8003	L8005	L8010	L8013	L8013	L8016
	SAMPLE ID	L8003S1P1	L8005S1P1	L8010S1P1	L8013S1P1	L8013S1D1	L8016S1P1
	DATE / TIME	04/10/97 / 10:40	04/09/97 / 10:15	04/09/97 / 16:30	04/25/97 / 10:05	04/25/97 / 10:05	04/24/97 / 15:10
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Duplicate 1	Primary
Aroclor-1254		35 U	36 UJ	39 U	35 UJ	35 U	35 UJ
Aroclor-1260		35 U	36 UJ	39 U	35 UJ	35 U	35 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, NJ = presumptive evidence UJ = estimated quantitation limit

TABLE 4

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	L8025	L8027
	SAMPLE ID	L8025S1P1	L8027S1P1
	DATE / TIME	04/24/97 / 15:50	04/25/97 / 14:35
	DEPTH (ft)	0.00	0.00
	RESULT TYPE	Primary	Primary
alpha-BHC		3.6 U	9 U
beta-BHC		3.6 U	9 U
delta-BHC		3.6 U	9 U
gamma-BHC(Lindane)		3.6 U	9 U
Heptachlor		3.6 U	9 U
Aldrin		3.6 U	9 U
Heptachlor epoxide		3.6 U	9 U
Endosulfan I		3.6 U	9 U
Dieldrin		7.2 U	18 U
4,4'-DDE		58	100
Endrin		7.2 U	18 U
Endosulfan II		7.2 U	18 U
4,4'-DDD		7.2 U	18 U
Endosulfan sulfate		7.2 U	18 U
4,4'-DDT		9	18 U
Methoxychlor		36 U	90 U
Endrin ketone		7.2 U	18 U
Endrin aldehyde		7.2 U	18 U
alpha-Chlordane		3.6 U	9 U
gamma-Chlordane		3.6 U	9 U
Toxaphene		360 U	900 U
Aroclor-1016		72 U	180 U
Aroclor-1221		140 U	360 U
Aroclor-1232		72 U	180 U
Aroclor-1242		72 U	180 U
Aroclor-1248		72 U	180 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, NJ = presumptive evidence = estimated quantitation limit

TABLE 4

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	L8025	L8027
	SAMPLE ID	L8025S1P1	L8027S1P1
	DATE / TIME	04/24/97 / 15:50	04/25/97 / 14:35
	DEPTH (ft)	0.00	0.00
	RESULT TYPE	Primary	Primary
Aroclor-1254		72 U	46 J
Aroclor-1260		72 U	180 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, NJ = presumptive evidence

UJ = estimated quantitation limit

TABLE 5

ON-BASE DELINEATION
HERBICIDE RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001D1P1	D1003D1P1	D1005D1P1	D1008D1P1	D1010D1P1	D1013D1P1
	DATE / TIME	04/10/97 / 10:40	04/10/97 / 11:10	04/10/97 / 09:20	04/09/97 / 13:50	04/09/97 / 11:00	04/09/97 / 08:40
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,4-D		140 U	110 U	100 U	150 U	150 U	110 U
2,4,5-TP (Silvex)		35 U	28 U	26 U	37 U	38 U	27 U
2,4,5-T		35 U	28 U	26 U	37 U	38 U	27 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, For RCL HERB = estimated quantitation limit

TABLE 5

ON-BASE DELINEATION
HERBICIDE RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D1015	D2003	D2006	D2006	D3003	D3005
	SAMPLE ID	D1015D1P1	D2003D1P1	D2006D1P1	D2006D1D1	D3003D1P1	D3005D1P1
	DATE / TIME	04/22/97 / 11:10	04/05/97 / 10:00	04/05/97 / 10:20	04/05/97 / 10:20	04/07/97 / 15:20	04/07/97 / 11:10
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
2,4-D		160 U	110 UJ	95 U	97 U	100 U	110 U
2,4,5-TP (Silvex)		41 U	28 UJ	24 U	24 U	26 U	27 U
2,4,5-T		41 U	28 UJ	24 U	24 U	26 U	27 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, For RCL HERB

UJ = estimated quantitation limit

TABLE 5

ON-BASE DELINEATION
HERBICIDE RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	D5004	D5007	D5009	D5013	D5030	L8001
	SAMPLE ID	D5004D1P1	D5007D1P1	D5009D1P1	D5013D1P1	D5030DPP1	L8001S1P1
	DATE / TIME	04/08/97 / 15:10	04/08/97 / 08:50	04/07/97 / 13:50	04/07/97 / 09:45	08/01/97 / 00:00	04/09/97 / 09:00
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,4-D		100 U	170 U	98 U	100 U	97 U	87 U
2,4,5-TP (Silvex)		25 U	41 U	24 U	25 U	24 U	22 U
2,4,5-T		25 U	41 U	24 U	25 U	24 U	22 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit -- = Not analyzed

U = non-detected, J = estimated, For RCL HERB = estimated quantitation limit

TABLE 5

ON-BASE DELINEATION
HERBICIDE RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

	SITE	L8003	L8005	L8010	L8013	L8013	L8016
	SAMPLE ID	L8003S1P1	L8005S1P1	L8010S1P1	L8013S1P1	L8013S1D1	L8016S1P1
CONSTITUENT (Units in ug/kg)	DATE / TIME	04/10/97 / 10:40	04/09/97 / 10:15	04/09/97 / 16:30	04/25/97 / 10:05	04/25/97 / 10:05	04/24/97 / 15:10
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Duplicate 1	Primary
2,4-D		85 U	86 U	94 U	84 U	84 U	85 U
2,4,5-TP (Silvex)		21 U	22 U	23 U	21 U	21 U	21 U
2,4,5-T		21 U	22 U	23 U	21 U	21 U	21 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, For RCL HERB

UJ = estimated quantitation limit

TABLE 5

ON-BASE DELINEATION
HERBICIDE RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/23/98

CONSTITUENT (Units in ug/kg)	SITE	L8025	L8027
	SAMPLE ID	L8025S1P1	L8027S1P1
	DATE / TIME	04/24/97 / 15:50	04/25/97 / 14:35
	DEPTH (ft)	0.00	0.00
	RESULT TYPE	Primary	Primary
2,4-D		86 U	86 U
2,4,5-TP (Silvex)		22 U	21 U
2,4,5-T		52 J	21 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-dete[redacted] J = estimated, For RCL HERB [redacted] = estimated quantitation limit

TABLE 6

OFF-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ng/kg)	SITE	BB001	BB002	BB003	BB004	BB005	BB006
	SAMPLE ID	BB001D1P2	BB002D1P2	BB003D1P2	BB004D1P2	BB005D1P2	BB006D2P1
	DATE / TIME	05/16/97 / 12:48	05/16/97 / 13:26	05/16/97 / 14:06	05/16/97 / 15:25	05/16/97 / 15:39	10/15/97 / 11:00
	DEPTH (ft)	0.50	0.50	0.50	0.50	0.50	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		0.3 U	0.68	1.3	0.3 U	3.6 U	1.4
1,2,3,7,8-PeCDD		0.4 U	0.7 U	1.7	0.4 U	5.6 U	2.8
1,2,3,4,7,8-HxCDD		0.75	2.2	5.6	1.1	5.2 U	10.2
1,2,3,6,7,8-HxCDD		2.6	5.4	20.4	6.9	36.2	76.1
1,2,3,7,8,9-HxCDD		6.8	8.8	22.9	4.1	22.4	31.6 J
1,2,3,4,6,7,8-HpCDD		98.7	290	807	225	1530	2390 J
1,2,3,4,6,7,8,9-OCDD		1570	2880	10350	2610	18990	1970 J
2,3,7,8-TCDF		0.3 U	(0.31)	1.6	0.3 U	3.2 U	4.7 U
1,2,3,7,8-PeCDF		0.3 U	0.5 U	0.7 U	0.3 U	3.8 U	4.3
2,3,4,7,8-PeCDF		0.3 U	0.5 U	0.7 U	0.3 U	3.6 U	4.6
1,2,3,4,7,8-HxCDF		1.0	1.6	11.0	5.1	34.5	30.8 J
1,2,3,6,7,8-HxCDF		0.36	0.72	4.5	2.4	18.7	14.6
2,3,4,6,7,8-HxCDF		0.91	1.5	7.0	3.4	21.1	25.8 J
1,2,3,7,8,9-HxCDF		0.4 U	0.6 U	0.9 U	0.4 U	4.8 U	2.1
1,2,3,4,6,7,8-HpCDF		10.6	22.5	126	70.5	442	737
1,2,3,4,7,8,9-HpCDF		0.96	1.9	12.9	5.7	17.9	47.9
1,2,3,4,6,7,8,9-OCDF		36.8	97.2	609	262	2160	2580 J
Total TCDD		18.2	16.8	37.9	3.2	22.2	42.2
Total PeCDD		28.5	13.4	15.2	1.7	47.1	23.8
Total HxCDD		142	151	239	53.4	178	548
Total HpCDD		228	1460	1870	481	3430	5000
Total TCDF		0.55	0.91	1.6	0.67	3.2 U	28.3
Total PeCDF		2.6	3.8	23.2	9.8	73.9	78.6
Total HxCDF		12.9	28.5	169	86.9	546	772
Total HpCDF		32.1	80.2	499	259	1690	3320
Total TEQ		3.95	8.85	29.9	8.18	54.3	60.7 J

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less than Reporting Limit

U = non-detect, J = estimated, R = rejected For RCL DIOX UJ = estimated quantitation limit

TABLE 6

OFF-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ng/kg)	SITE	BB007	BB008	BB009	BB010	BC001	BC002
	SAMPLE ID	BB007D2P1	BB008D2P1	BB009D2P1	BB010D2P1	BC001D1P2	BC002D1P2
	DATE / TIME	10/15/97 / 11:10	10/15/97 / 11:15	10/15/97 / 11:25	10/15/97 / 11:35	04/29/97 / 09:31	04/29/97 / 10:46
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.50	0.50
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		1.2	1.2	2	1.4	0.3 UJ	0.3 U
1,2,3,7,8-PeCDD		2.5	2.5	3.1	2.6	0.4 U	0.3 U
1,2,3,4,7,8-HxCDD		7.8	10.4	8.6	7.6	0.6 U	0.5 U
1,2,3,6,7,8-HxCDD		35.4	46.9	40.7	26.9	1.6 J	1.6
1,2,3,7,8,9-HxCDD		31.1	37.9 J	33 J	29.4 J	1.6	0.4 U
1,2,3,4,6,7,8-HpCDD		1200 J	1590	1420	947	49.9	26.7
1,2,3,4,6,7,8,9-OCDD		2000 J	1990 J	2000 J	1980 J	452	174
2,3,7,8-TCDF		3.3 U	4.8 U	4.5 U	2.9 U	0.3 UJ	0.3 U
1,2,3,7,8-PeCDF		2.6	3.5	2.5	2	0.3 U	0.2 U
2,3,4,7,8-PeCDF		3.9	6.1	4.1	3.6	0.3 U	0.35
1,2,3,4,7,8-HxCDF		23.3 J	29 J	23 J	18.9 J	2.5 J	1.2
1,2,3,6,7,8-HxCDF		9.7	12.3	9	7.5	0.69	0.3 U
2,3,4,6,7,8-HxCDF		5.8 U	7.7 J	7.6	4.7 U	1.3	0.4 U
1,2,3,7,8,9-HxCDF		1.4	1.5	1.4	0.73	0.5 U	0.5 U
1,2,3,4,6,7,8-HpCDF		318	385	296	218	10.8	4.7
1,2,3,4,7,8,9-HpCDF		24.7	27.6	26.1	14.3	0.97	0.6 U
1,2,3,4,6,7,8,9-OCDF		846 J	883	776 J	445 J	31.0	8.3
Total TCDD		36	45.5	50.9	54.9	0.3 U	0.3 U
Total PeCDD		34.3	41.7	35.4	34.9	2.5	0.3 U
Total HxCDD		364	645	547	416	10.8	3.7
Total HpCDD		2510	3820	3250	2280	103	45.9
Total TCDF		24	31.4	34.8	19.8	1.4	0.3 U
Total PeCDF		67.7	81.8	72.4	62.5	1.4	2.7
Total HxCDF		345	490	429	267	10.1	7.5
Total HpCDF		1170	1490	1180	734	23.2	14.4
Total TEQ		33.7 J	43.1 J	38.3 J	27.9 J	1.87 J	0.951

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, R = rejected For RCL DIOX = estimated quantitation limit

TABLE 6

OFF-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ng/kg)	SITE	BC003	BC004	BC005	BC006	BC007	C1001
	SAMPLE ID	BC003D1P1	BC004D1P1	BC005D1P1	BC006D2P1	BC007D2P1	C1001D1P2
	DATE / TIME	05/19/97 / 12:00	05/19/97 / 11:30	05/19/97 / 11:00	10/15/97 / 12:25	10/15/97 / 12:35	04/23/97 / 09:01
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.50
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		0.8 U	0.60	9.6 U	1.4	1.5	0.4 U
1,2,3,7,8-PeCDD		2.3	2.1	16.5 U	4.4	3.7	1.9
1,2,3,4,7,8-HxCDD		4.2	4.9	13.0 U	10.5	7.9	2.9
1,2,3,6,7,8-HxCDD		14.4	14.3	11.9 U	27.7	20.8	6.0
1,2,3,7,8,9-HxCDD		11.5	17.1	11.5 U	40.6 J	32.6 J	6.0
1,2,3,4,6,7,8-HpCDD		440	402	86.0	808	584	98.2
1,2,3,4,6,7,8,9-OCDD		5740	4740	1880	1990 J	7260	749
2,3,7,8-TCDF		2.6	3.3	7.9 U	5.4 U	4.4 U	0.59
1,2,3,7,8-PeCDF		2.3	1.9	10.3 U	2.9	2.3	0.3 U
2,3,4,7,8-PeCDF		1.8	2.2	10.0 U	4.3	3.2	0.3 U
1,2,3,4,7,8-HxCDF		10.6	8.8	9.5 U	16.6 J	15 J	5.6
1,2,3,6,7,8-HxCDF		5.5	4.1	7.7 U	9	7	1.6
2,3,4,6,7,8-HxCDF		5.7	6.0	9.5 U	6.7 J	6 U	0.74
1,2,3,7,8,9-HxCDF		0.9 U	0.6 U	10.5 U	0.77	0.5 U	0.6 U
1,2,3,4,6,7,8-HpCDF		72.2	62.2	15.8	184	129	22.2
1,2,3,4,7,8,9-HpCDF		5.4	4.3	12.8 U	10.7	8.2	2.0
1,2,3,4,6,7,8,9-OCDF		482	281	25.5 U	352	258	51.6
Total TCDD		3.8	9.8	9.6 U	38	25.9	0.4 U
Total PeCDD		13.6	18.2	16.5 U	44.9	28.9	1.7
Total HxCDD		85.7	173	12.1 U	397	300	37.4
Total HpCDD		665	721	182	2050	1430	184
Total TCDF		20.7	21.9	7.9 U	45.7	32.6	3.3
Total PeCDF		43.1	46.0	10.1 U	89	67.2	7.4
Total HxCDF		105	105	9.2 U	219	183	30.8
Total HpCDF		209	189	15.8	502	366	22.2
Total TEQ		18.0	18.4	2.90	29.5 J	28.1 J	6.32

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, R = rejected For RCL DIOX

UJ = estimated quantitation limit

TABLE 6

OFF-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

SITE	C1001	C1002	C1003	C1005	C1006	TC001
SAMPLE ID	C1001D1D2	C1002D1P2	C1003D1P2	C1005D1P2	C1006D1P2	TC001D1P2
CONSTITUENT (Units in ng/kg) DATE / TIME	04/23/97 / 09:01	04/24/97 / 09:31	04/22/97 / 13:46	04/23/97 / 10:46	04/23/97 / 13:31	04/25/97 / 15:31
DEPTH (ft)	0.50	0.50	0.50	0.50	0.50	0.50
RESULT TYPE	Duplicate 1	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD	0.6 U	4.5 U	5.5	0.86	0.3 U	0.2 U
1,2,3,7,8-PeCDD	2.2	3.3 U	0.8 U	0.3 U	0.3 U	0.2 U
1,2,3,4,7,8-HxCDD	2.7	4.0 U	3.0	(0.46)	0.4 U	0.72
1,2,3,6,7,8-HxCDD	5.2	3.7 U	7.4	1.2	0.4 U	1.8
1,2,3,7,8,9-HxCDD	5.3	3.6 U	6.8	1.6	1.4	8.1
1,2,3,4,6,7,8-HpCDD	82.8	85.8 J	208	41.6	13.1	51.2
1,2,3,4,6,7,8,9-OCDD	668	1340 J	1860	413	151	632
2,3,7,8-TCDF	0.6 U	4.5 U	2.2	0.4 U	0.3 U	0.2 U
1,2,3,7,8-PeCDF	0.4 U	3.0 U	0.6 U	0.3 U	0.2 U	0.2 U
2,3,4,7,8-PeCDF	0.51	2.9 U	0.6 U	0.3 U	0.2 U	0.2 U
1,2,3,4,7,8-HxCDF	4.6	17.8	4.3	0.4 U	1.1	0.2 U
1,2,3,6,7,8-HxCDF	1.4	2.9 U	2.3	0.4 U	0.3 U	0.25
2,3,4,6,7,8-HxCDF	0.97	3.6 U	3.2	0.4 U	0.4 U	0.37 U
1,2,3,7,8,9-HxCDF	0.7 U	4.0 U	1.2 U	0.5 U	0.4 U	0.2 U
1,2,3,4,6,7,8-HpCDF	18.2	14.3	32.2	5.2	2.8	0.2 U
1,2,3,4,7,8,9-HpCDF	1.9	3.6 U	2.8	0.77	1.0	0.3 U
1,2,3,4,6,7,8,9-OCDF	56.5	49.7 J	83.2	18.8	7.0	0.3 U
Total TCDD	0.6 U	4.5 U	5.5	0.86	0.3 U	10.2
Total PeCDD	2.2	3.3 U	1.4	1.1	0.84	23.8
Total HxCDD	29.5	20.1	58.1	16.0	5.8	144
Total HpCDD	160	186	474	170	27.3	232
Total TCDF	2.6	4.5 U	11.0	0.97	0.3 U	1.3
Total PeCDF	4.4	5.7	12.4	1.9	7.0	0.2 U
Total HxCDF	27.5	27.5	46.0	7.1	5.9	0.62
Total HpCDF	20.2	46.7	93.3	5.2	8.0	0.3 U
Total TEQ	6.13	4.17 J	12.8	2.09	0.677	2.21

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( ) = Less th[redacted]porting Limit

U = non-detect, J = estimated, R = rejected For RCL DIOX [redacted] = estimated quantitation limit [redacted]

TABLE 6

OFF-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ng/kg)	SITE	TC002	TC004	TC005	TC006	TC006	TC007
	SAMPLE ID	TC002D1P2	TC004D1P1	TC005D1P1	TC006D1P1	TC006D1D1	TC007D1P1
	DATE / TIME	04/25/97 / 15:31	04/28/97 / 14:20	04/28/97 / 11:00	05/14/97 / 14:30	05/14/97 / 14:30	05/14/97 / 16:15
	DEPTH (ft)	0.50	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Duplicate 1	Primary
2,3,7,8-TCDD		0.3 U	0.73 R	0.3 U	0.9 U	1.9 U	0.4 U
1,2,3,7,8-PeCDD		0.2 U	2.1 R	0.4 U	1.3 U	2.7 U	0.5 U
1,2,3,4,7,8-HxCDD		0.3 U	4.4 R	0.66 R	1.5 U	2.9 U	0.63
1,2,3,6,7,8-HxCDD		0.2 U	7.9 R	0.87 R	1.4 U	2.7 U	2.1
1,2,3,7,8,9-HxCDD		2.3	39.0 R	2.4 R	3.4	5.3	12.8
1,2,3,4,6,7,8-HpCDD		12.4	208 R	26.0 R	29.6	42.2 J	121
1,2,3,4,6,7,8,9-OCDD		152	2080 R	947 R	407	546 J	3550
2,3,7,8-TCDF		0.2 U	0.4 U	0.2 U	0.7 U	1.6 U	0.4 U
1,2,3,7,8-PeCDF		0.2 U	0.4 U	0.3 U	0.9 U	2.0 U	0.4 U
2,3,4,7,8-PeCDF		0.2 U	0.4 U	0.3 U	0.8 U	1.9 U	0.4 U
1,2,3,4,7,8-HxCDF		0.2 U	0.6 U	0.33 R	1.1 U	2.2 U	0.59
1,2,3,6,7,8-HxCDF		0.2 U	1.2 R	0.2 U	0.9 U	1.8 U	0.4 U
2,3,4,6,7,8-HxCDF		0.37 U	0.77 R	0.50 R	1.1 U	2.2 U	0.72
1,2,3,7,8,9-HxCDF		0.2 U	0.7 U	0.4 U	1.2 U	2.4 U	0.5 U
1,2,3,4,6,7,8-HpCDF		0.50	0.8 U	0.83 R	2.6	3.3	1.3
1,2,3,4,7,8,9-HpCDF		0.3 U	1.1 U	0.6 U	1.6 U	3.3 U	0.7 U
1,2,3,4,6,7,8,9-OCDF		0.3 U	1.2 U	0.91 R	3.0 U	5.1 U	2.4
Total TCDD		1.2	177	8.6	12.3	15.6	7.5
Total PeCDD		3.0	479	4.1	8.0	12.6	6.6
Total HxCDD		11.9	2450	9.7	63.4	86.1	74.1
Total HpCDD		29.8	1710	64.3	92.3	126	242
Total TCDF		0.2 U	1.5	17.2	0.7 U	1.6 U	0.4 U
Total PeCDF		0.2 U	0.4 U	0.73	0.9 U	1.9 U	0.46
Total HxCDF		0.66	2.0	1.4	1.1 U	2.1 U	1.9
Total HpCDF		1.4	(0.80)	1.7	2.6	3.3	1.8
Total TEQ		0.511	11.3 R	1.69 R	1.07	1.53	6.46

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UJ = estimated quantitation limit

TABLE 6

OFF-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ng/kg)	SITE	TC008	TC009	TC010	WL001	WL002	WL003
	SAMPLE ID	TC008D1P1	TC009D1P2	TC010D1P2	WL001D1P2	WL002D1P2	WL003D1P2
	DATE / TIME	05/14/97 / 15:30	05/16/97 / 09:36	05/16/97 / 09:59	05/16/97 / 14:01	05/16/97 / 14:21	05/16/97 / 14:41
	DEPTH (ft)	0.00	0.50	0.50	0.50	0.50	0.50
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		0.8 U	1.0	0.3 U	11.7	66.8	54.9
1,2,3,7,8-PeCDD		1.1 U	0.7 U	0.4 U	0.8 U	3.7	2.2
1,2,3,4,7,8-HxCDD		1.4 U	(0.78)	0.5 U	1.4	9.0	4.0
1,2,3,6,7,8-HxCDD		1.2 U	2.3	0.4 U	3.6	25.8	10.7
1,2,3,7,8,9-HxCDD		3.8	7.6	1.2	4.1	24.6	9.9
1,2,3,4,6,7,8-HpCDD		65.2	101	11.9	110	772	284
1,2,3,4,6,7,8,9-OCDD		674	1590	290	1060	7210	2240
2,3,7,8-TCDF		0.6 U	0.50	0.3 U	4.7	29.9	26.7
1,2,3,7,8-PeCDF		0.8 U	0.5 U	0.3 U	0.6 U	2.3	0.80
2,3,4,7,8-PeCDF		0.7 U	0.5 U	0.3 U	0.6 U	1.9	1.0
1,2,3,4,7,8-HxCDF		0.9 U	2.0	0.3 U	2.2	10.4	4.7
1,2,3,6,7,8-HxCDF		0.7 U	1.2	0.3 U	1.6	10.6	4.5
2,3,4,6,7,8-HxCDF		0.9 U	1.5	0.45	2.5	11.2	5.2
1,2,3,7,8,9-HxCDF		1.0 U	0.7 U	0.4 U	0.7 U	1.1 U	(0.27)
1,2,3,4,6,7,8-HpCDF		6.7 U	13.5	0.42	32.1	137	58.7
1,2,3,4,7,8,9-HpCDF		1.4 U	1.0 U	0.6 U	1.8	11.6	4.2
1,2,3,4,6,7,8,9-OCDF		26.6 U	36.4	1.9	94.0	538	212
Total TCDD		87.2	8.7	0.82	13.3	69.1	62.3
Total PeCDD		48.3	10.1	0.81	1.8	21.5	13.3
Total HxCDD		89.9	66.8	9.7	32.2	207	85.2
Total HpCDD		258	233	28.5	218	1600	551
Total TCDF		1.4	1.2	0.3 U	5.9	56.0	55.9
Total PeCDF		1.2	2.5	0.3 U	15.8	74.4	48.8
Total HxCDF		8.2	19.4	0.45	37.8	208	93.3
Total HpCDF		20.1	25.1	1.5	93.3	447	59.3
Total TEQ		1.71	5.36	0.580	16.3	98.8	69.1

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TABLE 6

OFF-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ng/kg)	SITE	WL004	WL005	WL006	WL007	WL008	WL009
	SAMPLE ID	WL004D1P2	WL005D1P1	WL006D1P1	WL007D1P1	WL008D1P1	WL009D1P1
	DATE / TIME	05/16/97 / 15:01	05/17/97 / 10:45	05/17/97 / 10:45	05/17/97 / 10:55	05/17/97 / 10:55	05/17/97 / 11:10
	DEPTH (ft)	0.50	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		133	136	109	176	212	0.4 U
1,2,3,7,8-PeCDD		5.2	4.4	4.6	7.2	6.5	0.5 U
1,2,3,4,7,8-HxCDD		11.8	9.0	9.2	15.9	12.1	0.8 U
1,2,3,6,7,8-HxCDD		31.9	24.8	27.0	42.9	33.1	0.86
1,2,3,7,8,9-HxCDD		28.7	21.9	17.0	33.3	20.4	6.2
1,2,3,4,6,7,8-HpCDD		883	626	745	1170	809	45.3
1,2,3,4,6,7,8,9-OCDD		7610	5130	8610 J	10980 J	6840 J	932
2,3,7,8-TCDF		49.8	66.1	40.7	56.6	77.2	0.3 U
1,2,3,7,8-PeCDF		2.3	5.3	2.3	3.4	3.2	0.4 U
2,3,4,7,8-PeCDF		2.2	5.4	3.9	3.7	3.2	0.4 U
1,2,3,4,7,8-HxCDF		13.3	31.7	22.0	22.7	15.9	0.5 U
1,2,3,6,7,8-HxCDF		14.5	17.7	12.3	16.2	14.7	0.4 U
2,3,4,6,7,8-HxCDF		15.2	17.9	11.9	9.4	12.5	0.62 U
1,2,3,7,8,9-HxCDF		1.1	0.89	0.98	0.98	0.84	0.5 U
1,2,3,4,6,7,8-HpCDF		162	246	289	218	169	1.00
1,2,3,4,7,8,9-HpCDF		11.9	14.9	13.5	17.7	10.8	0.7 U
1,2,3,4,6,7,8,9-OCDF		623	801	1690 J	1220 J	1950 J	1.0 U
Total TCDD		150	153	125	193	236	3.6
Total PeCDD		39.9	7.8	19.6	27.8	22.3	4.7
Total HxCDD		258	167	142	243	158	30.1
Total HpCDD		1880	1030	1000	1700	937	86.6
Total TCDF		120	194	110	134	195	3.4
Total PeCDF		125	224	110	146	177	0.67
Total HxCDF		270	349	263	341	292	0.62
Total HpCDF		514	600	757	701	501	1.0
Total TEQ		172	175	148 J	228 J	254 J	2.10

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TABLE 6

OFF-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ng/kg)	SITE	WL010	WL010	WL011	WL012	WL013	WL014
	SAMPLE ID	WL010D1P1	WL010D1D1	WL011D2P1	WL012D2P1	WL013D2P1	WL014D2P1
	DATE / TIME	05/17/97 / 11:05	05/17/97 / 11:05	10/12/97 / 12:50	10/12/97 / 13:10	10/12/97 / 13:13	10/12/97 / 13:25
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Duplicate 1	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		8.4	12.4	0.5 U	40	88.8	65.4
1,2,3,7,8-PeCDD		1.0 U	0.3 U	0.7 U	2.5	3.6	3.3
1,2,3,4,7,8-HxCDD		1.1	1.1	0.7 U	3.3	6	5.9
1,2,3,6,7,8-HxCDD		3.3	3.1	0.6 U	8.1	15	14.6
1,2,3,7,8,9-HxCDD		3.5	2.1	1.4 J	9 J	15.6 J	15.2 J
1,2,3,4,6,7,8-HpCDD		72.2	79.5	9.6	208	374	385
1,2,3,4,6,7,8,9-OCDD		581	751 J	147	1820 J	3080 J	3390
2,3,7,8-TCDF		3.3	4.9	0.4 U	4.9	9.4	7
1,2,3,7,8-PeCDF		0.7 U	0.2 U	0.5 U	1	1.2	0.9
2,3,4,7,8-PeCDF		0.7 U	0.2 U	0.5 U	1.1	1.8	2
1,2,3,4,7,8-HxCDF		1.7	2.3	0.5 U	3.5 J	5.3 J	4 J
1,2,3,6,7,8-HxCDF		0.6 U	0.97	0.4 U	2.2	4.1	3.1
2,3,4,6,7,8-HxCDF		1.8 U	1.4 U	0.5 U	2.9 J	5 J	3.5 J
1,2,3,7,8,9-HxCDF		0.8 U	0.3 U	0.6 U	0.7 U	0.5 U	0.8 U
1,2,3,4,6,7,8-HpCDF		14.1	12.9	1.6	67.5	115	105
1,2,3,4,7,8,9-HpCDF		1.0 U	0.6 U	0.7 U	3.9	6.4	6.2
1,2,3,4,6,7,8,9-OCDF		57.6	64.6 J	5.2	132 J	231 J	253
Total TCDD		8.4	14.5	0.5 U	47.8	103	77.1
Total PeCDD		1.6	2.2	0.7 U	7.6	17.7	17.8
Total HxCDD		20.9	20.8	4.2	75.8	132	131
Total HpCDD		146	154	18.8	420	746	782
Total TCDF		5.6	14.7	0.4 U	29.9	57	42
Total PeCDF		11.0	11.2	0.5 U	40.6	87	66.5
Total HxCDF		23.7	24.5	1.6	72.2	125	111
Total HpCDF		46.0	51.8	3.1	194	323	313
Total TEQ		11.2	15.6 J	0.404 J	50.0 J	106 J	82.0 J

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TABLE 6

OFF-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ng/kg)	SITE	WL015	WL015	WL016	WL017	WL018	WL019
	SAMPLE ID	WL015D2P1	WL015D2D1	WL016D2P1	WL017D2P1	WL018D2P1	WL019D2P1
	DATE / TIME	10/12/97 / 13:30	10/12/97 / 13:30	10/12/97 / 14:03	10/12/97 / 14:10	10/12/97 / 14:18	10/12/97 / 14:30
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Duplicate 1	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		55.1	51.9	41	71.8	75.3	30.1
1,2,3,7,8-PeCDD		2.8	2.5	2.6	3.9	4.3	1.5
1,2,3,4,7,8-HxCDD		4.8	4.6	4.7	7.8	7.7	2.4
1,2,3,6,7,8-HxCDD		11.8	11.9	10.7	17.6	17.9	6.6
1,2,3,7,8,9-HxCDD		13.2 J	13.2 J	11.2 J	18.8 J	20.9 J	7.3 J
1,2,3,4,6,7,8-HpCDD		315	302	285	477	480	150
1,2,3,4,6,7,8,9-OCDD		2700 J	2560	2440 J	3950 J	1990 J	1350
2,3,7,8-TCDF		7.2	6.9	8	10.2	9.7	3.3
1,2,3,7,8-PeCDF		0.99	1	1.4	1.5	1.3	0.63
2,3,4,7,8-PeCDF		1.8	1.3	1	1.8	1.6	0.8
1,2,3,4,7,8-HxCDF		6.7 J	5.3 J	3.9 J	6.8 J	7.5 J	1.9 J
1,2,3,6,7,8-HxCDF		3.4	3.4	3.2	5	4.5	1.5
2,3,4,6,7,8-HxCDF		4 J	4 J	3.9 J	5.5 J	5.2 J	2.5 J
1,2,3,7,8,9-HxCDF		1 U	0.2 U	0.6 U	0.6 U	0.47	0.3 U
1,2,3,4,6,7,8-HpCDF		99.5	89.1	79.6	142	133	45.4
1,2,3,4,7,8,9-HpCDF		5.7	4.8	4.4	7.8	8	2.4
1,2,3,4,6,7,8,9-OCDF		195 J	207	166 J	299 J	284 J	89.8
Total TCDD		66.6	64.3	48.9	77.9	81.7	42.2
Total PeCDD		12.4	13.5	10.6	15.5	17.8	10.1
Total HxCDD		112	109	94.3	158	162	59
Total HpCDD		637	605	570	948	939	312
Total TCDF		36.8	37.6	30.1	48.4	48.7	22.4
Total PeCDF		63	55.8	49.8	67.1	74.9	31
Total HxCDF		110	96.9	90.4	147	138	47
Total HpCDF		283	256	232	391	390	123
Total TEQ		69.7 J	66.5 J	53.7 J	92.4 J	94.2 J	37.1 J

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TABLE 6

OFF-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ng/kg)	SITE	WL020	WL021	WM001	WM002	WM003	WM004
	SAMPLE ID	WL020D2P1	WL021D2P1	WM001D1P2	WM002D1P2	WM003D1P2	WM004D1P2
	DATE / TIME	10/12/97 / 15:20	10/12/97 / 15:33	04/23/97 / 15:31	04/24/97 / 11:01	04/23/97 / 14:31	04/24/97 / 14:31
	DEPTH (ft)	0.00	0.00	0.50	0.50	0.50	0.50
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		379	174	5.3	6.4	0.6 U	0.8 U
1,2,3,7,8-PeCDD		8.3	7.1	0.7 U	1.9	0.6 U	0.8 U
1,2,3,4,7,8-HxCDD		11.1	11.1	1.2 U	2.8	0.8 U	1.0 U
1,2,3,6,7,8-HxCDD		25.8	25	7.0	7.6	0.7 U	0.9 U
1,2,3,7,8,9-HxCDD		25.1 J	26.9 J	6.3	7.2	3.3	0.9 U
1,2,3,4,6,7,8-HpCDD		598	623	201	212	29.4	13.0
1,2,3,4,6,7,8,9-OCDD		4770	4710	1740	1840	439	122
2,3,7,8-TCDF		107	39	1.0 U	1.9	0.6 U	0.8 U
1,2,3,7,8-PeCDF		3.4	1.9	0.6 U	0.70	0.4 U	0.7 U
2,3,4,7,8-PeCDF		3.8	2.3	0.6 U	0.85	0.4 U	0.7 U
1,2,3,4,7,8-HxCDF		14.8 J	11.1 J	7.0	5.3	0.7 U	0.9 U
1,2,3,6,7,8-HxCDF		10.4	6.6	2.1	2.5	0.6 U	0.7 U
2,3,4,6,7,8-HxCDF		6.5 J	5.4 J	3.6	2.2	0.7 U	0.9 U
1,2,3,7,8,9-HxCDF		0.89	0.6	1.0 U	0.7 U	0.8 U	1.0 U
1,2,3,4,6,7,8-HpCDF		181	170	44.7	42.3	2.4	3.1
1,2,3,4,7,8,9-HpCDF		11.7	10.6	3.5	3.6	0.9 U	1.0 U
1,2,3,4,6,7,8,9-OCDF		436	399	164	156	4.0	7.1
Total TCDD		414	192	5.3	8.0	4.3	0.8 U
Total PeCDD		46.6	33.2	0.7 U	6.9	10.6	0.8 U
Total HxCDD		225	209	44.1	63.7	88.8	3.5
Total HpCDD		1210	1200	478	445	128	29.1
Total TCDF		286	104	4.3	3.6	0.6 U	0.8 U
Total PeCDF		236	173	13.8	17.1	0.4 U	0.7 U
Total HxCDF		241	197	56.8	60.7	1.6	2.1
Total HpCDF		540	500	164	133	5.7	8.7
Total TEQ		418 J	204 J	12.3	15.3	1.09	0.290

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, R = rejected For RCL DIOX = estimated quantitation limit

TABLE 6

OFF-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ng/kg)	SITE	WM005	WM005
	SAMPLE ID	WM005D1P2	WM005D1D2
	DATE / TIME	04/24/97 / 15:16	04/24/97 / 15:16
	DEPTH (ft)	0.50	0.50
	RESULT TYPE	Primary	Duplicate 1
2,3,7,8-TCDD		2.2 U	0.4 U
1,2,3,7,8-PeCDD		2.1 U	0.4 U
1,2,3,4,7,8-HxCDD		2.5 U	0.5 U
1,2,3,6,7,8-HxCDD		2.3 U	0.5 U
1,2,3,7,8,9-HxCDD		4.5	3.9
1,2,3,4,6,7,8-HpCDD		49.0	34.2
1,2,3,4,6,7,8,9-OCDD		926 J	603 J
2,3,7,8-TCDF		2.0 U	0.4 U
1,2,3,7,8-PeCDF		1.7 U	0.3 U
2,3,4,7,8-PeCDF		1.7 U	0.3 U
1,2,3,4,7,8-HxCDF		2.0 U	0.5 U
1,2,3,6,7,8-HxCDF		1.6 U	0.4 U
2,3,4,6,7,8-HxCDF		2.0 U	0.5 U
1,2,3,7,8,9-HxCDF		2.2 U	0.5 U
1,2,3,4,6,7,8-HpCDF		2.3	1.7
1,2,3,4,7,8,9-HpCDF		2.3 U	0.5 U
1,2,3,4,6,7,8,9-OCDF		6.0 J	3.3 J
Total TCDD		4.9	3.0
Total PeCDD		2.1 U	1.1
Total HxCDD		8.0	19.7
Total HpCDD		101	70.0
Total TCDF		2.0 U	0.4 U
Total PeCDF		1.7 U	0.3 U
Total HxCDF		1.9 U	1.4
Total HpCDF		5.2	4.1
Total TEQ		1.90 J	1.36 J

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U = non-detect, J = estimated, R = rejected For RCL DIOX UJ = estimated quantitation limit

TABLE 7

OFF-BASE DELINEATION
VOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

SITE		BB003	BC003	C1001	C1001	TC002	TC006
SAMPLE ID		BB003D1P1	BC003D1P1	C1001D1P1	C1001D1D1	TC002D1P1	TC006D1P1
CONSTITUENT	(Units in ug/kg)	DATE / TIME	05/16/97 / 14:05	05/19/97 / 12:00	04/23/97 / 09:00	04/23/97 / 09:00	04/25/97 / 15:30	05/14/97 / 14:30
DEPTH (ft)		0.00	0.00	0.00	0.00	0.00	0.00
RESULT TYPE		Primary	Primary	Primary	Duplicate 1	Primary	Primary
Chloromethane		25 U	20 U	16 U	14 U	18 U	12 U
Bromomethane		25 U	20 U	16 U	14 U	18 U	12 U
Vinyl chloride		25 U	20 U	16 U	14 U	18 U	12 U
Chloroethane		25 U	20 U	16 U	14 U	18 U	12 U
Methylene chloride		25 U	20 U	16 U	14 U	18 U	12 U
Acetone		150	11 J	46 J	130 J	49 J	3.5 J
Carbon disulfide		25 U	20 U	16 U	14 U	18 U	12 U
1,1-Dichloroethene		25 U	20 U	16 U	14 U	18 U	12 U
1,1-Dichloroethane		25 U	20 U	16 U	14 U	18 U	12 U
1,2-Dichloroethene (total)		25 U	20 U	16 U	14 U	18 U	12 U
Chloroform		25 U	20 U	16 U	14 U	18 U	12 U
1,2-Dichloroethane		25 U	20 U	16 U	14 U	18 U	12 U
2-Butanone		34	20 U	9 J	14 J	18 U	12 U
1,1,1-Trichloroethane		25 U	20 U	16 U	14 U	18 U	12 U
Carbon tetrachloride		25 U	20 U	16 U	14 U	18 U	12 U
Bromodichloromethane		25 U	20 U	16 U	14 U	18 U	12 U
1,2-Dichloropropane		25 U	20 U	16 U	14 U	18 U	12 U
cis-1,3-Dichloropropene		25 U	20 U	16 U	14 U	18 U	12 U
Trichloroethene		25 U	20 U	16 U	14 U	18 U	12 U
Dibromochloromethane		25 U	20 U	16 U	14 U	18 U	12 U
1,1,2-Trichloroethane		25 U	20 U	16 U	14 U	18 U	12 U
Benzene		25 U	20 U	16 U	14 U	18 U	12 U
trans-1,3-Dichloropropene		25 U	20 U	16 U	14 U	18 U	12 U
Bromoform		25 U	20 U	16 U	14 U	18 U	12 U
4-Methyl-2-pentanone		25 U	20 U	16 U	14 U	18 U	12 U
2-Hexanone		25 U	20 U	16 U	14 U	18 U	12 U

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U = non-detect, J = estimated, For RCL VOA = estimated quantitation limit

TABLE 7

OFF-BASE DELINEATION
VOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

SITE		BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003D1P1	BC003D1P1	C1001D1P1	C1001D1D1	TC002D1P1	TC006D1P1
CONSTITUENT (Units in ug/kg)	DATE / TIME	05/16/97 / 14:05	05/19/97 / 12:00	04/23/97 / 09:00	04/23/97 / 09:00	04/25/97 / 15:30	05/14/97 / 14:30
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Tetrachloroethene		25 U	20 U	16 U	14 U	18 U	12 U
1,1,2,2-Tetrachloroethane		25 U	20 U	16 U	14 U	18 U	12 U
Toluene		25 U	20 U	16 U	14 U	18 U	12 U
Chlorobenzene		25 U	20 U	16 U	14 U	18 U	12 U
Ethylbenzene		25 U	20 U	16 U	14 U	18 U	12 U
Styrene		25 U	20 U	16 U	14 U	18 U	12 U
Xylenes (total)		25 U	20 U	16 U	14 U	18 U	12 U

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TABLE 7

OFF-BASE DELINEATION
VOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ug/kg)	SITE	TC006	WL001	WM002
	SAMPLE ID	TC006D1D1	WL001D1P1	WM002D1P1
	DATE / TIME	05/14/97 / 14:30	05/16/97 / 14:00	04/24/97 / 11:00
	DEPTH (ft)	0.00	0.00	0.00
	RESULT TYPE	Duplicate 1	Primary	Primary
Chloromethane		12 U	13 U	19 U
Bromomethane		12 U	13 U	19 U
Vinyl chloride		12 U	13 U	19 U
Chloroethane		12 U	13 U	19 U
Methylene chloride		12 U	13 U	19 U
Acetone		3.4 J	13 U	290
Carbon disulfide		12 U	13 U	19 U
1,1-Dichloroethene		12 U	13 U	19 U
1,1-Dichloroethane		12 U	13 U	19 U
1,2-Dichloroethene (total)		12 U	13 U	19 U
Chloroform		12 U	13 U	19 U
1,2-Dichloroethane		12 U	13 U	19 U
2-Butanone		12 U	13 U	18 J
1,1,1-Trichloroethane		12 U	13 U	19 U
Carbon tetrachloride		12 U	13 U	19 U
Bromodichloromethane		12 U	13 U	19 U
1,2-Dichloropropane		12 U	13 U	19 U
cis-1,3-Dichloropropene		12 U	13 U	19 U
Trichloroethene		12 U	13 U	19 U
Dibromochloromethane		12 U	13 U	19 U
1,1,2-Trichloroethane		12 U	13 U	19 U
Benzene		12 U	13 U	19 U
trans-1,3-Dichloropropene		12 U	13 U	19 U
Bromoform		12 U	13 U	19 U
4-Methyl-2-pentanone		12 U	13 U	19 U
2-Hexanone		12 U	13 U	19 U

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TABLE 7

OFF-BASE DELINEATION
VOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ug/kg)	SITE	TC008	WL001	WM002
	SAMPLE ID	TC008D1D1	WL001D1P1	WM002D1P1
	DATE / TIME	05/14/97 / 14:30	05/16/97 / 14:00	04/24/97 / 11:00
	DEPTH (ft)	0.00	0.00	0.00
	RESULT TYPE	Duplicate 1	Primary	Primary
Tetrachloroethene		12 U	13 U	19 U
1,1,2,2-Tetrachloroethane		12 U	13 U	19 U
Toluene		12 U	13 U	19 U
Chlorobenzene		12 U	13 U	19 U
Ethylbenzene		12 U	13 U	19 U
Styrene		12 U	13 U	19 U
Xylenes (total)		12 U	13 U	19 U

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U = non-detect, J = estimated, For RCL VOA UJ = estimated quantitation limit

TABLE 8

OFF-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ug/kg)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003D1P1	BC003D1P1	C1001D1P1	C1001D1D1	TC002D1P1	TC006D1P1
	DATE / TIME	06/16/97 / 14:05	05/19/97 / 12:00	04/23/97 / 09:00	04/23/97 / 09:00	04/25/97 / 15:30	05/14/97 / 14:30
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Phenol		1600 U	670 U	520 U	920 U	600 U	410 U
bis(2-chloroethyl)ether		1600 U	670 U	520 U	920 U	600 U	410 U
2-Chlorophenol		1600 U	670 U	520 U	920 U	600 U	410 U
1,3-Dichlorobenzene		1600 U	670 U	520 U	920 U	600 U	410 U
1,4-Dichlorobenzene		1600 U	670 U	520 U	920 U	600 U	410 U
1,2-Dichlorobenzene		1600 U	670 U	520 U	920 U	600 U	410 U
2-Methylphenol		1600 U	670 U	520 U	920 U	600 U	410 U
2,2'-oxybis(1-Chloropropane)		1600 U	670 U	520 U	920 U	600 U	410 U
N-Nitrosodinpropylamine		1600 U	670 U	520 U	920 U	600 U	410 U
4-Methylphenol		1600 U	670 U	520 U	920 U	600 U	410 U
Hexachloroethane		1600 U	670 U	520 U	920 U	600 U	410 U
Nitrobenzene		1600 U	670 U	520 U	920 U	600 U	410 U
Isophorone		1600 U	670 U	520 U	920 U	600 U	410 U
2-Nitrophenol		1600 U	670 U	520 U	920 U	600 U	410 U
2,4-Dimethylphenol		1600 U	670 U	520 U	920 U	600 U	410 U
bis(2-chloroethoxy)methane		1600 U	670 U	520 U	920 U	600 U	410 U
2,4-Dichlorophenol		1600 U	670 U	520 U	920 U	600 U	410 U
1,2,4-Trichlorobenzene		1600 U	670 U	520 U	920 U	600 U	410 U
Naphthalene		1400 J	670 U	520 U	720 J	600 U	410 U
4-Chloroaniline		1600 U	670 U	520 U	920 U	600 U	410 U
Hexachlorobutadiene		1600 U	670 U	520 U	920 U	600 U	410 U
4-Chloro-3-Methylphenol		1600 U	670 U	520 U	920 U	600 U	410 U
2-Methylnaphthalene		1100 J	670 U	520 U	400 J	600 U	410 U
Hexachlorocyclopentadiene		1600 U	670 U	520 U	920 U	600 U	410 U
2,4,6-Trichlorophenol		1600 U	670 U	520 U	920 U	600 U	410 U
2,4,5-Trichlorophenol		4000 U	1600 U	1200 U	2200 U	1400 U	990 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, For RCL SVOA = estimated quantitation limit

TABLE 8

OFF-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ug/kg)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003D1P1	BC003D1P1	C1001D1P1	C1001D1D1	TC002D1P1	TC006D1P1
	DATE / TIME	05/16/97 / 14:05	05/19/97 / 12:00	04/23/97 / 09:00	04/23/97 / 09:00	04/25/97 / 15:30	05/14/97 / 14:30
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
2-Chloronaphthalene		1600 U	670 U	520 U	920 U	600 U	410 U
2-Nitroaniline		4000 U	1600 U	1200 U	2200 U	1400 U	990 U
Dimethylphthalate		1600 U	670 U	520 U	920 U	600 U	410 U
Acenaphthylene		1600 U	670 U	520 U	460 J	600 U	410 U
2,6-Dinitrotoluene		1600 U	670 U	520 U	920 U	600 U	410 U
3-Nitroaniline		4000 U	1600 U	1200 U	2200 U	1400 U	990 U
Acenaphthene		1900	670 U	520 U	290 J	600 U	410 U
2,4-Dinitrophenol		4000 U	1600 U	1200 U	2200 U	1400 U	990 U
4-Nitrophenol		4000 U	1600 U	1200 U	2200 U	1400 U	990 U
Dibenzofuran		2000	670 U	520 U	640 J	600 U	410 U
2,4-Dinitrotoluene		1600 U	670 U	520 U	920 U	600 U	410 U
Diethylphthalate		1600 U	670 U	520 U	920 U	600 U	410 U
4-Chlorophenyl-phenylether		1600 U	670 U	520 U	920 U	600 U	410 U
Fluorene		2500	670 U	520 U	700 J	600 U	410 U
4-Nitroaniline		4000 U	1600 U	1200 U	2200 U	1400 U	990 U
4,6-Dinitro-2-methylphenol		4000 U	1600 U	1200 U	2200 U	1400 U	990 U
N-Nitrosodiphenylamine (1)		1600 U	670 U	520 U	920 U	600 U	410 U
4-Bromophenyl-phenylether		1600 U	670 U	520 U	920 U	600 U	410 U
Hexachlorobenzene		1600 U	670 U	520 U	920 U	600 U	410 U
Pentachlorophenol		4000 U	1600 U	1200 U	2200 U	1400 U	990 U
Phenanthrene		8500	71 J	300 J	5700	600 U	410 U
Anthracene		910 J	670 U	57 J	780 J	600 U	410 U
Carbazole		1600 U	670 U	520 U	680 J	600 U	410 U
Di-n-Butylphthalate		1600 U	670 U	520 U	920 U	600 U	410 U
Fluoranthene		3200	190 J	760 J	6000 J	600 U	410 U
Pyrene		2000	170 J	600 J	3700 J	600 U	410 U

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U = non-detect, J = estimated, For RCL SVOA

UJ = estimated quantitation limit

TABLE 8

OFF-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ug/kg)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003D1P1	BC003D1P1	C1001D1P1	C1001D1D1	TC002D1P1	TC006D1P1
	DATE / TIME	05/16/97 / 14:05	05/19/97 / 12:00	04/23/97 / 09:00	04/23/97 / 09:00	04/25/97 / 15:30	05/14/97 / 14:30
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Butylbenzylphthalate		1600 U	670 U	520 U	920 U	600 U	410 U
3,3'-Dichlorobenzidine		1600 U	670 U	520 U	920 U	600 U	410 U
Benzo(a)Anthracene		530 J	86 J	340 J	1700	600 U	410 U
Chrysene		460 J	120 J	380 J	2300	600 U	410 U
bis(2-ethylhexyl)Phthalate		430 J	340 J	57 J	920 U	600 U	410 U
Di-n-octylphthalate		1600 U	670 U	520 U	920 U	600 U	410 U
Benzo(b)fluoranthene		290 J	210 J	520 J	2700 J	600 U	410 U
Benzo(k)fluoranthene		1600 U	75 J	190 J	1200	600 U	410 U
Benzo(a)pyrene		170 J	90 J	250 J	1900	600 U	410 U
Indeno(1,2,3-cd)pyrene		1600 U	70 J	130 J	750 J	600 U	410 U
Dibenzo(a,h)anthracene		1600 U	670 U	520 U	190 J	600 U	410 U
Benzo(g,h,i)perylene		1600 U	670 U	100 J	610 J	600 U	410 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, For RCL SVOA = estimated quantitation limit

TABLE 8

OFF-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

	SITE	TC006	WL001	WM002
	SAMPLE ID	TC006D1D1	WL001D1P1	WM002D1P1
CONSTITUENT (Units in ug/kg)	DATE / TIME	05/14/97 / 14:30	05/16/97 / 14:00	04/24/97 / 11:00
	DEPTH (ft)	0.00	0.00	0.00
	RESULT TYPE	Duplicate 1	Primary	Primary
Phenol		410 U	420 U	620 U
bis(2-chloroethyl)ether		410 U	420 U	620 U
2-Chlorophenol		410 U	420 U	620 U
1,3-Dichlorobenzene		410 U	420 U	620 U
1,4-Dichlorobenzene		410 U	420 U	620 U
1,2-Dichlorobenzene		410 U	420 U	620 U
2-Methylphenol		410 U	420 U	620 U
2,2'-oxybis(1-Chloropropane)		410 U	420 U	620 U
N-Nitrosodinpropylamine		410 U	420 U	620 U
4-Methylphenol		410 U	420 U	620 U
Hexachloroethane		410 U	420 U	620 U
Nitrobenzene		410 U	420 U	620 U
Isophorone		410 U	420 U	620 U
2-Nitrophenol		410 U	420 U	620 U
2,4-Dimethylphenol		410 U	420 U	620 U
bis(2-chloroethoxy)methane		410 U	420 U	620 U
2,4-Dichlorophenol		410 U	420 U	620 U
1,2,4-Trichlorobenzene		410 U	420 U	620 U
Naphthalene		410 U	420 U	620 U
4-Chloroaniline		410 U	420 U	620 U
Hexachlorobutadiene		410 U	420 U	620 U
4-Chloro-3-Methylphenol		410 U	420 U	620 U
2-Methylnaphthalene		410 U	420 U	620 U
Hexachlorocyclopentadiene		410 U	420 U	620 U
2,4,6-Trichlorophenol		410 U	420 U	620 U
2,4,5-Trichlorophenol		1000 U	1000 U	1500 U

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TABLE 8

OFF-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ug/kg)	SITE	TC006	WL001	WM002
	SAMPLE ID	TC006D1D1	WL001D1P1	WM002D1P1
	DATE / TIME	05/14/97 / 14:30	05/16/97 / 14:00	04/24/97 / 11:00
	DEPTH (ft)	0.00	0.00	0.00
	RESULT TYPE	Duplicate 1	Primary	Primary
2-Chloronaphthalene		410 U	420 U	620 U
2-Nitroaniline		1000 U	1000 U	1500 U
Dimethylphthalate		410 U	420 U	620 U
Acenaphthylene		410 U	420 U	620 U
2,6-Dinitrotoluene		410 U	420 U	620 U
3-Nitroaniline		1000 U	1000 U	1500 U
Acenaphthene		410 U	420 U	620 U
2,4-Dinitrophenol		1000 U	1000 U	1500 U
4-Nitrophenol		1000 U	1000 U	1500 U
Dibenzofuran		410 U	420 U	620 U
2,4-Dinitrotoluene		410 U	420 U	620 U
Diethylphthalate		410 U	420 U	620 U
4-Chlorophenyl-phenylether		410 U	420 U	620 U
Fluorene		410 U	420 U	620 U
4-Nitroaniline		1000 U	1000 U	1500 U
4,6-Dinitro-2-methylphenol		1000 U	1000 U	1500 U
N-Nitrosodiphenylamine (1)		410 U	420 U	620 U
4-Bromophenyl-phenylether		410 U	420 U	620 U
Hexachlorobenzene		410 U	420 U	620 U
Pentachlorophenol		1000 U	1000 U	1500 U
Phenanthrene		410 U	420 U	270 J
Anthracene		410 U	420 U	620 U
Carbazole		410 U	420 U	620 U
Di-n-Butylphthalate		410 U	420 U	620 U
Fluoranthene		410 U	420 U	300 J
Pyrene		410 U	420 U	200 J

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect J = estimated, For RCL SVOA = estimated quantitation limit

TABLE 8

OFF-BASE DELINEATION
SVOC RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ug/kg)	SITE	TC006	WL001	WM002
	SAMPLE ID	TC006D1D1	WL001D1P1	WM002D1P1
	DATE / TIME	05/14/97 / 14:30	05/16/97 / 14:00	04/24/97 / 11:00
	DEPTH (ft)	0.00	0.00	0.00
	RESULT TYPE	Duplicate 1	Primary	Primary
Butylbenzylphthalate		410 U	420 U	620 U
3,3'-Dichlorobenzidine		410 U	420 U	620 U
Benzo(a)Anthracene		410 U	420 U	130 J
Chrysene		410 U	420 U	150 J
bis(2-ethylhexyl)Phthalate		410 U	420 U	620 U
Di-n-octylphthalate		410 U	420 U	620 U
Benzo(b)fluoranthene		410 U	420 U	620 U
Benzo(k)fluoranthene		410 U	420 U	620 U
Benzo(a)pyrene		410 U	420 U	100 J
Indeno(1,2,3-cd)pyrene		410 U	420 U	620 U
Dibenzo(a,h)anthracene		410 U	420 U	620 U
Benzo(g,h,i)perylene		410 U	420 U	620 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, For RCL SVOA

UJ = estimated quantitation limit

TABLE 9

OFF-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ug/kg)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003D1P1	BC003D1P1	C1001D1P1	C1001D1D1	TC002D1P1	TC006D1P1
	DATE / TIME	05/16/97 / 14:05	05/19/97 / 12:00	04/23/97 / 09:00	04/23/97 / 09:00	04/25/97 / 15:30	05/14/97 / 14:30
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
alpha-BHC		4.2 U	3.3 U	2.6 U	2.3 UJ	3 U	2 U
beta-BHC		4.2 U	3.3 U	2.6 U	2.3 UJ	3 U	2 U
delta-BHC		4.2 U	3.3 U	2.6 U	2.3 UJ	3 U	2 U
gamma-BHC(Lindane)		4.2 U	3.3 U	2.6 U	2.3 UJ	3 U	2 U
Heptachlor		4.2 U	3.3 U	2.6 U	2.3 UJ	3 U	2 U
Aldrin		4.2 U	3.3 U	2.6 U	2.3 UJ	3 U	2 U
Heptachlor epoxide		4.2 U	3.3 U	2.6 U	2.3 UJ	3 U	2 U
Endosulfan I		4.2 U	3.3 U	2.6 U	2.3 UJ	3 U	2 U
Dieldrin		0.73 J	0.96 NJ	0.49 J	4.6 UJ	6 U	4.1 U
4,4'-DDE		8.3 U	1.5 J	0.6 J	4.6 UJ	6 U	4.1 U
Endrin		8.3 U	6.7 U	5.2 U	4.6 UJ	6 U	4.1 U
Endosulfan II		8.3 U	6.7 U	5.2 U	4.6 UJ	6 U	4.1 U
4,4'-DDD		8.3 U	5.3 J	0.88 J	4.6 UJ	6 U	4.1 U
Endosulfan sulfate		8.3 U	6.7 U	5.2 U	4.6 UJ	6 U	4.1 U
4,4'-DDT		8.3 U	6.7 U	5.2 U	4.6 UJ	6 U	4.1 U
Methoxychlor		42 UJ	33 UJ	26 U	23 UJ	30 U	20 UJ
Endrin ketone		8.3 U	6.7 U	5.2 U	0.8 NJ	6 U	4.1 U
Endrin aldehyde		8.3 U	6.7 U	5.2 U	4.6 UJ	6 U	4.1 U
alpha-Chlordane		0.2 NJ	2.9 J	2.6 U	2.3 UJ	3 U	2 U
gamma-Chlordane		4.2 U	3.6 J	0.21 J	0.34 NJ	3 U	2 U
Toxaphene		420 U	330 U	260 U	230 UJ	300 U	200 U
Aroclor-1016		83 U	67 U	52 U	46 UJ	60 U	41 U
Aroclor-1221		170 U	130 U	100 U	92 UJ	120 U	82 U
Aroclor-1232		83 U	67 U	52 U	46 UJ	60 U	41 U
Aroclor-1242		83 U	67 U	52 U	46 UJ	60 U	41 U
Aroclor-1248		83 U	67 U	52 U	46 UJ	60 U	41 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, NJ = presumptive evidence For RCL = estimated quantitation limit

TABLE 9

OFF-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ug/kg)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003D1P1	BC003D1P1	C1001D1P1	C1001D1D1	TC002D1P1	TC006D1P1
	DATE / TIME	05/16/97 / 14:05	05/19/97 / 12:00	04/23/97 / 09:00	04/23/97 / 09:00	04/25/97 / 15:30	05/14/97 / 14:30
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Aroclor-1254		83 U	67 U	52 U	46 UJ	60 U	41 U
Aroclor-1260		83 U	67 U	52 U	46 UJ	60 U	41 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, NJ = presumptive evidence For RCL UJ = estimated quantitation limit

TABLE 9

OFF-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ug/kg)	SITE	TC006	WL001	WM002
	SAMPLE ID	TC006D1D1	WL001D1P1	WM002D1P1
	DATE / TIME	05/14/97 / 14:30	05/16/97 / 14:00	04/24/97 / 11:00
	DEPTH (ft)	0.00	0.00	0.00
	RESULT TYPE	Duplicate 1	Primary	Primary
alpha-BHC		2.1 U	2.1 U	3.1 U
beta-BHC		2.1 U	2.1 U	3.1 U
delta-BHC		2.1 U	2.1 U	3.1 U
gamma-BHC(Lindane)		2.1 U	2.1 U	3.1 U
Heptachlor		2.1 U	2.1 U	3.1 U
Aldrin		2.1 U	2.1 U	3.1 U
Heptachlor epoxide		2.1 U	2.1 U	3.1 U
Endosulfan I		2.1 U	2.1 U	3.1 U
Dieldrin		4.2 U	0.3 NJ	6.3 U
4,4'-DDE		4.2 U	1.4 J	1.1 J
Endrin		4.2 U	4.2 U	6.3 U
Endosulfan II		4.2 U	4.2 U	6.3 U
4,4'-DDD		4.2 U	5.2	2.3 J
Endosulfan sulfate		4.2 U	0.78 J	6.3 U
4,4'-DDT		4.2 U	4.2 U	6.3 U
Methoxychlor		21 UJ	21 UJ	31 U
Endrin ketone		4.2 U	4.2 U	6.3 U
Endrin aldehyde		4.2 U	4.2 U	6.3 U
alpha-Chlordane		2.1 U	3.5	1.4 J
gamma-Chlordane		2.1 U	3 J	1.3 J
Toxaphene		210 U	210 U	310 U
Aroclor-1016		42 U	42 U	63 U
Aroclor-1221		84 U	84 U	120 U
Aroclor-1232		42 U	42 U	63 U
Aroclor-1242		42 U	42 U	63 U
Aroclor-1248		42 U	42 U	63 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect J = estimated, NJ = presumptive evidence For RCL = estimated quantitation limit

TABLE 9

OFF-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

SITE		TC006	WL001	WM002
SAMPLE ID		TC006D1D1	WL001D1P1	WM002D1P1
CONSTITUENT (Units in ug/kg)	DATE / TIME	05/14/97 / 14:30	05/16/97 / 14:00	04/24/97 / 11:00
	DEPTH (ft)	0.00	0.00	0.00
	RESULT TYPE	Duplicate 1	Primary	Primary
Aroclor-1254		42 U	42 U	63 U
Aroclor-1260		42 U	42 U	63 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, NJ = presumptive evidence For RCL UJ = estimated quantitation limit

TABLE 10

OFF-BASE DELINEATION
HERBICIDE RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ug/kg)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003D1P1	BC003D1P1	C1001D1P1	C1001D1D1	TC002D1P1	TC006D1P1
	DATE / TIME	06/16/97 / 14:05	05/19/97 / 12:00	04/23/97 / 09:00	04/23/97 / 09:00	04/25/97 / 15:30	05/14/97 / 14:30
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00	0.00
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
2,4-D		200 U	160 U	130 U	110 U	150 U	99 U
2,4,5-TP (Silvex)		50 U	41 U	31 U	28 U	37 U	25 U
2,4,5-T		50 U	41 U	31 U	28 U	37 U	25 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, = estimated quantitation limit For RCL HERB

TABLE 10

OFF-BASE DELINEATION
HERBICIDE RESULTS
NCBC GULPORT
(soil/sediment)

Date: 07/24/98

CONSTITUENT (Units in ug/kg)	SITE	TC006	WL001	WM002
	SAMPLE ID	TC006D1D1	WL001D1P1	WM002D1P1
	DATE / TIME	05/14/97 / 14:30	05/16/97 / 14:00	04/24/97 / 11:00
	DEPTH (ft)	0.00	0.00	0.00
	RESULT TYPE	Duplicate 1	Primary	Primary
2,4-D		100 U	100 U	150 U
2,4,5-TP (Silvex)		25 U	25 U	38 U
2,4,5-T		25 U	25 U	38 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, UJ = estimated quantitation limit For RCL HERB

TABLE 11

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in pg/L)	SITE	D1001	D1003	D1003	D1005	D1008	D1010
	SAMPLE ID	D1001W1P3	D1003W1P1	D1003W1D1	D1005W1P2	D1008W1P1	D1010W1P1
	DATE	06/26/97	04/10/97	04/10/97	04/10/97	04/09/97	04/09/97
	RESULT TYPE	Primary	Primary	Duplicate 1	Primary	Primary	Primary
2,3,7,8-TCDD		6.6	3.0 U	3.8 U	26.3 U	1.8 U	1.9 U
1,2,3,7,8-PeCDD		3.1 U	4.3 U	6.7 U	16.2 U	2.8 U	2.7 U
1,2,3,4,7,8-HxCDD		4.9 U	4.6 U	5.7 U	15.9 U	3.3 U	3.3 U
1,2,3,6,7,8-HxCDD		4.1 U	3.6 U	4.5 U	12.4 U	3.0 U	3.0 U
1,2,3,7,8,9-HxCDD		4.3 U	3.9 U	5.0 U	13.6 U	2.9 U	2.9 U
1,2,3,4,6,7,8-HpCDD		6.8	5.0 U	6.7 U	14.3 U	6.8	5.3
1,2,3,4,6,7,8,9-OCDD		43.6	8.7 U	12.4 U	88.5 U	46.9	32.2
2,3,7,8-TCDF		3.2 U	2.1 U	2.9 U	17.6 U	1.6 U	1.7 U
1,2,3,7,8-PeCDF		2.4 U	2.7 U	3.6 U	13.2 U	2.0 U	1.9 U
2,3,4,7,8-PeCDF		2.6 U	2.6 U	3.6 U	13.0 U	1.9 U	1.9 U
1,2,3,4,7,8-HxCDF		3.7 U	2.6 U	3.4 U	12.1 U	2.7 U	2.4 U
1,2,3,6,7,8-HxCDF		3.0 U	2.0 U	2.6 U	9.1 U	2.1 U	1.9 U
2,3,4,6,7,8-HxCDF		4.8 U	2.6 U	4.1 R	12.1 U	3.7	3.2
1,2,3,7,8,9-HxCDF		4.5 U	2.9 U	3.8 U	13.6 U	2.9 U	2.6 U
1,2,3,4,6,7,8-HpCDF		3.7 U	3.0 U	4.1 U	12.2 U	2.4 U	2.2 U
1,2,3,4,7,8,9-HpCDF		5.2 U	4.3 U	5.8 U	16.5 U	3.8 U	3.4 U
1,2,3,4,6,7,8,9-OCDF		6.4 U	6.4 U	9.1 U	23.4	4.6 U	4.5 U
Total TCDD		6.6	3.0 U	3.8 U	26.3 U	1.8 U	1.9 U
Total PeCDD		3.1 U	4.3 U	5.7 U	16.2 U	2.8 U	2.7 U
Total HxCDD		4.4 U	4.0 U	5.0 U	13.8 U	3.1 U	3.0 U
Total HpCDD		14.4	5.0 U	6.7 U	20.7	6.8	15.1
Total TCDF		3.2 U	2.1 U	2.9 U	17.6 U	1.6 U	1.7 U
Total PeCDF		2.6 U	2.7 U	3.6 U	13.1 U	2.0 U	1.9 U
Total HxCDF		4.8	2.6 U	4.1	11.6 U	3.7	3.2
Total HpCDF		4.3 U	3.5 U	4.8 U	14.0 U	2.9 U	2.7 U
Total TEQ		6.71	0	0.410	0.023	0.485	0.405

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL DIOX

TABLE 11

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in pg/L)	SITE	D1013	D2003	D2006	D2006	D3003	D3005
	SAMPLE ID	D1013W1P1	D2003W1P2	D2006W1P2	D2006W1D2	D3003W1P2	D3005W1P2
	DATE	04/09/97	04/04/97	04/04/97	04/04/97	04/07/97	04/07/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
2,3,7,8-TCDD		1.7 U	8.7 U	7.8	5.6 U	15.6 U	11.6 U
1,2,3,7,8-PeCDD		2.4 U	21.1	18.8	5.8 U	12.5 U	10.1 U
1,2,3,4,7,8-HxCDD		2.9 U	7.5 U	13.1	5.7 U	13.9 U	11.3 U
1,2,3,6,7,8-HxCDD		2.7 U	20.8	13.3	5.2 U	12.7 U	10.4 U
1,2,3,7,8,9-HxCDD		2.6 U	20.5	13.4	5.1 U	12.3 U	10.0 U
1,2,3,4,6,7,8-HpCDD		4.1	114	16.6	6.1 U	12.3 U	286
1,2,3,4,6,7,8,9-OCDD		25.6	700	41.2	29.5	187 J	2000 J
2,3,7,8-TCDF		1.5 U	7.2 U	8.7	4.8 U	14.5 U	11.6 U
1,2,3,7,8-PeCDF		1.7 U	23.8	16.7	4.6 U	10.1 U	7.8 U
2,3,4,7,8-PeCDF		1.7 U	22.4	13.6	4.4 U	9.8 U	7.5 U
1,2,3,4,7,8-HxCDF		2.1 U	29.4	13.9	4.1 U	11.6 U	10.6
1,2,3,6,7,8-HxCDF		1.7 U	18.6	14.3	3.3 U	9.3 U	7.2 U
2,3,4,6,7,8-HxCDF		3.5	26.7	15.3	8.3	11.5 U	8.9 U
1,2,3,7,8,9-HxCDF		2.3 U	32.9	20.5	4.5 U	12.8 U	9.8 U
1,2,3,4,6,7,8-HpCDF		1.9 U	27.8	11.1	3.6 U	8.0 U	46.9
1,2,3,4,7,8,9-HpCDF		3.0 U	30.7	16.7	5.6 U	12.5 U	10.3 U
1,2,3,4,6,7,8,9-OCDF		3.7 U	86.8	43.7	17.0	10.7 U	218 J
Total TCDD		1.7 U	8.7 U	7.8	5.6 U	15.6 U	14.2
Total PeCDD		2.4 U	21.1	18.8	5.8 U	12.5 U	10.1 U
Total HxCDD		2.7 U	41.3	26.6	5.3 U	13.0 U	53.9
Total HpCDD		8.3	201	16.6	6.1 U	25.1	592
Total TCDF		1.5 U	7.2 U	8.7	4.8 U	14.5 U	11.6 U
Total PeCDF		1.7 U	46.2	30.4	4.5 U	9.9 U	7.6 U
Total HxCDF		3.5	100	64.0	8.3	11.2 U	48.6
Total HpCDF		2.4 U	77.7	16.7	4.4 U	9.8 U	146
Total TEQ		0.417	40.3	36.6	0.876	0.187 J	6.61 J

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL DIOX

TABLE 11

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in pg/L)	SITE	D3007	D3007	D5004	D5007	D5009	D5013
	SAMPLE ID	D3007W1P3	D3007W1D3	D5004W1P2	D5007W1P2	D5009W1P3	D5013W1P1
	DATE	06/24/97	06/24/97	04/08/97	04/08/97	06/24/97	04/07/97
	RESULT TYPE	Primary	Duplicate 1	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		1.9 U	4.3	7.6 U	6.1 U	(3.2)	4.5 U
1,2,3,7,8-PeCDD		2.1 U	3.9	5.5 U	5.1 U	4.0 U	7.3 U
1,2,3,4,7,8-HxCDD		2.9 U	7.4	8.3 U	7.7 U	6.8 U	7.0 U
1,2,3,6,7,8-HxCDD		2.7 U	10.2	7.6 U	7.0 U	6.2 U	6.5 U
1,2,3,7,8,9-HxCDD		2.6 U	12.3	7.3 U	6.8 U	6.0 U	6.1 U
1,2,3,4,6,7,8-HpCDD		39.9	163	51.6	89.4	17.3	35.9
1,2,3,4,6,7,8,9-OCDD		291	992	408	563	219	279
2,3,7,8-TCDF		1.9 U	2.1 U	7.7 U	6.0 U	3.8 U	3.9
1,2,3,7,8-PeCDF		1.6 U	1.9 U	4.8 U	4.5 U	3.1 U	4.7 U
2,3,4,7,8-PeCDF		1.5 U	1.8 U	4.6 U	4.4 U	3.0 U	4.6 U
1,2,3,4,7,8-HxCDF		2.6 U	4.4	7.6 U	10.3	5.4 U	8.8
1,2,3,6,7,8-HxCDF		2.1 U	3.2	6.1 U	5.3 U	4.3 U	3.3 U
2,3,4,6,7,8-HxCDF		4.1 U	7.3 U	7.5 U	6.6 U	5.3 U	7.4
1,2,3,7,8,9-HxCDF		2.8 U	3.5 U	8.3 U	7.3 U	5.9 U	4.9 U
1,2,3,4,6,7,8-HpCDF		9.6	30.0	6.6 U	14.2	6.0	7.9
1,2,3,4,7,8,9-HpCDF		3.4 U	5.5	10.3 U	9.2 U	6.8 U	6.7 U
1,2,3,4,6,7,8,9-OCDF		23.1	57.4	11.4 U	40.3	(7.3)	22.7
Total TCDD		1.9 U	4.3	7.6 U	6.1 U	(3.2)	4.5 U
Total PeCDD		2.1 U	3.6	5.5 U	5.1 U	4.0 U	7.3 U
Total HxCDD		6.0	22.6	7.7 U	19.9	6.3 U	8.0
Total HpCDD		59.6	316	76.7	168	27.0	69.4
Total TCDF		1.9 U	2.1 U	7.7 U	6.0 U	3.8 U	3.6
Total PeCDF		1.6 U	4.6	4.7 U	4.4 U	3.1 U	16.0
Total HxCDF		3.1	5.5	7.3 U	24.8	(3.6)	23.1
Total HpCDF		19.4	69.8	14.8	14.2	12.1	7.9
Total TEQ		0.809	13.0	0.924	2.67	3.66	2.75

Values represent total concentrations unless noted < = Not detected at indicated reporting limit — = Not analyzed

( ) = Less tha[redacted]porting Limit

U = non-detect[redacted] J = estimated For RCL DIOX

TABLE 11

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in pg/L)	SITE	GPT-04-04	GPT-04-04	GPT-04-05	GPT-04-06	GPT-04-07	GPT-05-04
	SAMPLE ID	GPT44G1P1	GPT44G1D1	GPT45G1P1	GPT46G1P2	GPT47G1P2	GPT54G1P1
	DATE	05/19/97	05/19/97	05/19/97	05/20/97	05/20/97	05/20/97
	RESULT TYPE	Primary	Duplicate 1	Primary	Primary	Primary	Primary
2,3,7,8-TCDD		3.0 U	2.6 U	3.3 U	6.9 U	7.9 U	4.0
1,2,3,7,8-PeCDD		(1.6)	2.5 U	4.8 U	8.9 U	7.6 U	7.4
1,2,3,4,7,8-HxCDD		(2.0)	5.3 U	4.8 U	11.1 U	7.2 U	17.8
1,2,3,6,7,8-HxCDD		(2.3)	3.9 U	3.5 U	17.4	6.5 U	19.1
1,2,3,7,8,9-HxCDD		6.1	11.1	3.9 U	75.2	20.3	84.2
1,2,3,4,6,7,8-HpCDD		33.5	57.5	20.9	653	135	765
1,2,3,4,6,7,8,9-OCDD		461	768	282	10090	1680	12460
2,3,7,8-TCDF		5.3 U	6.0 U	2.7 U	6.4 U	7.3 U	8.4 U
1,2,3,7,8-PeCDF		(2.3)	2.1 U	3.3 U	6.2 U	6.2 U	2.4
2,3,4,7,8-PeCDF		2.3 U	2.0 U	3.2 U	6.0 U	6.0 U	3.1 U
1,2,3,4,7,8-HxCDF		3.3 U	3.1 U	3.7 U	9.0 U	6.6 U	3.7 U
1,2,3,6,7,8-HxCDF		2.2 U	2.1 U	2.5 U	7.2 U	5.3 U	3.4 U
2,3,4,6,7,8-HxCDF		4.6 U	3.9 U	4.4 U	9.0 U	6.5 U	6.0 U
1,2,3,7,8,9-HxCDF		3.3 U	3.1 U	3.7 U	9.9 U	7.2 U	2.7
1,2,3,4,6,7,8-HpCDF		(2.6)	3.8 U	13.9	42.1	11.2	7.5
1,2,3,4,7,8,9-HpCDF		(2.0)	(2.7)	4.6 U	11.7 U	7.4 U	2.9
1,2,3,4,6,7,8,9-OCDF		(5.0)	9.3 U	19.6	98.7	9.1 U	12.7
Total TCDD		22.8	52.1	3.3 U	184	7.9 U	259
Total PeCDD		35.0	62.6	12.6	205	7.6 U	458
Total HxCDD		217	477	82.9	1740	220	2620
Total HpCDD		193	359	81.4	2420	379	3090
Total TCDF		9.5	10.3	2.7 U	19.9	7.3 U	16.8
Total PeCDF		2.3	2.1 U	3.3 U	6.1 U	6.1 U	3.1
Total HxCDF		6.0	3.9	4.4	40.0	6.3 U	19.1
Total HpCDF		7.1	5.8	22.7	117	11.2	9.4
Total TEQ		2.80	2.48	0.650	26.4	5.17	40.4

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less than Reporting Limit

U = non-detect, J = estimated For RCL DIOX

TABLE 11

ON-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in pg/L)	SITE	GPT-05-06	GPT-05-06	L4001	L4001	L4002
	SAMPLE ID	GPT55G1P1	GPT56G1P2	L4001P1P2	L4001P1D2	L4002P1P2
	DATE	05/20/97	05/20/97	04/28/97	04/28/97	04/28/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary
2,3,7,8-TCDD		1.7 U	25.2 U	7.3 U	14.1	3.9 U
1,2,3,7,8-PeCDD		4.1	28.0 U	7.9 U	13.0	11.9
1,2,3,4,7,8-HxCDD		15.1	27.4 U	7.5 U	18.7	16.3
1,2,3,6,7,8-HxCDD		17.1	25.0 U	5.8 U	48.5	37.3
1,2,3,7,8,9-HxCDD		104	110	6.3 U	55.7	39.9
1,2,3,4,6,7,8-HpCDD		852	1200	47.5	1670	835
1,2,3,4,6,7,8,9-OCDD		14780	19710	369	13000	6360
2,3,7,8-TCDF		5.2 U	23.6 U	6.0 U	5.1 U	3.4 U
1,2,3,7,8-PeCDF		1.7 U	21.3 U	5.6 U	5.1 U	6.4
2,3,4,7,8-PeCDF		1.6 U	20.6 U	5.6 U	10.5	6.4
1,2,3,4,7,8-HxCDF		1.7 U	23.6 U	5.4 U	70.9	52.1
1,2,3,6,7,8-HxCDF		2.4 U	18.9 U	4.0 U	15.1	10.3
2,3,4,6,7,8-HxCDF		4.1 U	23.4 U	4.7 U	3.5 U	14.7
1,2,3,7,8,9-HxCDF		1.7 U	26.0 U	5.5 U	4.1 U	13.9
1,2,3,4,6,7,8-HpCDF		11.7	18.5 U	5.4 U	498	163
1,2,3,4,7,8,9-HpCDF		1.9 U	28.9 U	6.5 U	38.1	14.7
1,2,3,4,6,7,8,9-OCDF		37.4	43.7 U	36.5	1170	305
Total TCDD		246	169	7.3 U	29.9	3.9 U
Total PeCDD		402	501	7.9 U	35.9	43.2
Total HxCDD		3470	3080	6.4 U	509	283
Total HpCDD		4200	6410	107	3270	1790
Total TCDF		5.2	23.6 U	6.0 U	44.5	22.0
Total PeCDF		1.6 U	21.0 U	5.6 U	115	54.6
Total HxCDF		12.2	22.7 U	4.8 U	480	168
Total HpCDF		31.8	22.6 U	5.9 U	1450	485
Total TEQ		39.1	42.7	0.880	83.0	44.7

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL DIOX

TABLE 12

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001W1P1	D1003W1P1	D1005W1P1	D1008W1P1	D1010W1P1	D1013W1P1
	DATE	04/10/97	04/10/97	04/10/97	04/09/97	04/09/97	04/09/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Chloromethane		10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane		10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride		10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride		10 U	10 U	10 U	10 U	10 U	10 U
Acetone		10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide		10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene		10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)		10 U	10 U	10 U	10 U	10 U	10 U
Chloroform		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone		10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride		10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane		10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene		10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane		10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Benzene		10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U
Bromoform		10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone		10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL VOA UJ = quantitation limit estimated

TABLE 12

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001W1P1	D1003W1P1	D1005W1P1	D1008W1P1	D1010W1P1	D1013W1P1
	DATE	04/10/97	04/10/97	04/10/97	04/09/97	04/09/97	04/09/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Chloromethane		10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane		10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride		10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride		10 U	10 U	10 U	10 U	10 U	10 U
Acetone		10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide		10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene		10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)		10 U	10 U	10 U	10 U	10 U	10 U
Chloroform		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone		10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride		10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane		10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene		10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane		10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Benzene		10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U
Bromoform		10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone		10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone		10 U	10 U	10 U	10 U	10 U	10 U

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U = non-detect, J = estimated For RCL VOA UJ = quantitation limit estimated

TABLE 12

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001W1P1	D1003W1P1	D1005W1P1	D1008W1P1	D1010W1P1	D1013W1P1
	DATE	04/10/97	04/10/97	04/10/97	04/09/97	04/09/97	04/09/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Tetrachloroethene		10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Toluene		10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene		10 U	10 U	10 U	10 U	10 U	10 U
Styrene		10 U	10 U	10 U	10 U	10 U	10 U
Xylenes (total)		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-dete[redacted] = estimated For RCL VOA [redacted] = quantitation limit estimated

TABLE 12

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D2003	D2006	D2006	D3003	D3005	D5004
	SAMPLE ID	D2003W1P1	D2006W1P1	D2006W1D1	D3003W1P1	D3005W1P1	D5004W1P1
	DATE	04/05/97	04/05/97	04/05/97	04/07/97	04/07/97	04/08/97
	RESULT TYPE	Primary	Primary	Duplicate 1	Primary	Primary	Primary
Chloromethane		10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane		10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride		10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride		10 U	10 U	10 U	10 U	10 U	10 U
Acetone		10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide		10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene		10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)		10 U	10 U	10 U	10 U	10 U	10 U
Chloroform		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone		10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride		10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane		10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene		10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane		10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Benzene		10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U
Bromoform		10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone		10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone		10 U	10 U	10 U	10 U	10 U	10 U

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TABLE 12

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D2003	D2006	D2006	D3003	D3005	D5004
	SAMPLE ID	D2003W1P1	D2006W1P1	D2006W1D1	D3003W1P1	D3005W1P1	D5004W1P1
	DATE	04/05/97	04/05/97	04/05/97	04/07/97	04/07/97	04/08/97
	RESULT TYPE	Primary	Primary	Duplicate 1	Primary	Primary	Primary
Tetrachloroethene		10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Toluene		10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene		10 U	10 U	10 U	10 U	10 U	10 U
Styrene		10 U	10 U	10 U	10 U	10 U	10 U
Xylenes (total)		10 U	10 U	10 U	10 U	10 U	10 U

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U = non-detect, J = estimated For RCL VOA = quantitation limit estimated

TABLE 12

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D5007	D5009	D5013	GPT-04-04	GPT-04-04	GPT-04-05
	SAMPLE ID	D5007W1P1	D5009W1P1	D5013W1P1	GPT44G1P1	GPT44G1D1	GPT45G1P1
	DATE	04/08/97	04/07/97	04/07/97	05/19/97	05/19/97	05/19/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Duplicate 1	Primary
Chloromethane		10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane		10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride		10 U	10 U	10 U	10 U	10 U	37
Chloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride		10 U	10 U	10 U	10 U	10 U	10 U
Acetone		10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide		10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene		10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane		10 U	2 J	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)		10 U	10 U	10 U	10 U	10 U	180
Chloroform		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone		10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride		10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane		10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene		10 U	10 U	10 U	10 U	10 U	4.7 J
Dibromochloromethane		10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Benzene		10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U
Bromoform		10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone		10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL VOA UJ = quantitation limit estimated

TABLE 12

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D5007	D5009	D5013	GPT-04-04	GPT-04-04	GPT-04-05
	SAMPLE ID	D5007W1P1	D5009W1P1	D5013W1P1	GPT44G1P1	GPT44G1D1	GPT45G1P1
	DATE	04/08/97	04/07/97	04/07/97	05/19/97	05/19/97	05/19/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Duplicate 1	Primary
Tetrachloroethene		10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Toluene		10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene		10 U	10 U	10 U	10 U	10 U	10 U
Styrene		10 U	10 U	10 U	10 U	10 U	10 U
Xylenes (total)		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL VOA = quantitation limit estimated

TABLE 12

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	GPT-04-05	GPT-04-06	GPT-04-07	GPT-05-04	GPT-05-05	GPT-05-06
	SAMPLE ID	GPT45G1P3	GPT46G1P1	GPT47G1P1	GPT54G1P1	GPT55G1P1	GPT56G1P1
	DATE	09/19/97	05/20/97	05/20/97	05/20/97	05/20/97	05/20/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Chloromethane		20 U	10 U	10 U	10 U	10 U	10 U
Bromomethane		20 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride		52	10 U	10 U	10 U	10 U	10 U
Chloroethane		20 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride		10 U	10 U	10 U	10 U	10 U	10 U
Acetone		110	10 U	10 U	10 U	10 U	10 U
Carbon disulfide		10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene		10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)		230	10 U	10 U	10 U	10 U	10 U
Chloroform		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone		100 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride		10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane		10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene		5.7 J	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane		10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Benzene		10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U
Bromoform		10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone		100 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone		100 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL VOA UJ = quantitation limit estimated

TABLE 12

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	GPT-04-05	GPT-04-06	GPT-04-07	GPT-05-04	GPT-05-05	GPT-05-06
	SAMPLE ID	GPT45G1P3	GPT46G1P1	GPT47G1P1	GPT54G1P1	GPT55G1P1	GPT56G1P1
	DATE	09/19/97	05/20/97	05/20/97	05/20/97	05/20/97	05/20/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Tetrachloroethene		10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Toluene		10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene		10 U	10 U	10 U	10 U	10 U	10 U
Styrene		10 U	10 U	10 U	10 U	10 U	10 U
Xylenes (total)		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-dete[redacted] = estimated For RCL VOA [redacted] = quantitation limit estimated

TABLE 12

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	GPT-GC-01	GPT-GC-02	L4001	L4001	L4002
	SAMPLE ID	L4001W1P3	L4002W1P3	L4001P1P1	L4001P1D1	L4002P1P1
	DATE	09/19/97	09/19/97	04/28/97	04/28/97	04/28/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary
Chloromethane		2 U	3.5	10 U	10 U	10 U
Bromomethane		2 U	2.5 U	10 U	10 U	10 U
Vinyl chloride		2 U	0.19 J	10 U	10 U	10 U
Chloroethane		2 U	2.5 U	10 U	10 U	10 U
Methylene chloride		1 U	0.52 J	10 U	10 U	10 U
Acetone		10 U	38	10 U	10 U	10 U
Carbon disulfide		1 U	0.3 J	10 U	10 U	10 U
1,1-Dichloroethene		1 U	1.2 U	10 U	10 U	10 U
1,1-Dichloroethane		1 U	1.2 U	10 U	10 U	10 U
1,2-Dichloroethene (total)		1 U	1.2 U	10 U	10 U	10 U
Chloroform		1 U	5.3	10 U	10 U	10 U
1,2-Dichloroethane		1 U	1.2 U	10 U	10 U	10 U
2-Butanone		10 U	12 U	10 U	10 U	10 U
1,1,1-Trichloroethane		1 U	1.2 U	10 U	10 U	10 U
Carbon tetrachloride		1 U	4.2	10 U	10 U	10 U
Bromodichloromethane		1 U	1.2 U	10 U	10 U	10 U
1,2-Dichloropropane		1 U	1.2 U	10 U	10 U	10 U
cis-1,3-Dichloropropene		1 U	1.2 U	10 U	10 U	10 U
Trichloroethene		1 U	1.2 U	10 U	10 U	10 U
Dibromochloromethane		1 U	1.2 U	10 U	10 U	10 U
1,1,2-Trichloroethane		1 U	1.2 U	10 U	10 U	10 U
Benzene		1 U	1.2 U	10 U	10 U	10 U
trans-1,3-Dichloropropene		1 U	1.2 U	10 U	10 U	10 U
Bromoform		1 U	1.2 U	10 U	10 U	10 U
4-Methyl-2-pentanone		10 U	12 U	10 U	10 U	10 U
2-Hexanone		10 U	12 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL VOA UJ = quantitation limit estimated

TABLE 12

ON-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	GPT-GC-01	GPT-GC-02	L4001	L4001	L4002
	SAMPLE ID	L4001W1P3	L4002W1P3	L4001P1P1	L4001P1D1	L4002P1P1
	DATE	09/19/97	09/19/97	04/28/97	04/28/97	04/28/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary
Tetrachloroethene		1 U	1.2 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane		1 U	1.2 U	10 U	10 U	10 U
Toluene		1 U	1.2 U	10 U	10 U	10 U
Chlorobenzene		1 U	1.2 U	10 U	10 U	10 U
Ethylbenzene		1 U	1.2 U	10 U	10 U	10 U
Styrene		1 U	1.2 U	10 U	10 U	10 U
Xylenes (total)		1 U	1.2 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL VOA = quantitation limit estimated

TABLE 13

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001W1P1	D1003W1P1	D1005W1P1	D1008W1P1	D1010W1P1	D1013W1P1
	DATE	04/10/97	04/10/97	04/10/97	04/09/97	04/09/97	04/09/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Phenol		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-chloroethyl)ether		10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)		10 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosodinpropylamine		10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Isophorone		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-chloroethoxy)methane		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene		10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene		10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene		10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol		25 U	25 U	25 U	25 U	25 U	25 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL SVOA UJ = quantitation limit estimated

TABLE 13

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001W1P1	D1003W1P1	D1005W1P1	D1008W1P1	D1010W1P1	D1013W1P1
	DATE	04/10/97	04/10/97	04/10/97	04/09/97	04/09/97	04/09/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2-Chloronaphthalene		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
Dimethylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene		10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene		10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
Acenaphthene		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol		25 U	25 U	25 U	25 U	25 U	25 U
4-Nitrophenol		25 U	25 U	25 U	25 U	25 U	25 U
Dibenzofuran		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene		10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether		10 U	10 U	10 U	10 U	10 U	10 U
Fluorene		10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol		25 U	25 U	25 U	25 U	25 U	25 U
N-Nitrosodiphenylamine (1)		10 U	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol		25 U	25 U	25 U	25 U	25 U	25 U
Phenanthrene		10 U	10 U	10 U	10 U	10 U	10 U
Anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Carbazole		10 U	10 U	10 U	10 U	10 U	10 U
Di-n-Butylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Pyrene		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-det[redacted] J = estimated For RCL SVOA

[redacted] = quantitation limit estimated

TABLE 13

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001W1P1	D1003W1P1	D1005W1P1	D1008W1P1	D1010W1P1	D1013W1P1
	DATE	04/10/97	04/10/97	04/10/97	04/09/97	04/09/97	04/09/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Butylbenzylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Chrysene		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-ethylhexyl)Phthalate		10 U	10 U	10 U	10 U	10 U	10 U
Di-n-octylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene		10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene		10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene		10 U	10 U	10 U	10 U	10 U	10 U

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U = non-detect, J = estimated For RCL SVOA UJ = quantitation limit estimated

TABLE 13

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D2003	D2006	D2006	D3003	D3005	D5004
	SAMPLE ID	D2003W1P1	D2006W1P1	D2006W1D1	D3003W1P1	D3005W1P1	D5004W1P1
	DATE	04/05/97	04/05/97	04/05/97	04/07/97	04/07/97	04/08/97
	RESULT TYPE	Primary	Primary	Duplicate 1	Primary	Primary	Primary
Phenol		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-chloroethyl)ether		10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)		10 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosodinpropylamine		10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Isophorone		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-chloroethoxy)methane		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene		10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene		10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene		10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol		25 U	25 U	25 U	25 U	25 U	25 U

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TABLE 13

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D2003	D2006	D2006	D3003	D3005	D5004
	SAMPLE ID	D2003W1P1	D2006W1P1	D2006W1D1	D3003W1P1	D3005W1P1	D5004W1P1
	DATE	04/05/97	04/05/97	04/05/97	04/07/97	04/07/97	04/08/97
	RESULT TYPE	Primary	Primary	Duplicate 1	Primary	Primary	Primary
2-Chloronaphthalene		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
Dimethylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene		10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene		10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
Acenaphthene		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol		25 U	25 U	25 U	25 U	25 U	25 U
4-Nitrophenol		25 U	25 U	25 U	25 U	25 U	25 U
Dibenzofuran		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene		10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether		10 U	10 U	10 U	10 U	10 U	10 U
Fluorene		10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol		25 U	25 U	25 U	25 U	25 U	25 U
N-Nitrosodiphenylamine (1)		10 U	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol		25 U	25 U	25 U	25 U	25 U	25 U
Phenanthrene		10 U	10 U	10 U	10 U	10 U	10 U
Anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Carbazole		10 U	10 U	10 U	10 U	10 U	10 U
Di-n-Butylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Pyrene		10 U	10 U	10 U	10 U	10 U	10 U

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U = non-detect, J = estimated For RCL SVOA UJ = quantitation limit estimated

TABLE 13

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D2003	D2006	D2006	D3003	D3005	D5004
	SAMPLE ID	D2003W1P1	D2006W1P1	D2006W1D1	D3003W1P1	D3005W1P1	D5004W1P1
	DATE	04/05/97	04/05/97	04/05/97	04/07/97	04/07/97	04/06/97
	RESULT TYPE	Primary	Primary	Duplicate 1	Primary	Primary	Primary
Butylbenzylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Chrysene		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-ethylhexyl)Phthalate		10 U	10 U	10 U	10 U	10 U	10 U
Di-n-octylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene		10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene		10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene		10 U	10 U	10 U	10 U	10 U	10 U

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U = non-detect, J = estimated For RCL SVOA

= quantitation limit estimated

TABLE 13

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D5007	D5009	D5013	GPT-04-04	GPT-04-04	GPT-04-05
	SAMPLE ID	D5007W1P1	D5009W1P1	D5013W1P1	GPT44G1P1	GPT44G1D1	GPT45G1P1
	DATE	04/08/97	04/07/97	04/07/97	05/19/97	05/19/97	05/19/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Duplicate 1	Primary
Phenol		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-chloroethyl)ether		10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)		10 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosodinpropylamine		10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Isophorone		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-chloroethoxy)methane		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene		10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene		10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene		10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol		25 U	25 U	25 U	25 U	25 U	25 U

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TABLE 13

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D5007	D5009	D5013	GPT-04-04	GPT-04-04	GPT-04-05
	SAMPLE ID	D5007W1P1	D5009W1P1	D5013W1P1	GPT44G1P1	GPT44G1D1	GPT45G1P1
	DATE	04/08/97	04/07/97	04/07/97	05/19/97	05/19/97	05/19/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Duplicate 1	Primary
2-Chloronaphthalene		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
Dimethylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene		10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene		10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
Acenaphthene		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol		25 U	25 U	25 U	25 U	25 U	25 U
4-Nitrophenol		25 U	25 U	25 U	25 UJ	25 UJ	25 UJ
Dibenzofuran		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene		10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether		10 U	10 U	10 U	10 U	10 U	10 U
Fluorene		10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol		25 U	25 U	25 U	25 U	25 U	25 U
N-Nitrosodiphenylamine (1)		10 U	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol		25 U	25 U	25 U	25 U	25 U	25 U
Phenanthrene		10 U	10 U	10 U	10 U	10 U	10 U
Anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Carbazole		10 U	10 U	10 U	10 U	10 U	10 U
Di-n-Butylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Pyrene		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL SVOA = quantitation limit estimated

TABLE 13

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D5007	D5009	D5013	GPT-04-04	GPT-04-04	GPT-04-05
	SAMPLE ID	D5007W1P1	D5009W1P1	D5013W1P1	GPT44G1P1	GPT44G1D1	GPT45G1P1
	DATE	04/08/97	04/07/97	04/07/97	05/19/97	05/19/97	05/19/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Duplicate 1	Primary
Butylbenzylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Chrysene		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-ethylhexyl)Phthalate		10 U	10 U	10 U	10 U	2 J	3 J
Di-n-octylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene		10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene		10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL SVOA UJ = quantitation limit estimated

TABLE 13

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	GPT-04-05	GPT-04-06	GPT-04-07	GPT-05-04	GPT-05-05	GPT-05-06
	SAMPLE ID	GPT45G1P3	GPT46G1P1	GPT47G1P1	GPT54G1P1	GPT55G1P1	GPT56G1P1
	DATE	09/19/97	05/20/97	05/20/97	05/20/97	05/20/97	05/20/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Phenol		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-chloroethyl)ether		10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropene)		10 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosodinpropylamine		10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Isophorone		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-chloroethoxy)methane		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene		10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene		10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene		50 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol		10 U	25 U	25 U	25 U	25 U	25 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit — = Not analyzed

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TABLE 13

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	GPT-04-05	GPT-04-06	GPT-04-07	GPT-05-04	GPT-05-05	GPT-05-06
	SAMPLE ID	GPT45G1P3	GPT46G1P1	GPT47G1P1	GPT54G1P1	GPT55G1P1	GPT56G1P1
	DATE	09/19/97	05/20/97	05/20/97	05/20/97	05/20/97	05/20/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2-Chloronaphthalene		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline		50 U	25 U	25 U	25 U	25 U	25 U
Dimethylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene		10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene		10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline		50 U	25 U	25 U	25 U	25 U	25 U
Acenaphthene		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol		50 U	25 U	25 U	25 U	25 U	25 U
4-Nitrophenol		50 U	25 UJ	25 UJ	25 UJ	25 UJ	25 UJ
Dibenzofuran		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene		10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether		10 U	10 U	10 U	10 U	10 U	10 U
Fluorene		10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline		50 U	25 U	25 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol		50 U	25 U	25 U	25 U	25 U	25 U
N-Nitrosodiphenylamine (1)		10 U	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol		50 U	25 U	25 U	25 U	25 U	25 U
Phenanthrene		10 U	10 U	10 U	10 U	10 U	10 U
Anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Carbazole		10 U	10 U	10 U	10 U	10 U	10 U
Di-n-Butylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Pyrene		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL SVOA UJ = quantitation limit estimated

TABLE 13

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	GPT-04-05	GPT-04-06	GPT-04-07	GPT-05-04	GPT-05-05	GPT-05-06
	SAMPLE ID	GPT45G1P3	GPT46G1P1	GPT47G1P1	GPT54G1P1	GPT55G1P1	GPT56G1P1
	DATE	09/19/97	05/20/97	05/20/97	05/20/97	05/20/97	05/20/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Butylbenzylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine		50 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Chrysene		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-ethylhexyl)Phthalate		10 U	10 U	10 U	10 U	10 U	10 U
Di-n-octylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene		10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene		10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL SVOA

= quantitation limit estimated

TABLE 13

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	GPT-GC-01	GPT-GC-02	L4001	L4001	L4002
	SAMPLE ID	L4001W1P3	L4002W1P3	L4001P1P1	L4001P1D1	L4002P1P1
	DATE	09/19/97	09/19/97	04/28/97	04/28/97	04/28/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary
Phenol		10 U	10 U	10 U	10 U	10 U
bis(2-chloroethyl)ether		10 U	10 U	10 U	10 U	10 U
2-Chlorophenol		10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U
2-Methylphenol		10 U	10 U	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)		10 U	10 U	10 U	10 U	10 U
N-Nitrosodinpropylamine		10 U	10 U	10 U	10 U	10 U
4-Methylphenol		10 U	10 U	10 U	10 U	10 U
Hexachloroethane		10 U	10 U	10 U	10 U	10 U
Nitrobenzene		10 U	10 U	10 U	10 U	10 U
Isophorone		10 U	10 U	10 U	10 U	10 U
2-Nitrophenol		10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol		10 U	10 U	10 U	10 U	10 U
bis(2-chloroethoxy)methane		10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol		10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene		10 U	10 U	10 U	10 U	10 U
Naphthalene		10 U	10 U	10 U	10 U	10 U
4-Chloroaniline		10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene		10 U	10 U	10 U	10 U	10 U
4-Chloro-3-Methylphenol		10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene		10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene		50 U	50 U	10 U	10 U	10 U
2,4,6-Trichlorophenol		10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol		10 U	10 U	25 U	25 U	25 U

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TABLE 13

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	GPT-GC-01	GPT-GC-02	L4001	L4001	L4002
	SAMPLE ID	L4001W1P3	L4002W1P3	L4001P1P1	L4001P1D1	L4002P1P1
	DATE	09/19/97	09/19/97	04/28/97	04/28/97	04/28/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary
2-Chloronaphthalene		10 U	10 U	10 U	10 U	10 U
2-Nitroaniline		50 U	50 U	25 U	25 U	25 U
Dimethylphthalate		10 U	10 U	10 U	10 U	10 U
Acenaphthylene		10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene		10 U	10 U	10 U	10 U	10 U
3-Nitroaniline		50 U	50 U	25 U	25 U	25 U
Acenaphthene		10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol		50 U	50 U	25 U	25 U	25 U
4-Nitrophenol		50 U	50 U	25 U	25 U	25 U
Dibenzofuran		10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene		10 U	10 U	10 U	10 U	10 U
Diethylphthalate		10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether		10 U	10 U	10 U	10 U	10 U
Fluorene		10 U	10 U	10 U	10 U	10 U
4-Nitroaniline		50 U	50 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol		50 U	50 U	25 U	25 U	25 U
N-Nitrosodiphenylamine (1)		10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether		10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene		10 U	10 U	10 U	10 U	10 U
Pentachlorophenol		50 U	50 U	25 U	25 U	25 U
Phenanthrene		10 U	10 U	10 U	10 U	10 U
Anthracene		10 U	10 U	10 U	10 U	10 U
Carbazole		10 U	10 U	10 U	10 U	10 U
Di-n-Butylphthalate		10 U	10 U	10 U	10 U	10 U
Fluoranthene		10 U	10 U	10 U	10 U	10 U
Pyrene		10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

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TABLE 13

ON-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	GPT-GC-01	GPT-GC-02	L4001	L4001	L4002
	SAMPLE ID	L4001W1P3	L4002W1P3	L4001P1P1	L4001P1D1	L4002P1P1
	DATE	09/19/97	09/19/97	04/28/97	04/28/97	04/28/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary
Butylbenzylphthalate		10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine		50 U	50 U	10 U	10 U	10 U
Benzo(a)Anthracene		10 U	10 U	10 U	10 U	10 U
Chrysene		10 U	10 U	10 U	10 U	10 U
bis(2-ethylhexyl)Phthalate		10 U	10 U	10 U	10 U	10 U
Di-n-octylphthalate		10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene		10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene		10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene		10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene		10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene		10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene		10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL SVOA

UJ = quantitation limit estimated

TABLE 14

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001W1P1	D1003W1P1	D1005W1P1	D1008W1P1	D1010W1P1	D1013W1P1
	DATE	04/10/97	04/10/97	04/10/97	04/09/97	04/09/97	04/09/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
alpha-BHC		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
beta-BHC		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
delta-BHC		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
gamma-BHC(Lindane)		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
Heptachlor		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
Aldrin		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
Heptachlor epoxide		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
Endosulfan I		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
Dieldrin		0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDE		0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ
Endrin		0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ
Endosulfan II		0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDD		0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ
Endosulfan sulfate		0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDT		0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ
Methoxychlor		0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
Endrin ketone		0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ
Endrin aldehyde		0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ
alpha-Chlordane		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
gamma-Chlordane		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ
Toxaphene		5 UJ	5 U	5 U	5 UJ	5 UJ	5 UJ
Aroclor-1016		1 UJ	1 U	1 U	1 UJ	1 UJ	1 UJ
Aroclor-1221		2 UJ	2 U	2 U	2 UJ	2 UJ	2 UJ
Aroclor-1232		1 UJ	1 U	1 U	1 UJ	1 UJ	1 UJ
Aroclor-1242		1 UJ	1 U	1 U	1 UJ	1 UJ	1 UJ
Aroclor-1248		1 UJ	1 U	1 U	1 UJ	1 UJ	1 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, NJ = presumptive evidence = quantitation limit estimated

TABLE 14

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
	SAMPLE ID	D1001W1P1	D1003W1P1	D1005W1P1	D1008W1P1	D1010W1P1	D1013W1P1
	DATE	04/10/97	04/10/97	04/10/97	04/09/97	04/09/97	04/09/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Aroclor-1254		1 UJ	1 U	1 U	1 UJ	1 UJ	1 UJ
Aroclor-1260		1 UJ	1 U	1 U	1 UJ	1 UJ	1 UJ

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TABLE 14

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D2003	D2006	D2006	D3003	D3005	D5004
	SAMPLE ID	D2003W1P1	D2006W1P1	D2006W1D1	D3003W1P1	D3005W1P1	D5004W1P1
	DATE	04/05/97	04/05/97	04/05/97	04/07/97	04/07/97	04/08/97
	RESULT TYPE	Primary	Primary	Duplicate 1	Primary	Primary	Primary
alpha-BHC		0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 UJ
beta-BHC		0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 UJ
delta-BHC		0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 UJ
gamma-BHC(Lindane)		0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 UJ
Heptachlor		0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 UJ
Aldrin		0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 UJ
Heptachlor epoxide		0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 UJ
Endosulfan I		0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 UJ
Dieldrin		0.1 UJ	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ
4,4'-DDE		0.1 UJ	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ
Endrin		0.1 UJ	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ
Endosulfan II		0.1 UJ	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ
4,4'-DDD		0.1 UJ	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ
Endosulfan sulfate		0.1 UJ	0.0051 NJ	0.1 UJ	0.1 U	0.1 U	0.1 UJ
4,4'-DDT		0.1 UJ	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ
Methoxychlor		0.5 UJ	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 UJ
Endrin ketone		0.1 UJ	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ
Endrin aldehyde		0.1 UJ	0.1 U	0.027 J	0.1 U	0.1 U	0.1 UJ
alpha-Chlordane		0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 UJ
gamma-Chlordane		0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 UJ
Toxaphene		5 UJ	5 U	5 UJ	5 U	5 U	5 UJ
Aroclor-1016		1 UJ	1 U	1 UJ	1 U	1 U	1 UJ
Aroclor-1221		2 UJ	2 U	2 UJ	2 U	2 U	2 UJ
Aroclor-1232		1 UJ	1 U	1 UJ	1 U	1 U	1 UJ
Aroclor-1242		1 UJ	1 U	1 UJ	1 U	1 U	1 UJ
Aroclor-1248		1 UJ	1 U	1 UJ	1 U	1 U	1 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detected, J = estimated, NJ = presumptive evidence = quantitation limit estimated

TABLE 14

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D2003	D2006	D2006	D3003	D3005	D5004
	SAMPLE ID	D2003W1P1	D2006W1P1	D2006W1D1	D3003W1P1	D3005W1P1	D5004W1P1
	DATE	04/05/97	04/05/97	04/05/97	04/07/97	04/07/97	04/08/97
	RESULT TYPE	Primary	Primary	Duplicate 1	Primary	Primary	Primary
Aroclor-1254		1 UJ	1 U	1 UJ	1 U	1 U	1 UJ
Aroclor-1260		1 UJ	1 U	1 UJ	1 U	1 U	1 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit -- = Not analyzed

U = non-detect, J = estimated, NJ = presumptive evidence

UJ = quantitation limit estimated

TABLE 14

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D5007	D5009	D5013	GPT-04-04	GPT-04-04	GPT-04-05
	SAMPLE ID	D5007W1P1	D5009W1P1	D5013W1P1	GPT44G1P1	GPT44G1D1	GPT45G1P1
	DATE	04/08/97	04/07/97	04/07/97	05/19/97	05/19/97	05/19/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Duplicate 1	Primary
alpha-BHC		0.05 UJ	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
beta-BHC		0.05 UJ	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
delta-BHC		0.05 UJ	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
gamma-BHC(Lindane)		0.05 UJ	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Heptachlor		0.05 UJ	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Aldrin		0.05 UJ	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Heptachlor epoxide		0.05 UJ	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Endosulfan I		0.05 UJ	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Dieldrin		0.1 UJ	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDE		0.1 UJ	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Endrin		0.1 UJ	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Endosulfan II		0.1 UJ	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDD		0.1 UJ	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Endosulfan sulfate		0.1 UJ	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDT		0.1 UJ	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Methoxychlor		0.5 UJ	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
Endrin ketone		0.1 UJ	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Endrin aldehyde		0.1 UJ	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
alpha-Chlordane		0.05 UJ	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
gamma-Chlordane		0.05 UJ	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Toxaphene		5 UJ	5 U	5 UJ	5 UJ	5 UJ	5 UJ
Aroclor-1016		1 UJ	1 U	1 UJ	1 UJ	1 UJ	1 UJ
Aroclor-1221		2 UJ	2 U	2 UJ	2 UJ	2 UJ	2 UJ
Aroclor-1232		1 UJ	1 U	1 UJ	1 UJ	1 UJ	1 UJ
Aroclor-1242		1 UJ	1 U	1 UJ	1 UJ	1 UJ	1 UJ
Aroclor-1248		1 UJ	1 U	1 UJ	1 UJ	1 UJ	1 UJ

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U = non-detect, J = estimated, NJ = presumptive evidence = quantitation limit estimated

TABLE 14

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D5007	D5009	D5013	GPT-04-04	GPT-04-04	GPT-04-05
	SAMPLE ID	D5007W1P1	D5009W1P1	D5013W1P1	GPT44G1P1	GPT44G1D1	GPT45G1P1
	DATE	04/08/97	04/07/97	04/07/97	05/19/97	05/19/97	05/19/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Duplicate 1	Primary
Aroclor-1254		1 UJ	1 U	1 UJ	1 UJ	1 UJ	1 UJ
Aroclor-1260		1 UJ	1 U	1 UJ	1 UJ	1 UJ	1 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, NJ = presumptive evidence UJ = quantitation limit estimated

TABLE 14

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	GPT-04-05	GPT-04-06	GPT-04-07	GPT-05-04	GPT-05-05	GPT-05-06
	SAMPLE ID	GPT45G1P3	GPT46G1P1	GPT47G1P1	GPT54G1P1	GPT55G1P1	GPT56G1P1
	DATE	09/19/97	05/20/97	05/20/97	05/20/97	05/20/97	05/20/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
alpha-BHC		0.025 U	0.05 UJ	0.05 UJ	0.0027 NJ	0.05 UJ	0.05 UJ
beta-BHC		0.025 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
delta-BHC		0.025 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
gamma-BHC(Lindane)		0.025 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Heptachlor		0.025 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Aldrin		0.025 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Heptachlor epoxide		0.025 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Endosulfan I		0.025 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Dieldrin		0.05 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDE		0.05 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Endrin		0.05 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Endosulfan II		0.05 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDD		0.05 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Endosulfan sulfate		0.05 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDT		0.05 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Methoxychlor		0.25 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
Endrin ketone		0.05 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Endrin aldehyde		0.05 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
alpha-Chlordane		0.025 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
gamma-Chlordane		0.025 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Toxaphene		1.2 U	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ
Aroclor-1016		0.25 U	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
Aroclor-1221		0.25 U	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
Aroclor-1232		0.25 U	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
Aroclor-1242		0.25 U	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
Aroclor-1248		0.25 U	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ

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TABLE 14

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	GPT-04-05	GPT-04-06	GPT-04-07	GPT-05-04	GPT-05-05	GPT-05-06
	SAMPLE ID	GPT45G1P3	GPT46G1P1	GPT47G1P1	GPT54G1P1	GPT55G1P1	GPT56G1P1
	DATE	09/19/97	05/20/97	05/20/97	05/20/97	05/20/97	05/20/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Aroclor-1254		0.5 U	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
Aroclor-1260		0.5 U	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, NJ = presumptive evidence

UJ = quantitation limit estimated

TABLE 14

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	GPT-GC-01	GPT-GC-02	L4001	L4001	L4002
	SAMPLE ID	L4001W1P3	L4002W1P3	L4001P1P1	L4001P1D1	L4002P1P1
	DATE	09/19/97	09/19/97	04/28/97	04/28/97	04/28/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary
alpha-BHC		0.025 U	0.025 U	0.05 UJ	<0.05 R	0.05 UJ
beta-BHC		0.025 U	0.025 U	0.05 UJ	<0.05 R	0.05 UJ
delta-BHC		0.025 U	0.025 U	0.05 UJ	<0.05 R	0.05 UJ
gamma-BHC(Lindane)		0.025 U	0.025 U	0.05 UJ	<0.05 R	0.05 UJ
Heptachlor		0.025 U	0.025 U	0.05 UJ	<0.05 R	0.05 UJ
Aldrin		0.025 U	0.025 U	0.05 UJ	<0.05 R	0.05 UJ
Heptachlor epoxide		0.025 U	0.025 U	0.05 UJ	<0.05 R	0.05 UJ
Endosulfan I		0.025 U	0.025 U	0.05 UJ	<0.05 R	0.05 UJ
Dieldrin		0.05 U	0.05 U	0.015 J	0.01 J	0.1 UJ
4,4'-DDE		0.05 U	0.05 U	0.1 UJ	<0.1 R	0.1 UJ
Endrin		0.05 U	0.05 U	0.1 UJ	<0.1 R	0.1 UJ
Endosulfan II		0.05 U	0.05 U	0.1 UJ	<0.1 R	0.1 UJ
4,4'-DDD		0.05 U	0.05 U	0.1 UJ	<0.1 R	0.1 UJ
Endosulfan sulfate		0.05 U	0.05 U	0.1 UJ	<0.1 R	0.1 UJ
4,4'-DDT		0.05 U	0.05 U	0.1 UJ	<0.1 R	0.1 UJ
Methoxychlor		0.25 U	0.25 U	0.5 UJ	<0.5 R	0.5 UJ
Endrin ketone		0.05 U	0.05 U	0.1 UJ	<0.1 R	0.1 UJ
Endrin aldehyde		0.05 U	0.05 U	0.1 UJ	<0.1 R	0.1 UJ
alpha-Chlordane		0.025 U	0.025 U	0.05 UJ	<0.05 R	0.05 UJ
gamma-Chlordane		0.025 U	0.025 U	0.05 UJ	<0.05 R	0.05 UJ
Toxaphene		1.2 U	1.2 U	5 UJ	<5 R	5 UJ
Aroclor-1016		0.25 U	0.25 U	1 UJ	<1 R	1 UJ
Aroclor-1221		0.25 U	0.25 U	2 UJ	<2 R	2 UJ
Aroclor-1232		0.25 U	0.25 U	1 UJ	<1 R	1 UJ
Aroclor-1242		0.25 U	0.25 U	1 UJ	<1 R	1 UJ
Aroclor-1248		0.25 U	0.25 U	1 UJ	<1 R	1 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

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TABLE 14

ON-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	GPT-GC-01	GPT-GC-02	L4001	L4001	L4002
	SAMPLE ID	L4001W1P3	L4002W1P3	L4001P1P1	L4001P1D1	L4002P1P1
	DATE	09/19/97	09/19/97	04/28/97	04/28/97	04/28/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary
Aroclor-1254		0.5 U	0.5 U	1 UJ	<1 R	1 UJ
Aroclor-1260		0.5 U	0.5 U	1 UJ	<1 R	1 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, NJ = presumptive evidence UJ = quantitation limit estimated

TABLE 15

ON-BASE DELINEATION
HERBICIDE RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT	(Units in ug/L)	SITE	D1001	D1003	D1005	D1008	D1010	D1013
		SAMPLE ID	D1001W1P1	D1003W1P1	D1005W1P1	D1008W1P1	D1010W1P1	D1013W1P1
		DATE	04/10/97	04/10/97	04/10/97	04/09/97	04/09/97	04/09/97
		RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,4-D			4 U	4 U	4 U	4 U	4 U	4 U
2,4,5-TP (Silvex)			1 U	1 U	1 U	1 U	1 U	1 U
2,4,5-T			1 U	1 U	1 U	1 U	1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, = quantitation limit estimated For RCL HERB

TABLE 15

ON-BASE DELINEATION
HERBICIDE RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D2003	D2006	D2006	D3003	D3005	D5004
	SAMPLE ID	D2003W1P1	D2006W1P1	D2006W1D1	D3003W1P1	D3005W1P1	D5004W1P1
	DATE	04/05/97	04/05/97	04/05/97	04/07/97	04/07/97	04/08/97
	RESULT TYPE	Primary	Primary	Duplicate 1	Primary	Primary	Primary
2,4-D		4 U	4 U	4 U	4 U	4 U	4 U
2,4,5-TP (Silvex)		1 U	1 U	1 U	1 U	1 U	1 U
2,4,5-T		1 U	1 U	1 U	1 U	1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, UJ = quantitation limit estimated For RCL HERB

TABLE 15

ON-BASE DELINEATION
HERBICIDE RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	D5007	D5009	D5013	GPT-04-04	GPT-04-04	GPT-04-05
	SAMPLE ID	D5007W1P1	D5009W1P1	D5013W1P1	GPT44G1P1	GPT44G1D1	GPT45G1P1
	DATE	04/08/97	04/07/97	04/07/97	05/19/97	05/19/97	05/19/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Duplicate 1	Primary
2,4-D		4 U	4 U	4 U	4 U	4 U	4 U
2,4,5-TP (Silvex)		1 U	1 U	1 U	1 U	1 U	1 U
2,4,5-T		1 U	1 U	1 U	1 U	1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, = quantitation limit estimated For RCL HERB

TABLE 15

ON-BASE DELINEATION
HERBICIDE RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	GPT-04-06	GPT-04-07	GPT-05-04	GPT-05-05	GPT-05-06	L4001
	SAMPLE ID	GPT46G1P1	GPT47G1P1	GPT54G1P1	GPT55G1P1	GPT56G1P1	L4001P1P1
	DATE	05/20/97	05/20/97	05/20/97	05/20/97	05/20/97	04/28/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2,4-D		4 U	4 U	4 U	4 U	4 U	4 UJ
2,4,5-TP (Silvex)		1 U	1 U	1 U	1 U	1 U	1 U
2,4,5-T		1 U	1 U	1 U	1 U	1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, UJ = quantitation limit estimated For RCL HERB

TABLE 15

ON-BASE DELINEATION
HERBICIDE RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	L4001	L4002
	SAMPLE ID	L4001P1D1	L4002P1P1
	DATE	04/28/97	04/28/97
	RESULT TYPE	Duplicate 1	Primary
2,4-D		4 UJ	4 UJ
2,4,5-TP (Silvex)		1 U	1 U
2,4,5-T		1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detected J = estimated, = quantitation limit estimated For RCL HERB

TABLE 16

OFF-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in pg/L)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003W1P2	BC003W1P1	C1001W1P1	C1001W1D1	TC002W1P2	TC006W1P1
	DATE	05/16/97	05/19/97	04/23/97	04/23/97	04/25/97	05/14/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
2,3,7,8-TCDD		4.8 U	1.5 U	(4.1)	3.9 U	5.3 U	5.8 U
1,2,3,7,8-PeCDD		5.6 U	1.7 U	22.1	(4.6)	4.5 U	7.2 U
1,2,3,4,7,8-HxCDD		6.1 U	2.1 U	16.6	4.8	6.6 U	7.2 U
1,2,3,6,7,8-HxCDD		4.3 U	1.5 U	22.1	6.4	5.6 U	5.2 U
1,2,3,7,8,9-HxCDD		4.7 U	1.7 U	29.6	8.9	5.7 U	5.6 U
1,2,3,4,6,7,8-HpCDD		23.5	7.7	297	74.2	11.5	6.8 U
1,2,3,4,6,7,8,9-OCDD		266	74.6 U	2100	506	174	85.6
2,3,7,8-TCDF		3.7 U	1.2 U	6.7	2.6 U	5.1 U	4.3 U
1,2,3,7,8-PeCDF		4.5 U	1.3 U	11.8	3.7 U	3.5 U	5.0 U
2,3,4,7,8-PeCDF		4.3 U	1.2 U	8.6	3.7 U	3.7 U	4.8 U
1,2,3,4,7,8-HxCDF		3.9 U	1.5 U	18.0	5.6	5.1 U	5.2 U
1,2,3,6,7,8-HxCDF		2.8 U	1.0 U	12.9	3.3	4.2 U	3.7 U
2,3,4,6,7,8-HxCDF		5.5	3.0 U	19.2	3.3 U	5.4 U	5.0 U
1,2,3,7,8,9-HxCDF		4.0 U	1.5 U	7.3	4.4	6.2 U	5.3 U
1,2,3,4,6,7,8-HpCDF		10.5	3.0	78.5	19.9	5.5 U	4.8 U
1,2,3,4,7,8,9-HpCDF		4.4 U	1.8 U	(9.1)	(3.0)	7.6 U	6.0 U
1,2,3,4,6,7,8,9-OCDF		22.8	5.5	130	34.2	9.5 U	6.5 U
Total TCDD		4.8 U	1.5 U	(4.1)	3.9 U	5.3 U	5.8 U
Total PeCDD		5.6 U	1.7 U	22.1	(4.6)	4.5 U	7.2 U
Total HxCDD		4.9 U	1.7 U	101	31.3	5.9 U	6.9 U
Total HpCDD		51.5	16.2	574	132	11.5	6.8 U
Total TCDF		3.7 U	1.2 U	10.1	2.6 U	5.1 U	4.3 U
Total PeCDF		4.4 U	1.3 U	29.8	3.7 U	3.6 U	4.9 U
Total HxCDF		5.5	3.0	124	24.9	5.1 U	4.7 U
Total HpCDF		26.1	5.8	199	49.1	6.3 U	5.4 U
Total TEQ		1.18	0.112	39.4	7.15	0.289	0.086

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

( ) = Less than Reporting Limit

U = non-detect, For RCL DIOX

TABLE 16

OFF-BASE DELINEATION
DIOXIN/FURAN RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in pg/L)	SITE	TC006	WM002
	SAMPLE ID	TC006W1D1	WM002W1P2
	DATE	05/14/97	04/24/97
	RESULT TYPE	Duplicate 1	Primary
2,3,7,8-TCDD		2.2 U	4.8 U
1,2,3,7,8-PeCDD		2.4 U	5.1 U
1,2,3,4,7,8-HxCDD		2.6 U	6.8 U
1,2,3,6,7,8-HxCDD		1.9 U	6.2 U
1,2,3,7,8,9-HxCDD		2.0 U	6.0 U
1,2,3,4,6,7,8-HpCDD		8.2	6.2 U
1,2,3,4,6,7,8,9-OCDD		80.2	29.3 U
2,3,7,8-TCDF		1.7 U	4.8 U
1,2,3,7,8-PeCDF		1.8 U	4.5 U
2,3,4,7,8-PeCDF		1.8 U	4.3 U
1,2,3,4,7,8-HxCDF		1.8 U	5.4 U
1,2,3,6,7,8-HxCDF		1.3 U	4.3 U
2,3,4,6,7,8-HxCDF		3.7	5.4 U
1,2,3,7,8,9-HxCDF		1.9 U	5.9 U
1,2,3,4,6,7,8-HpCDF		1.7 U	3.9 U
1,2,3,4,7,8,9-HpCDF		2.2 U	6.0 U
1,2,3,4,6,7,8,9-OCDF		2.3 U	7.0 U
Total TCDD		2.2 U	4.8 U
Total PeCDD		2.4 U	5.1 U
Total HxCDD		2.1 U	6.3 U
Total HpCDD		16.1	6.2 U
Total TCDF		1.7 U	4.8 U
Total PeCDF		1.8 U	4.4 U
Total HxCDF		3.7	5.2 U
Total HpCDF		1.9 U	4.7 U
Total TEQ		0.532	0

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, For RCL DIOX

TABLE 17

OFF-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003W1P1	BC003W1P1	C1001W1P1	C1001W1D1	TC002W1P1	TC006W1P1
	DATE	05/16/97	05/19/97	04/23/97	04/23/97	04/25/97	05/14/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Chloromethane		10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane		10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride		10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride		10 U	10 U	10 U	10 U	10 U	10 U
Acetone		10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide		10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene		10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)		10 U	10 U	10 U	10 U	10 U	10 U
Chloroform		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone		10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride		10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane		10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene		10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane		10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Benzene		10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U
Bromoform		10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone		10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit -- = Not analyzed

U = non-detect, J = estimated For RCL VOA UJ = estimated quantitation limit

TABLE 17

OFF-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003W1P1	BC003W1P1	C1001W1P1	C1001W1D1	TC002W1P1	TC006W1P1
	DATE	05/16/97	05/19/97	04/23/97	04/23/97	04/25/97	05/14/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Tetrachloroethene		10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Toluene		10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene		10 U	10 U	10 U	10 U	10 U	10 U
Styrene		10 U	10 U	10 U	10 U	10 U	10 U
Xylenes (total)		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL VOA = estimated quantitation limit

TABLE 17

OFF-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	TC006	WM002
	SAMPLE ID	TC006W1D1	WM002W1P1
	DATE	05/14/97	04/24/97
	RESULT TYPE	Duplicate 1	Primary
Chloromethane		10 U	10 U
Bromomethane		10 U	10 U
Vinyl chloride		10 U	10 U
Chloroethane		10 U	10 U
Methylene chloride		10 U	10 U
Acetone		10 U	10 U
Carbon disulfide		10 U	10 U
1,1-Dichloroethene		10 U	10 U
1,1-Dichloroethane		10 U	10 U
1,2-Dichloroethene (total)		10 U	10 U
Chloroform		10 U	10 U
1,2-Dichloroethane		10 U	10 U
2-Butanone		10 U	10 U
1,1,1-Trichloroethane		10 U	10 U
Carbon tetrachloride		10 U	10 U
Bromodichloromethane		10 U	10 U
1,2-Dichloropropane		10 U	10 U
cis-1,3-Dichloropropene		10 U	10 U
Trichloroethene		10 U	10 U
Dibromochloromethane		10 U	10 U
1,1,2-Trichloroethane		10 U	10 U
Benzene		10 U	10 U
trans-1,3-Dichloropropene		10 U	10 U
Bromoform		10 U	10 U
4-Methyl-2-pentanone		10 U	10 U
2-Hexanone		10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL VOA

UJ = estimated quantitation limit

TABLE 17

OFF-BASE DELINEATION
VOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	TC006	WM002
	SAMPLE ID	TC006W1D1	WM002W1P1
	DATE	05/14/97	04/24/97
	RESULT TYPE	Duplicate 1	Primary
Tetrachloroethene		10 U	10 U
1,1,2,2-Tetrachloroethane		10 U	10 U
Toluene		10 U	10 U
Chlorobenzene		10 U	10 U
Ethylbenzene		10 U	10 U
Styrene		10 U	10 U
Xylenes (total)		10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL VOA = estimated quantitation limit

TABLE 18

OFF-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003W1P1	BC003W1P1	C1001W1P1	C1001W1D1	TC002W1P1	TC006W1P1
	DATE	05/16/97	05/19/97	04/23/97	04/23/97	04/25/97	05/14/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Phenol		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-chloroethyl)ether		10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)		10 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosodinpropylamine		10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Isophorone		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-chloroethoxy)methane		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene		10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene		10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-Methylphenol		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene		10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol		10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol		25 U	25 U	25 U	25 U	25 U	25 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL SVOA UJ = estimated quantitation limit

TABLE 18

OFF-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003W1P1	BC003W1P1	C1001W1P1	C1001W1D1	TC002W1P1	TC006W1P1
	DATE	05/16/97	05/19/97	04/23/97	04/23/97	04/25/97	05/14/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
2-Chloronaphthalene		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
Dimethylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene		10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene		10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
Acenaphthene		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol		25 U	25 U	25 U	25 U	25 U	25 U
4-Nitrophenol		25 UJ	25 UJ	25 U	25 U	25 U	25 UJ
Dibenzofuran		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene		10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether		10 U	10 U	10 U	10 U	10 U	10 U
Fluorene		10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline		25 U	25 U	25 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol		25 U	25 U	25 U	25 U	25 U	25 U
N-Nitrosodiphenylamine (1)		10 U	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene		10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol		25 U	25 U	25 U	25 U	25 U	25 U
Phenanthrene		10 U	10 U	10 U	10 U	10 U	10 U
Anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Carbazole		10 U	10 U	10 U	10 U	10 U	10 U
Di-n-Butylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Pyrene		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit — = Not analyzed

U = non-detect J = estimated For RCL SVOA = estimated quantitation limit

TABLE 18

OFF-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003W1P1	BC003W1P1	C1001W1P1	C1001W1D1	TC002W1P1	TC006W1P1
	DATE	05/16/97	05/19/97	04/23/97	04/23/97	04/25/97	05/14/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Butylbenzylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Chrysene		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-ethylhexyl)Phthalate		10 U	10 U	10 U	10 U	10 U	10 U
Di-n-octylphthalate		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene		10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene		10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene		10 U	10 U	10 U	10 U	10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL SVOA UJ = estimated quantitation limit

TABLE 18

OFF-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	TC006	WM002
	SAMPLE ID	TC006W1D1	WM002W1P1
	DATE	05/14/97	04/24/97
	RESULT TYPE	Duplicate 1	Primary
Phenol		10 U	10 U
bis(2-chloroethyl)ether		10 U	10 U
2-Chlorophenol		10 U	10 U
1,3-Dichlorobenzene		10 U	10 U
1,4-Dichlorobenzene		10 U	10 U
1,2-Dichlorobenzene		10 U	10 U
2-Methylphenol		10 U	10 U
2,2'-oxybis(1-Chloropropane)		10 U	10 U
N-Nitrosodinpropylamine		10 U	10 U
4-Methylphenol		10 U	10 U
Hexachloroethane		10 U	10 U
Nitrobenzene		10 U	10 U
Isophorone		10 U	10 U
2-Nitrophenol		10 U	10 U
2,4-Dimethylphenol		10 U	10 U
bis(2-chloroethoxy)methane		10 U	10 U
2,4-Dichlorophenol		10 U	10 U
1,2,4-Trichlorobenzene		10 U	10 U
Naphthalene		10 U	10 U
4-Chloroaniline		10 U	10 U
Hexachlorobutadiene		10 U	10 U
4-Chloro-3-Methylphenol		10 U	10 U
2-Methylnaphthalene		10 U	10 U
Hexachlorocyclopentadiene		10 U	10 U
2,4,6-Trichlorophenol		10 U	10 U
2,4,5-Trichlorophenol		25 U	25 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-dete[redacted] = estimated For RCL SVOA

[redacted] = estimated quantitation limit

TABLE 18

OFF-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	TC006	WM002
	SAMPLE ID	TC006W1D1	WM002W1P1
	DATE	05/14/97	04/24/97
	RESULT TYPE	Duplicate 1	Primary
2-Chloronaphthalene		10 U	10 U
2-Nitroaniline		25 U	25 U
Dimethylphthalate		10 U	10 U
Acenaphthylene		10 U	10 U
2,6-Dinitrotoluene		10 U	10 U
3-Nitroaniline		25 U	25 U
Acenaphthene		10 U	10 U
2,4-Dinitrophenol		25 U	25 U
4-Nitrophenol		25 UJ	25 U
Dibenzofuran		10 U	10 U
2,4-Dinitrotoluene		10 U	10 U
Diethylphthalate		10 U	10 U
4-Chlorophenyl-phenylether		10 U	10 U
Fluorene		10 U	10 U
4-Nitroaniline		25 U	25 U
4,6-Dinitro-2-methylphenol		25 U	25 U
N-Nitrosodiphenylamine (1)		10 U	10 U
4-Bromophenyl-phenylether		10 U	10 U
Hexachlorobenzene		10 U	10 U
Pentachlorophenol		25 U	25 U
Phenanthrene		10 U	10 U
Anthracene		10 U	10 U
Carbazole		10 U	10 U
Di-n-Butylphthalate		10 U	10 U
Fluoranthene		10 U	10 U
Pyrene		10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated For RCL SVOA

UJ = estimated quantitation limit

TABLE 18

OFF-BASE DELINEATION
SVOC RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	TC006	WM002
	SAMPLE ID	TC006W1D1	WM002W1P1
	DATE	05/14/97	04/24/97
	RESULT TYPE	Duplicate 1	Primary
Butylbenzylphthalate		10 U	10 U
3,3'-Dichlorobenzidine		10 U	10 U
Benzo(a)Anthracene		10 U	10 U
Chrysene		10 U	10 U
bis(2-ethylhexyl)Phthalate		10 U	10 U
Di-n-octylphthalate		10 U	10 U
Benzo(b)fluoranthene		10 U	10 U
Benzo(k)fluoranthene		10 U	10 U
Benzo(a)pyrene		10 U	10 U
Indeno(1,2,3-cd)pyrene		10 U	10 U
Dibenzo(a,h)anthracene		10 U	10 U
Benzo(g,h,i)perylene		10 U	10 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect J = estimated For RCL SVOA = estimated quantitation limit

TABLE 19

OFF-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003W1P1	BC003W1P1	C1001W1P1	C1001W1D1	TC002W1P1	TC006W1P1
	DATE	05/16/97	05/19/97	04/23/97	04/23/97	04/25/97	05/14/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
alpha-BHC		0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U
beta-BHC		0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U
delta-BHC		0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U
gamma-BHC(Lindane)		0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U
Heptachlor		0.05 U	0.05 UJ	0.05 UJ	0.026 J	0.05 UJ	0.05 U
Aldrin		0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U
Heptachlor epoxide		0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U
Endosulfan I		0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U
Dieldrin		0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
4,4'-DDE		0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
Endrin		0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
Endosulfan II		0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
4,4'-DDD		0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
Endosulfan sulfate		0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
4,4'-DDT		0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
Methoxychlor		0.5 U	0.5 UJ	0.5 UJ	0.031 NJ	0.5 UJ	0.5 U
Endrin ketone		0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
Endrin aldehyde		0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
alpha-Chlordane		0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U
gamma-Chlordane		0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U
Toxaphene		5 U	5 UJ	5 UJ	5 UJ	5 UJ	5 U
Aroclor-1016		1 U	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Aroclor-1221		2 U	2 UJ	2 UJ	2 UJ	2 UJ	2 U
Aroclor-1232		1 U	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Aroclor-1242		1 U	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Aroclor-1248		1 U	1 UJ	1 UJ	1 UJ	1 UJ	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, NJ = presumptive evidence UJ = estimated quantitation limit

TABLE 19

OFF-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003W1P1	BC003W1P1	C1001W1P1	C1001W1D1	TC002W1P1	TC006W1P1
	DATE	05/16/97	05/19/97	04/23/97	04/23/97	04/25/97	05/14/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Aroclor-1254		1 U	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Aroclor-1260		1 U	1 UJ	1 UJ	1 UJ	1 UJ	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, NJ = presumptive evidence

= estimated quantitation limit

TABLE 19

OFF-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	TC006	WM002
	SAMPLE ID	TC006W1D1	WM002W1P1
	DATE	05/14/97	04/24/97
	RESULT TYPE	Duplicate 1	Primary
alpha-BHC		0.05 U	0.05 UJ
beta-BHC		0.05 U	0.05 UJ
delta-BHC		0.05 U	0.05 UJ
gamma-BHC(Lindane)		0.05 U	0.05 UJ
Heptachlor		0.05 U	0.05 UJ
Aldrin		0.05 U	0.05 UJ
Heptachlor epoxide		0.05 U	0.05 UJ
Endosulfan I		0.05 U	0.05 UJ
Dieldrin		0.1 U	0.1 UJ
4,4'-DDE		0.1 U	0.1 UJ
Endrin		0.1 U	0.1 UJ
Endosulfan II		0.1 U	0.1 UJ
4,4'-DDD		0.1 U	0.1 UJ
Endosulfan sulfate		0.1 U	0.1 UJ
4,4'-DDT		0.1 U	0.1 UJ
Methoxychlor		0.5 U	0.5 UJ
Endrin ketone		0.1 U	0.1 UJ
Endrin aldehyde		0.1 U	0.1 UJ
alpha-Chlordane		0.05 U	0.05 UJ
gamma-Chlordane		0.05 U	0.05 UJ
Toxaphene		5 U	5 UJ
Aroclor-1016		1 U	1 UJ
Aroclor-1221		2 U	2 UJ
Aroclor-1232		1 U	1 UJ
Aroclor-1242		1 U	1 UJ
Aroclor-1248		1 U	1 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, NJ = presumptive evidence

UJ = estimated quantitation limit

TABLE 19

OFF-BASE DELINEATION
PESTICIDE/PCB RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	TC006	WM002
	SAMPLE ID	TC006W1D1	WM002W1P1
	DATE	05/14/97	04/24/97
	RESULT TYPE	Duplicate 1	Primary
Aroclor-1254		1 U	1 UJ
Aroclor-1260		1 U	1 UJ

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, NJ = presumptive evidence = estimated quantitation limit

TABLE 20

OFF-BASE DELINEATION
HERBICIDE RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	BB003	BC003	C1001	C1001	TC002	TC006
	SAMPLE ID	BB003W1P1	BC003W1P1	C1001W1P1	C1001W1D1	TC002W1P1	TC006W1P1
	DATE	05/16/97	05/19/97	04/23/97	04/23/97	04/25/97	05/14/97
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
2,4-D		4 U	4 U	4 UJ	4 UJ	4 UJ	4 U
2,4,5-TP (Silvex)		1 U	1 U	1 UJ	1 U	1 U	1 U
2,4,5-T		1 U	1 U	1 UJ	1 U	1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-detect, J = estimated, UJ = estimated quantitation limit For RCL HERB

TABLE 20

OFF-BASE DELINEATION
HERBICIDE RESULTS
NCBC GULFPORT
(water)

Date: 07/24/98

CONSTITUENT (Units in ug/L)	SITE	TC006	WM002
	SAMPLE ID	TC006W1D1	WM002W1P1
	DATE	05/14/97	04/24/97
	RESULT TYPE	Duplicate 1	Primary
2,4-D		4 U	4 UJ
2,4,5-TP (Silvex)		1 U	1 U
2,4,5-T		1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = non-dete[illegible] = estimated, [illegible] = estimated quantitation limit For RCL HERB

APPENDIX B

FISH SAMPLING INFORMATION

Table B-1

Summary of Biological Tissue (Whole Body) Submitted for Analysis[a]

Tier I/II Screening Level Fish/Sediment Sampling Results
Naval Construction Battalion Center
Gulfport, Mississippi

Sample Location	Sampling Date (1997)	Sample Identification	Species	Trophic Level[b]	Length (mm)	Weight (g)	Fillet Weight (g)	Anomalies
BIO-2	15-19 Mar	BIO-2-WF-GS	Gizzard shad	P/S	110	13		None
BIO-2	15-19 Mar	BIO-2-WF-GS	Gizzard shad	P/S	150	34		None
BIO-2	15-19 Mar	BIO-2-WF-GS	Gizzard shad	P/S	160	41		None
BIO-2	15-19 Mar	BIO-2-WF-GS	Gizzard shad	P/S	170	57		None
BIO-2	15-19 Mar	BIO-2-WF-CF	Brown bullhead	BF	373	775		None
BIO-2	15-19 Mar	BIO-2-WF-LB	Largemouth bass	T	233	156		None
BIO-2	23-27 Aug	BIO-2-WF-CF[c]	Brown bullhead	BF	346	820	177	None
BIO-2	23-27 Aug	BIO-2-WF-BG	Bluegill sunfish	T	125	35		None
BIO-2	23-27 Aug	BIO-2-WF-BG	Bluegill sunfish	T	155	70		None
BIO-2	23-27 Aug	BIO-2-WF-BG	Bluegill sunfish	T	142	56		None
BIO-2	23-27 Aug	BIO-2-WF-GS	Gizzard shad	P/S	160	41		None
BIO-2	23-27 Aug	BIO-2-WF-GS	Gizzard shad	P/S	173	55		None
BIO-2	23-27 Aug	BIO-2-WF-GS	Gizzard shad	P/S	172	54		None
BIO-2	23-27 Aug	BIO-2-WF-GSR[d]	Gizzard shad	P/S	173	53		None
BIO-2	23-27 Aug	BIO-2-WF-GSR[d]	Gizzard shad	P/S	154	38		None
BIO-2	23-27 Aug	BIO-2-WF-GSR[d]	Gizzard shad	P/S	136	26		None
BIO-3	15-19 Mar	BIO-3-WF-CS	Lake chubsucker	P/S	155	56		Eroded caudal fin
BIO-3	15-19 Mar	BIO-3-WF-CS	Lake chubsucker	P/S	162	63		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	88	14		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	80	9		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	90	12		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	88	11		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	68	6		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	80	8		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	70	6		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	70	6		None

Table B-1

Summary of Biological Tissue (Whole Body) Submitted for Analysis[a]

Tier I/II Screening Level Fish/Sediment Sampling Results
Naval Construction Battalion Center
Gulfport, Mississippi

Sample Location	Sampling Date (1997)	Sample Identification	Species	Trophic Level[b]	Length (mm)	Weight (g)	Fillet Weight (g)	Anomalies
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	73	6		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	80	8		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	72	6		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	66	5		None
BIO-3	23-27 Aug	BIO-3-WF-BG	Bluegill sunfish	T	115	21		None
BIO-3	23-27 Aug	BIO-3-WF-BG	Bluegill sunfish	T	107	20		None
BIO-3	23-27 Aug	BIO-3-WF-BG	Bluegill sunfish	T	70	6		None
BIO-3	23-27 Aug	BIO-3-WF-PP	Pirate perch	P/S	64	4		None
BIO-3	23-27 Aug	BIO-3-WF-PP	Pirate perch	P/S	60	4		None
BIO-3	23-27 Aug	BIO-3-WF-PP	Pirate perch	P/S	45	2		None
BIO-3	23-27 Aug	BIO-3-WF-PP	Pirate perch	P/S	50	2		None
BIO-3	23-27 Aug	BIO-3-WF-PP	Pirate perch	P/S	55	3		None
BIO-3	23-27 Aug	BIO-3-WF-PP	Pirate perch	P/S	45	1		None
BIO-3	23-27 Aug	BIO-3-WF-PP	Pirate perch	P/S	118	18		None
BIO-4	15-19 Mar	BIO-4-WF-CF	Channel catfish	BF	300	440		Abrasion near dorsal fin
BIO-4	15-19 Mar	BIO-4-WF-BG	Bluegill sunfish	T	135	52		None
BIO-4	23-27 Aug	BIO-4-WF-BG	Bluegill sunfish	T	110	20		None
BIO-4	23-27 Aug	BIO-4-WF-BG	Bluegill sunfish	T	98	16		None
BIO-4	23-27 Aug	BIO-4-WF-BG	Bluegill sunfish	T	122	30		None
BIO-4	23-27 Aug	BIO-4-WF-BT	Blackspotted topminnow	P/S	70	3		None
BIO-4	23-27 Aug	BIO-4-WF-BT	Blackspotted topminnow	P/S	68	3		None
BIO-4	23-27 Aug	BIO-4-WF-BT	Blackspotted topminnow	P/S	68	3		None
BIO-4	23-27 Aug	BIO-4-WF-BT	Blackspotted topminnow	P/S	45	1		None
BIO-4	23-27 Aug	BIO-4-WF-BT	Blackspotted topminnow	P/S	44	1		None
BIO-4	23-27 Aug	BIO-4-WF-BT	Blackspotted topminnow	P/S	48	1		None
BIO-4	23-27 Aug	BIO-4-WF-BT	Blackspotted topminnow	P/S	45	1		None

Table B-1

Summary of Biological Tissue (Whole Body) Submitted for Analysis[a]

Tier I/II Screening Level Fish/Sediment Sampling Results
Naval Construction Battalion Center
Gulfport, Mississippi

Sample Location	Sampling Date (1997)	Sample Identification	Species	Trophic Level[b]	Length (mm)	Weight (g)	Fillet Weight (g)	Anomalies
BIO-5	15-19 Mar	BIO-5-WF-SS	Brook silverside	P/S	7 @ 80	7 @ 19		None
BIO-5	15-19 Mar	BIO-5-WF-SS	Shiner	P/S	9 @ 60	9 @ 21		None
BIO-5	15-19 Mar	BIO-5-WF-LB	Largemouth bass	T	265	242		None
BIO-5	23-27 Aug	BIO-5-WF-LB	Largemouth bass	T	295	410		None
BIO-5	23-27 Aug	BIO-5-WF-LB	Largemouth bass	T	235	170		None
BIO-5	23-27 Aug	BIO-5-WF-CF[c]	Channel catfish	BF	450	1070	234	None
BIO-5	23-27 Aug	BIO-5-WF-GS	Gizzard shad	P/S	140	24		None
BIO-5	23-27 Aug	BIO-5-WF-GS	Gizzard shad	P/S	155	35		None
BIO-5	23-27 Aug	BIO-5-WF-GS	Gizzard shad	P/S	150	35		None
BIO-5	23-27 Aug	BIO-5-WF-SM[d]	Striped mullet	P/S	310	350		None
BIO-5	23-27 Aug	BIO-5-WF-SM[d]	Striped mullet	P/S	314	355		Contusions
BIO-6	15-19 Mar	BIO-6-WF-SM	Striped mullet	P/S	172	60		None
BIO-6	15-19 Mar	BIO-6-WF-SM	Striped mullet	P/S	180	64		None
BIO-6	15-19 Mar	BIO-6-WF-SM	Striped mullet	P/S	175	62		None
BIO-6	15-19 Mar	BIO-6-WF-SM	Striped mullet	P/S	163	52		None
BIO-6	15-19 Mar	BIO-6-WF-CF	Channel catfish	BF	280	210		None
BIO-6	15-19 Mar	BIO-6-WF-CF	Channel catfish	BF	395	700		None
BIO-6	15-19 Mar	BIO-6-WF-LB	Largemouth bass	T	258	252		None
BIO-6	15-19 Mar	BIO-6-WF-LB	Largemouth bass	T	230	152		None
BIO-6	15-19 Mar	BIO-6-WF-LBR[d]	Largemouth bass	T	310	490		Contusions from electrode
BIO-7	15-19 Mar	BIO-7-WF-SM	Striped mullet	P/S	178	50		None
BIO-7	15-19 Mar	BIO-7-WF-SM	Striped mullet	P/S	163	48		None
BIO-7	15-19 Mar	BIO-7-WF-LB	Largemouth bass	T	188	80		None
BIO-7	15-19 Mar	BIO-7-WF-LB	Largemouth bass	T	225	162		None
BIO-8	15-19 Mar	BIO-8-WF-CF	Black bullhead	BF	175	95		None
BIO-8	15-19 Mar	BIO-8-WF-CF	Black bullhead	BF	198	112		None

Table B-1
Summary of Biological Tissue (Whole Body) Submitted for Analysis[a]

Tier I/II Screening Level Fish/Sediment Sampling Results
Naval Construction Battalion Center
Gulfport, Mississippi

Sample Location	Sampling Date (1997)	Sample Identification	Species	Trophic Level[b]	Length (mm)	Weight (g)	Fillet Weight (g)	Anomalies
BIO-8	15-19 Mar	BIO-8-WF-LB	Largemouth bass	T	260	254		None
BIO-8	15-19 Mar	BIO-8-WF-LB	Largemouth bass	T	230	170		None
BIO-8	23-27 Aug	BIO-8-WF-CF	Brown bullhead	BF	210	120		None
BIO-8	23-27 Aug	BIO-8-WF-CF	Brown bullhead	BF	190	100		None
BIO-8	23-27 Aug	BIO-8-WF-CF	Brown bullhead	BF	175	75		None
BIO-8	23-27 Aug	BIO-8-WF-CFR[d]	Brown bullhead	BF	170	65		None
BIO-8	23-27 Aug	BIO-8-WF-CFR[d]	Brown bullhead	BF	185	100		None
BIO-8	23-27 Aug	BIO-8-WF-LB	Largemouth bass	T	95	10		None
BIO-8	23-27 Aug	BIO-8-WF-LB	Largemouth bass	T	85	9		None
BIO-8	23-27 Aug	BIO-8-WF-LB	Largemouth bass	T	80	6		None
BIO-8	23-27 Aug	BIO-8-WF-SM	Sailfin molly	P/S	av. = 45	av. = 2.4		None
BIO-9	23-27 Aug	BIO-9-WF-AM	Two-toed amphiuma	Other	~600	~5,000		None

Notes:
a. Information summarized from two Ecological Sampling Services reports prepared by C^2 Environmental Services; reports dated June and November 1999.
b. Trophic level categories include: P/S - primary/secondary consumer; T - tertiary consumer; BF - bottom feeder.
c. Carcass and fillet samples used for whole body analytical tissue reconstruction.
d. Replicate sample.

ECOLOGICAL SAMPLING SERVICES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
PHASE II

FINAL REPORT

FOR

HARDING LAWSON ASSOCIATES ES, INC.

NOVEMBER, 1999

PREPARED BY:

C^2 ENVIRONMENTAL SERVICES, INC.
CHAMBLEE, GA

INTRODUCTION

C^2 Environmental Services, Inc. was contracted by Harding Lawson Associates ES, Inc. (HLA-ES) to collect various fish and shellfish species for laboratory analyses for dioxins in their tissue. This information is to be used to identify whether these contaminant levels are within acceptable risk levels for human health consumption and are not of ecological concern (human and ecological risk assessments).

METHODOLOGY - WORK PLAN/TECHNICAL APPROACH

The following work plan outlines the original proposed technical scope-of-work and sampling locations for this field effort. The investigation at NCBC Gulfport was scheduled to occur at a total of eight sampling locations: two locations in the on-site drainage ditches (BIO-1 and BIO-2); two locations in Turkey Creek (BIO-4 and BIO-5); two location in Brickyard Creek (BIO-7 and BIO-8); one location in Bernard Bayou (BIO-6); and, one location in an undisturbed reference site (BIO-3).

Sampling in freshwater was scheduled to occur via electrofishing (boat and/or backpack) and/or alternative methods (dependent on electrofishing success), including trot lines, hoop nets, gill nets, seine, or rod and reel. Boat electrofishing was to be conducted in deep water locations from a 14-ft john boat using a Smith-Root 5.0 GPP electrofishing unit, rated for conductivities ranging from 10 to 6,750 µmhos/cm, and was to be conducted by maneuvering the boat along the bank, vegetation, submerged stumps and logs, and other potential sources of cover. Backpack electrofishing (in wadable, shallow sampling locations) was to be conducted using a Smith-Root Model 15-C POW Backpack Electrofisher. During all electrofishing efforts, proper protective gear (e.g., gloves, waders, etc.) was to be worn. Polarized sunglasses were to be worn as weather conditions dictate to reduce glare and improve sampling efficiency. Stunned fish were to be dipnetted and placed in an aerated live well for processing. All types of shoreline habitat were to be sampled. Electrofishing equipment is preferred for collecting predator species, such as largemouth bass and bluegill.

Trot lines and/or hoop nets are the preferred methods for collecting the bottom feeder, i.e., channel catfish. These methods were to be deployed and baited, usually in the evening, and checked the next morning. For brackish water sampling, i.e., Bernard Bayou, alternate collection methods were to include gill netting, seining, cast netting, and rod and reel, if necessary. These methods also were to be used at the freshwater sites, if the preferred methods did not achieve the desired results. If gill netting was utilized, experimental gill nets (different mesh sized panels) were scheduled to be used. Dependent on site conditions and capture success, gill nets were to be set perpendicular to the shore for varying lengths of time (No more than 12-hour, overnight sets are anticipated.).

Crawfish were to be collected using crawfish traps or nets. These were to be baited with locally-available baits.

Water level data and *in situ* water quality measurements (water temperature, pH, dissolved oxygen, salinity, and specific conductance) were to be taken at each study location during sampling/ electrofishing. A daily logbook was to be maintained which summarized all field activities, including date and time of each sample collection, instrument calibrations, site conditions, and any pertinent observations or problems encountered during sampling.

Several species of fish and shellfish were to be targeted for collection for human health and ecological risk. For human health, channel catfish (omnivorous bottom feeder), largemouth bass (tertiary consumer of recreational importance), and crawfish (bottom-dwelling, bottom feeding shellfish) were to be targeted. Bluegill was to be substituted for largemouth bass, if this species was not present. For ecological risk assessment, striped mullet (primary/ secondary consumer feeding on planktonic macroinvertebrates and algae), channel catfish, and largemouth bass were to be targeted for collection. Possible alternate species included gizzard shad or blacktail shiner (for striped mullet) and chain pickerel (for largemouth bass).

Collected target individuals were to be identified to species, measured for total length, sexed (if possible from external examination), and examined carefully for external anomalies, including fin erosion, skin ulcers, skeletal anomalies, and neoplasms (i.e., ulcers). Next, target species were to be composited for tissue analysis. Composites are mixtures of two or more individuals of the same species and should include approximately similar sized specimens (smallest no less than 75% of largest) collected at the same time. Samples were to provide a minimum of 100 grams of fish or 300 grams of shellfish (i.e., crawfish) tissue for analysis. Emphasis for samples was to be on larger specimens. Single replicates were to be collected at a minimum of 10 percent of the sampling locations. Whole fish were to be utilized for ecological risk assessment, and fish were to be filleted for human risk assessment.

Protective gloves were to be worn when handling samples; gloves were to be rinsed or changed after processing each sample. Individuals selected for tissue analysis were to be washed in ambient water to remove any foreign material from surface. Targeted species were to be grouped by species and separated to prevent contamination.

All whole fish and shellfish samples were to be individually wrapped in extra heavy duty aluminum foil, labeled, and placed inside plastic zip-lock bags and sealed. Chain-of-Custody labels were to be attached to each bag. If possible, all composite samples were to be kept together in a single large waterproof bag in the same shipping container. Once packaged, all samples were to be cooled with wet or blue ice (with adequate layers of ice between samples) and shipped as soon as possible.

Fish filleting was to be completed in the field. Target fish were to be filleted, and fillets retained for laboratory analysis. Channel catfish were to be processed by gutting the individual and removing its head and skin. Largemouth bass and bluegill were to be processed by removing the head, internal organs, and scales. Processing was to occur as soon as possible after collection and was to be performed on precleaned glass surfaces. The cutting surface was to be cleaned properly between processing. Dissections were to be made

using teflon-coated stainless steel microtome blades.

A report describing field procedures and summarizing fishery data collected in the field were to be produced. HLA-ES was to be provided with four hard copies of the report and an electronic copy on disk. A copy of all field logs also were to be provided.

RESULTS AND DISCUSSION

The sampling effort was conducted on August 23 - 27, 1999. This was the second sampling effort (Phase II) and was conducted primarily to collect post-spawn fish (first effort in March to collect pre-spawn fish). As during the first sampling effort, some of proposed sampling sites and methodologies were changed.

Environmental conditions had changed considerably in the study area since the first sampling event. A lack of rainfall had resulted in little to no flow at many of the sampling locations. No flow was present in upper Turkey Creek, and little flow was present in Brickyard Creek. Sampling sites BIO-3 and BIO-4 were stagnant pools. Water levels were lower at BIO-2 and BIO-8, but sampling was still possible. Low flows/rainfall also appeared to have caused a major change in water chemistry at several of the sampling locations. The lower (downstream-most) sampling sites, i.e., BIO-5, BIO-6 and BIO-7, had become saline (> 2 ppt salinity). These conditions resulted in the elimination of sampling at BIO-6 and BIO-7 and the relocation of BIO-5 upstream adjacent to the airport (where freshwater present). Saline/marine areas were not sampled because the aquatic biota present in these conditions would be seasonal at best and would not represent the maximum dioxin exposure potential, whose source was upstream in freshwater systems.

The revised sampling locations/sites are presented on Figure 1. Descriptions of each site are presented in Appendix A. Any site relocation was to be as close as possible to the original study site to allow for similar data/information collection.

Sampling was conducted similarly to the previous event. Boat and backpack electrofishers, seines, and trot lines were used to collect fish, and traps were utilized in an attempt to collect crawfish. No hoop or gill nets or rod and reel were used for sampling during Phase II. A summary of sampling methods is presented in Table 1. Trot lines were baited with several different commercial catfish baits. Beef liver was used as bait in the crawfish traps.

Despite extensive sampling efforts, all target species were not collected/present at each site. Additionally, collection of the planned size groupings were not always possible. For human health samples, the largest fish were retained for filleting. For ecological health samples, smaller fish (e.g., capable of being ingested by piscivorous wildlife) were retained as samples. Wherever possible, a minimum of 100 grams of sample was obtained. Some samples, however, had less than this amount. In some instances where sufficient number of fish were lacking, carcasses of filleted fish were kept for whole body samples, i.e., body

reconstruction. Information on each fish tissue sample submitted to the laboratory for analysis is located in Appendix C.

In general, sample handling, preparation, labeling, and shipping was conducted in accordance with the original work plan. Stainless steel fillet knives were used to fillet the fish. The fish were filleted on a cutting board wrapped in aluminum foil. Tissue extraction equipment (e.g., knives, gloves, etc.) were decontaminated between each sample. Except for catfish, human health fish samples were scaled and filleted with skin on. Catfish were skinned and filleted. Whole fish and fillet samples were grouped by species and trophic level, wrapped in aluminum foil, and placed in a zip-lock plastic bag. The foiled samples and the plastic bags were labeled, and chain-of-custody labels were attached to each bag. Whenever possible (size permitting), composite samples from each site were placed into a single, labeled bag. Samples were preserved on wet ice and shipped on dry ice within two days of processing.

A summary of the water quality parameters measured at each site during sampling is presented in Table 2. Low flow, stagnant conditions and high water temperatures resulted in some low DO levels at many of the sampling sites. Low DO levels of 2.20 mg/l, 2.44 mg/l, 3.92 mg/l, and 4.26 mg/l were measured at BIO-1, BIO-3, BIO-4, and BIO-5, respectively. Due to heavy algal growth and lack of canopy cover (extensive exposure to sunlight), the DO level at BIO-8 was supersaturated (10.86 mg/l). The other *in situ* water quality parameters measured at the survey sites were within acceptable levels for protection of aquatic biota (USEPA, 1986). Water temperature ranged from 27.3 to 32.3°C, pH from 5.49 to 8.11, specific conductance from 46.2 to 247.0 µS/cm, and salinity from 0.0 to 0.1 ppt. The lowest pH level was measured in the upper section of Turkey Creek at BIO-3; this level of 5.49 was within the pH range commonly found in "blackwater" systems such as Turkey Creek (due to abundance of naturally-occuring tannic acid in these waters). Specific conductance levels varied greatly, which is common in freshwater systems, where the proportion of different ions (conductivity) is highly dependent on climatic and edaphic factors (Boyd, 1990).

As mentioned, low flow conditions were present throughout the study area. Some brief, heavy rains were encountered during this field effort, but these had little, substantial effect on stream flows and sampling conditions.

Field notes were recorded daily in field logs. A copy of these notes is found in Appendix B.

Samples Collected

A complete list of all fish species collected during the sampling effort is presented in Table 3. Most the species collected during this survey were the same as previously sampled. A total of 25 species of fish were collected at the various study sites. Sunfish (Family Centrarchidae) again were the dominant taxa; 7 of the 25 species of fish collected during the sampling effort were centrarchids.

Not all the targeted species were collected at each site. Crayfish traps were set at most of the study sites, but no crawfish were collected. During late summer, the crawfish species

commonly found in the Gulf coastal plain (family Cambaridae) are usually in their burrows brooding eggs (Hobbs, 1991). A summary of fish tissue samples submitted for analysis is presented in Table 4. The following is a description of the fish sample data collected at each site, and the Field Record Forms are located in Appendix C:

BIO-1

As per the work plan, only fish fillets (i.e., no whole fish samples) were obtained at BIO-1 for human health assessment. The bottom feeder trophic level representative from this site was yellow bullhead. The sample was comprised of one individual. Length and weight of this fish was 245 millimeters (mm) and 205 grams (g), respectively. The fillet extracted from this specimen weighed 63 g. The tertiary consumer of recreational importance trophic level representative from this site was largemouth bass. A single female specimen was collected. The length was 202 mm, and the weight was 107 g. The fillet weight was 51 g.

No external anomalies were observed on any of the fish submitted to the laboratory for analysis.

BIO-2

Both fillets and whole fish (i.e., human and ecological health) were obtained at BIO-2. For human health/fillets, the bottom feeder trophic level representative from this site was brown bullhead. The sample consisted of a single female specimen with eggs. Length and weight of this individual was 346 mm and 820 g, respectively, and the fillet weight was 177 g. The tertiary consumer of recreational importance trophic level representative from this site was largemouth bass. Two individuals of this species comprised the sample, measuring 294 and 256 mm and weighing 430 and 250 g, respectively. The smaller bass was a female with eggs. The composite fillet sample weighed 212 g.

Ecological health/whole fish samples were collected for all three trophic levels at this site. Gizzard shad was the species representing the primary/secondary consumer from this site. A composite sample of three individuals of this species was assembled. Lengths ranged from 160 to 173 mm, and weights ranged from 41 to 55 g. Additionally, a three-fish *replicate* sample of gizzard shad, i.e., primary/secondary consumer, was assembled. Lengths ranged from 136 to 173 mm and weights from 26 to 53 g. The single brown bullhead utilized for the fillet sample also was used for the whole fish bottom feeder sample; this was accomplished by maintaining the carcass after filleting for whole body reconstruction. The tertiary consumer of recreational importance trophic level whole body sample consisted of three bluegill, which ranged from 125 to 155 mm in length and 35 to 70 g in weight.

No external anomalies were observed on any of the fish submitted to the laboratory for analysis.

BIO-3

This site was selected as the study reference station, because of its location up-gradient of any site-related contamination. Due to extreme low flow conditions during this field event, no samples representing the bottom feeder trophic level were collected from this site, nor were any fillet samples for the tertiary consumer of recreational importance obtained. Whole fish samples were collected, however, for the tertiary consumer of recreational importance and for the primary/secondary consumer trophic levels. The fish species representing the tertiary consumer of recreational importance was bluegill. Three bluegill were composited for the whole body sample. Lengths of these individuals ranged from 70 to 115 mm, and weights ranged from 6 to 21 g. The primary/secondary consumer from this site was represented by pirate perch. This sample consisted of seven individuals, ranging from 45 to 118 mm in length and from 1 to 18 g in weight.

No external anomalies were observed on any of the fish submitted to the laboratory for analysis.

BIO-4

Like at BIO-3, low flow conditions at this site precluded the collection of all the targeted samples. No bottom feeder trophic level samples were obtained. The primary/secondary consumer trophic level sample was represented by blackspotted topminnow. The sample was a composite of seven individuals, which ranged from 44 to 70 mm in length and from 1 to 3 g in weight. Bluegill represented the tertiary consumer of recreational importance trophic level (both fillet and whole fish samples). A composite fillet sample (76 g) of two bluegill, 172 mm/104 g and 158 mm/77 g was obtained, and a three-bluegill whole fish sample was assembled from this site. The three bluegill ranged from 98 to 122 mm in length and from 16 to 30 g in weight.

No external anomalies were observed on any of the fish submitted to the laboratory for analysis from this site.

BIO-5

All trophic level samples were collected at BIO-5. The primary/secondary consumer trophic level sample from this site was comprised of three gizzard shad, ranging from 140 to 155 mm in length and from 24 to 35 g in weight. An additional primary/secondary consumer trophic level sample was assembled as a replicate using striped mullet. This sample consisted of two fish, which measured 310 mm/350 g and 314 mm/355 g. Largemouth bass represented the tertiary consumer of recreational importance trophic level. The whole fish sample consisted of two specimens, 295 mm/410 g and 235 mm/170 g. Two largemouth bass also were collected for the fillet sample, which included a replicate. These largemouth bass were 465 and 390 mm in length and weighed 2,000 and 1,000 g, respectively, and produced fillet samples of 515 and 253 g. One fillet (from one side of each fish) went to the regular composite sample, and one side/fillet comprised the replicate fillet sample. The bottom feeder trophic level species

was channel catfish. A single specimen was used for the fillet and whole fish sample; this was accomplished by maintaining the carcass after filleting for whole body reconstruction. The fish was 450 mm long and weighed 1070 g. The fillet sample weighed 234 g.

One of the striped mullets in the replicate sample had some contusions; otherwise, no external anomalies were observed on any of the other fish submitted to the laboratory for analysis from this site.

BIO-6 and BIO-7

These sites not sampled due to saline conditions.

BIO-8

A complete set of human and ecological fish samples was collected at BIO-8. The primary/secondary consumer trophic level representative species was sailfin molly. A total of sixteen individuals were composited for this trophic level sample. These specimens averaged 45 mm in length and a little about 2.4 g in weight. Largemouth bass represented the tertiary consumer of recreational importance trophic level. Two specimens were composited for the fillet sample, and three fish were used for the whole body sample. The largemouth bass used in the fillet sample were 218 and 225 mm in length and 150 and 160 g in weight, respectively, and produced a 144 g composite fillet. The three individuals comprising the whole fish sample ranged from 80 to 95 mm in length and from 6 to 10 g in weight. The bottom feeder trophic level was represented by black bullhead. Both the fillet and whole body samples consisted of three specimens. The fillet sample was comprised of three individuals ranging from 210 to 238 mm in length and from 138 to 200 g in weight. The three black bullhead making up the whole body sample ranged from 175 to 210 mm in length and from 75 to 120 g in weight. A two-fish, bottom feeder trophic level whole body replicate sample also was assembled using black bullhead. These specimens were 170 mm/65 g and 185 mm/100 g.

One of the largemouth bass used in fillet sample had a few lesions. No external anomalies were observed on any of the other fish submitted to the laboratory for analysis from this site.

SWAMP

A two-toed amphiuma (*Amphiuma means*) was collected from the swamp area down-gradient of the NCBC between the base and Turkey Creek. The specimen was a couple of feet in length and weighed several pounds.

Amphiumas are eel-like salamanders often referred to as "ditch eels" or "congo eels". There are three species of amphiumas within a single genus, and all are found exclusively in the southeastern United States, usually in coastal areas. Amphiumas are active mainly at night, when they forage for crawfish, earthworms, and other small biota. They occur in a variety of aquatic and semi-aquatic habitats in soft substrate (for burrowing) or in abundant aquatic vegetation/debris. The two-toed amphiuma can attain a maximum length of about 1,015 mm (Mount, 1975).

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Mount, R.H. 1975. The Reptiles and Amphibians of Alabama. Auburn University, Agricultural Experiment Station, Auburn, AL.

USEPA (U.S. Environmental Protection Agency). 1986. Quality Criteria for Water. EPA 440/5-86-001. Office of Water, Regulations and Standards, Washington, DC.

TABLE 1

SUMMARY OF FISH SAMPLING METHODOLOGIES

SAMPLING SITES	ELECTROFISHER	TROT LINE	SEINE
BIO-1	x	x	
BIO-2	x	x	
BIO-3	x	x	x
BIO-4	x	x	x
BIO-5	x	x	
BIO-8	x		

TABLE 2

SUMMARY OF *IN SITU* WATER QUALITY MEASUREMENTS

SAMPLING SITES	pH (s.u.)	WATER TEMPERATURE (° C)	SALINITY (ppt)	DISSOLVED OXYGEN (mg/l)	SPECIFIC CONDUCTANCE (µS/cm)
BIO-1	6.83	29.8	0.1	2.20	126.9
BIO-2	6.76	29.0	0.1	5.75	142.2
BIO-3	5.49	27.3	0.0	2.44	46.2
BIO-4	6.38	29.2	0.1	3.92	121.5
BIO-5	7.31	29.3	0.1	4.26	96.4
BIO-8	8.11	32.3	0.1	10.86	247.0

s.u. = standard units
° C = degrees Celsius
ppt = parts per thousand
mg/l = milligrams per liter
µS/cm = micro-Siemens per centimeter

TABLE 3

FISH COLLECTED FROM STUDY SITES
NCBC GULFPORT, MISSISSIPPI

Anguillidae -
American eel, *Anguilla rostrata*

Amiidae -
Bowfin, *Amia calva*

Aphredoderidae -
Pirate perch, *Aphredoderus sayanus*

Atherinidae -
Brook silverside, *Labidesthes sicculus*

Catostomidae -
Lake chubsucker, *Erimyzon sucetta*

Centrarchidae -
Bluegill, *Lepomis macrochirus*
Green sunfish, *Lepomis cyanellus*
Longear sunfish, *Lepomis megalotis*
Redear sunfish, *Lepomis microlophus*
Spotted sunfish, *Lepomis punctatus*
Warmouth, *Lepomis gulosus*
Largemouth bass, *Micropterus salmoides*

Clupeidae -
Gizzard shad, *Dorosoma cepedianum*

Cyprinodontidae -
Gulf killifish, *Fundulus grandis*
Blackspotted topminnow, *Fundulus olivaceus*

Esocidae -
Chain pickerel, *Esox niger*

Ictaluridae -
Brown bullhead, *Ameiurus nebulosus*
Yellow bullhead, *Ameiurus natalis*
Black bullhead, *Ameiurus melas*
Channel catfish, *Ictalurus punctatus*

Lepisostidae -
Spotted gar, *Lepisosteus oculatus*

Mugilidae -
Striped mullet, *Mugil cephalus*

Poeciliidae -
Mosquitofish, *Gambusia sp.*
Sailfin molly, *Poecilia latipinna*

Percidae -
Gulf darter, *Etheostoma swaini*

TABLE 4

SUMMARY OF FISH SAMPLES SUBMITTED FOR ANALYSIS

SAMPLING SITE	SPECIES	FILLET (F)/ WHOLE BODY (W)	LENGTH (mm)	WEIGHT (g)	FILLET WEIGHT (g)	ANOMALIES
BIO-1	Yellow bullhead	F	245	205	63	---
	Largemouth bass	F	202	107	51	---
BIO-2	Brown bullhead*	W	346	820	---	---
	Brown bullhead	F	346	820	177	---
	Bluegill	W	125	35	---	---
	Bluegill	W	155	70	---	---
	Bluegill	W	142	56	---	---
	Largemouth bass	F	294	430	212	---
	Largemouth bass	F	256	250	212	---
	Gizzard shad	W	160	41	---	---
	Gizzard shad	W	173	55	---	---
	Gizzard shad	W	172	54	---	---
replicate	Gizzard shad	W	173	53	---	---
replicate	Gizzard shad	W	154	38	---	---

SAMPLING SITE	SPECIES	FILLET (F)/ WHOLE BODY (W)	LENGTH (mm)	WEIGHT (g)	FILLET WEIGHT (g)	ANOMALIES
replicate	Gizzard shad	W	136	26	---	---
BIO-3	Bluegill	W	115	21	---	---
	Bluegill	W	107	20	---	---
	Bluegill	W	70	6	---	---
	Pirate perch	W	64	4	---	---
	Pirate perch	W	60	4	---	---
	Pirate perch	W	45	2	---	---
	Pirate perch	W	50	2	---	---
	Pirate perch	W	55	3	---	---
	Pirate perch	W	45	1	---	---
	Pirate perch	W	118	18	---	---
BIO-4	Bluegill	W	110	20	---	---
	Bluegill	W	98	16	---	
	Bluegill	W	122	30	---	---
	Bluegill	F	172	104	76	---
	Bluegill	F	158	77	76	---

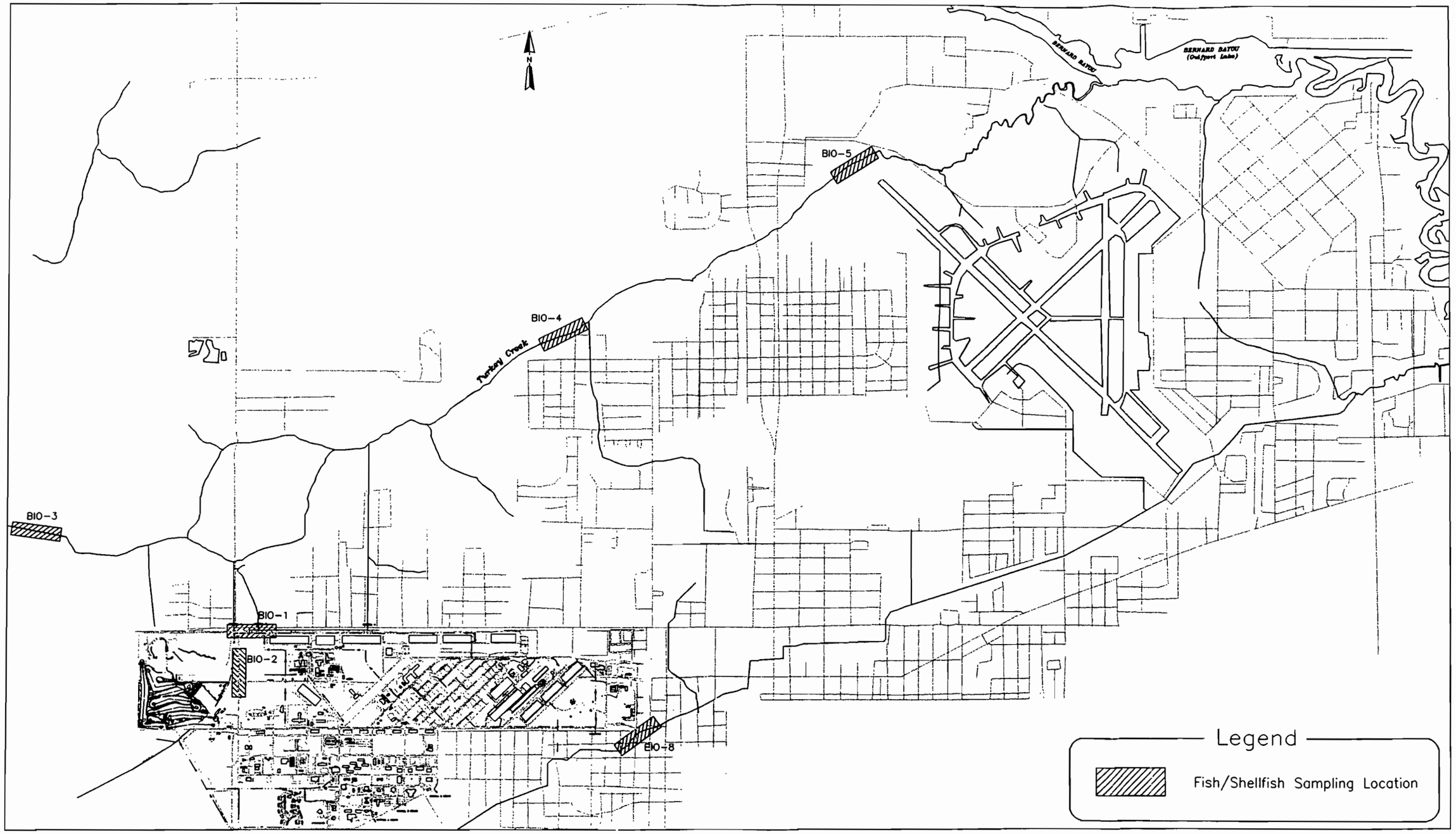
SAMPLING SITE	SPECIES	FILLET (F)/ WHOLE BODY (W)	LENGTH (mm)	WEIGHT (g)	FILLET WEIGHT (g)	ANOMALIES
	Blackspotted topminnow	W	70	3	---	---
	Blackspotted topminnow	W	68	3	---	---
	Blackspotted topminnow	W	68	3	---	---
	Blackspotted topminnow	W	45	1	---	---
	Blackspotted topminnow	W	44	1	---	---
	Blackspotted topminnow	W	48	1	---	---
	Blackspotted topminnow	W	45	1	---	---
BIO-5	Largemouth bass	W	295	410	---	---
replicate	Largemouth bass	W	235	170	---	---
	Largemouth bass	F	465	2000	515	---
	Largemouth bass	F	390	1000	253	---
	Channel catfish*	W	450	1070	---	---
	Channel catfish	F	450	1070	234	---

SAMPLING SITE	SPECIES	FILLET (F)/ WHOLE BODY (W)	LENGTH (mm)	WEIGHT (g)	FILLET WEIGHT (g)	ANOMALIES
	Gizzard shad	W	140	24	---	---
	Gizzard shad	W	155	35	---	---
	Gizzard shad	W	150	35	---	---
replicate	Striped mullet	W	310	350	---	---
replicate	Striped mullet	W	314	355	---	Contusions
BIO-8	Black bullhead	W	210	120	---	---
	Black bullhead	W	190	100	---	---
	Black bullhead	W	175	75	---	---
replicate	Black bullhead	W	170	65	---	---
replicate	Black bullhead	W	185	100	---	---
	Black bullhead	F	215	150	132	---
	Black bullhead	F	210	138	132	---
	Black bullhead	F	238	200	132	---
	Largemouth bass	W	95	10	---	---
	Largemouth bass	W	85	9	---	---
	Largemouth bass	W	80	6	---	---
	Largemouth bass	F	218	150	144	---

SAMPLING SITE	SPECIES	FILLET (F)/ WHOLE BODY (W)	LENGTH (mm)	WEIGHT (g)	FILLET WEIGHT (g)	ANOMALIES
	Largemouth bass	F	225	160	144	Lesions
	Sailfin molly	W	av. = 45	av. = 2.4	---	---

* Carcass used for whole body reconstruction/sample.

mm = millimeters
g = grams



HARDING LAWSON ASSOCIATES

TITLE: Naval Construction Battalion Center
Off-Site Fish/Shellfish Sampling Locations
Gulfport, MS

0 1250 2500
FEET

DWN: DAH	DES.:	PROJECT NO.:
CHKD:	APPD:	FIGURE NO.: 1
DATE:	REV.:	

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APPENDIX A

SITE DESCRIPTIONS

BIO-1

This study station was located on-site, south of 28th St. and upstream of a sediment recovery trap. This site was a small pool (15 feet by 50 feet) in a drainage ditch. The average depth was approximately two feet, and substrate was primarily mud. Some emergent and submergent vegetation was observed in shallow littoral areas. No flow was observed, and the water was fairly turbid.

BIO-2

This study station was located on-site in Canal No. 1. Depths generally ranged from 2 to 4 feet, and the canal width was about 20 feet. Substrate was primarily mud. Considerable emergent and submergent vegetation were located in the shallow littoral areas. Although some flow was observed, the water was stagnant and turbid.

BIO-3

This site was located in the upper section of Turkey Creek. This site was considered to be relatively undisturbed (i.e., reference site) because of its location up-gradient from NCBC Gulfport. A roadway (Turner Road) crossed Turkey Creek at this location, and sampling was conducted upstream of the road crossing only during this phase of the study. The stream upstream of the roadway was pooled with no observed flow. Depths generally ranged from 2 to 4 feet, and the width was about 5 to 8 feet. Substrate was primarily mud and hardpan (clay). Small areas of emergent vegetation was located in the shallow littoral areas. Canopy cover was 50 to 80%, and the surrounding riparian area was forested. Numerous snags and overhanging branches were present. The water was turbid.

The stream section downstream of the roadway was dry, except for a small plunge pool located below the pipe which crossed beneath the road. The channel appeared to have been dredged and straightened in the past (not recent). The exposed substrate was primarily hardpan. Canopy cover was nearly 100%. The surrounding riparian area was forested to the north, and some single family dwellings were located south of the stream.

BIO-4

This site was located on Turkey Creek just downstream from NCBC Gulfport. The stream appeared channelized in this area. The channel was deeply incised, and the stream banks were steep. There was no flow in this area, which consisted of a series of stagnant pools. There was little instream cover was present (some overhanging branches and undercut banks with exposed rootwads). Water depths generally were less than 3 feet, and the stream was about 15 to 20 feet wide. Substrate was primarily hardpan. The water was moderately turbid.

BIO-5

This site was located on Turkey Creek adjacent to the airport (end of runway) off Airport Road. The area was completely developed, with no canopy cover and a straightened stream channel. The stream was located between the roadway and the airport runway, and the riparian area was completely planted in grasses. Stream width was about 20 to 30 feet, and depths were generally greater than 4 feet. The substrate appeared to be primarily composed

of mud and clay. Little instream cover was present. The current was moderate, and the water was fairly turbid.

BIO-8

This site was the upstream-most location on Brickyard Creek, immediately downstream of the base. The area was completely surrounded by residential development, and riparian zone often had little or no vegetation (i.e., structures or impervious surface). The stream was highly impacted by anthropogenic activities and contained large amounts of refuse. The creek was channelized, and little canopy (0% to 30%) was present. The stream was relatively small in the sampling area, with stream widths generally ranging from 5 to 10 feet and depths of 2 inches to about 4 feet. Substrate consisted primarily of mud, sand, and rubble (rip rap).

APPENDIX B

COPIES OF FIELD NOTES

8/23 - 5-7:30 PM
- hot, humid
- set trot lines @ B103, 4, + 7
→ overall, water levels low; water hot
→ B103 - no flow; series of pools isolated, alt in same area upstream of road (as previous)
B104 - same area, no discernible flow, wadeable in much of area
B107 - lower; set line across canal @ bridge (Washington St)

8/24 - hot, humid
- checked trot line @ B107 - none 8:30 AM
- calibrated meters pH 6.97 → 6.99 + 4.00
DO 7.95 @ 8:00 @ 29.3°C → 7.66

B103

DO - 2.44 pH - 5.49 sal. - 0.0
temp - 27.3/27.1 sp. cond - 46.2
- shocked up from road + small plunge pool down - rest dry
- few fish (low DO) - longear sun, bluegill, LMB, mosquitofish, pirate perch, lake chubsucker
- nothing on trotline - removed
- set 2 crawfish traps
settings - I-5, 400V
time - 680 sec

B10 4 noon

- nothing on trot line - rebaited
- set 2 crawfish traps

DO: 3.92 pH 6.38 Sal. 0.1
Temp 29.2/29.0 SpCond. 121.5

- shocked great distance up + down several hundred meters
- settings - I-4, 300V time - 1992 sec
- bluegill, longeur sunfish, spotted sunfish LMB, topminnow, mosquitofish, pirate perch, gulfdarter (1)
- stagnant water, no flow, low DO; downstream shallower w/ small creek entering + more cover

B10 8 2PM

- no flow, stagnant w/ excessive algae

- DO - 10.86 pH - 8.11 Sal - 0.1
temp - 32.3/32.6 Spcond - 247

Spotted Sun Brook Silverside
Green Sun
~~Mummy Chub~~ black sulf killifish I-5, 200V
Bullhead t = 2948
Sailfin Molly - set 2 crawfish traps
Largemouth (fillet)
Bluegill (whole)

B10 5&6 - single trot line set @ each = 6PM

B10 7 - trot line checked in AM - nothing + rebaited in PM (5PM)
→ heavy rain + storms (2-3" inches)
B10 1+2 - trot lines set ≈ 7PM

8/25 - heavy rains previous afternoon
- B10 1 - 1 yellow bullhead
B10 2 - none; 1 dead softshell turtle
B10 3 - crawfish traps - none, pulled (1 dead bluegill; 2 toed amphiuma)
B10 4 - none on trot line or crawfish traps - all pulled

B10 5 - electro - checked trot line - nothing
- no fish on trot line
- DO - 1.92 pH 6.60 Sal - 8.4
temp - 31.1 Sp Cond - 14.65
- rain + generator would not start
→ engine rope broken, so B10 6 trot line not checked + B10 5 not rebaited

☆ B10 5, 6, 7 highly saline requiring moving stations upstream, except won't be able to do B10 6
B10 1+2 rebaited in PM
+ scales calibrated - previously collected fish worked up

8/26 BIO 2 · electrofished
DO - 5.75 pH - 6.76 sal - 0.1
temp - 29° sp cond - 142.2 time - 1150
→ boat electro ; settings DC, 60 PPS, 40%, High, 4-7 AMPS
→ shocked several hundred meters of canal - numerous fish
bluegill, warmouth, redear, giz shad, bowfin, spotted gar, LMB, silversides, brown bullhead, mosquitofish

BIO 1 - electro
DO - 2.2 pH - 6.83 sal - 0.1
temp - 29.8 sp cond - 126.9 time - 311
settings - DC, 60 PPS 50%, High ; 5-8 Amps
→ narrow canal up from pool along golf course = 10' wide ; 2-4' deep, overhanging shrubs along both sides
- fish - redear, bluegill, giz shad, LMB (1), silversides, mosquitofish

Salinity
Bio 7 (washington st. bridge) - 3.0 ppt
Hewes Av bridge - 2.6 ppt
Co (saw blue crabs)
34th st. bridge - 0.3 ppt
} Brickyard Cr
Turkey Cr - @ BIO 5 (yesterday) - 8.4 ppt
today @ airport - 0.1 ppt

Bio 5 - electro
→ moved to airport runway to eliminate sal.
DO - 4.26 pH - 7.31 sal - 0.1
temp - 29.3 sp cond - 96.4
- numerous fish - bluegill, redear, gulf killifish, silversides, giz shad, mullet, LMB, channel catfish (1), pickerel
- settings - same as previous site
- set trotline
⇒ picked up trotlines @ BIO 5 (old site) BIO 6 + BIO 7
+ renewed upstream access on Brickyard (1-) none
- reset BIO 1 + 2 trotlines

8/27 · checked trotlines @ BIO 1, 2, + 5 - no fish
- zeroed scales + cleaned rest of fish
→ No samples from BIO 6 + 7 due to salinity problems
→ additional sample - 2 toed amphiuma (Amphiuma means)
→ processed remaining fish + sent to lab (placed on dry ice)
→ all descent samples individually wrapped in foil + labeled ; whenever possible, all samples from site placed in single bags

APPENDIX C

COPIES OF FIELD RECORD FORMS

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: 26 Aug 99 / 1150

SITE LOCATION:

Site Name/Number: NCBC GULFPORT

County/Parish: HARRISON CO. Lat/Long.:

Waterbody Name/Segment Number:

Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY

Site Description

Collection Method:

Collector Name: C² Environmental Services
(print and sign)

Agency: Phone: (770) 986-8092

Address: 4122 Admiral Dr.
Atlanta, GA 30341

FISH COLLECTED: Yellow bullhead

Bottom Feeder—Species Name:

Composite Sample No.: BIO-1-FF-CF Number of Individuals: 1

Fish #	Length (mm)	Sex	Wt (g)	Fillet	Fish #	Length (mm)	Sex
001	245		205	63g	006		
002					007		
003					008		
004					009		
005					010		

Minimum size ____ x 100 = ____ >75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies):

Predator—Species Name: Largemouth bass

Composite Sample No.: BIO-1-FF-LB Number of Individuals: 1

Fish #	Length (mm)	Sex	Wt (g)	Fillet	Fish #	Length (mm)	Sex
001	202	Female	107	51	006		
002					007		
003					008		
004					009		
005					010		

Minimum size ____ x 100 = ____ ≥75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies):

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: 26 Aug 99 / 1000

SITE LOCATION:

Site Name/Number: NCBC GULFPORT

County/Parish: HARRISON CO. Lat/Long.:

Waterbody Name/Segment Number:

Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY

Site Description

Collection Method:

Collector Name: C² Environmental Services
(print and sign)

Agency: Phone: (770) 986-8092

Address: 4122 Admiral Dr.
Atlanta, GA 30341

FISH COLLECTED: Brown Bullhead

Bottom Feeder—Species Name:

Composite Sample No.: BF-FF-F Number of Individuals: 11

Fish #	Length (mm)	Sex	Wt (g)	Fillet Fish #	Length (mm)	Sex
001	234		82	006		
002				007		
003				008		
004				009		
005				010		

Minimum size ____ x 100 = ____ >75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies): Body reconstruction.

Predator—Species Name:

Composite Sample No.: Number of Individuals: 3

Fish #	Length (mm)	Sex	Wt (g)	Fish #	Length (mm)	Sex
001	125		35	006		
002	155		56	007		
003	142		56	008		
004				009		
005				010		

Minimum size ____ x 100 = ____ ≥75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies):

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: _____

SITE LOCATION:

Site Name/Number: NCBC GULFPORT

County/Parish: HARRISON CO. Lat/Long.: _____

Waterbody Name/Segment Number: _____

Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY

Site Description _____

Collection Method: _____

Collector Name: C² Environmental Services
(print and sign)

Agency: _____ Phone: (770) 986-8092

Address: 4122 Admiral Dr.
Atlanta, GA 30341

FISH COLLECTED: Gizzard Shad

~~Bottom Feeder~~ primary Species Name: _____

Composite Sample No.: B10-2-WF-GS Number of Individuals: 3 regular | 3 replicate

Fish #	Length (mm)	Sex	Wt (g)	Fish #	Length (mm)	Sex	Wt (g)
001	160		41	006	Replicates		
002	173		55	007	173		53
003	172		54	008	154		35
004				009	136		26
005				010			

Minimum size _____ x 100 = _____ >75% Composite mean length _____ mm

Maximum size

Notes (e.g., morphological anomalies): _____

Predator—Species Name: Largemouth bass

Composite Sample No.: B10-2-FF-LB Number of Individuals: 2

Fish #	Length (mm)	Sex	Wt (g)	Filet	Fish #	Length (mm)	Sex
001	294		430	215	006		
002	256	Female w/ eggs	250		007		
003					008		
004					009		
005					010		

Minimum size _____ x 100 = _____ ≥75% Composite mean length _____ mm

Maximum size

Notes (e.g., morphological anomalies): _____

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: 24 Aug 93

SITE LOCATION:

Site Name/Number: NCBC Gulfport

County/Parish: Harrison County Lat/Long.:

Waterbody Name/Segment Number:

Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY

Site Description

Collection Method:

Collector Name: C² Environmental Services, Inc
(print and sign)

Agency: Phone: 770 986-9092

Address: 4122 Admiral Dr., Atlanta, GA 30341

FISH COLLECTED:

~~Bottom Feeder~~ Species Name: Bluegill

Composite Sample No.: BG-3-WF-BG Number of Individuals: 3

Fish #	Length (mm)	Sex	Weight (g)	Fish #	Length (mm)	Sex
001	115		21	006		
002	105		20	007		
003	70		6	008		
004				009		
005				010		

Minimum size ____ x 100 = ____ >75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies):

~~Predator~~ Species Name: Black Crappie

Composite Sample No.: BC-3-WF-PP Number of Individuals: 7

Fish #	Length (mm)	Sex	Weight (g)	Fish #	Length (mm)	Sex
001	64		1- 4g	006	45	
002	60		2- 4g	007	115	
003	45		3- 2g	008		
004	55		4- 3g	009		
005	50		5- 2g	010		

Minimum size ____ x 100 = ____ ≥75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies):

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: 24 Aug 93

SITE LOCATION:

Site Name/Number: NCBC Gulfport

County/Parish: Harrison County Lat/Long.:

Waterbody Name/Segment Number:

Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY

Site Description

Collection Method:

Collector Name: C² Environmental Services, Inc
(print and sign)

Agency: Phone: 770 986-9092

Address: 4122 Admiral Dr., Atlanta, GA 30341

FISH COLLECTED: Blackspotted Topminnow

~~Bottom Feeder Species Name~~: Primary

Composite Sample No.: B10-4-WF-BT Number of Individuals: 7

Fish #	Length (mm)	Sex	Weight (g)	Fish #	Length (mm)	Sex	Weight (g)
001	50		3		46		1
002	46		3		45		1
003	46		3				
004	45		1	009			
005	44		1	010			

Minimum size ____ x 100 = ____ ≥75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies):

Predator—Species Name: Bluegill

Composite Sample No.: B10-4-FF-BG Number of Individuals: 2

Fish #	Length (mm)	Sex	Weight	Filet	Fish #	Length (mm)	Sex
001	172		104 g	176 g	006		
002	158		77 g		007		
003					008		
004					009		
005					010		

Minimum size ____ x 100 = ____ ≥75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies):

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: 24 Aug 97

SITE LOCATION:

Site Name/Number: NCBC Gulfport

County/Parish: Harrison County Lat/Long.:

Waterbody Name/Segment Number:

Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY

Site Description

Collection Method:

Collector Name: C² Environmental Services, Inc
(print and sign)

Agency: Phone: 770 986-9092

Address: 4122 Admiral Dr., Atlanta, GA 30341

FISH COLLECTED:

Bottom Feeder—Species Name:

Composite Sample No.: Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001			006		
002			007		
003			008		
004			009		
005			010		

Minimum size × 100 = >75%

Composite mean length mm

Maximum size

Notes (e.g., morphological anomalies):

Predator—Species Name: Bluegill

Composite Sample No.: B16 - 4 - WF - BG Number of Individuals: 3

Fish #	Length (mm)	Sex		Fish #	Length (mm)	Sex
001	110		20 g	006		
002	98		16 g	007		
003	122		30 g	008		
004				009		
005				010		

Minimum size × 100 = ≥75%

Composite mean length mm

Maximum size

Notes (e.g., morphological anomalies):

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

1 OF 3

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: 26 Aug 99 / 1600 HRS

SITE LOCATION:

Site Name/Number: NCBC GULFPORT

County/Parish: HARRISON CO. Lat/Long.:

Waterbody Name/Segment Number:

Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY

Site Description

Collection Method:

Collector Name: C² Environmental Services
(print and sign)

Agency: Phone: (770) 986-8092

Address: 4122 Admiral Dr.
Atlanta, GA 30341

FISH COLLECTED: Channel Catfish

Bottom Feeder—Species Name:

Composite Sample No.: B10-5-FF-CF
B10-5-WF-CF (carcass)

Number of Individuals: 1

Fish #	Length (mm)	Sex	Wt (g)	Fish #	Length (mm)	Sex
001	450		1070	006		
002				007		
003				008		
004				009		
005				010		

Minimum size ____ x 100 = ____ >75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies):

Predator—Species Name: Largemouth bass

Composite Sample No.: B10-5-WF-LB

Number of Individuals: 2

Fish #	Length (mm)	Sex	Wt (g)	Fish #	Length (mm)	Sex
001	295		410	006		
002	235		170	007		
003				008		
004				009		
005				010		

Minimum size ____ x 100 = ____ ≥75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies):

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: 26 Aug 99 / 1600 HR

SITE LOCATION:
Site Name/Number: NCBC GULFPORT
County/Parish: HARRISON CO. Lat/Long.:
Waterbody Name/Segment Number:
Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY
Site Description

Collection Method:
Collector Name: C² Environmental Services
(print and sign)
Agency: Phone: (770) 986-8092
Address: 4122 Admiral Dr.
Atlanta, GA 30341

FISH COLLECTED: Gizzard Shad
~~Bottom Feeder~~ Primary Species Name:
Composite Sample No.: B10-5-WF-GS Number of Individuals: 3

Fish #	Length (mm)	Sex	Wt (g)	Fish #	Length (mm)	Sex
001	140		24	006		
002	155		35	007		
003	150		35	008		
004				009		
005				010		

Minimum size ____ x 100 = ____ >75% Composite mean length ____ mm
Maximum size

Notes (e.g., morphological anomalies):

Predator—Species Name: Largemouth bass
Composite Sample No.: B10-5-FF-LB Number of Individuals: 2 ~~fish~~ comp. / 2 fish replicate

Fish #	Length (mm)	Sex	Wt (g)	Filet	Fish #	Length (mm)	Sex	Wt (g)	Filet Wt
001	465		2pct	515g	006	Replicates			253g
002					007	390		1,000	
003					008				
004					009				
005					010				

Minimum size ____ x 100 = ____ ≥75% Composite mean length ____ mm
Maximum size

Notes (e.g., morphological anomalies): 1 Filet from each for filet composite, 1 filet from each for replicate filets,

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: 26 Aug 99 / 1600 Hr

SITE LOCATION:

Site Name/Number: NCBC GULFPORT

County/Parish: HARRISON CO. Lat/Long.:

Waterbody Name/Segment Number:

Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY

Site Description

Collection Method:

Collector Name: C² Environmental Services
(print and sign)

Agency: Phone: (770) 986-8092

Address: 4122 Admiral Dr.
Atlanta, GA 30341

FISH COLLECTED: Striped Mullet

~~Bottom Feeder~~ Species Name: Primary Replicate

Composite Sample No.: B1D-5-WF-SM Number of Individuals:

Fish #	Length (mm)	Sex	Wt (g)	Fish #	Length (mm)	Sex
001	310		350	006		
*002	314		355	007		
003				008		
004				009		
005				010		

Minimum size ____ x 100 = ____ >75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies): Replicate primary producers
*2nd fish w/ contusions

Predator—Species Name:

Composite Sample No.: Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001			006		
002			007		
003			008		
004			009		
005			010		

Minimum size ____ x 100 = ____ ≥75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies):

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: C2540.30 Sampling Date and Time: 24 Aug 99, 1500 HRS

SITE LOCATION:
Site Name/Number: NCBC Gulfport
County/Parish: Harrison Co Lat/Long.:
Waterbody Name/Segment Number:
Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY
Site Description

Collection Method:
Collector Name: (print and sign) C2 Environmental
Agency: Phone: ( )
Address:

FISH COLLECTED:
Bottom Feeder—Species Name: Black bullhead catfish
Composite Sample No.: B10-B-BF-CF Number of Individuals: 3 fish composited / 2 replicates

Fish #	Length (mm)	Sex	Wt (g)	Fish #	Length (mm)	Sex	Wt (g)
001	210		120	006	Replicates		
002	190		100	007	170 mm		659
003	175		75	008	185		100
004				009			
005				010			

Minimum size ___ × 100 = ___ >75% Composite mean length ___ mm
Maximum size

Notes (e.g., morphological anomalies):

~~Predator~~ Primary ~~Species~~ Name: Sailfin Molly
Composite Sample No.: B10-B-WF-SM Number of Individuals: 16

Fish #	Length (mm)	Sex		Fish #	Length (mm)	Sex
001	Avg = 45 mm		Whole wt. (g) = 28g	006		
002				007		
003				008		
004				009		
005				010		

Minimum size ___ × 100 = ___ ≥75% Composite mean length ___ mm
Maximum size

Notes (e.g., morphological anomalies):

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 0254F.30 Sampling Date and Time: 24 Aug 99, 1500 hrs

SITE LOCATION:

Site Name/Number: NCBC Gulfport

County/Parish: Harrison Co. Lat/Long.:

Waterbody Name/Segment Number:

Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY

Site Description

Collection Method:

Collector Name: C C Environmental Service
(print and sign)

Agency: Phone: ( )

Address: 4127 Admiral Dr; Atlanta GA

FISH COLLECTED:

Bottom Feeder—Species Name: Black bullhead

Composite Sample No.: BID-B-FF-CF Number of Individuals: 3 Fish

Fish #	Length (mm)	Sex	Wt(g)	Fillet(g)	Fish #	Length (mm)	Sex
001	215		150g	132g	006		
002	~~210~~ 210		138		007		
003	238		200		008		
004					009		
005					010		

Minimum size ____ x 100 = ____ >75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies):

Predator—Species Name: Largemouth Bass

Composite Sample No.: BID-B-FF-LB Number of Individuals: 2

Fish #	Length (mm)	Sex	Wt(g)	Fillet(g)	Fish #	Length (mm)	Sex
001	218		150	194g	006		
002	225		160		007		
003					008		
004					009		
005					010		

Minimum size ____ x 100 = ____ ≥75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies): lesion - on large bass

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: 24 Aug 99, 1500

SITE LOCATION:

Site Name/Number: _____

County/Parish: _____ Lat/Long.: _____

Waterbody Name/Segment Number: _____

Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY

Site Description _____

_____

Collection Method: _____

Collector Name: _____
(print and sign)

Agency: _____ Phone: (___) _____ _____

Address: _____

_____

FISH COLLECTED: _____

Bottom Feeder—Species Name: _____

Composite Sample No.: _____ Number of Individuals: _____

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001			006		
002			007		
003			008		
004			009		
005			010		

Minimum size ___ x 100 = _____ >75% Composite mean length _____ mm

Maximum size

Notes (e.g., morphological anomalies): _____

_____

Predator—Species Name: Largemouth bass

Composite Sample No.: B10-8-WF-LB Number of Individuals: 3

Fish #	Length (mm)	Sex	Wt. (g)	Fish #	Length (mm)	Sex
001	95		10 g	006		
002	85		9	007		
003	80		6	008		
004				009		
005				010		

Minimum size ___ x 100 = _____ ≥75% Composite mean length _____ mm

Maximum size

Notes (e.g., morphological anomalies): _____

_____

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

ECOLOGICAL SAMPLING SERVICES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
FINAL REPORT

FOR

HARDING LAWSON ASSOCIATES ES, INC.

JUNE, 1999

PREPARED BY:
C^2 ENVIRONMENTAL SERVICES, INC.
CHAMBLEE, GA

INTRODUCTION

C^2 Environmental Services, Inc. was contracted by Harding Lawson Associates ES, Inc. (HLA-ES) to collect various fish and shellfish species for laboratory analyses for dioxins in their tissue. This information is to be used to identify whether these contaminant levels are within acceptable risk levels for human health consumption and are not of ecological concern (human and ecological risk assessments).

METHODOLOGY - WORK PLAN/TECHNICAL APPROACH

The following work plan outlines the original proposed technical scope-of-work and sampling locations for this field effort. The investigation at NCBC Gulfport was scheduled to occur at a total of eight sampling locations: two locations in the on-site drainage ditches (BIO-1 and BIO-2); two locations in Turkey Creek (BIO-4 and BIO-5); two location in Brickyard Creek (BIO-7 and BIO-8); one location in Bernard Bayou (BIO-6); and, one location in an undisturbed reference site (BIO-3).

Sampling in freshwater was scheduled to occur via electrofishing (boat and/or backpack) and/or alternative methods (dependent on electrofishing success), including trot lines, hoop nets, gill nets, seine, or rod and reel. Boat electrofishing was to be conducted in deep water locations from a 14-ft john boat using a Smith-Root 5.0 GPP electrofishing unit, rated for conductivities ranging from 10 to 6,750 µmhos/cm, and was to be conducted by maneuvering the boat along the bank, vegetation, submerged stumps and logs, and other potential sources of cover. Backpack electrofishing (in wadable, shallow sampling locations) was to be conducted using a Smith-Root Model 15-C POW Backpack Electrofisher. During all electrofishing efforts, proper protective gear (e.g., gloves, waders, etc.) was to be worn. Polarized sunglasses were to be worn as weather conditions dictate to reduce glare and improve sampling efficiency. Stunned fish were to be dipnetted and placed in an aerated live well for processing. All types of shoreline habitat were to be sampled. Electrofishing equipment is preferred for collecting predator species, such as largemouth bass and bluegill.

Trot lines and/or hoop nets are the preferred methods for collecting the bottom feeder, i.e., channel catfish. These methods were to be deployed and baited, usually in the evening, and checked the next morning. For brackish water sampling, i.e., Bernard Bayou, alternate collection methods were to include gill netting, seining, cast netting, and rod and reel, if necessary. These methods also were to be used at the freshwater sites, if the preferred methods did not achieve the desired results. If gill netting was utilized, experimental gill nets (different mesh sized panels) were scheduled to be used. Dependent on site conditions and capture success, gill nets were to be set perpendicular to the shore for varying lengths of time (No more than 12-hour, overnight sets are anticipated.).

Crawfish were to be collected using crawfish traps or nets. These were to be baited with locally-available baits.

Water level data and *in situ* water quality measurements (water temperature, pH, dissolved oxygen, salinity, and conductivity) were to be taken at each study location during sampling/ electrofishing. A daily logbook was to be maintained which summarized all field activities, including date and time of each sample collection, instrument calibrations, site conditions, and any pertinent observations or problems encountered during sampling.

Several species of fish and shellfish were to be targeted for collection for human health and ecological risk. For human health, channel catfish (omnivorous bottom feeder), largemouth bass (tertiary consumer of recreational importance), and crawfish (bottom-dwelling, bottom feeding shellfish) were to be targeted. Bluegill was to be substituted for largemouth bass, if this species was not present. For ecological risk assessment, striped mullet (primary/ secondary consumer feeding on planktonic macroinvertebrates and algae), channel catfish, and largemouth bass were to be targeted for collection. Possible alternate species included gizzard shad or blacktail shiner (for striped mullet) and chain pickerel (for largemouth bass).

Collected target individuals were to be identified to species, measured for total length, sexed (if possible from external examination), and examined carefully for external anomalies, including fin erosion, skin ulcers, skeletal anomalies, and neoplasms (i.e., ulcers). Next, target species were to be composited for tissue analysis. Composites are mixtures of two or more individuals of the same species and should include approximately similar sized specimens (smallest no less than 75% of largest) collected at the same time. Samples were to provide a minimum of 100 grams of fish or 300 grams of shellfish (i.e., crawfish) tissue for analysis. Emphasis for samples was to be on larger specimens. Single replicates were to be collected at a minimum of 10 percent of the sampling locations. Whole fish were to be utilized for ecological risk assessment, and fish were to be filleted for human risk assessment.

Protective gloves were to be worn when handling samples; gloves were to be rinsed or changed after processing each sample. Individuals selected for tissue analysis were to be washed in ambient water to remove any foreign material from surface. Targeted species were to be grouped by species and separated to prevent contamination.

All whole fish and shellfish samples were to be individually wrapped in extra heavy duty aluminum foil, labeled, and placed inside plastic zip-lock bags and sealed. Chain-of-Custody labels were to be attached to each bag. If possible, all composite samples were to be kept together in a single large waterproof bag in the same shipping container. Once packaged, all samples were to be cooled with wet or blue ice (with adequate layers of ice between samples) and shipped as soon as possible.

Fish filleting was to be completed in the field. Target fish were to be filleted, and fillets retained for laboratory analysis. Channel catfish were to be processed by gutting the individual and removing its head and skin. Largemouth bass and bluegill were to be processed by removing the head, internal organs, and scales. Processing was to occur as soon as possible after collection and was to be performed on precleaned glass surfaces. The cutting surface was to be cleaned properly between processing. Dissections were to be made

using teflon-coated stainless steel microtome blades.

A report describing field procedures and summarizing fishery data collected in the field were to be produced. HLA-ES was to be provided with four hard copies of the report and an electronic copy on disk. A copy of all field logs also were to be provided.

RESULTS

The sampling effort was conducted on March 15 - 19, 1999. After reviewing the proposed sampling sites (in the field) and methodologies, some changes were effected. First, due to access and other physical restriction (e.g., water depths and currents), some of the sampling locations were moved slightly, including BIO-3, BIO-4, BIO-5, and BIO-7. Sites BIO-4, BIO-5, and BIO-7 were moved downstream somewhat from their originally planned locations, while BIO-3 was moved upstream from its original site. The revised sampling locations/sites are presented on Figure 1. Descriptions of each site are presented in Appendix A. The new sites were selected to be as close as possible to the original locations and allow for similar data/information collection.

Most of the originally planned sampling methods were employed. Boat and backpack electrofishers, seines, trot lines, and hoop nets were used to collect fish, and traps and dip nets/seines were utilized in an attempt to collect crawfish. No gill nets or rod and reels were used for sampling. A summary of sampling methods is presented in Table 1. Trot lines and hoop nets were baited with several different cheese-base baits and chicken and beef livers. Cut fish and fresh shrimp also were used to bait the trot lines. Beef liver was used as bait in the crawfish traps.

Despite extensive sampling efforts, all target species were not collected/present at each site. Additionally, collection of the planned size groupings were not always possible. For human health samples, the largest fish were retained for filleting. For ecological health samples, smaller fish (e.g., capable of being ingested by piscivorous wildlife) were retained as samples. Wherever possible, a minimum of 100 grams of sample was obtained. Some samples, however, had less than this amount. Information on each fish tissue sample submitted to the laboratory for analysis is located in Appendix C.

In general, sample handling, preparation, labeling, and shipping was conducted in accordance with the original work plan. Stainless steel fillet knives were used to fillet the fish. The fish were filleted on a cutting board wrapped in aluminum foil. Tissue extraction equipment (e.g., knives, gloves, etc.) were decontaminated between each sample. Except for catfish, human health fish samples were scaled and filleted with skin on. Catfish were skinned and filleted. Whole fish and fillet samples were grouped by species and trophic level, wrapped in aluminum foil, and placed in a zip-lock plastic bag. The foiled samples and the plastic bags were labeled, and chain-of-custody labels were attached to each bag. Whenever possible (size permitting), composite samples from each site were placed into a single, labeled bag.

Samples were preserved on wet ice and shipped within two days of processing.

A summary of the water quality parameters measured at each site during sampling is presented in Table 2. In general, the *in situ* water quality parameters measured at the survey sites were within acceptable levels for protection of aquatic biota (USEPA, 1986). Water temperature ranged from 13.6 to 22.2°C, DO from 5.35 to 9.65 mg/l, pH from 4.96 to 7.53, specific conductance from 41.6 to 633.0 µS/cm, and salinity from 0.0 to 0.3 ppt. The pH levels were lower at the Turkey Creek sites (BIO-3, -4, and -5), but these levels were within the pH range commonly found in "blackwater" systems such as Turkey Creek (due to abundance of naturally-occuring tannic acid in these waters). Specific conductance levels varied greatly, which is common in freshwater systems, where the proportion of different ions (conductivity) is highly dependent on climatic and edaphic factors (Boyd, 1990). The highest specific conductance levels were measured at BIO-6 and -7, which probably was due to the tidal influence (i.e., highly-conductive saline water) at these sites. BIO-7 also was downstream of considerable residential and commercial development within the City of Gulfport, and Brickyard Creek may have received concentrated levels of dissolved solids and ions from non-point source runoff. Although it had rained prior to initiating field efforts, no rain occurred during the sampling, and water levels appeared to be at normal, base flow conditions.

Field notes were recorded daily in field logs. A copy of these notes is found in Appendix B.

Fish Collected

A complete list of all fish species collected during the sampling effort is presented in Table 3. A total of 29 species of fish were collected at the various study sites. Sunfish (Family Centrarchidae) were the dominant taxa; 9 of the 29 species of fish collected during the sampling effort were centrarchids.

Not all the targeted species were collected at each site. Crayfish traps were set at each study site, and dip netting was conducted in the swampy area south of Turkey Creek just upstream of BIO-4. Although some crayfish were collected, insufficient numbers and small body size (i.e., less than 300 grams composite samples) prevented submittal of any crayfish tissue for laboratory analyses from any of the sites. A summary of fish tissue samples submitted for analysis is presented in Table 4. The following is a summary of the fish sample data collected at each site, and the Field Record Forms (as well as Chain-of-Custody and tissue labels) are located in Appendix C:

BIO-1

As per the work plan, only fish fillets (i.e., no whole fish samples) were obtained at BIO-1 for human health assessment. The bottom feeder trophic level representative from this site was yellow bullhead. The laboratory sample was comprised of two individuals. Length and weight of each fish was 238 millimeters (mm)/204 grams (g) and 300 mm/460 g, respectively. The larger yellow bullhead was a female with eggs.

The tertiary consumer of recreational importance trophic level representative from this site was redear sunfish. A total of 6 fish were filleted. Lengths ranged from 130 to 154 mm, and weights ranged from 44 to 74 g. Eggs were present in 4 of the 6 fish. No external anomalies were observed on any of the fish submitted to the laboratory for analysis.

BIO-2

Both fillets and whole fish (i.e., human and ecological health) were obtained at BIO-2. For human health/fillets, the bottom feeder trophic level representative from this site was brown bullhead. The laboratory sample was comprised of three individuals of this species. Lengths ranged from 425 to 430 mm, and weights ranged from 1190 to 1330 g. The tertiary consumer of recreational importance trophic level representative from this site was largemouth bass. Two individuals of this species comprised the sample, measuring 430 and 260 mm and weighing 1440 and 246 g, respectively. The larger bass was a female with eggs.

For ecological health/whole fish, all three trophic level samples were collected. Gizzard shad was the species representing the primary/secondary consumer from this site. A composite sample of four individuals of this species was assembled. Lengths ranged from 110 to 170 mm, and weights ranged from 13 to 57 g. A single brown bullhead comprised the whole fish bottom feeder sample (length of 373 mm and weight of 775 g). The tertiary consumer of recreational importance trophic level sample consisted of a single largemouth bass, which measured 233 mm and weighed 156 g.

With the exception of some mouth damage to one of the brown bullheads (fillet) caused by the trot line on which it was captured, no external anomalies were observed on any of the fish submitted to the laboratory for analysis.

BIO-3

This site was selected as the study reference station, because of its location upgradient of any site-related contamination. No samples representing the bottom feeder trophic level were collected from this site. Both fillet and whole fish samples were obtained for the tertiary consumer of recreational importance trophic level, however. The fish species which comprised these samples was bluegill. Four bluegill were filleted. Lengths of these individuals ranged from 125 to 152 mm, and weights ranged from 36 to 53 g. A total of 12 small bluegill were composited for the whole fish sample. Lengths of these specimens ranged from 68 to 90 mm and weights from 6 to 14 g. The primary/secondary consumer from this site was represented by lake chubsucker. This whole fish sample was comprised of two individuals, measuring 155 and 162 mm and weighing 56 and 63 g, respectively. The smaller lake chubsucker had an eroded caudal fin; none of the other fish submitted to the laboratory for analysis from this site had any observed external anomalies.

BIO-4

No primary/secondary consumer trophic level sample was collected from this site. Bluegill

represented the tertiary consumer of recreational importance trophic level (both fillet and whole fish samples). A single bluegill comprised the whole fish sample (length of 135 mm and weight of 52 g). A composite fillet sample of two bluegill, 162 mm/80 g and 168 mm/92 g, also was obtained from this site. The fillet sample for bottom feeder trophic level consisted of one female channel catfish with eggs, which measured 435 mm and weighed 1100 g. The bottom feeder trophic level whole fish sample was comprised of a single yellow bullhead. This specimen was 300 mm in length and 440 g in weight, and had an abrasion near the dorsal fin/spine. No other external anomalies were observed on any of the fish submitted to the laboratory for analysis from this site.

BIO-5

Due to insufficient size and numbers of a single species, the primary/secondary consumer trophic level sample from this site consisted of a mixture of brook silversides and shiners (*Notropis* sp.). Seven brook silversides (averaging 80 mm in length and 2.3 g in weight) and 9 shiners (average length of 60 mm and average weight of 2.7 g) were composited for the whole fish sample. Largemouth bass represented the tertiary consumer of recreational importance trophic level. Single specimens comprised both fillet and whole fish samples. The whole fish sample/individual measured 265 mm and weighed 242 g, and the fillet sample fish was 355 mm long and weighed 755 g. The largemouth bass used for the fillet sample was a female with eggs and had a slight deformity on the caudal fin. Only a human health/fillet sample representing the bottom feeder trophic level was collected from this site, i.e., no whole fish for ecological assessment. The fillet sample consisted of a single yellow bullhead, which measured 260 mm and weighed 278 g.

Besides the largemouth bass with the slightly deformed caudal fin, no other external anomalies were observed on any of the fish submitted to the laboratory for analysis from this site.

BIO-6

A complete set of human and ecological fish samples was collected at BIO-6. The primary/secondary consumer trophic level representative species was striped mullet. A total of 4 individuals were composited for this trophic level sample. The 4 striped mullets ranged from 163 to 180 mm in length and 52 to 64 g in weight. Largemouth bass represented the tertiary consumer of recreational importance trophic level. Two specimens were composited for both the fillet and whole fish samples. Both fish in the fillet sample were females, and the larger one had eggs. Their lengths and weights were 300 mm/450 g and 345 mm/ 660 g, respectively. The whole fish sample consisted of specimens measuring 258 and 230 mm and weighing 252 and 152 g, respectively. The smaller fish was a female. The bottom feeder trophic level was represented by channel catfish. The fillet sample consisted of a single female with eggs. The fish measured 450 mm and weighed 1250 g. The whole fish sample also consisted of two specimens, measuring 280 and 395 mm and weighing 210 and 700 g, respectively. No external anomalies were observed on any of the fish submitted to the

laboratory for analysis from this site.

Replicate samples were collected from this site. Both human and ecological health samples were obtained. The human health replicate was a bottom feeder trophic level sample represented by a single channel catfish, which measured 550 mm in length and weighed 2500 g. The ecological/whole fish sample consisted of a largemouth bass. This tertiary consumer of recreational importance trophic level sample measured 310 mm in length and weighed 490 g. This specimen was injured slightly (contusion caused by electrode burn) during collection.

BIO-7

As previously mentioned, this site received considerable runoff from residential and commercial areas in Gulfport and also was located just downstream of the airport. No samples representing the bottom feeder trophic level were collected from this site. The primary/secondary consumer trophic level representative species from this site was striped mullet. Two individuals were composited for this trophic level sample. One fish was 178 mm in length and 50 g in weight, and the other was 163 mm in length and 48 g in weight. The tertiary consumer of recreational importance trophic level species was largemouth bass. The whole fish sample consisted of two individuals, measuring 188 and 225 mm and weighing 80 and 162 g, respectively. The smaller fish was a female with eggs. The tertiary consumer fillet sample also consisted of two largemouth bass. One fish measured 262 mm and weighed 255 g, and the other fish was 253 mm in length and weighed 210 g. No other external anomalies were observed on any of the fish submitted to the laboratory for analysis from this site.

BIO-8

No primary/secondary consumer trophic level sample was collected from this site. Largemouth bass represented the tertiary consumer of recreational importance trophic level (both fillet and whole fish samples). Both samples consisted of two individuals. The fillet sample was a composite of one fish measuring 288 mm in length and weighing 345 g and another fish (female with eggs) 220 mm long and weighing 158 g. The whole fish sample consisted of one fish measuring 260 mm in length and weighing 254 g and another fish measuring 230 mm in length and weighing 170 g. The bottom feeder trophic level was represented by black bullhead. Two specimens were composited for both the fillet and whole fish samples. The fillet sample consisted of fish measuring 275 and 220 mm in length and weighing 330 and 158 g, respectively. The whole fish sample consisted of specimens measuring 175 and 198 mm and weighing 95 and 112 g, respectively. The largest black bullhead (275 mm/330 g; used in fillet sample) had a deformed dorsal spine, but no other external anomalies were observed on any of the fish submitted to the laboratory for analysis from this site.

LITERATURE CITED

Boyd, C.E. 1990. Water Quality in Ponds for Aquaculture. Birmingham Publishing Company, Birmingham, AL.

USEPA (U.S. Environmental Protection Agency). 1986. Quality Criteria for Water. EPA 440/5-86-001. Office of Water, Regulations and Standards, Washington, DC.

TABLE 1

SUMMARY OF FISH SAMPLING METHODOLOGIES

SAMPLING SITES	ELECTROFISHER	TROT LINE	HOOP NET	SEINE
BIO-1	x	x	x	
BIO-2	x	x	x	
BIO-3	x	x	x	
BIO-4		x	x	
BIO-5	x	x	x	x
BIO-6	x	x	x	
BIO-7	x			
BIO-8	x	x	x	

TABLE 2

SUMMARY OF *IN SITU* WATER QUALITY MEASUREMENTS

SAMPLING SITES	pH (s.u.)	WATER TEMPERATURE (° C)	SALINITY (ppt)	DISSOLVED OXYGEN (mg/l)	SPECIFIC CONDUCTANCE (µS/cm)
BIO-1	7.53	22.2	0.1	9.65	159.3
BIO-2	6.55	21.5	0.1	8.86	175.4
BIO-3	4.96	14.9	0.0	5.35	42.3
BIO-4	5.81	16.3	0.0	7.32	52.1
BIO-5	5.31	13.6	0.0	6.86	41.6
BIO-6	5.89	14.3	0.2	7.10	465.2
BIO-7	7.32	18.2	0.3	6.33	633.0
BIO-8	7.17	18.4	0.1	7.87	227.3

s.u. = standard units
° C = degrees Celcius
ppt = parts per thousand
mg/l = milligrams per liter
µS/cm = micro-Siemens per centimeter

TABLE 3

FISH COLLECTED FROM STUDY SITES
NCBC GULFPORT, MISSISSIPPI

Amiidae
Bowfin, *Amia calva*

Aphredoderidae
Pirate perch, *Aphredoderus sayanus*

Atherinidae
Brook silverside, *Labidesthes sicculus*

Catostomidae -
Lake chubsucker, *Erimyzon sucetta*

Centrarchidae -
Bluegill, *Lepomis macrochirus*
Green sunfish, *Lepomis cyanellus*
Longear sunfish, *Lepomis megalotis*
Redbreast sunfish, *Lepomis auritus*
Redear sunfish, *Lepomis microlophus*
Spotted sunfish, *Lepomis punctatus*
Warmouth, *Lepomis gulosus*
White crappie, *Pomoxis annularis*
Largemouth bass, *Micropterus salmoides*

Clupeidae -
Gizzard shad, *Dorosoma cepedianum*

Cyprinidae -
Common carp, *Cyprinus carpio*
Unidentified shiner, *Notropis* sp.

Engraulidae
Bay anchovy, *Anchoa mitchilli*

Cyprinodontidae -
Golden topminnow, *Fundulus chrysotus*
Gulf killifish, *Fundulus grandis*

Gobiidae
Darter goby, *Gobionellus boleosoma*

Ictaluridae -
Brown bullhead, *Ameiurus nebulosus*
Yellow bullhead, *Ameiurus natalis*
Black bullhead, *Ameiurus melas*

Channel catfish, *Ictalurus punctatus*

Lepisostidae -
Spotted gar, *Lepisosteus oculatus*

Mugilidae -
Striped mullet, *Mugil cephalus*

Poeciliidae -
Mosquitofish, *Gambusia sp.*
Sailfin molly, *Poecilia latipinna*

Sciaenidae -
Freshwater drum, *Aplodinotus grunniens*

TABLE 4

SUMMARY OF FISH SAMPLES SUBMITTED FOR ANALYSIS

SAMPLING SITE	SPECIES	FILLET (F)/ WHOLE BODY (W)	LENGTH (mm)	WEIGHT (g)	PRESENCE OF EGGS	ANOMALIES
BIO-1	Yellow bullhead	F	238	204	---	---
	Yellow bullhead	F	300	460	X	---
	Redear sunfish	F	154	74	X	---
	Redear sunfish	F	150	65	X	---
	Redear sunfish	F	150	68	X	---
	Redear sunfish	F	140	50	---	---
	Redear sunfish	F	135	48	X	---
	Redear sunfish	F	130	44	---	---
BIO-2	Brown bullhead	W	373	775	---	---
	Brown bullhead	F	425	1330	---	---
	Brown bullhead	F	425	1190	---	Mouth damaged by trot line
	Brown bullhead	F	430	1250	---	---
	Largemouth bass	F	430	1440	X	---

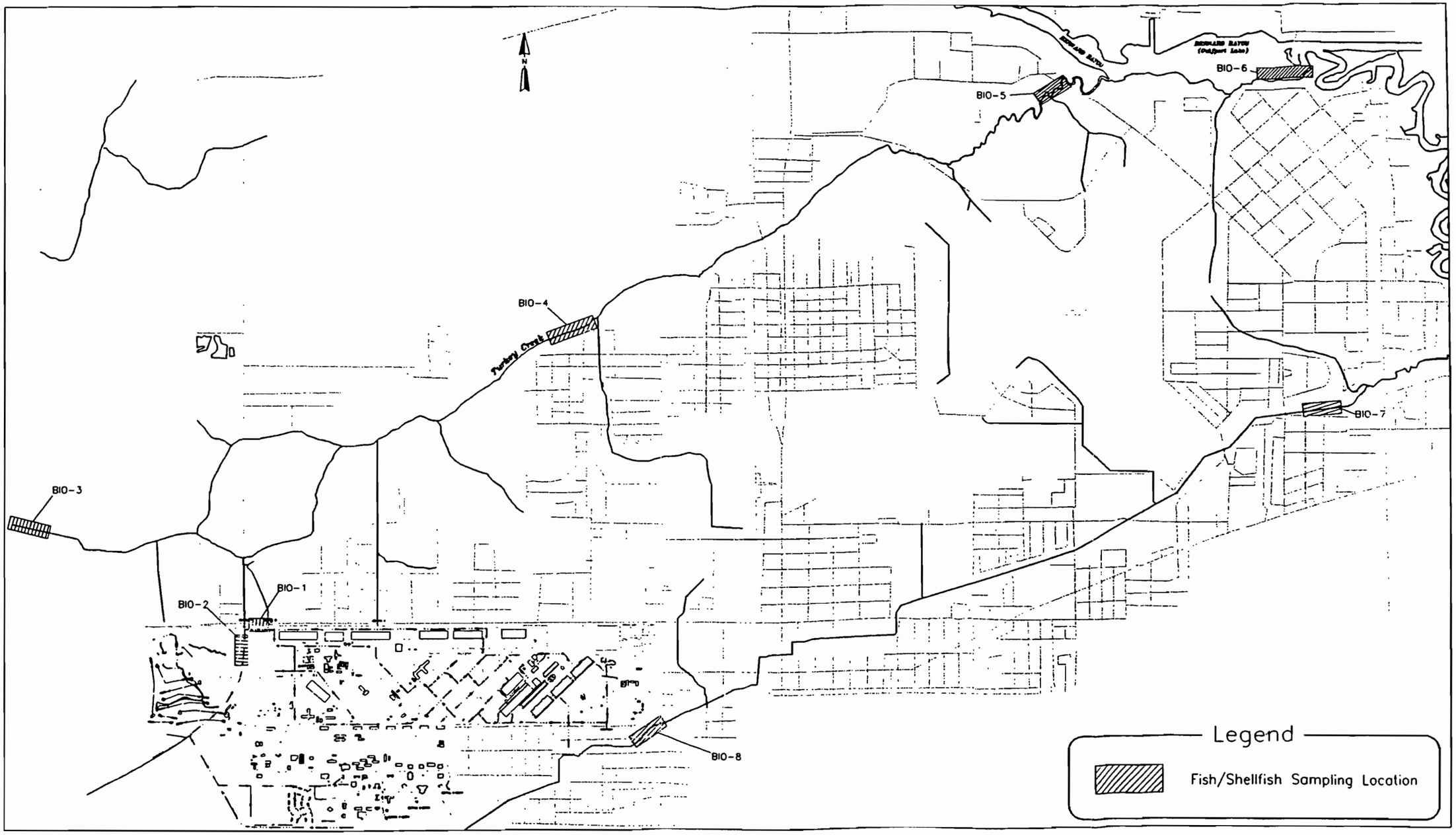
SAMPLING SITE	SPECIES	FILLET (F)/ WHOLE BODY (W)	LENGTH (mm)	WEIGHT (g)	PRESENCE OF EGGS	ANOMALIES
	Largemouth bass	F	260	246	---	---
	Largemouth bass	W	233	156	---	---
	Gizzard shad	W	110	13	---	---
	Gizzard shad	W	150	34	---	---
	Gizzard shad	W	160	41	---	---
	Gizzard shad	W	170	57	---	---
BIO-3	Bluegill	W	88	14	---	---
	Bluegill	W	80	9	---	---
	Bluegill	W	90	12	---	---
	Bluegill	W	88	11	---	---
	Bluegill	W	68	6	---	---
	Bluegill	W	80	8	---	---
	Bluegill	W	70	6	---	---
	Bluegill	W	70	6	---	---
	Bluegill	W	73	6	---	---
	Bluegill	W	80	8	---	---
	Bluegill	W	72	6	---	---

SAMPLING SITE	SPECIES	FILLET (F)/ WHOLE BODY (W)	LENGTH (mm)	WEIGHT (g)	PRESENCE OF EGGS	ANOMALIES
	Bluegill	W	66	5	---	---
	Bluegill	F	147	53	---	---
	Bluegill	F	152	62	---	---
	Bluegill	F	131	43	---	---
	Bluegill	F	125	36	---	---
	Lake chubsucker	W	155	56	---	Eroded caudal fin
	Lake chubsucker	W	162	63	---	---
BIO-4	Channel catfish	F	435	1100	X	---
	Channel catfish	W	300	440	---	Abrasion near dorsal fin
	Bluegill	W	135	52	---	---
	Bluegill	F	162	80	---	---
	Bluegill	F	168	92	---	---
BIO-5	Brook silverside	W	7 @ 80	7 @ 19	---	---
	Shiner	W	9 @ 60	9 @ 21	---	---
	Largemouth bass	W	265	242	---	---
	Largemouth bass	F	355	755	X	Slight deformity of caudal fin

SAMPLING SITE	SPECIES	FILLET (F)/ WHOLE BODY (W)	LENGTH (mm)	WEIGHT (g)	PRESENCE OF EGGS	ANOMALIES
	Yellow bullhead	F	260	278	---	---
BIO-6	Channel catfish	W	280	210	---	---
	Channel catfish	W	395	700	---	---
	Channel catfish	F	450	1250	X	---
	Channel catfish	F (replicate)	550	2500	X	---
	Largemouth bass	W	258	252	---	---
	Largemouth bass	W	230	152	---	---
	Largemouth bass	W (replicate)	310	490	---	Contusion from electrode
	Largemouth bass	F	300	450	---	---
	Largemouth bass	F	345	660	X	---
	Striped mullet	W	172	60	---	---
	Striped mullet	W	180	64	---	---
	Striped mullet	W	175	62	---	---
	Striped mullet	W	163	52	---	---
BIO-7	Largemouth bass	W	188	80	X	---
	Largemouth bass	W	225	162	---	---

SAMPLING SITE	SPECIES	FILLET (F)/ WHOLE BODY (W)	LENGTH (mm)	WEIGHT (g)	PRESENCE OF EGGS	ANOMALIES
	Largemouth bass	F	262	255	---	---
	Largemouth bass	F	253	210	---	---
	Striped mullet	W	178	50	---	---
	Striped mullet	W	163	48	---	---
BIO-8	Black bullhead	W	175	95	---	---
	Black bullhead	W	198	112	---	---
	Black bullhead	F	275	330	---	Deformed dorsal spine
	Black bullhead	F	220	158	---	---
	Largemouth bass	W	260	254	---	---
	Largemouth bass	W	230	170	---	---
	Largemouth bass	F	288	345	---	---
	Largemouth bass	F	265	270	X	---

mm = millimeters
g = grams



HARDING LAWSON ASSOCIATES

TITLE: Naval Construction Battallion Center
Fish/Shellfish Sampling Locations
Gulfport, MS

0 1250 2500
FEET

DWN: JRF	DES.:	PROJECT NO.:
CHKD:	APPD:	FIGURE NO. 1
DATE:	REV.:	

APPENDIX A

SITE DESCRIPTIONS

BIO-1

This study station was located on-site, south of 28th St. and upstream of a sediment recovery trap. This site was a small pool (15 feet by 50 feet) in a drainage ditch. The average depth was approximately two feet, and substrate was primarily mud. Some emergent and submergent vegetation was observed in shallow littoral areas. No flow was observed, and the water was fairly turbid.

BIO-2

This study station was located on-site in Canal No. 1. Depths generally ranged from 2 to 4 feet, and the canal width was about 20 feet. Substrate was primarily mud. Considerable emergent and submergent vegetation were located in the shallow littoral areas. Although some flow was observed, the water was stagnant and turbid.

BIO-3

This site was located in the upper section of Turkey Creek. This site was considered to be relatively undisturbed (i.e., reference site) because of its location up-gradient from NCBC Gulfport. A roadway (Turner Road) crossed Turkey Creek at this location, and sampling was conducted upstream and downstream of the road crossing. The stream upstream of the roadway was pooled with little observed flow. Depths generally ranged from 2 to 4 feet, and the width was about 5 to 8 feet. Substrate was primarily mud and hardpan (clay). Small areas of emergent vegetation was located in the shallow littoral areas. Canopy cover was 50 to 80%, and the surrounding riparian area was forested. Numerous snags and overhanging branches were present. The water was turbid.

Downstream of the roadway, the stream was flowing (< 1 cubic feet per second [cfs]). The channel appeared to have been dredged and straightened in the past (not recent). Water depths were generally less than 1 to 2 feet, and average stream width was about 4 feet. Substrate was primarily hardpan. Canopy cover was nearly 100%. The surrounding riparian area was forested to the north, and some single family dwellings were located south of the stream. Some instream cover (e.g., snags, limbs) was present.

BIO-4

This site was located on Turkey Creek just downstream from NCBC Gulfport. The stream appeared channelized in this area. The channel was deeply incised, and the stream banks were steep. The current was swift in this area, and little instream cover was present (some overhanging branches). Water depths generally were greater than 4 feet, and the stream was about 15 to 20 feet wide. Substrate was primarily hardpan. The water was turbid.

BIO-5

This site was located on Turkey Creek downstream of the airport and about half a mile upstream of the confluence with Bernard Bayou. The area appeared relatively undisturbed and natural. The stream exhibited good sinuosity at this site, and the riparian zone was densely forested and relatively undisturbed for several hundred feet in most areas. Canopy cover was about 80% to 90%. Stream width was about 20 to 30 feet, and depths were

generally greater than 4 feet. The substrate was a mixture of sand, mud, and detritus. Numerous stumps, limbs, and snags were present, often extending nearly across the stream; downed trees completely blocked passage at the upstream-most section of this site. Swift current was present in the main stream channel, and the water was fairly turbid.

BIO-6

This site was in the eastern side of Bernard Bayou and was lacustrine in nature. Some tidal influence was observed; however, water was principally fresh. There was a mixture of residential and industrial development along much of the shoreline at this site; however, relatively undisturbed, natural areas also were present. Docks were common in the developed areas, and stumps and snags were frequently encountered along the more undisturbed shoreline. Substrate consisted of a mixture of firm sand and mud in most areas. Depths varied but were generally less than 5 feet within about hundred feet of the shore in most areas.

BIO-7

This site was the downstream-most location on Brickyard Creek and was downstream of the airport. The stream was channelized in this area and may have been somewhat tidally influenced. No noticeable flow was observed during sampling. The site was surrounded by residential development, but the immediate riparian area predominantly was forested (forested riparian zone generally 20 feet to greater than 100 feet. Canopy cover was approximately 50% to 80%. Stream width was about 30 to 40 feet, and depths were generally greater than 4 feet. Substrate appeared to be primarily mud. A moderate amount of instream cover was present, primarily snags and overhanging limbs. Water was turbid.

BIO-8

This site was the uptream-most location on Brickyard Creek, immediately downstream of the base. The area was completely surrounded by residential development, and riparian zone often had little or no vegetation (i.e., structures or impervious surface). The stream was highly impacted by anthropogenic activities and contained large amounts of refuse. The creek was channelized, and little canopy (0% to 30%) was present. The stream was relatively small in the sampling area, with stream widths generally ranging from 5 to 10 feet and depths of 2 inches to about 4 feet. Substrate consisted primarily of mud, sand, and rubble (rip rap).

APPENDIX B

COPIES OF FIELD NOTES

2

3/15

NCBC Gulfport

→ reviewed ~~all sites~~

BIO 2 - 207 m up from road 1 PM

3 crawfish traps, hoop net

↳ varying depths, w/in 30' apart

BIO 1 - @ sediment trap

3 crawfish traps; trotline

BIO 8 - just off base site 3 PM

3 crawfish traps, trotline

BIO 6 - Bernard Bayou 4 PM

3 crawfish traps, trotline, hoop net

BIO 7 - end of runway site 5 PM

3 crawfish traps; trotline

3/16

7 AM

BIO 1, 8, 6 + 7 - no crawfish or fish on trotlines (hoop net @ BIO 2 not checked)

Crawfish traps rebaited @ all, ~~rebait~~ (trotlines not rebaited)

BIO 2 - 1 yellow bullhead; trotline + crawfish traps rebaited

#63 calibrated - 4 + 7 pH

DO @ 13.6°C - 13.76 → 10.37

BIO 6 - 9 AM

DO - ~~17~~ 7.10 pH - 5.89 Sal - 0.2

temp - 14.3 cond - ~~367~~ 465.2 µS/cm ppt

- trotline - 2 channel catfish (GBH attacking one of these)

hoop net - 1 small bluegill

→ reset trotline + added another; reset hoop net

electro - DC, low, 50%, 60 PPS

amps - 6-9 amps time 669

a few hundred feet of shoreline

collected - LMB, bluegill, redear, striped mullet, 1 ~~[illegible]~~ freshwater drum juv

Habitat - lacustrine w/ some tidal influence; mixture of a few resid; industrial (northshore); shoreline - shrubs, ducks, trees, stumps (sal in shore)

- set trotline + hoop net

BIO 5 - bottom station on Turkey Cr

DO - 6.86 pH - 5.31 Sal - 0

temp - 13.6 cond - 41.6

electro - DC, high, 100%, 120 PPS, amp - 4.6

time - 733 + 604 = 1337 sec

- started @ end + drift down to bridge, then fishing down

collected - LMB, bluegill, redear, spotted shiner?, silversides

while sediment samples, collected flounder juv (left - yed?)

B10 3 - set hoop net + trotline
B10 4 - set trotline
B10 2 - set trotline
Turner Rd

3/17 sunny, warm
- checked trotlines, traps

B10 2 - 3 brown bullhead on trotline
B10 1 - nothing; rebanted crawfish traps
B10 3 - nothing on trotline
hoop net - redbreast; bluegill, chubsucker; hoop net reset
B10 4 - set hoop net - 1 large chan. cat

B10 6 - 2 large channel cat on 2nd trotline 2 pm
none on 1st; trotline + hoop net pulled
B10 5 - no catfish on trotline; hoop net - nothing; pulled

collected minnows
→ worked up fish collected - fillets - whole fish; complete decon between each site's fish
- ~~[illegible]~~ new gloves, foil, newsbrd, etc
Decon → soap, DI rinse, alcohol, DI rinse
- set trotlines @ B10 3, 4, 1 + 2 in PM

3/18 - foggy, warm
- meters calibrated
pH - 4+7; DO - 9.84 → 100% @ 14.3

B10 2 - checked trotline; - none
B10 1 - " ; - 1 yellow bullhead
B10 3 - " + hoop net - 1 bluegill + redeam, pulled
nothing; pulled
electro (backpeak) - numerous bluegill, longear, green, spotted, redbreast, mosquitofish, other, including crawfish, birdpeak
DO - 5.35 pH - 4.96 Sal - 0.0
temp - 14.9 cond - ~~84.7~~ 42.3
Pics 1-3 -
setting - 7-5, Volts = 500, time 1079
- also some seine pulls - a few crawfish Gambusia

Habitat - water turbid (blackwater?)
Down - small flowing stream (flow < 1cfs), wid - 3-5', depth - 1"-2'; sub - hardpan; canopy - 100%, channelized, mod. to [illegible]
up - pool, depths - 2-4'; no flow; wid - 5-8'; sub - mud, hardpan; canopy - 50-90%, good cover, [illegible], roots

B10 4 - trotline - 1 bullhead, hoop net - [illegible]
Pics 4+5
DO - 7.32 pH - 5.81 Sal - 0
temp - 16.0 cond - 52.1

6

Pics 6 & 7 flow - 50-75 cfs water turbid, 2193 1019 1719

Habitat - channelized; deep - >4'; wid - 15-20'; sub - hardpan; canopy - 100%; little cover, straight

11 AM

BIO 8 -

DO - 7.87 pH - 7.12 sal - 0.1

temp - 18.4 cond - 227.3

electro - II-5 volts 200-300, time - 1719

fish - LMB, bullhead, bluegill, redspotted, spotted, warmouth, greensunfish, silverside, mosquitofish, goby (V); mummichog (V), golden trophiuma (V), pleuroid (V), 2 toed amphiuma; crawfish; shrimp (V)

Habitat - small stream highly impacted, turbid; large amounts of trash, rubble, fencing, etc

flow - 1-2 cfs; wid - 5-10'; depth - 2"-4'; sub - mud, sand, rubble; can - 0-30%; straight, channelized

Pics 8 & 9

1 PM

BIO 2

Pics 10 & 11

DO - 8.86 pH - 6.55 sal - 0.1

temp 21.5 cond - ~~[illegible]~~ 175.4 cc

Pics 10 & 11

electro - DC, 50%, High, 120 PPS, 8-10 amps, time 733.

fish - numerous sunfish (bluegill, red, spotted, green?)

gizzardshad, bowfin, gar; carp;

Habitat - canal; 20' wid; depth - 2-4'; sub mud; abund emergent & submerg, along edge, no canopy

BIO 1 -

Pic 12

DO - 9.65 pH - 7.53 sal - 0.1

temp - 22.2 cond - 159.3

electro - DC, 50%, High, 120 PPS, 8-10 amp, time - 387

fish - 1° bluegill, redeam

Habitat - pool caused by retention dam, wid - 15-20'; depth - 1-4'; sub - mud, some emergent & sub; no canopy

BIO 5 - Pics 13 & 14 4 PM

set another trot line - relocated other turbid

- Habitat = riverine good & invertebrate/natural, fly - thick, forested; wid - 20-30', depth - 1-25'; sub - sand, mud, debris; canopy & 90% in [illegible] snags, limbs, [illegible]

BIO 7 (?) - runway site

Pics 14 & 15

DO 7.65 pH - 7.27 sal. - 0.3

temp - 20.4 cond - 573

- too deep to back pack shock - boat [illegible]

BIO 4

- pulled trot line & hoopnet

↳ 3 bluegill

8 (3/19)

7:30 AM

B105 - checked + pulled both frot-lines
1 yellow bullhead

B107 - electrofished 9 AM
DO - 6.33 pH - 7.32 sal 0.3
temp - 18.2 cond - 633
settings - DC, 120 pps, Low-High, 50%
time - 1110 sec + 200-300 m
@ Washington/Simpson Rd bridge
fish - carp (1 large); gizzard shad, striped mullet, LMB, redear, bluegill, spotted, cyprinids (anchovies?)
Habitat - straight/canal; no noticeable flow (tidally influenced?); wid - 30-40'; dep > 4'; sub-mud; canopy - 50-80%; some cover - snags, limbs; rip + residential/forested

Worked up fish (same methods/decon as previous) 10:30 AM
— finished all processing by 12:30 PM

Vouchers - 2 - black bullheads 4 - darter gobies
1 - lake chubsucker
1 - brook silverside
1 - golden topminnow
1 - sailfin molly
1 - gulf killifish

APPENDIX C

COPIES OF FIELD RECORD FORMS

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: 3-16-99 - AM
3-18-99 - AM, PM

SITE LOCATION:

Site Name/Number: NCBC Gulfport

County/Parish: Harrison County Lat/Long.:

Waterbody Name/Segment Number:

Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY Drainage Ditch

Site Description

Collection Method:

Collector Name: C² Environmental Services, Inc
(print and sign)

Agency: Phone: 770 986-8092

Address: 4122 Admiral Dr., Atlanta, GA 30341

FISH COLLECTED:

Bottom Feeder—Species Name: Yellow Bullhead

Composite Sample No.: Bio-1-FF-CF Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001	238 (204g)	F	006		
002	300 (460g)	F (w/eggs)	007		
003			008		
004			009		
005			010		

Minimum size ____ x 100 = ____ ≥75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies):

Predator—Species Name: Bio-1-FF-RE

Composite Sample No.: Redear Sunfish Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001	154 (74g)	F (w/Eggs)	006	130 (44)	
002	150 (65g)	F (w/Eggs)	007		
003	150 (68g)	F (w/eggs)	008		
004	140 (50)		009		
005	135 (48)	F (w/eggs)	010		

Minimum size ____ x 100 = ____ ≥75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies):

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: 3-17-99 AM
3-18-99 PM

SITE LOCATION:
Site Name/Number: NCBC Gulfport
County/Parish: Harrison County Lat/Long.:
Waterbody Name/Segment Number:
Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY Drainage ditch
Site Description

Collection Method:
Collector Name: C² Environmental Services, Inc
(print and sign)
Agency: Phone: 770 986-9092
Address: 4122 Admiral Dr., Atlanta, GA 30341

FISH COLLECTED:
Bottom Feeder—Species Name: Brown Bullhead
Composite Sample No.: Bio-2-WF-CF Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001	373 (775 g)		006	425 (1380 g)	
002			007	425 (1190 g)	
003			008	430 (1250)	
004			009		
005			010		

Minimum size × 100 = ≥75%
Composite mean length mm
Maximum size
Bio-2-FF-CF

Notes (e.g., morphological anomalies): (607) Mouth damaged by trout line

Predator—Species Name: Largemouth Bass
Composite Sample No.: Bio-2-FF-LB Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001	430 - (1440 g)	F (w/ eggs)	006	233 (156 g)	
002	260 (246)		007		
003			008		
004			009		
005			010		

Minimum size × 100 = ≥75%
Composite mean length Bio-2-WF-LB mm
Maximum size

Notes (e.g., morphological anomalies):

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: 3-18-99 - PM

SITE LOCATION:

Site Name/Number: NCBC Gulfport

County/Parish: Harrison County Lat/Long.:

Waterbody Name/Segment Number:

Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY Drainage Ditch

Site Description

Collection Method:

Collector Name: C² Environmental Services, Inc
(print and sign)

Agency: Phone: 770 986-8092

Address: 4122 Admiral Dr., Atlanta, GA 30341

FISH COLLECTED:

Bottom Feeder—Species Name:

Composite Sample No.: Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001			006		
002			007		
003			008		
004			009		
005			010		

Minimum size × 100 = ≥75% Composite mean length mm

Maximum size

Notes (e.g., morphological anomalies):

~~Predator~~ Primary Species Name: Gizzard Shad

Composite Sample No.: B10-2-WF-GS Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001	110 (13 g)		006		
002	150 (34 g)		007		
003	160 (41)		008		
004	170 (57)		009		
005			010		

Minimum size × 100 = ≥75% Composite mean length mm

Maximum size

Notes (e.g., morphological anomalies):

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: 3-18-99 - AM
3-18-99 - AM

SITE LOCATION:
Site Name/Number: NCBC Gulfport
County/Parish: Harrison County Lat/Long.:
Waterbody Name/Segment Number:
Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY Creek
Site Description

Collection Method:
Collector Name: C² Environmental Services, Inc
(print and sign)
Agency: Phone: 770 986-8092
Address: 4122 Admiral Dr., Atlanta, GA 30341

FISH COLLECTED:
~~Bottom Feed~~ Secondary ~~Species Name~~: Blue Gill
Composite Sample No.: 810-3-WF-BG Number of Individuals:

Fish #	Length (mm)	Sex	mm	g	Fish #	Length (mm)	Sex
001	88 (14 g)	0011	72	6	006	80 (8)	
002	80 (9 g)	0012	66	5	007	70 (6)	
003	90 (12)				008	70 (6)	
004	88 (11)				009	73 (6)	
005	68 (6)				010	80 (8)	

Minimum size × 100 = ____ ≥75% Composite mean length ____ mm
Maximum size

Notes (e.g., morphological anomalies):

~~Predator~~ Primary ~~Species Name~~: Chub Sucker
Composite Sample No.: 810-3-WF-CS Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001	155 (56)		006		
002	162 (63g)		007		
003			008		
004			009		
005			010		

Minimum size × 100 = ____ ≥75% Composite mean length ____ mm
Maximum size

Notes (e.g., morphological anomalies):
(001) Eroded Caudal Fin

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: _____

SITE LOCATION:

Site Name/Number: NCBC Gulfport

County/Parish: Harrison County Lat/Long.: _____

Waterbody Name/Segment Number: _____

Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY Creek

Site Description _____

Collection Method: _____

Collector Name: C² Environmental Services, Inc
(print and sign)

Agency: _____ Phone: 770 986-8092

Address: 4122 Admiral Dr., Atlanta, GA 30341

FISH COLLECTED: _____

Bottom Feeder—Species Name: _____

Composite Sample No.: _____ Number of Individuals: _____

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001			006		
002			007		
003			008		
004			009		
005			010		

Minimum size / Maximum size × 100 = _____ >75% Composite mean length _____ mm

Notes (e.g., morphological anomalies): _____

~~Predator—Species Name~~ Secondary: Bluegill

Composite Sample No.: B10-3-OFF-BG Number of Individuals: _____

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001	147 (53)		006		
002	152 (62)		007		
003	131 (43)		008		
004	125 (36)		009		
005			010		

Minimum size / Maximum size × 100 = _____ ≥75% Composite mean length _____ mm

Notes (e.g., morphological anomalies): _____

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: 3-17-99 AM 3-18-99 PM

SITE LOCATION:

Site Name/Number: NCBC Gulfport

County/Parish: Harrison County Lat/Long.:

Waterbody Name/Segment Number:

Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY Creek

Site Description

Collection Method:

Collector Name: C² Environmental Services, Inc
(print and sign)

Agency: Phone: 770 986-8092

Address: 4122 Admiral Dr., Atlanta, GA 30341

FISH COLLECTED:

Bottom Feeder—Species Name: Channel Catfish, (Yellow Bullhead for whole fish)

Composite Sample No.: Bio-04-FF-CF Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001	435 (1100g)	F (with eggs)	006	300 (440)	
002			007		
003			008		
004			009		
005			010		

Minimum size × 100 = ≥75% Composite mean length Bio-04-WF-CF mm

Maximum size

Notes (e.g., morphological anomalies): Abrasion near dorsal fin

~~Predator Species Name~~: Bluegill

Composite Sample No.: Bio-4-WF-B6 Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001	135 (52)		006	162 (80)	
002			007	168 (92)	
003			008		
004			009		
005			010		

Minimum size × 100 = ≥75% Composite mean length Bio-4-FF-B6 mm

Maximum size

Notes (e.g., morphological anomalies):

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02590.30 Sampling Date and Time: 3-16-99 PM
3-17-99 PM

SITE LOCATION:

Site Name/Number: NCBC Gulfport

County/Parish: Harrison County Lat/Long.:

Waterbody Name/Segment Number:

Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY Creek

Site Description

Collection Method:

Collector Name: C² Environmental Services, Inc
(print and sign)

Agency: Phone: 770 986-8092

Address: 4122 Admiral Dr., Atlanta, GA 30341

FISH COLLECTED:

Primary Secondary Consumer
~~Bottom Feeder~~—Species Name: Brook Silverside, Spottail Shiner

Composite Sample No.: Bio-S-WF-SS Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001	(9-21g) 60-Avg Length		006		
002	(7-19g) 80-Avg Length		007		
003			008		
004			009		
005			010		

Minimum size × 100 = ≥75%

Maximum size

Composite mean length mm

Notes (e.g., morphological anomalies):

Predator—Species Name: Largemouth Bass

Composite Sample No.: Bio-S-WF-LB Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001	265 (242g)		006	355 (755g)	F (with eggs)
002			007		
003			008		
004			009		
005			010		

Minimum size × 100 = ≥75%

Maximum size

Composite mean length mm

Bio-S-FF-LB

Notes (e.g., morphological anomalies): Slight deformity on Caudal Fin (006)

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: 3-19-97 AM

SITE LOCATION:

Site Name/Number: NCBC Gulfport

County/Parish: Harrison County Lat/Long.:

Waterbody Name/Segment Number:

Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY Creek

Site Description

Collection Method:

Collector Name: C² Environmental Services, Inc
(print and sign)

Agency: Phone: 770 986-8092

Address: 4122 Admiral Dr., Atlanta, GA 30341

FISH COLLECTED:

Bottom Feeder—Species Name: Yellow Bullhead

Composite Sample No.: Bio-S-FF-CF Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001	260 (278)		006		
002			007		
003			008		
004			009		
005			010		

Minimum size ____ x 100 = ____ >75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies):

Predator—Species Name:

Composite Sample No.: Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001			006		
002			007		
003			008		
004			009		
005			010		

Minimum size ____ x 100 = ____ ≥75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies):

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: 3-16-99 AM. 3-17-99 AM

SITE LOCATION:

Site Name/Number: NCBC Gulfport

County/Parish: Harrison County Lat/Long.:

Waterbody Name/Segment Number:

Waterbody Type: ☐ RIVER ☒ LAKE ☐ ESTUARY

Site Description

Collection Method:

Collector Name: C² Environmental Services, Inc
(print and sign)

Agency: Phone: 770 986-9092

Address: 4122 Admiral Dr., Atlanta, GA 30341

FISH COLLECTED:

Bottom Feeder—Species Name: Channel Catfish

Composite Sample No.: B10-6-WF-CF Number of Individuals: 2

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001	280 (210g)		006	450 (1250g)	F (with eggs)
002	395 (700g)		007		
003			008	550 (2500)	F (with eggs)
004			009		
005			010		

Replicate

Minimum size ____ x 100 = ____ ≥75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies): B10-6-FF-CF

Predator—Species Name: Largemouth Bass

Composite Sample No.: B10-6-WF-LB Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001	258 (252g)		006	300 (450g)	F
002	230 (152g)	F	007	346 (660)	F (with eggs)
003			008		
004	310 (490g)	Replicate	009		
005			010		

Minimum size ____ x 100 = ____ ≥75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies): B10-6-FF-LB

004 - Injured during collection

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: 2-16-99 AM

SITE LOCATION:

Site Name/Number: NCBC Gulfport

County/Parish: Harrison County Lat/Long.:

Waterbody Name/Segment Number:

Waterbody Type: ☐ RIVER ☒ LAKE ☐ ESTUARY

Site Description

Collection Method:

Collector Name: C² Environmental Services, Inc
(print and sign)

Agency: Phone: 770 986-9092

Address: 4122 Admiral Dr., Atlanta, GA 30341

FISH COLLECTED: ~~Primary~~ Secondary Consumer

~~Bottom Feeder~~ Species Name: Striped Mullet

Composite Sample No.: B10-6-WF-SM Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001	172 (60g)		006		
002	180 (64)		007		
003	175 (62)		008		
004	163 (52		009		
005			010		

Minimum size × 100 = ____ >75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies):

Predator—Species Name:

Composite Sample No.: Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001			006		
002			007		
003			008		
004			009		
005			010		

Minimum size × 100 = ____ ≥75% Composite mean length ____ mm

Maximum size

Notes (e.g., morphological anomalies):

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: 3-19-99 - AM

SITE LOCATION:

Site Name/Number: NCBC Gulfport

County/Parish: Harrison County Lat/Long.:

Waterbody Name/Segment Number:

Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY

Site Description

Collection Method:

Collector Name: C² Environmental Services, Inc
(print and sign)

Agency: Phone: 770 986-9092

Address: 4122 Admiral Dr., Atlanta, GA 30341

FISH COLLECTED:

~~Bottom Feeder~~ Secondary Species Name: Largemouth Bass

Composite Sample No.: Bio-7-WF-LB Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001	188 (80)	F (w/eggs)	006	262 (265g)	
002	225 (162)		007	253 (210)	
003			008		
004			009		
005			010		

Minimum size × 100 = ≥75%

Composite mean length Bio-7-FF-LB mm

Maximum size

Notes (e.g., morphological anomalies):

Predator ~~Species~~ Primary Species Name: Striped Mullet

Composite Sample No.: Bio-7-WF-SM Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001	178 (50g)		006		
002	~~189~~ 163 (48)		007		
003			008		
004			009		
005			010		

Minimum size × 100 = ≥75%

Composite mean length mm

Maximum size

Notes (e.g., morphological anomalies)

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

Field Record for Fish Contaminant Monitoring Program — Screening Study

Project Number: 02540.30 Sampling Date and Time: 3-18-99 AM

SITE LOCATION:

Site Name/Number: NCBC Gulfport

County/Parish: Harrison County Lat/Long.:

Waterbody Name/Segment Number:

Waterbody Type: ☐ RIVER ☐ LAKE ☐ ESTUARY

Site Description

Collection Method:

Collector Name: C² Environmental Services, Inc
(print and sign)

Agency: Phone: 770 986-8092

Address: 4122 Admiral Dr., Atlanta, GA 30341

FISH COLLECTED:

Bottom Feeder—Species Name: Black Bullhead

Composite Sample No.: B20-8-WF-OF Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001	175 (95)		006	275 (330) g	
002	198 (112)		007	220 (158)	
003			008		
004			009		
005			010		

Minimum size ____ x 100 = ____ ≥75% Composite mean length B10-8-FF-CF mm

Maximum size

Notes (e.g., morphological anomalies): 006 (Deformed Dorsal Spine)

Predator—Species Name: Largemouth Bass

Composite Sample No.: B10-8-WF-LB Number of Individuals:

Fish #	Length (mm)	Sex	Fish #	Length (mm)	Sex
001	260 (254) g		006	288 (345) g	F (w/ eggs)
002	230 (170)		007	265 (270)	
003			008		
004			009		
005			010		

Minimum size ____ x 100 = ____ ≥75% Composite mean length B10-8-FF-LB mm

Maximum size

Notes (e.g., morphological anomalies):

Figure A-2 Example of a Field Record for Fish Contaminant Monitoring Program—Screening Study

50 Bathurst Drive, Unit 12
Waterloo, Ontario N2V 2C5
FAX (519) 747-3806
Phone (519) 747-2575

CHAIN OF CU[illegible]Y RECORD AND AGREEMENT TO PERFORM SERVICES

CLIENT PROJECT NUMBER: 0254030	CANVIRO QUOTATION NUMBER:
COMPANY NAME: [illegible] Lawson Associates	CLIENT PURCHASE ORDER NUMBER:
PROJECT MANAGER: Penny Baxter	PHONE NUMBER: (923) 531-1922
Requested Completion Date:	REGULATIONS: REG 347 ☐ MISA ☐ ODWO ☐ OTHER ___
Sample Disposal: Dispose ☒ Return ☐	

FOR LAB USE ONLY

LOT NO. 2 3

ENTERED BY:

DATE ENTERED:

SAMPLING Date	Time	Type COMP.	Type GRAB	Matrix WATER	Matrix SOIL	Matrix OTHER	SAMPLE DESCRIPTION (This Description Will Appear On The Report)	NUMBER OF CONTAINERS	Dioxin 3290	SAMPLE REMARKS
16/99 17/99		X				X	BIO-6-WF-CF	2	X	tissue
16/99		X				X	BIO-6-WF-SM	1	X	tissue
16/99		X				X	BIO-6-WF-LB	2	X	tissue
16/99		X				X	BIO-6-WF-LBR	1	X	tissue replicate
17/99		X				X	BIO-6-FF-CF	1	X	tissue
17/99		X				X	BIO-6-FF-CFR	1	X	tissue - replicate
16/99		X				X	BIO-6-FF-LB	1	X	tissue
17/99		X				X	BIO-4-FF-CF	1	X	tissue
16/99		X				X	BIO-1-FF-CF	1	X	tissue
17/99		X				X	BIO-2-FF-CF	1	X	tissue
17/99		X				X	BIO-2-WF-CF	1	X	tissue
18/99		X				X	BIO-1-FF-RE	1	X	tissue
18/99		X				X	BIO-2-WF-GS	1	X	tissue

SAMPLED BY: (SIGNATURE) [signature]	DATE 3/19/99	TIME 1640
RECEIVED BY: (SIGNATURE)	DATE	TIME
RECEIVED BY: (SIGNATURE)	DATE	TIME
RECEIVED BY: (SIGNATURE)	DATE	TIME

COMMENTS:

SHIPPED BY: UPS ☐ HAND DELIVERED ☐ FED-EX ☐ PUROLATOR ☐ OTHER ___

SHIPPING NUMBER

RECEIVED AT LAB: (SIGNATURE) DATE TIME

DISTRIBUTION: ORIGINAL - LAB, Yellow - LAB, Pink - Client

REV 9/

Analytical Laboratories Ltd.
50 Bathurst Drive, Unit 12
Waterloo, Ontario N2V 2C5
FAX (519) 747-3806
Phone (519) 747-2575

Page ___ of ___

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

CLIENT PROJECT NUMBER	CANVIRO QUOTATION NUMBER
02540.30	
COMPANY NAME: Harding Lawson Associates	CLIENT PURCHASE ORDER NUMBER
PROJECT MANAGER (MR [X] MS [ ] DR [ ]): Penny Baxter	PHONE NUMBER: (423) 531-1922
Requested Completion Date: Standard TAT	REGULATIONS: REG 347 [ ] MISA [ ] ODWO [ ] OTHER ___
	Sample Disposal: Dispose [ ] Return [ ]

SAMPLING Date	SAMPLING Time	Type COMP.	Type GRAB	Matrix WATER	Matrix SOIL	Matrix OTHER	SAMPLE DESCRIPTION (This Description Will Appear On The Report)	NUMBER OF CONTAINERS	ANALYSES REQUESTED: B250 (Dioxin)	SAMPLE REMARKS
3/16/99	1435		X		X		BIO-SD-5	1	X	Sediment
3/16/99	1435		X		X		BIO-SD-5D (duplicate)	1	X	
3/16/99	1500		X		X		BIO-SD-6	1	X	
3/16/99	1700		X		X		BIO-SD-2	1	X	
3/17/99	0900		X		X		BIO-SD-1	1	X	
3/17/99	1000		X		X		BIO-SD-3	1	X	
3/17/99	1245		X		X		BIO-SD-8	1	X	
3/17/99	1315		X		X		BIO-SD-4	1	X	
3/17/99	1400		X		X		BIO-SD-7	1	X	
3/18/99	0945		X	X			BIO-FB-1	1	X	potable water rinsate
3/18/99	0945		X	X			BIO-RB-1	1	X	

FOR LAB USE ONLY

LOT NO. ___

ENTERED BY: ___

DATE ENTERED: ___

SAMPLED BY: (SIGNATURE)	DATE	TIME
	3/18/99	1330
RECEIVED BY: (SIGNATURE)	DATE	TIME
RECEIVED BY: (SIGNATURE)	DATE	TIME
RECEIVED BY: (SIGNATURE)	DATE	TIME

COMMENTS:

SHIPPED BY: UPS [ ] HAND DELIVERED [ ] FED-EX [ ] PUROLATOR [ ] OTHER ___

SHIPPING NUMBER ___

RECEIVED AT LAB: (SIGNATURE) DATE TIME

Analytical Laboratories Ltd.
50 Bathurst Drive, Unit 12
Waterloo, Ontario N2V 2C5
FAX (519) 747-3806
Phone (519) 747-2575

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

CLIENT PROJECT NUMBER: 02540.30

CANVIRO QUOTATION NUMBER:

COMPANY NAME: Harding Lawson Associates

CLIENT PURCHASE ORDER NUMBER:

PROJECT MANAGER: MR / MS / DR Penny Baker

PHONE NUMBER: (413) 521-1922

Requested Completion Date:

REGULATIONS: REG 347 ☐ MISA ☐ ODWO ☐ OTHER ____

Sample Disposal: Dispose ☒ Return ☐

FOR LAB USE ONLY

LOT NO.

ENTERED BY:

DATE ENTERED:

SAMPLING Date	SAMPLING Time	Type COMP.	Type GRAB	Matrix WATER	Matrix SOIL	Matrix OTHER	SAMPLE DESCRIPTION (This Description Will Appear On The Report)	NUMBER OF CONTAINERS	ANALYSES REQUESTED	SAMPLE REMARKS
/16/99		X				X	BIO-5-FF-LB	1	X	tissue
/16/99		X				X	BIO-5-WF-SS	2	X	tissue - 2 [illegible]
/16/99		X				X	BIO-5-WF-LB	1	X	tissue
3/18/99		X				X	BIO-2-FF-LB	1	X	tissue
3/18/99		X				X	BIO-2-WF-LB	1	X	tissue
3/18/99		X				X	BIO-3-WF-BG	1	X	tissue
3/18/99		X				X	BIO-3-FF-BG	1	X	tissue
3/17/99		X				X	BIO-3-WF-CS	1	X	tissue
3/18/99		X				X	BIO-4-FF-BG	1	X	tissue
3/18/99		X				X	BIO-4-WF-CF	1	X	tissue
3/18/99		X				X	BIO-4-WF-BG	1	X	tissue
3/19/99		X				X	BIO-5-FF-CF	1	X	tissue
3/19/99		X				X	BIO-7-WF-LB	1	X	tissue

SAMPLED BY: (SIGNATURE)	DATE	TIME
[signature]	3/19/99	1640
RECEIVED BY: (SIGNATURE)	DATE	TIME
RECEIVED BY: (SIGNATURE)	DATE	TIME
RECEIVED BY: (SIGNATURE)	DATE	TIME

COMMENTS:

SHIPPED BY: UPS ☐ HAND DELIVERED ☐ FED-EX ☐ PUROLATOR ☐ OTHER ____

SHIPPING NUMBER

RECEIVED AT LAB: (SIGNATURE) DATE TIME

Analytical Laboratories Ltd.
50 Bathurst Drive, Unit 12
Waterloo, Ontario N2V 2C5
FAX (519) 747-3806
Phone (519) 747-2575

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

CLIENT PROJECT NUMBER

CANVIRO QUOTATION NUMBER

COMPANY NAME: Gartling Lawson Associates

CLIENT PURCHASE ORDER NUMBER

REPORT TO: Penny Baxter

PHONE NUMBER: (423) 531-1922

Requested Completion Date: Standard TAT

REGULATIONS: REG 347 ☐ MISA ☐ ODWO ☐ OTHER ☐

Sample Disposal: Dispose ☒ Return ☐

FOR LAB USE ONLY

LOT NO. _____

ENTERED BY: _____

DATE ENTERED: _____

SAMPLING Date	SAMPLING Time	Type COMP.	Type GRAB	Matrix WATER	Matrix SOIL	Matrix OTHER	SAMPLE DESCRIPTION (This Description Will Appear On The Report)	NUMBER OF CONTAINERS	ANALYSES REQUESTED: Dioxin 8290	SAMPLE REMARKS
3/19/99		X				X	BIO-7-FF-LB	1	X	tissue
3/19/99		X				X	BIO-7-WF-SM	1	X	tissue
3/19/99		X				X	BIO-8-FF-CF	1	X	tissue
3/19/99		X				X	BIO-8-WF-LB	1	X	tissue
3/18/99		X				X	BIO-8-WF-CF	1	X	tissue
3/18/99		X				X	BIO-8-FF-LB	1	X	tissue

3/19/99

SAMPLED BY: (SIGNATURE) _____ DATE 3/19/99 TIME 16:40

RECEIVED BY: (SIGNATURE) _____ DATE _____ TIME _____

RECEIVED BY: (SIGNATURE) _____ DATE _____ TIME _____

RECEIVED BY: (SIGNATURE) _____ DATE _____ TIME _____

COMMENTS:

SHIPPED BY: UPS ☐ HAND DELIVERED ☐ SHIPPING NUMBER

FED-EX ☐ PUROLATOR ☐ OTHER _____

RECEIVED AT LAB: (SIGNATURE) DATE TIME

REV 01

Project Number	Collecting Agency (name, address, phone)
02540.30	C² Env. Services Inc
Sampling Site (name and/or ID number)	**Sampler (name and signature)**
BIO-5-WF-LB	Chris Cow
Composite Number/Specimen Number(s)	**Chemical Analyses**	**Study Type**
NA	Dioxin 8290	
Sampling Date (d/m/yr)/Time (24-hr clock)	☐ All target analytes ☐ Others (specify) Dioxin 8290	**Screening** X	**Intensive** Phase I ☐ Phase II ☐
16/7/99			
Species Name or Code	**Processing**		**Type of Ice**	
Largemouth Bass	**Whole Body**	**Resection**	**Wet**	**Dry**
Comments	X		X	

Species Name or Code: Largemouth Bass LB
Total Length or Size (cm): 24.5mm 2425
Specimen Number: 1 fish
Sampling Site (name/number): BIO-5-WF-LB
Sampling Date (d/m/yr): 16/7/99
Time

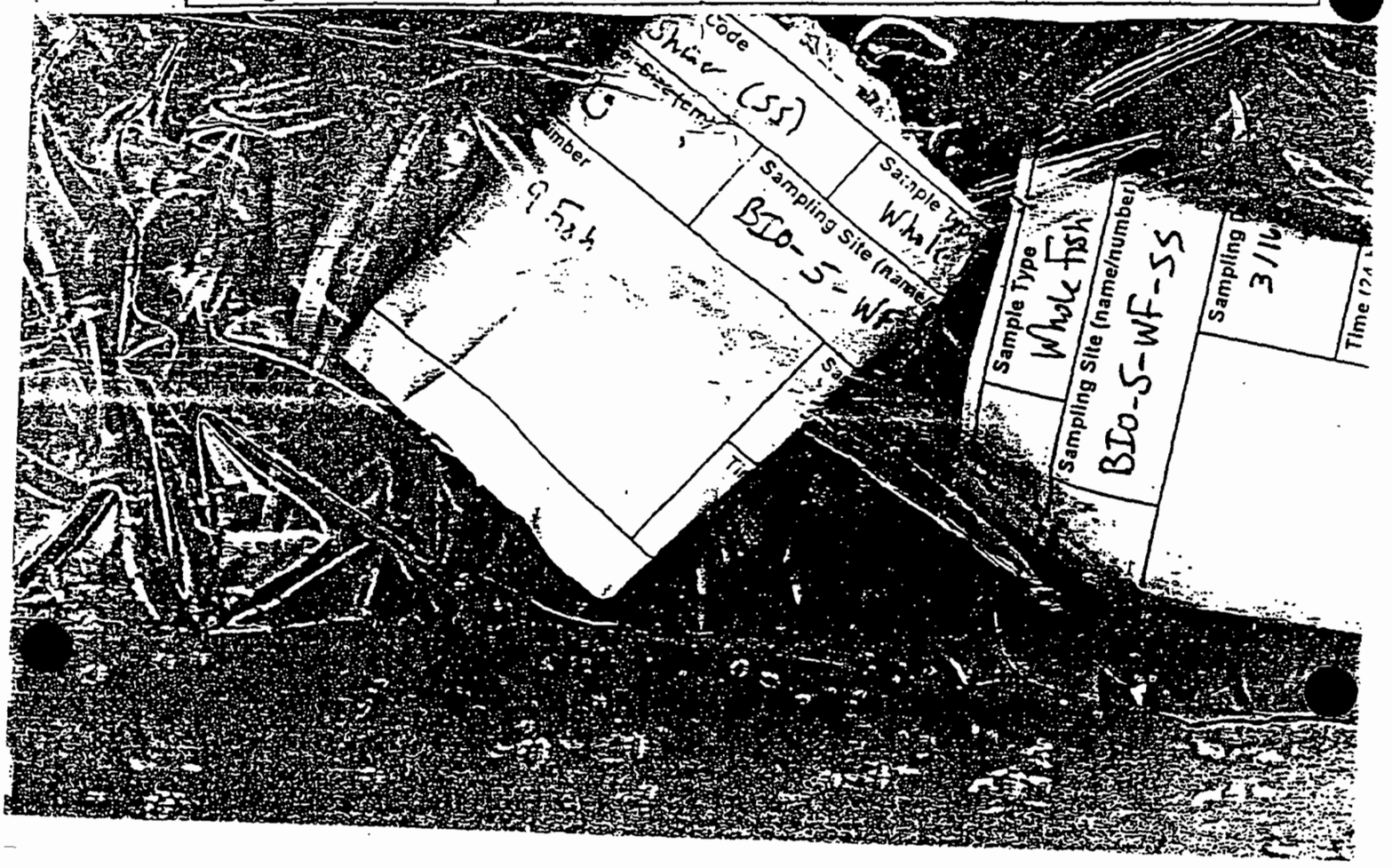
Project Number	Collecting Agency (name, address, phone)
02540.30	C² Env. Services, Inc.

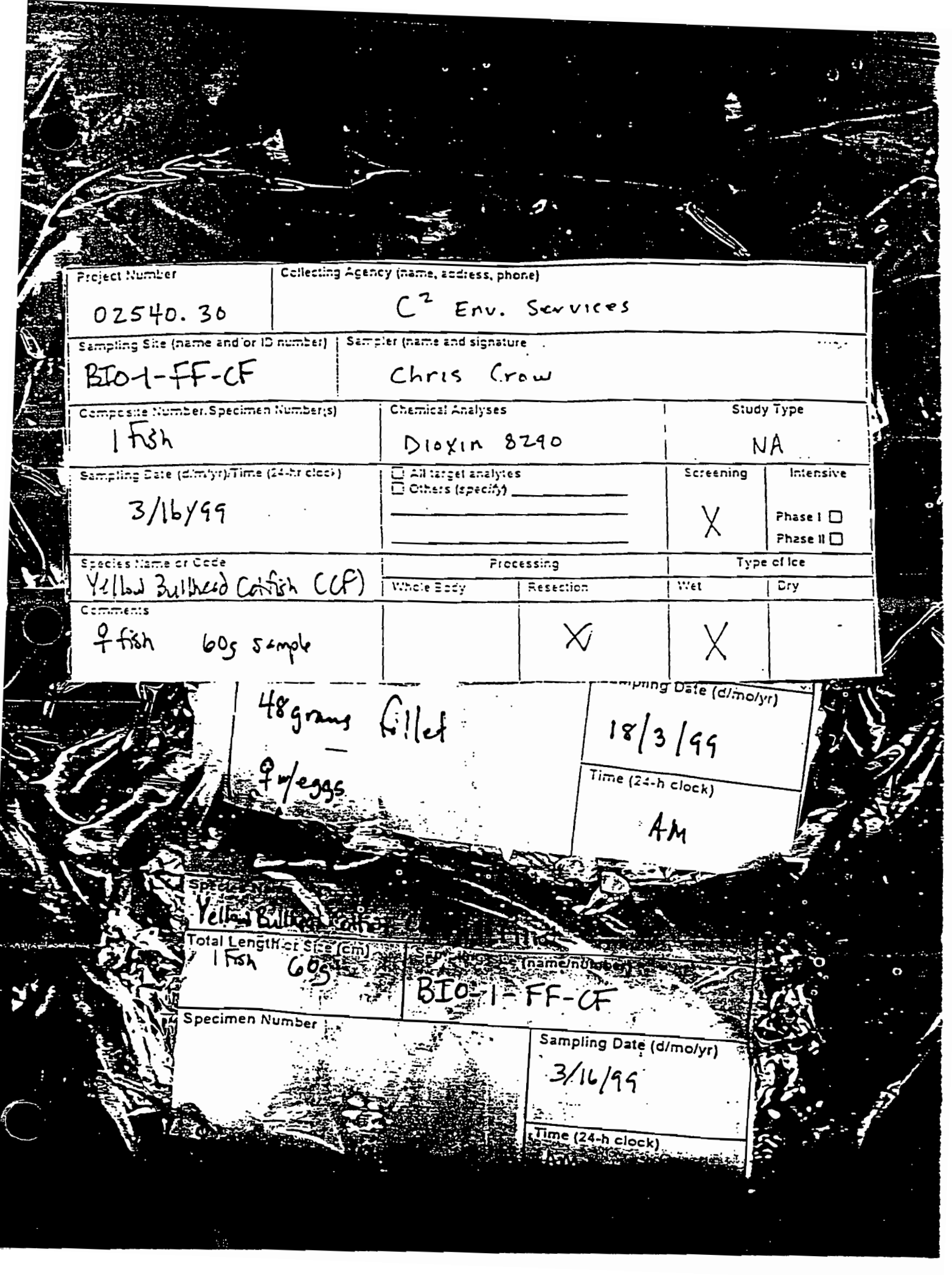
Sampling Site (name and/or ID number)	Sampler (name and signature)
BIO-5-WF-SS	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
NA	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☐ All target analytes ☐ Others (specify) Dioxin	Screening	Intensive
16/3/99 17/3/99		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
	Whole Body	Resection	Wet	Dry
See comments				
Comments: 2 species included Spottail shiner & silverside ~40 g in 2 composite samples	X		X	





Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

Sampling Site (name and/or ID number)	Sampler (name and signature)
BIO-1-FF-CF	Chris Crow

Composite Number.Specimen Number(s)	Chemical Analyses	Study Type
1 Fish	Dioxin 8290	NA

Sampling Date (d/mo/yr)/Time (24-hr clock)	☐ All target analytes ☐ Others (specify) _____	Screening	Intensive
3/16/99		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
	Whole Body	Resection	Wet	Dry
Yellow Bullhead Catfish (CF)				
Comments: 9 fish 60g sample		X	X	

48 grams fillet
9 w/eggs

Sampling Date (d/mo/yr): 18/3/99

Time (24-h clock): AM

Species: Yellow Bullhead Catfish

Total Length of Specimen (cm)	Sample ID (name/number)
1 Fish 60g	BIO-1-FF-CF

Specimen Number	Sampling Date (d/mo/yr)
	3/16/99
	Time (24-h clock)

Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

Sampling Site (name and/or ID number)	Sampler (name and signature
BIO-1-FF-RE	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
6 fish	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☒ All target analytes ☐ Others (specify) _____	Screening	Intensive
18/3/99 pm		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
	Whole Body	Resection	Wet	Dry
Red Ear (RE)				
Comments: 136 grams 4-f w/eggs		X	X	

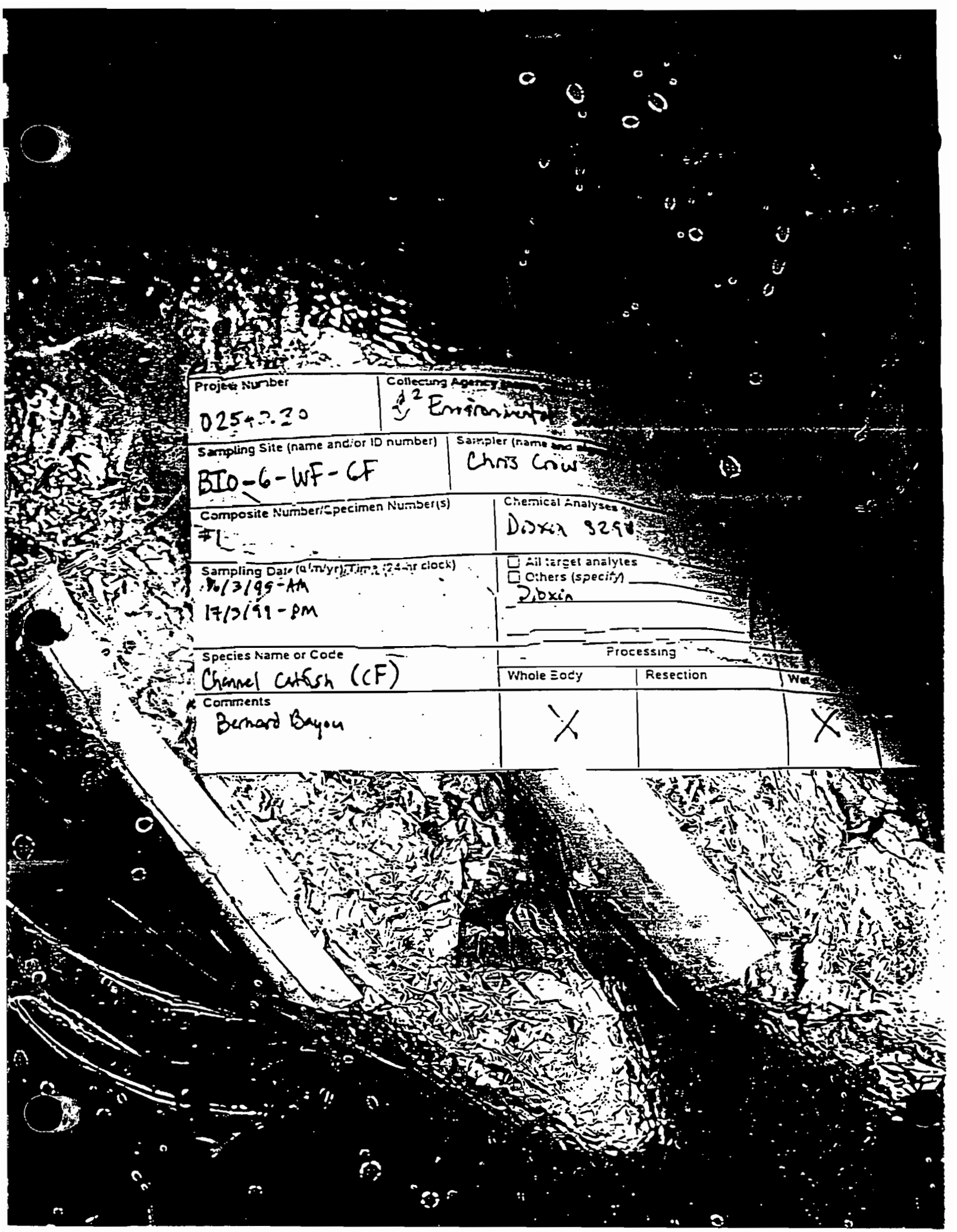
Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

Sampling Site (name and or ID number)	Sampler (name and signature
BIO-2-WF-GS	Chris. Crow

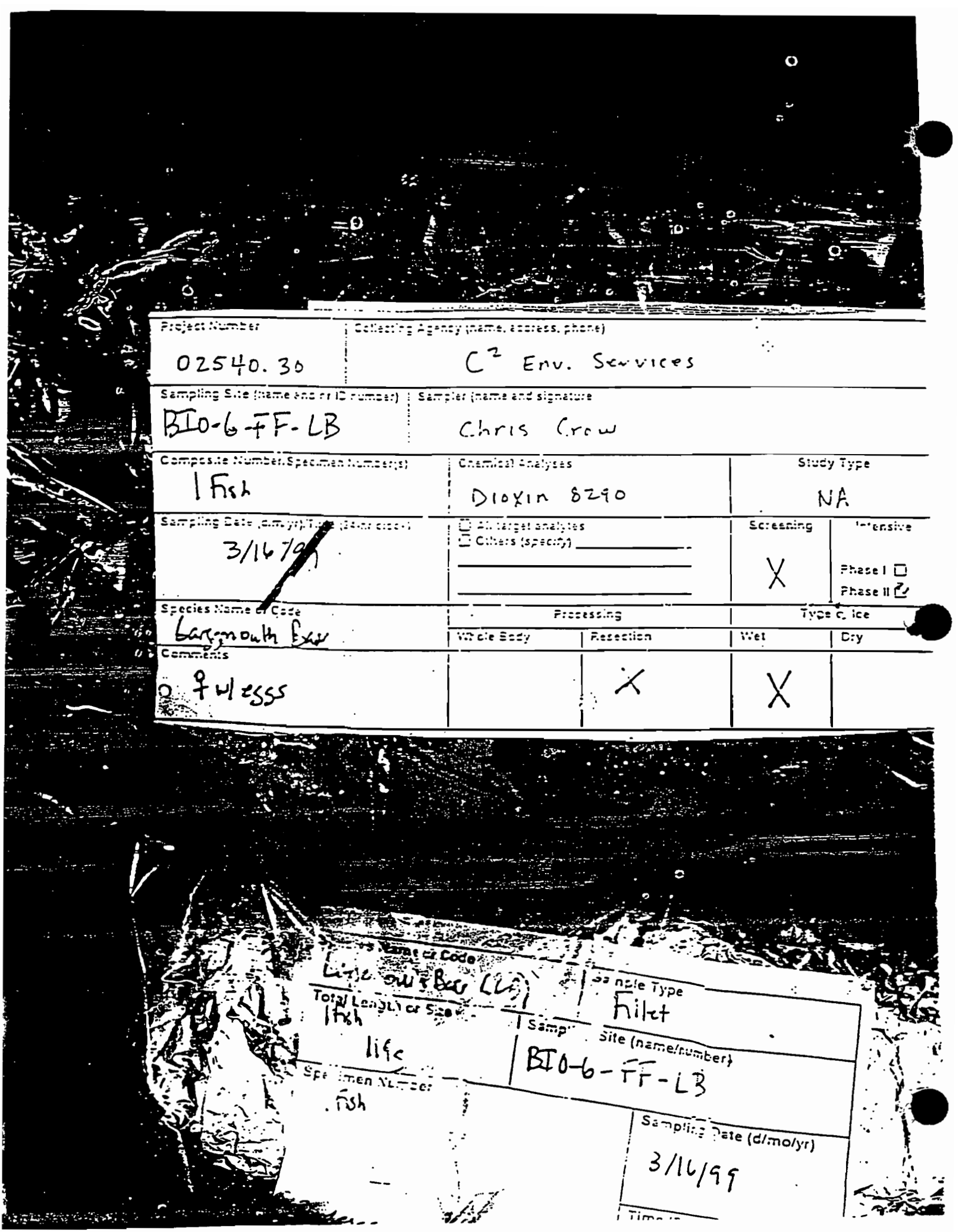
Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
4 fish	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☒ All target analytes ☐ Others (specify) _____	Screening	Intensive
18/3/99 pm		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
	Whole Body	Resection	Wet	Dry
Gizzard shad (GS)				
Comments: 4 fish	X		X	



Project Number	Collecting Agency
02543.20	E² Environmental
Sampling Site (name and/or ID number)	**Sampler (name and ...)**
BIO-6-WF-CF	Chris Crow
Composite Number/Specimen Number(s)	**Chemical Analyses**
#1	Dioxin 8290
Sampling Date (d/m/yr) Time (24-hr clock)	☐ All target analytes ☐ Others (specify) Dioxin
16/3/99 - AM 17/3/99 - PM	
Species Name or Code	**Processing**
Channel Catfish (CF)	Whole Body: X; Resection: ; Wet: X
Comments	
Bernard Bayou	



Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

Sampling Site (name and/or ID number)	Sampler (name and signature)
BIO-6-FF-LB	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
1 Fish	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☐ All target analytes ☐ Others (specify)	Screening	Intensive
3/16/99		X	Phase I ☐ Phase II ☑

Species Name or Code	Processing		Type of Ice	
	Whole Body	Resection	Wet	Dry
Largemouth Bass		X	X	

Comments
♀ w/ eggs

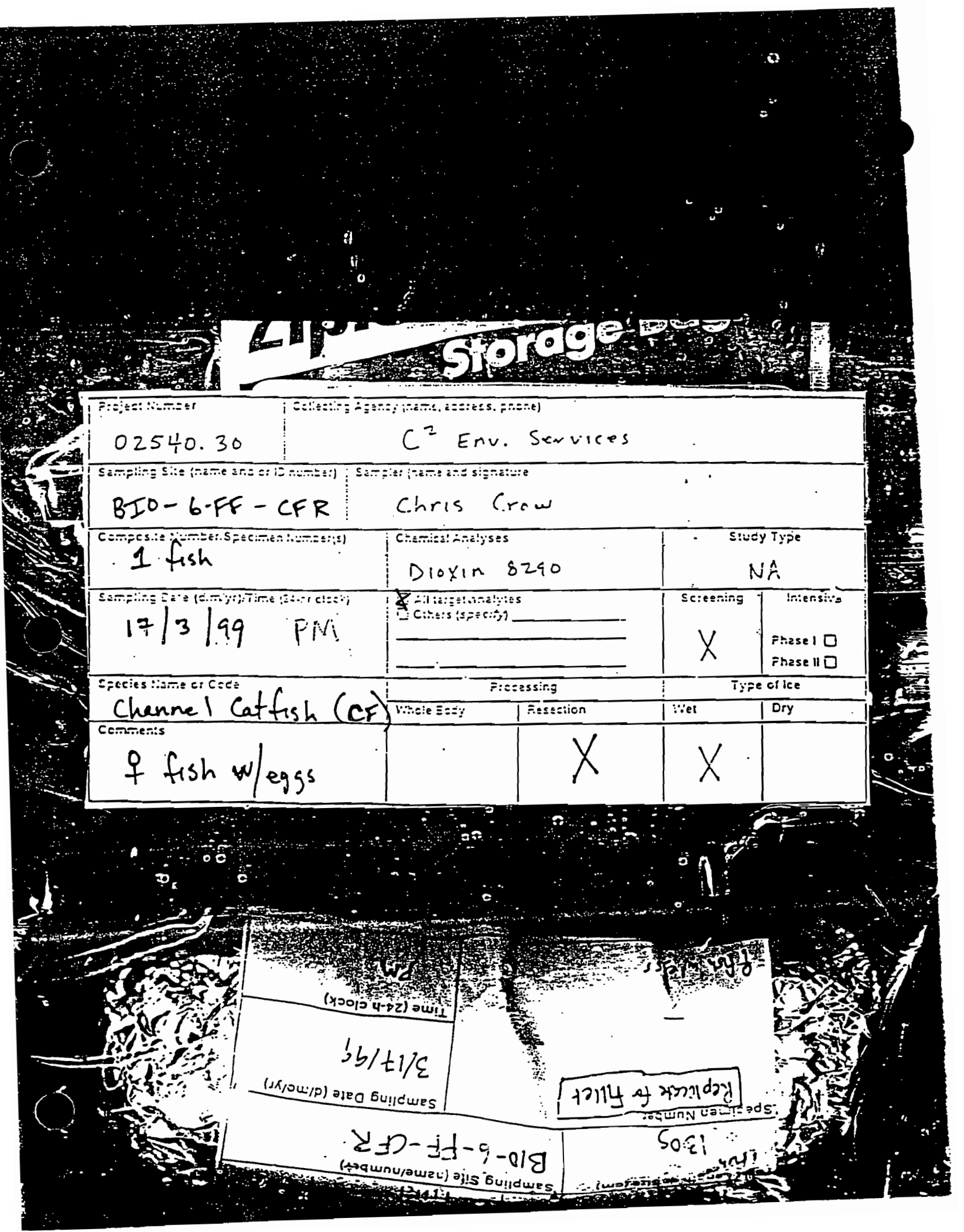
Species Name or Code	Sample Type
Largemouth Bass (LB)	Filet

Total Length or Size	Sampling Site (name/number)
1 fish 11 ft	BIO-6-FF-LB

Specimen Number	Sampling Date (d/mo/yr)
Fish	3/16/99

Time

Storage



Project Number	Collecting Agency (name, address, phone)
02540.30	C² Env. Services

Sampling Site (name and or ID number)	Sampler (name and signature)
BIO-6-FF-CFR	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
1 fish	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)		Screening	Intensive
17/3/99 PM	☒ All target analytes ☐ Others (specify) _____	X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
	Whole Body	Resection	Wet	Dry
Channel Catfish (CF)				

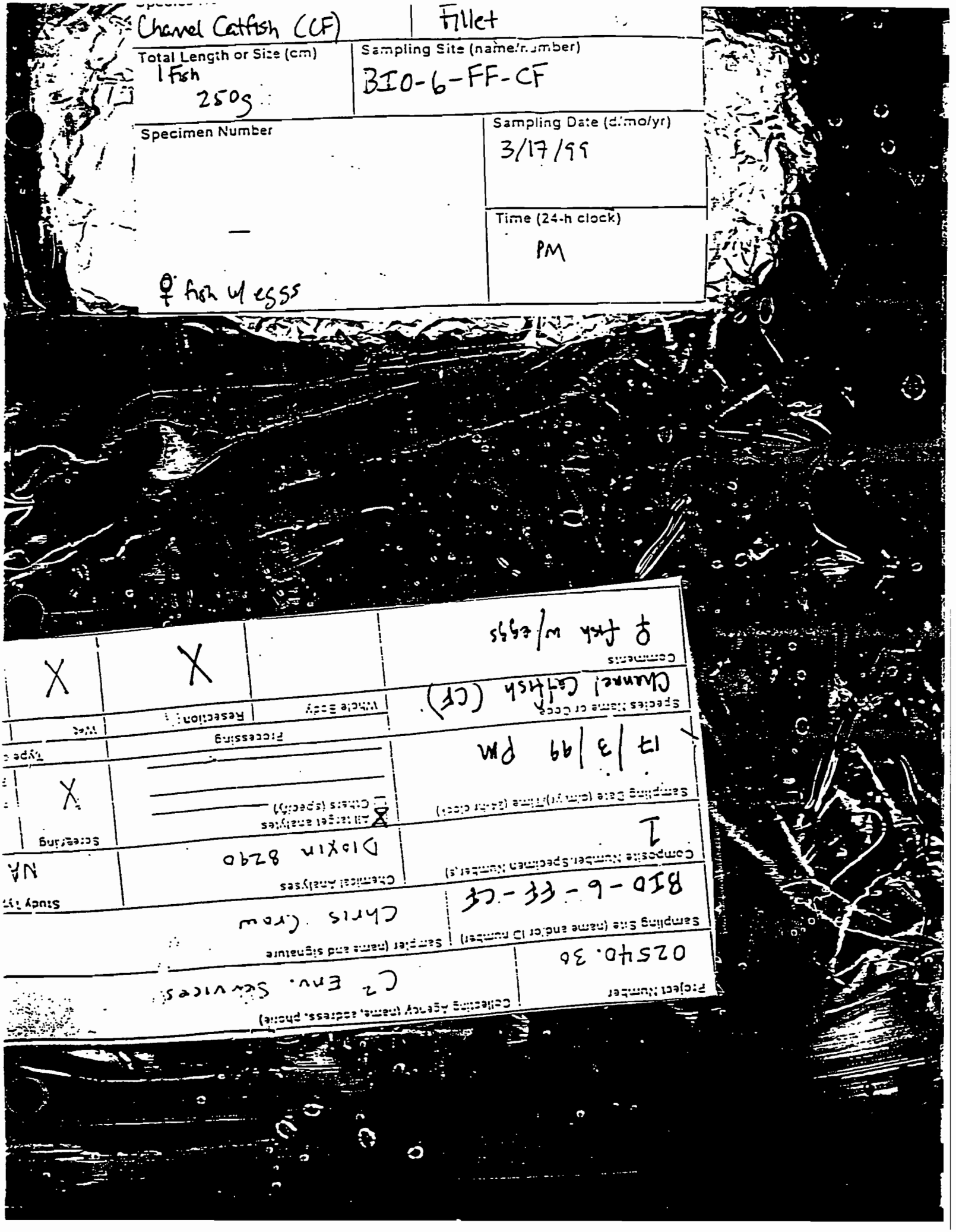
Comments				
♀ fish w/eggs		X	X	

Sampling Site (name/number)
BIO-6-FF-CFR

Specimen Number
Replicate for fillet

Sampling Date (d/mo/yr)
3/17/99

Time (24-h clock)
PM



Species: Channel Catfish (CF) | Fillet

Total Length or Size (cm)	Sampling Site (name/number)
1 Fish 250g	BIO-6-FF-CF

Specimen Number	Sampling Date (d/mo/yr)
—	3/17/99
♀ fish w/ eggs	Time (24-h clock) PM

Project Number	Collecting Agency (name, address, phone)
02540.30	C2 Env. Services

Sampling Site (name and/or ID number)	Sampler (name and signature
BIO-6-FF-CF	Chris Crow

Composite Number:Specimen Number(s)	Chemical Analyses	Study Ty
1	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☒ All target analytes ☐ Others (specify)	Scaling
12/3/99 PM		X

Species Name or Code	Processing			Type c
Channel Catfish (CF)	Whole Body	Resection	Wet	
		X	X	

Comments: ♀ fish w/ eggs

Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

Sampling Site (name and/or ID number)	Sampler (name and signature)
BIO-7-WF-SM	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
2-fish	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☒ All target analytes ☐ Others (specify) _____	Screening	Intensive
19/3/99 AM		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
Stripped Mullet (SM)	Whole Body	Resection	Wet	Dry
Comments: 178 mm - 50g 163 mm - 48g	X		X	

Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

Sampling Site (name and or ID number)	Sampler (name and signature)
BIO-7-WF-LB	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
2 fish	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☐ All target analytes ☐ Others (specify) _____	Screening	Intensive
19/3/99 AM		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
Largemouth Bass (LB)	Whole Body	Resection	Wet	Dry
Comments: 188 mm - 80g 225 mm - 162g	X		X	

Project Number	Collecting Agency (name, address, phone)
02540.30	C² Env. Services

Sampling Site (name and/or ID number)	Sampler (name and signature
BIO-7-FF-LB	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
2 x fish	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☒ All target analytes ☐ Others (specify) _____	Screening	Intensive
19/3/99		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
	Whole Body	Resection	Wet	Dry
Largemouth Bass (LB)				
Comments 1 - ♀ w/eggs Total wt. 132g		X	X	

Project Number	Collecting Agency (name, address, phone)
02540.30	C² Env. Services

Sampling Site (name and/or ID number)	Sampler (name and signature
	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☐ All target analytes ☐ Others (specify)	Screening	Intensive
		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
	Whole Body	Resection	Wet	Dry
Comments			X	

Project Number	Collecting Agency (name, address, phone)
02540.30	E2 Environmental Services

Sampling Site (name and/or ID number)	Sampler (name and signature)
BIO-6-WF-SM	Chris Crow

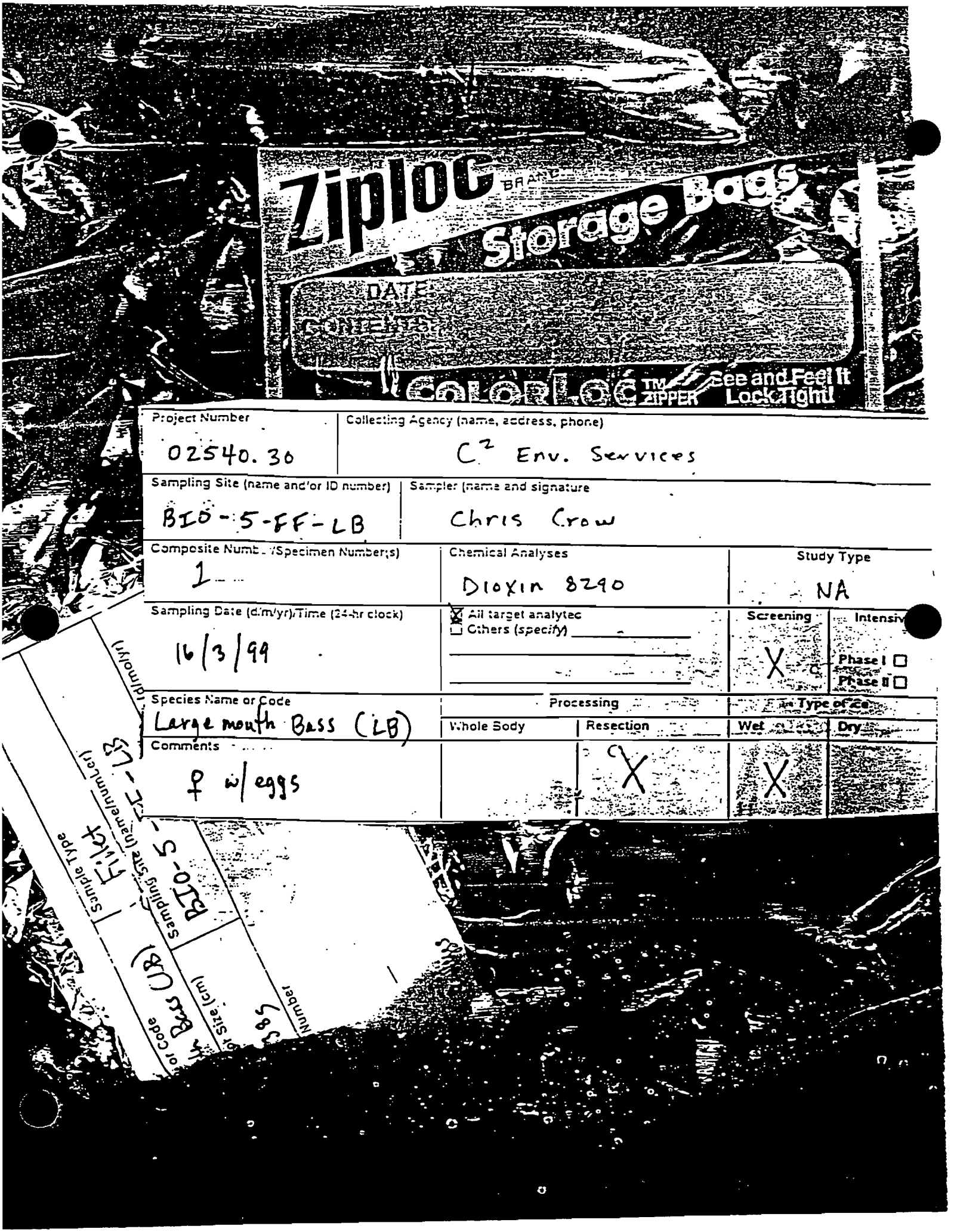
Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
#1	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	All target analytes / others (specify)	Screening	Intensive
4/3/99 AM	Dioxin	X	

Species Name or Code	Processing			
Striped Mullet (SM)	Whole Body	Resection	Wet	Dry
Comments	X		X	

Composite of 4 fish	3/16/99
	Time (24-h clock) AM

Chris Cri..
Number(s)
1
Chemical Analyses
DIOXIN 8290
All target analytes
Others (specify)
DIOXIN
Sampling Date (d/m/yr)/Time (24-hr clock)
16/3/99 AM
Study Type
NA
Intensive
Species Name or Code
Large mouth Bass (LMB)
Processing
Whole Body
Resection
Wet
Dry
Comments
Replicate



Project Number	Collecting Agency (name, address, phone)
02540.30	C² Env. Services

Sampling Site (name and/or ID number)	Sampler (name and signature
BIO-5-FF-LB	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
1	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☒ All target analytes ☐ Others (specify)	Screening	Intensive
16/3/99		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
	Whole Body	Resection	Wet	Dry
Large mouth Bass (LB)		X	X	

Comments
♀ w/eggs

Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

Sampling Site (name and/or ID number)	Sampler (name and signature)
BIO-5-FF-CF	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
1 fish	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	Chemical Analyses	Screening	Intensive
19/3/99 Am	☒ All target analytes ☐ Others (specify) _____	X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
	Whole Body	Resection	Wet	Dry
Catfish (CF)		X	X	

Comments: 290mm - 278g fillet wt. 72g

Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

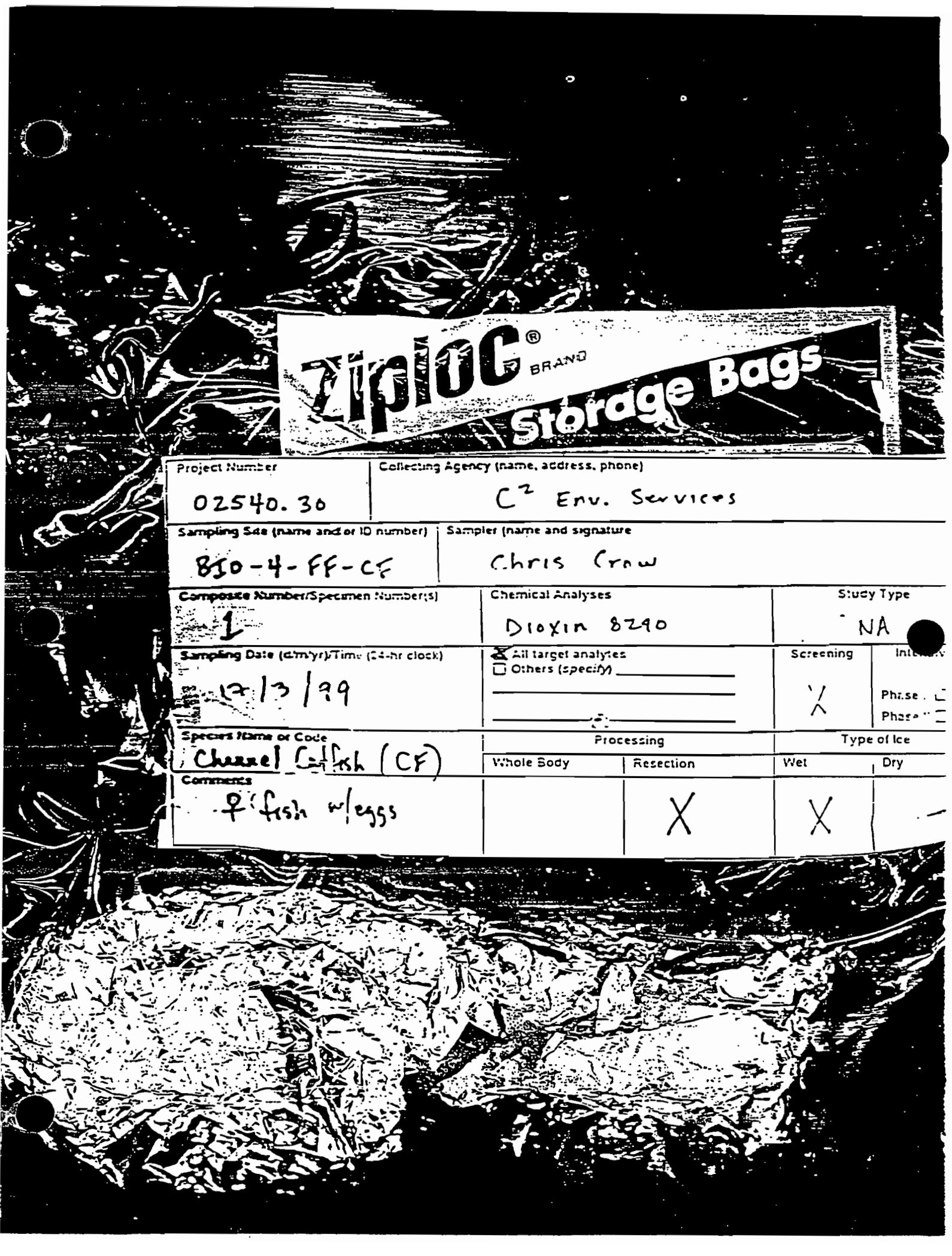
Sampling Site (name and or ID number)	Sampler (name and signature)
	Chris Crow.

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
~~Largemouth Bass (1~~	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	Chemical Analyses	Screening	Intensive
	☐ All target analytes ☐ Others (specify) _____	X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
	Whole Body	Resection	Wet	Dry
			X	

Comments:



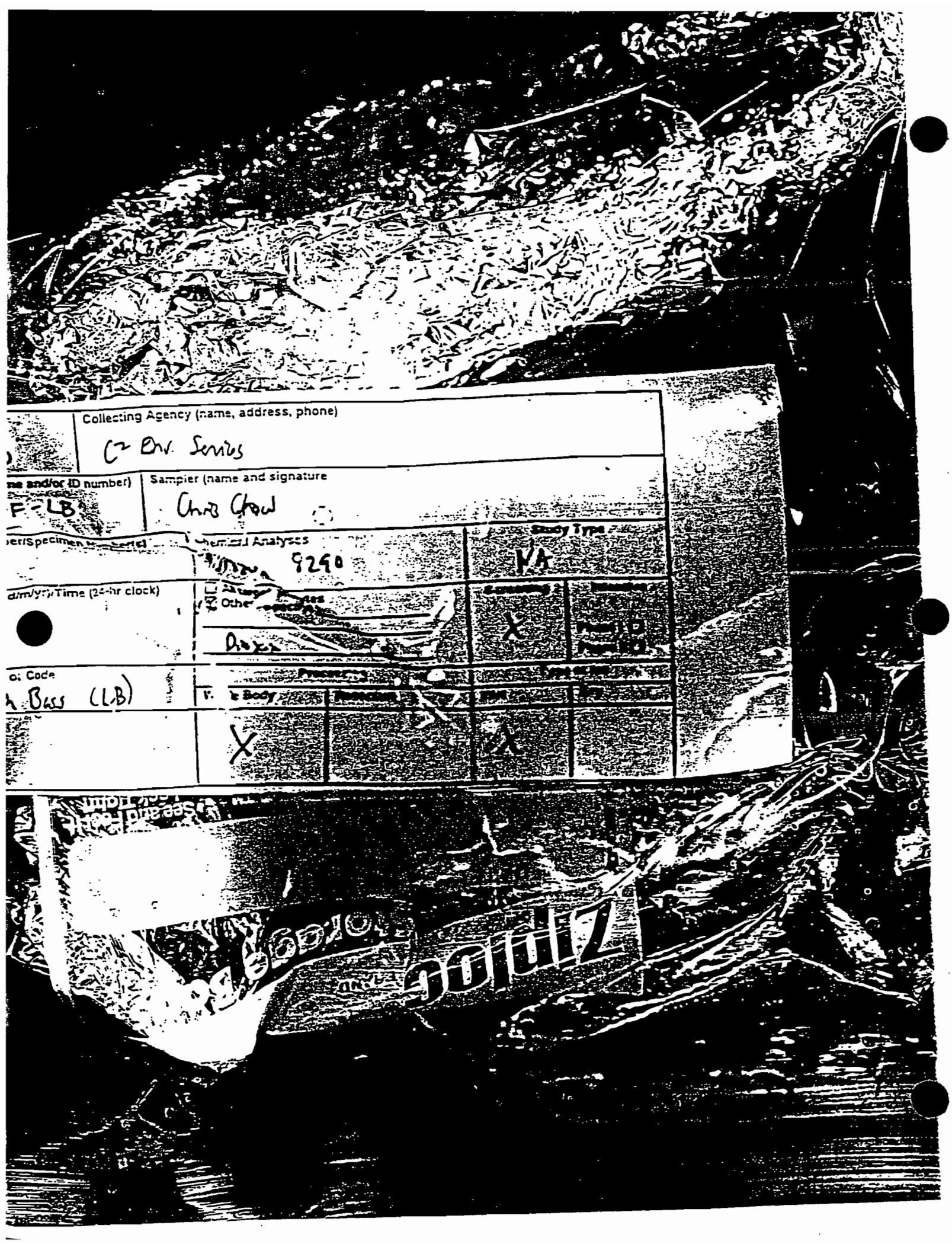
Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

Sampling Site (name and or ID number)	Sampler (name and signature
BIO-4-FF-CF	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
1	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☒ All target analytes ☐ Others (specify)	Screening	Int...
12/13/99		X	Phase ☐ Phase ☐

Species Name or Code	Processing		Type of Ice	
	Whole Body	Resection	Wet	Dry
Channel Catfish (CF)				
Comments: 9 fish w/eggs		X	X	


Collecting Agency (name, address, phone)
C2 Env. Services
me and/or ID number)
F-LB
Sampler (name and signature
Chris Chow
Chemical Analyses
9290
Study Type
NA
d/m/yr)/Time (24-hr clock)
Other
X
Code
Bass (LB)
Body
X
X

Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

Sampling Site (name and/or ID number)	Sampler (name and signature)
BIO-4-WF-CF	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
1 fish	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☒ All target analytes ☐ Others (specify) _____	Screening	Intensive
18/3/99 AM		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
catfish (CF)	Whole Body	Resection	Wet	Dry
Comments: 380mm - 440g	X		X	

Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

Sampling Site (name and or ID number)	Sampler (name and signature)
BIO-4-FF-BG	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
2-fish	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☒ All target analytes ☐ Others (specify) _____	Screening	Intensive
18/3/99 PM		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
Blue gill (BG)	Whole Body	Resection	Wet	Dry
Comments: Total Wt. filleted = 78 grams		X	X	

Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

Sampling Site (name and/or ID number)	Sampler (name and signature)
BIO-3-WF-BG	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
12 fish	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☒ All target analytes ☐ Others (specify) _____	Screening	Intensive
18/3/99 AM		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
	Whole Body	Resection	Wet	Dry
Blue Gill (BG)				
Comments	X		X	

Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

Sampling Site (name and or ID number)	Sampler (name and signature)
BIO-4-WF-BG	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
1 fish	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☒ All target analytes ☐ Others (specify) _____	Screening	Intensive
18/3/99 PM		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
	Whole Body	Resection	Wet	Dry
Blue gill (BG)				
Comments	X		X	
135 mm - 52g				

Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

Sampling Site (name and/or ID number)	Sampler (name and signature)
BIO-3-WF-CS	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
2 fish	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☒ All target analytes ☐ Others (specify) _____	Screening	Intensive
17/3/99 AM		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
	Whole Body	Resection	Wet	Dry
Chub Sucker (CS)				
Comments: one has eroded caudle fin	X		X	

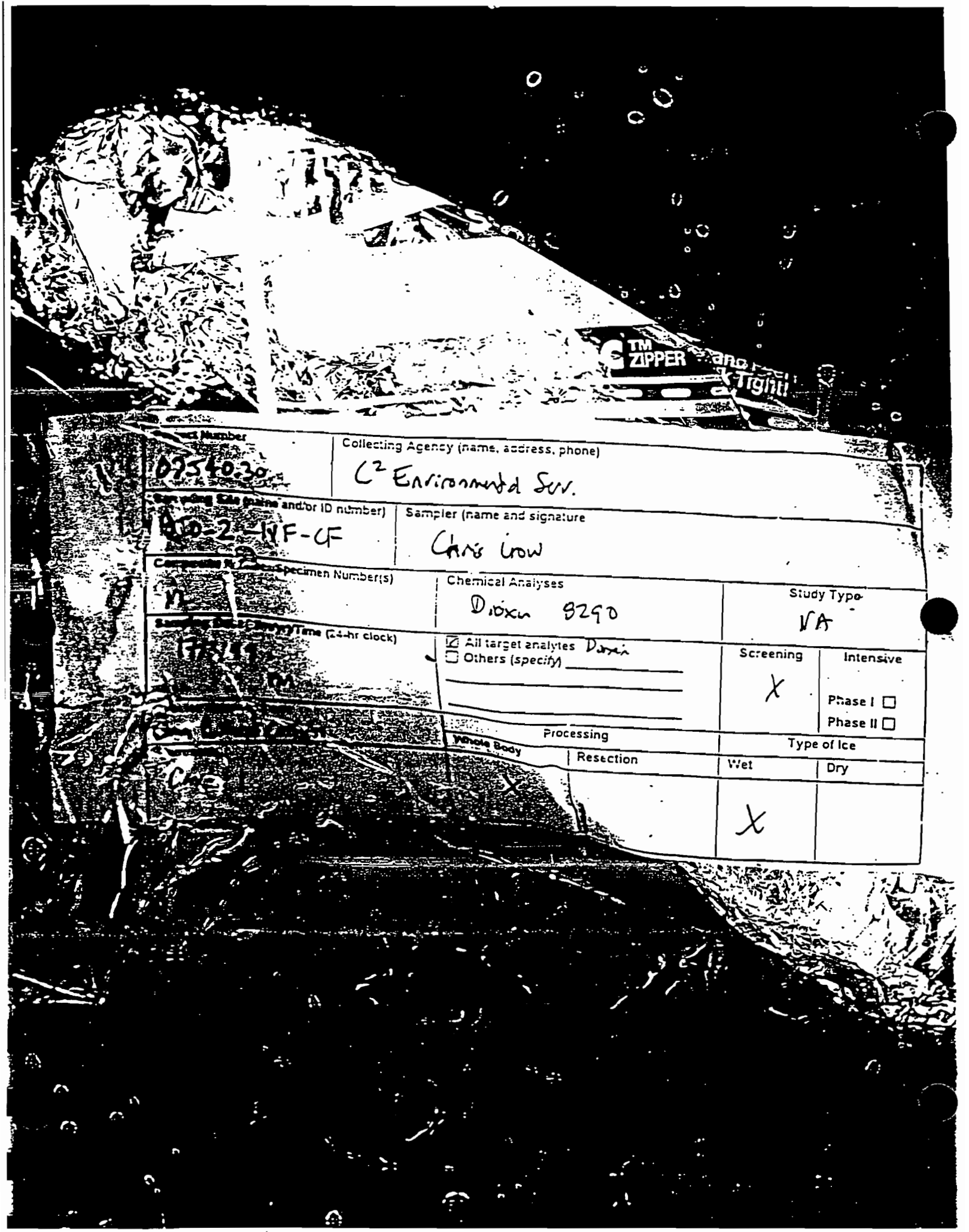
Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

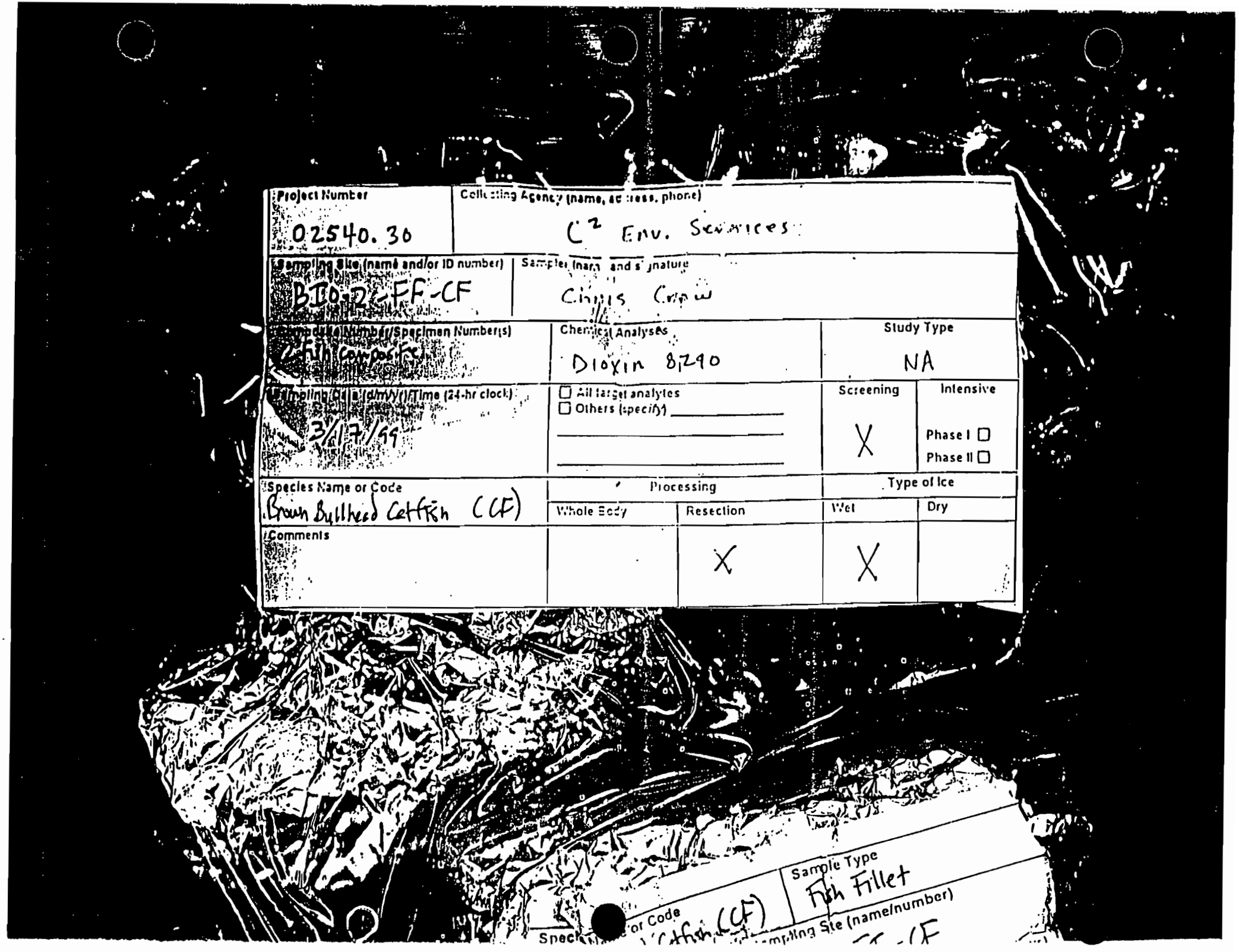
Sampling Site (name and or ID number)	Sampler (name and signature)
BIO-3-FF-BG	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
4 fish	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☒ All target analytes ☐ Others (specify) _____	Screening	Intensive
18/3/99 AM		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
	Whole Body	Resection	Wet	Dry
Blue Gill (BG)				
Comments: Total wt. filleted = 76g		X	X	


TM ZIPPER
Tight!
Collecting Agency (name, address, phone)
C² Environmental Serv.
Sampler (name and signature
Chris Crow
Chemical Analyses
Dioxin 8290
Study Type
VA
All target analytes Dioxin
Others (specify)
Screening
Intensive
Phase I
Phase II
Processing
Whole Body
Resection
Type of Ice
Wet
Dry



Project Number	Collecting Agency (name, address, phone)
02540.30	C² Env. Services
Sampling Site (name and/or ID number)	**Sampler (name and signature)**
BIO-2-FF-CF	Chris Crew
Sample Number(s)/Specimen Number(s)	**Chemical Analyses** / **Study Type**
Fish Composites	Dioxin 8290 / NA
Sampling Date (d/m/y) / Time (24-hr clock)	☐ All target analytes ☐ Others (specify) _____
3/17/99	**Screening:** X **Intensive:** Phase I ☐ Phase II ☐
Species Name or Code	**Processing** / **Type of Ice**
Brown Bullhead Catfish (CF)	Whole Body: / Resection: X / Wet: X / Dry:
Comments	

Sample Type: Fish Fillet

Species Name or Code: Catfish (CF)

Sampling Site (name/number): -CF

Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

Sampling Site (name and/or ID number)	Sampler (name and signature
BIO-2-WF-LB	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
1 fish	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☒ All target analytes ☐ Others (specify) _____	Screening	Intensive
18/3/99 PM		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
	Whole Body	Resection	Wet	Dry
Largemouth Bass (LB)				
Comments: 233 mm – 156 g	X		X	

Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

Sampling Site (name and or ID number)	Sampler (name and signature
BIO-2-FF-LB	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
1 fish	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☐ All target analytes ☐ Others (specify) _____	Screening	Intensive
18/3/99 PM		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
	Whole Body	Resection	Wet	Dry
Largemouth Bass (LB)				
Comments: ♀ w/eggs		X	X	

Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

Sampling Site (name and/or ID number)	Sampler (name and signature
BIO-8-WF-CF	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
2-fish ~~A~~	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☒ All target analytes ☐ Others (specify)	Screening	Intensive
18/3/99 AM		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
Catfish (CF) Black Bullhead	Whole Body	Resection	Wet	Dry
Comments: 175 mm - 95g; 198 mm - 112g	X		X	

Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

Sampling Site (name and/or ID number)	Sampler (name and signature
BIO-8-FF-CF	Chris Crow

Composite Number/Specimen Number(s)	Chemical Analyses	Study Type
2-fish	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☒ All target analytes ☐ Others (specify)	Screening	Intensive
18/3/99 AM		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
Catfish (CF) Black Bullhead	Whole Body	Resection	Wet	Dry
Comments: 1-deformed dorsal spine; 1-♀ w/eggs; Total Wt. 112g		X	X	

Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

Sampling Site (name and/or ID number)	Sampler (name and signature)
BIO-8-WF-LB	Chris Crow

Composite Number.Specimen Number(s)	Chemical Analyses	Study Type
2-fish	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☒ All target analytes ☐ Others (specify) _____	Screening	Intensive
18/3/99 AM		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
Largemouth Bass (LB)	Whole Body	Resection	Wet	Dry
Comments 260mm - 254g 230mm - 170g	X		X	

Project Number	Collecting Agency (name, address, phone)
02540.30	C^2 Env. Services

Sampling Site (name and or ID number)	Sampler (name and signature)
BIO-8-FF-LB	Chris Crow

Composite Number.Specimen Number(s)	Chemical Analyses	Study Type
2-fish	Dioxin 8290	NA

Sampling Date (d/m/yr)/Time (24-hr clock)	☒ All target analytes ☐ Others (specify) _____	Screening	Intensive
18/3/99 AM		X	Phase I ☐ Phase II ☐

Species Name or Code	Processing		Type of Ice	
Largemouth Bass (LB)	Whole Body	Resection	Wet	Dry
Comments fillet wt. 223g		X	X	

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-1	3/16/99	BIO-1-FF-CF	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	1,2,3,4,6,7,8-HpCDD		<	3.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	1,2,3,4,6,7,8,9-OCDD		<	6.7	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	Total TCDD		<	1.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	Total PeCDD		<	1.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	Total HxCDD		<	3.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	Total HpCDD		<	3.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	Total TCDF		<	1.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	Total PeCDF		<	1.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	Total HxCDF		<	3.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	Total HpCDF		<	3.3	ng/kg	U
BIO-1	3/16/99	BIO-1-FF-CF	Total TEQ	0			ng/kg	
BIO-1	8/26/99	BIO-1-FF-CF	2,3,7,8-TCDD	2.12		1	pg/g	EMP
BIO-1	8/26/99	BIO-1-FF-CF	1,2,3,7,8-PeCDD		<	1	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	1,2,3,4,6,7,8-HpCDD		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	1,2,3,4,6,7,8,9-OCDD		<	5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	2,3,7,8-TCDF		<	1	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	1,2,3,4,7,8-HxCDF		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	Total TCDD		<	1	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	Total PeCDD		<	1	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	Total HxCDD		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	Total HpCDD		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	Total TCDF		<	1	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	Total PeCDF		<	1	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	Total HxCDF		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	Total HpCDF		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-CF	Total TEQ	0			pg/g	
BIO-1	8/26/99	BIO-1-FF-LB	2,3,7,8-TCDD	4.97		1	pg/g	
BIO-1	8/26/99	BIO-1-FF-LB	1,2,3,7,8-PeCDD		<	1	pg/g	U

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-1	8/26/99	BIO-1-FF-LB	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	1,2,3,4,6,7,8-HpCDD		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	1,2,3,4,6,7,8,9-OCDD		<	5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	2,3,7,8-TCDF		<	1	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	1,2,3,4,7,8-HxCDF		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	Total TCDD	4.97		1	pg/g	
BIO-1	8/26/99	BIO-1-FF-LB	Total PeCDD		<	1	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	Total HxCDD		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	Total HpCDD		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	Total TCDF		<	1	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	Total PeCDF		<	1	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	Total HxCDF	12.7		2.5	pg/g	
BIO-1	8/26/99	BIO-1-FF-LB	Total HpCDF		<	2.5	pg/g	U
BIO-1	8/26/99	BIO-1-FF-LB	Total TEQ	4.97			pg/g	
BIO-1	3/18/99	BIO-1-FF-RE	2,3,7,8-TCDD	2.59		1	ng/kg	
BIO-1	3/18/99	BIO-1-FF-RE	1,2,3,7,8-PeCDD		<	1	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	1,2,3,4,7,8-HxCDD		<	2.5	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	1,2,3,6,7,8-HxCDD		<	2.5	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	1,2,3,7,8,9-HxCDD		<	2.5	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	1,2,3,4,6,7,8-HpCDD		<	2.5	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	1,2,3,4,6,7,8,9-OCDD		<	5	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	2,3,7,8-TCDF		<	1	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	1,2,3,7,8-PeCDF		<	1	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	2,3,4,7,8-PeCDF		<	1	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	1,2,3,4,7,8-HxCDF		<	2.5	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	1,2,3,6,7,8-HxCDF		<	2.5	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	2,3,4,6,7,8-HxCDF		<	2.5	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	1,2,3,7,8,9-HxCDF		<	2.5	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	1,2,3,4,6,7,8-HpCDF		<	2.5	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	1,2,3,4,7,8,9-HpCDF		<	2.5	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	1,2,3,4,6,7,8,9-OCDF		<	5	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	Total TCDD	2.59		1	ng/kg	
BIO-1	3/18/99	BIO-1-FF-RE	Total PeCDD		<	1	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	Total HxCDD		<	2.5	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	Total HpCDD		<	2.5	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	Total TCDF		<	1	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	Total PeCDF		<	1	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	Total HxCDF		<	2.5	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	Total HpCDF		<	2.5	ng/kg	U
BIO-1	3/18/99	BIO-1-FF-RE	Total TEQ	2.59			ng/kg	
BIO-2	3/17/99	BIO-2-FF-CF	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-2	3/17/99	BIO-2-FF-CF	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	1,2,3,4,6,7,8-HpCDD		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	1,2,3,4,6,7,8,9-OCDD		<	6.7	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	Total TCDD		<	1.3	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	Total PeCDD		<	1.3	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	Total HxCDD		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	Total HpCDD		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	Total TCDF	5		1.33333333	ng/kg	
BIO-2	3/17/99	BIO-2-FF-CF	Total PeCDF	9.33		1.33333333	ng/kg	
BIO-2	3/17/99	BIO-2-FF-CF	Total HxCDF	13.5		3.33333333	ng/kg	
BIO-2	3/17/99	BIO-2-FF-CF	Total HpCDF		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-FF-CF	Total TEQ	0			ng/kg	
BIO-2	8/26/99	BIO-2-FF-CF	2,3,7,8-TCDD		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	1,2,3,7,8-PeCDD		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	1,2,3,4,6,7,8-HpCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	1,2,3,4,6,7,8,9-OCDD		<	5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	2,3,7,8-TCDF		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	1,2,3,4,7,8-HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	Total TCDD		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	Total PeCDD		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	Total HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	Total HpCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	Total TCDF	7.11		1	pg/g	
BIO-2	8/26/99	BIO-2-FF-CF	Total PeCDF	9.56		1	pg/g	
BIO-2	8/26/99	BIO-2-FF-CF	Total HxCDF	7.59		2.5	pg/g	
BIO-2	8/26/99	BIO-2-FF-CF	Total HpCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF	Total TEQ	0			pg/g	
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	2,3,7,8-TCDD	3.77		1	pg/g	EMP
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	1,2,3,7,8-PeCDD		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	1,2,3,4,6,7,8-HpCDD	6.3		2.5	pg/g	

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	1,2,3,4,6,7,8,9-OCD	33.5		5	pg/g	
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	2,3,7,8-TCDF		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	1,2,3,4,7,8-HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	Total TCDD		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	Total PeCDD		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	Total HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	Total HpCDD	10.5		2.5	pg/g	
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	Total TCDF		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	Total PeCDF		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	Total HxCDF	4.84		2.5	pg/g	
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	Total HpCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-CF(carcass)	Total TEQ	0.097			pg/g	
BIO-2	3/18/99	BIO-2-FF-LB	2,3,7,8-TCDD		<	1	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	1,2,3,7,8-PeCDD		<	1	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	1,2,3,4,7,8-HxCDD		<	2.5	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	1,2,3,6,7,8-HxCDD		<	2.5	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	1,2,3,7,8,9-HxCDD		<	2.5	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	1,2,3,4,6,7,8-HpCDD		<	2.5	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	1,2,3,4,6,7,8,9-OCDD		<	5	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	2,3,7,8-TCDF		<	1	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	1,2,3,7,8-PeCDF		<	1	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	2,3,4,7,8-PeCDF		<	1	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	1,2,3,4,7,8-HxCDF		<	2.5	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	1,2,3,6,7,8-HxCDF		<	2.5	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	2,3,4,6,7,8-HxCDF		<	2.5	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	1,2,3,7,8,9-HxCDF		<	2.5	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	1,2,3,4,6,7,8-HpCDF		<	2.5	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	1,2,3,4,7,8,9-HpCDF		<	2.5	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	1,2,3,4,6,7,8,9-OCDF		<	5	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	Total TCDD		<	1	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	Total PeCDD		<	1	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	Total HxCDD		<	2.5	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	Total HpCDD		<	2.5	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	Total TCDF		<	1	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	Total PeCDF		<	1	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	Total HxCDF		<	2.5	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	Total HpCDF		<	2.5	ng/kg	U
BIO-2	3/18/99	BIO-2-FF-LB	Total TEQ	0			ng/kg	
BIO-2	8/26/99	BIO-2-FF-LB	2,3,7,8-TCDD	1.84		1	pg/g	
BIO-2	8/26/99	BIO-2-FF-LB	1,2,3,7,8-PeCDD		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-FF-LB	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-LB	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-LB	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-LB	1,2,3,4,6,7,8-HpCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-LB	1,2,3,4,6,7,8,9-OCDD		<	5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-LB	2,3,7,8-TCDF		<	1	pg/g	U

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-2	8/26/99	BIO-2-FF-LB	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-FF-LB	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-FF-LB	1,2,3,4,7,8-HxCDF	4.68		2.5	pg/g	
BIO-2	8/26/99	BIO-2-FF-LB	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-LB	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-LB	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-LB	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-LB	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-LB	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-LB	Total TCDD	1.84		1	pg/g	
BIO-2	8/26/99	BIO-2-FF-LB	Total PeCDD		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-FF-LB	Total HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-LB	Total HpCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-FF-LB	Total TCDF	27.34		1	pg/g	
BIO-2	8/26/99	BIO-2-FF-LB	Total PeCDF		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-FF-LB	Total HxCDF	41		2.5	pg/g	
BIO-2	8/26/99	BIO-2-FF-LB	Total HpCDF	4.64		2.5	pg/g	
BIO-2	8/26/99	BIO-2-FF-LB	Total TEQ	2.308			pg/g	
BIO-2	8/26/99	BIO-2-WF-BG	2,3,7,8-TCDD	2.56		1	pg/g	
BIO-2	8/26/99	BIO-2-WF-BG	1,2,3,7,8-PeCDD		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-WF-BG	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-BG	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-BG	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-BG	1,2,3,4,6,7,8-HpCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-BG	1,2,3,4,6,7,8,9-OCD	8.84		5	pg/g	
BIO-2	8/26/99	BIO-2-WF-BG	2,3,7,8-TCDF		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-WF-BG	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-WF-BG	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-WF-BG	1,2,3,4,7,8-HxCDF	6.8		2.5	pg/g	
BIO-2	8/26/99	BIO-2-WF-BG	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-BG	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-BG	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-BG	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-BG	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-BG	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-BG	Total TCDD	2.56		1	pg/g	
BIO-2	8/26/99	BIO-2-WF-BG	Total PeCDD		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-WF-BG	Total HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-BG	Total HpCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-BG	Total TCDF	30		1	pg/g	
BIO-2	8/26/99	BIO-2-WF-BG	Total PeCDF		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-WF-BG	Total HxCDF	6.8		2.5	pg/g	
BIO-2	8/26/99	BIO-2-WF-BG	Total HpCDF	6.81		2.5	pg/g	
BIO-2	8/26/99	BIO-2-WF-BG	Total TEQ	3.249			pg/g	
BIO-2	3/17/99	BIO-2-WF-CF	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	Total TCDD		<	1.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	Total PeCDD		<	1.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	Total HxCDD		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	Total HpCDD		<	3.3	ng/kg	U

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SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-2	3/17/99	BIO-2-WF-CF	Total TCDF		<	1.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	Total PeCDF		<	1.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	Total HxCDF		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	Total HpCDF		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	Total TEQ	0			ng/kg	
BIO-2	3/17/99	BIO-2-WF-CF	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	1,2,3,4,6,7,8-HpCDD		<	3.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	1,2,3,4,6,7,8,9-OCD	9.83		6.66666666	ng/kg	EMP
BIO-2	3/17/99	BIO-2-WF-CF	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-2	3/17/99	BIO-2-WF-CF	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	1,2,3,6,7,8-HxCDD	2.59		3.33333333	ng/kg	EMP
BIO-2	3/18/99	BIO-2-WF-GS	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	1,2,3,4,6,7,8-HpCDD	10.7		3.33333333	ng/kg	
BIO-2	3/18/99	BIO-2-WF-GS	1,2,3,4,6,7,8,9-OCD	68.9		6.66666666	ng/kg	
BIO-2	3/18/99	BIO-2-WF-GS	2,3,7,8-TCDF	2.14		1.33333333	ng/kg	EMP
BIO-2	3/18/99	BIO-2-WF-GS	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	Total TCDD		<	1.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	Total PeCDD		<	1.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	Total HxCDD		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	Total HpCDD	17		3.33333333	ng/kg	
BIO-2	3/18/99	BIO-2-WF-GS	Total TCDF		<	1.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	Total PeCDF		<	1.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	Total HxCDF		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	Total HpCDF		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-GS	Total TEQ	0.176			ng/kg	
BIO-2	8/26/99	BIO-2-WF-GS	2,3,7,8-TCDD	5.39		1	pg/g	
BIO-2	8/26/99	BIO-2-WF-GS	1,2,3,7,8-PeCDD	1		1	pg/g	
BIO-2	8/26/99	BIO-2-WF-GS	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GS	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GS	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GS	1,2,3,4,6,7,8-HpCDD	6.28		2.5	pg/g	EMP
BIO-2	8/26/99	BIO-2-WF-GS	1,2,3,4,6,7,8,9-OCD	20.9		5	pg/g	
BIO-2	8/26/99	BIO-2-WF-GS	2,3,7,8-TCDF	2.95		1	pg/g	EMP
BIO-2	8/26/99	BIO-2-WF-GS	1,2,3,7,8-PeCDF	1.0		1	pg/g	EMP
BIO-2	8/26/99	BIO-2-WF-GS	2,3,4,7,8-PeCDF	1.15		1	pg/g	
BIO-2	8/26/99	BIO-2-WF-GS	1,2,3,4,7,8-HxCDF	5.4		2.5	pg/g	
BIO-2	8/26/99	BIO-2-WF-GS	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-2	8/26/99	BIO-2-WF-GS	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GS	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GS	1,2,3,4,6,7,8-HpCDF	4.21		2.5	pg/g	
BIO-2	8/26/99	BIO-2-WF-GS	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GS	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GS	Total TCDD	5.39		1	pg/g	
BIO-2	8/26/99	BIO-2-WF-GS	Total PeCDD		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GS	Total HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GS	Total HpCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GS	Total TCDF	38.4		1	pg/g	
BIO-2	8/26/99	BIO-2-WF-GS	Total PeCDF	1.15		1	pg/g	
BIO-2	8/26/99	BIO-2-WF-GS	Total HxCDF	5.4		2.5	pg/g	
BIO-2	8/26/99	BIO-2-WF-GS	Total HpCDF	8.02		2.5	pg/g	
BIO-2	8/26/99	BIO-2-WF-GS	Total TEQ	6.568			pg/g	
BIO-2	8/26/99	BIO-2-WF-GSR	2,3,7,8-TCDD	4.3		1	pg/g	
BIO-2	8/26/99	BIO-2-WF-GSR	1,2,3,7,8-PeCDD	1.44		1	pg/g	EMP
BIO-2	8/26/99	BIO-2-WF-GSR	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GSR	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GSR	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GSR	1,2,3,4,6,7,8-HpCDD	5.37		2.5	pg/g	
BIO-2	8/26/99	BIO-2-WF-GSR	1,2,3,4,6,7,8,9-OCD	19.6		5	pg/g	
BIO-2	8/26/99	BIO-2-WF-GSR	2,3,7,8-TCDF	1.64		1	pg/g	
BIO-2	8/26/99	BIO-2-WF-GSR	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GSR	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GSR	1,2,3,4,7,8-HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GSR	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GSR	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GSR	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GSR	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GSR	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GSR	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GSR	Total TCDD	4.3		1	pg/g	
BIO-2	8/26/99	BIO-2-WF-GSR	Total PeCDD		<	1	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GSR	Total HxCDD		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GSR	Total HpCDD	5.37		2.5	pg/g	
BIO-2	8/26/99	BIO-2-WF-GSR	Total TCDF	1.64		1	pg/g	
BIO-2	8/26/99	BIO-2-WF-GSR	Total PeCDF	2.25		1	pg/g	
BIO-2	8/26/99	BIO-2-WF-GSR	Total HxCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GSR	Total HpCDF		<	2.5	pg/g	U
BIO-2	8/26/99	BIO-2-WF-GSR	Total TEQ	4.537			pg/g	
BIO-2	3/18/99	BIO-2-WF-LB	2,3,7,8-TCDD	3.08		1.3	ng/kg	
BIO-2	3/18/99	BIO-2-WF-LB	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-LB	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-LB	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-LB	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-LB	1,2,3,4,6,7,8-HpCDD	2.97		3.3	ng/kg	
BIO-2	3/18/99	BIO-2-WF-LB	1,2,3,4,6,7,8,9-OCD	8.8		6.7	ng/kg	
BIO-2	3/18/99	BIO-2-WF-LB	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-LB	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-LB	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-LB	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-LB	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-LB	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-LB	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-2	3/18/99	BIO-2-WF-LB	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-LB	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-LB	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-LB	Total TCDD	3.08		1.3	ng/kg	
BIO-2	3/18/99	BIO-2-WF-LB	Total PeCDD		<	1.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-LB	Total HxCDD		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-LB	Total HpCDD	2.97		3.3	ng/kg	
BIO-2	3/18/99	BIO-2-WF-LB	Total TCDF	13.8		1.3	ng/kg	
BIO-2	3/18/99	BIO-2-WF-LB	Total PeCDF	14.1		1.3	ng/kg	
BIO-2	3/18/99	BIO-2-WF-LB	Total HxCDF		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-LB	Total HpCDF		<	3.3	ng/kg	U
BIO-2	3/18/99	BIO-2-WF-LB	Total TEQ	3.119			ng/kg	
BIO-3	3/18/99	BIO-3-FF-BG	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	1,2,3,4,6,7,8-HpCDD		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	1,2,3,4,6,7,8,9-OCDD		<	6.7	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	Total TCDD		<	1.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	Total PeCDD		<	1.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	Total HxCDD		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	Total HpCDD		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	Total TCDF		<	1.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	Total PeCDF		<	1.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	Total HxCDF		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	Total HpCDF		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-FF-BG	Total TEQ	0			ng/kg	
BIO-3	3/18/99	BIO-3-WF-BG	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	1,2,3,4,6,7,8-HpCDD		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	1,2,3,4,6,7,8,9-OCD	16.4		6.7	ng/kg	
BIO-3	3/18/99	BIO-3-WF-BG	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-3	3/18/99	BIO-3-WF-BG	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	Total TCDD		<	1.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	Total PeCDD		<	1.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	Total HxCDD		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	Total HpCDD		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	Total TCDF		<	1.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	Total PeCDF		<	1.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	Total HxCDF		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	Total HpCDF		<	3.3	ng/kg	U
BIO-3	3/18/99	BIO-3-WF-BG	Total TEQ	0.016			ng/kg	
BIO-3	8/24/99	BIO-3-WF-BG	2,3,7,8-TCDD		<	1	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	1,2,3,7,8-PeCDD		<	1	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	1,2,3,4,6,7,8-HpCDD		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	1,2,3,4,6,7,8,9-OCD	6.81		5	pg/g	
BIO-3	8/24/99	BIO-3-WF-BG	2,3,7,8-TCDF		<	1	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	1,2,3,4,7,8-HxCDF		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	Total TCDD		<	1	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	Total PeCDD		<	1	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	Total HxCDD		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	Total HpCDD		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	Total TCDF		<	1	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	Total PeCDF		<	1	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	Total HxCDF		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	Total HpCDF		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-BG	Total TEQ	0.007			pg/g	
BIO-3	3/17/99	BIO-3-WF-CS	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	1,2,3,4,6,7,8-HpCDD		<	3.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	1,2,3,4,6,7,8,9-OCD	10.4		6.7	ng/kg	
BIO-3	3/17/99	BIO-3-WF-CS	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	Total TCDD		<	1.3	ng/kg	U

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-3	3/17/99	BIO-3-WF-CS	Total PeCDD		<	1.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	Total HxCDD		<	3.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	Total HpCDD		<	3.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	Total TCDF		<	1.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	Total PeCDF		<	1.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	Total HxCDF		<	3.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	Total HpCDF		<	3.3	ng/kg	U
BIO-3	3/17/99	BIO-3-WF-CS	Total TEQ	0.01			ng/kg	
BIO-3	8/24/99	BIO-3-WF-PP	2,3,7,8-TCDD		<	1	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	1,2,3,7,8-PeCDD		<	1	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	1,2,3,4,6,7,8-HpCDD	3.93		2.5	pg/g	EMP
BIO-3	8/24/99	BIO-3-WF-PP	1,2,3,4,6,7,8,9-OCD	10.6		5	pg/g	
BIO-3	8/24/99	BIO-3-WF-PP	2,3,7,8-TCDF		<	1	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	1,2,3,4,7,8-HxCDF		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	Total TCDD		<	1	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	Total PeCDD		<	1	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	Total HxCDD		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	Total HpCDD		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	Total TCDF		<	1	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	Total PeCDF		<	1	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	Total HxCDF		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	Total HpCDF		<	2.5	pg/g	U
BIO-3	8/24/99	BIO-3-WF-PP	Total TEQ	0.011			pg/g	
BIO-4	3/18/99	BIO-4-FF-BG	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	1,2,3,4,6,7,8-HpCDD		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	1,2,3,4,6,7,8,9-OCDD		<	6.7	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	Total TCDD		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	Total PeCDD		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	Total HxCDD		<	3.3	ng/kg	U

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-4	3/18/99	BIO-4-FF-BG	Total HpCDD		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	Total TCDF		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	Total PeCDF		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	Total HxCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	Total HpCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-FF-BG	Total TEQ	0			ng/kg	
BIO-4	8/24/99	BIO-4-FF-BG	2,3,7,8-TCDD		<	1	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	1,2,3,7,8-PeCDD		<	1	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	1,2,3,4,6,7,8-HpCDD		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	1,2,3,4,6,7,8,9-OCDD		<	5	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	2,3,7,8-TCDF		<	1	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	1,2,3,4,7,8-HxCDF		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	Total TCDD		<	1	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	Total PeCDD		<	1	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	Total HxCDD		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	Total HpCDD		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	Total TCDF		<	1	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	Total PeCDF		<	1	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	Total HxCDF		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	Total HpCDF		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-FF-BG	Total TEQ	0			pg/g	
BIO-4	3/17/99	BIO-4-FF-CF	2,3,7,8-TCDD		<	1	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	1,2,3,7,8-PeCDD		<	1	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	1,2,3,4,7,8-HxCDD		<	2.5	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	1,2,3,6,7,8-HxCDD		<	2.5	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	1,2,3,7,8,9-HxCDD		<	2.5	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	1,2,3,4,6,7,8-HpCDD	6.24		2.5	ng/kg	
BIO-4	3/17/99	BIO-4-FF-CF	1,2,3,4,6,7,8,9-OCD	5.02		5	ng/kg	
BIO-4	3/17/99	BIO-4-FF-CF	2,3,7,8-TCDF		<	1	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	1,2,3,7,8-PeCDF		<	1	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	2,3,4,7,8-PeCDF		<	1	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	1,2,3,4,7,8-HxCDF		<	2.5	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	1,2,3,6,7,8-HxCDF		<	2.5	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	2,3,4,6,7,8-HxCDF		<	2.5	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	1,2,3,7,8,9-HxCDF		<	2.5	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	1,2,3,4,6,7,8-HpCDF		<	2.5	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	1,2,3,4,7,8,9-HpCDF		<	2.5	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	1,2,3,4,6,7,8,9-OCDF		<	5	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	Total TCDD		<	1	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	Total PeCDD		<	1	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	Total HxCDD		<	2.5	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	Total HpCDD	6.24		2.5	ng/kg	
BIO-4	3/17/99	BIO-4-FF-CF	Total TCDF		<	1	ng/kg	U

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-4	3/17/99	BIO-4-FF-CF	Total PeCDF		<	1	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	Total HxCDF		<	2.5	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	Total HpCDF		<	2.5	ng/kg	U
BIO-4	3/17/99	BIO-4-FF-CF	Total TEQ	0.067			ng/kg	
BIO-4	3/18/99	BIO-4-WF-BG	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	1,2,3,4,6,7,8-HpCDD		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	1,2,3,4,6,7,8,9-OCD	9.93		6.7	ng/kg	
BIO-4	3/18/99	BIO-4-WF-BG	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	Total TCDD		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	Total PeCDD		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	Total HxCDD		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	Total HpCDD		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	Total TCDF		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	Total PeCDF		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	Total HxCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	Total HpCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-BG	Total TEQ	0.01			ng/kg	
BIO-4	8/24/99	BIO-4-WF-BG	2,3,7,8-TCDD		<	1	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BG	1,2,3,7,8-PeCDD		<	1	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BG	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BG	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BG	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BG	1,2,3,4,6,7,8-HpCDD	3.06		2.5	pg/g	EMP
BIO-4	8/24/99	BIO-4-WF-BG	1,2,3,4,6,7,8,9-OCD	29.6		5	pg/g	
BIO-4	8/24/99	BIO-4-WF-BG	2,3,7,8-TCDF		<	1	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BG	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BG	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BG	1,2,3,4,7,8-HxCDF		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BG	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BG	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BG	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BG	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BG	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BG	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BG	Total TCDD		<	1	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BG	Total PeCDD		<	1	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BG	Total HxCDD		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BG	Total HpCDD		<	2.5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BG	Total TCDF	2.94		1	pg/g	
BIO-4	8/24/99	BIO-4-WF-BG	Total PeCDF	7.47		1	pg/g	
BIO-4	8/24/99	BIO-4-WF-BG	Total HxCDF	14.3		2.5	pg/g	

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-4	8/24/99	BIO-4-WF-BG	Total HpCDF	3.3		2.5	pg/g	
BIO-4	8/24/99	BIO-4-WF-BG	Total TEQ	0.03			pg/g	
BIO-4	8/24/99	BIO-4-WF-BT	2,3,7,8-TCDD		<	2	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	1,2,3,7,8-PeCDD		<	2	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	1,2,3,4,7,8-HxCDD		<	5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	1,2,3,6,7,8-HxCDD		<	5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	1,2,3,7,8,9-HxCDD		<	5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	1,2,3,4,6,7,8-HpCDD	7.54		5	pg/g	EMP
BIO-4	8/24/99	BIO-4-WF-BT	1,2,3,4,6,7,8,9-OCD	35		10	pg/g	
BIO-4	8/24/99	BIO-4-WF-BT	2,3,7,8-TCDF		<	2	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	1,2,3,7,8-PeCDF		<	2	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	2,3,4,7,8-PeCDF		<	2	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	1,2,3,4,7,8-HxCDF		<	5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	1,2,3,6,7,8-HxCDF		<	5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	2,3,4,6,7,8-HxCDF		<	5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	1,2,3,7,8,9-HxCDF		<	5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	1,2,3,4,6,7,8-HpCDF		<	5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	1,2,3,4,7,8,9-HpCDF		<	5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	1,2,3,4,6,7,8,9-OCDF		<	10	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	Total TCDD		<	2	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	Total PeCDD		<	2	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	Total HxCDD		<	5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	Total HpCDD	6.6		5	pg/g	
BIO-4	8/24/99	BIO-4-WF-BT	Total TCDF		<	2	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	Total PeCDF		<	2	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	Total HxCDF		<	5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	Total HpCDF		<	5	pg/g	U
BIO-4	8/24/99	BIO-4-WF-BT	Total TEQ	0.035			pg/g	
BIO-4	3/18/99	BIO-4-WF-CF	2,3,7,8-TCDD	2.15		1.3	ng/kg	EMP
BIO-4	3/18/99	BIO-4-WF-CF	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	1,2,3,4,6,7,8-HpCDD	4.94		3.3	ng/kg	
BIO-4	3/18/99	BIO-4-WF-CF	1,2,3,4,6,7,8,9-OCD	13.6		6.7	ng/kg	
BIO-4	3/18/99	BIO-4-WF-CF	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	Total TCDD		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	Total PeCDD		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	Total HxCDD		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	Total HpCDD	4.94		3.3	ng/kg	
BIO-4	3/18/99	BIO-4-WF-CF	Total TCDF		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	Total PeCDF		<	1.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	Total HxCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	Total HpCDF		<	3.3	ng/kg	U
BIO-4	3/18/99	BIO-4-WF-CF	Total TEQ	0.063			ng/kg	

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-5	3/19/99	BIO-5-FF-CF	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	1,2,3,4,6,7,8-HpCDD		<	3.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	1,2,3,4,6,7,8,9-OCDD		<	6.7	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	Total TCDD		<	1.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	Total PeCDD		<	1.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	Total HxCDD		<	3.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	Total HpCDD		<	3.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	Total TCDF		<	1.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	Total PeCDF		<	1.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	Total HxCDF		<	3.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	Total HpCDF		<	3.3	ng/kg	U
BIO-5	3/19/99	BIO-5-FF-CF	Total TEQ	0			ng/kg	
BIO-5	8/26/99	BIO-5-FF-CF	2,3,7,8-TCDD	1.53		1	pg/g	EMP
BIO-5	8/26/99	BIO-5-FF-CF	1,2,3,7,8-PeCDD		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF	1,2,3,4,6,7,8-HpCDD	2.96		2.5	pg/g	EMP
BIO-5	8/26/99	BIO-5-FF-CF	1,2,3,4,6,7,8,9-OCDD		<	5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF	2,3,7,8-TCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF	1,2,3,4,7,8-HxCDF	3.92		2.5	pg/g	
BIO-5	8/26/99	BIO-5-FF-CF	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF	Total TCDD		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF	Total PeCDD		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF	Total HxCDD		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF	Total HpCDD		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF	Total TCDF	20.8		1	pg/g	
BIO-5	8/26/99	BIO-5-FF-CF	Total PeCDF	20.4		1	pg/g	
BIO-5	8/26/99	BIO-5-FF-CF	Total HxCDF	61.6		2.5	pg/g	
BIO-5	8/26/99	BIO-5-FF-CF	Total HpCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF	Total TEQ	0.392			pg/g	
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	2,3,7,8-TCDD	1.72		1	pg/g	EMP
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	1,2,3,7,8-PeCDD		<	1	pg/g	U

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	1,2,3,6,7,8-HxCDD	4.51		2.5	pg/g	
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	1,2,3,4,6,7,8-HpCDD	5.86		2.5	pg/g	
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	1,2,3,4,6,7,8,9-OCD	19.8		5	pg/g	
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	2,3,7,8-TCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	1,2,3,4,7,8-HxCDF	3.02		2.5	pg/g	
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	1,2,3,4,6,7,8-HpCDF	5.52		2.5	pg/g	EMP
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	1,2,3,4,6,7,8,9-OCDF	12.6		5	pg/g	
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	Total TCDD		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	Total PeCDD		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	Total HxCDD	4.51		2.5	pg/g	
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	Total HpCDD	5.86		2.5	pg/g	
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	Total TCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	Total PeCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	Total HxCDF	3.02		2.5	pg/g	
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	Total HpCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-CF(carcass)	Total TEQ	0.844			pg/g	
BIO-5	3/16/99	BIO-5-FF-LB	2,3,7,8-TCDD		<	1	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	1,2,3,7,8-PeCDD		<	1	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	1,2,3,4,7,8-HxCDD		<	2.5	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	1,2,3,6,7,8-HxCDD		<	2.5	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	1,2,3,7,8,9-HxCDD		<	2.5	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	1,2,3,4,6,7,8-HpCDD		<	2.5	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	1,2,3,4,6,7,8,9-OCDD		<	5	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	2,3,7,8-TCDF		<	1	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	1,2,3,7,8-PeCDF		<	1	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	2,3,4,7,8-PeCDF		<	1	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	1,2,3,4,7,8-HxCDF		<	2.5	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	1,2,3,6,7,8-HxCDF		<	2.5	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	2,3,4,6,7,8-HxCDF		<	2.5	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	1,2,3,7,8,9-HxCDF		<	2.5	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	1,2,3,4,6,7,8-HpCDF		<	2.5	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	1,2,3,4,7,8,9-HpCDF		<	2.5	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	1,2,3,4,6,7,8,9-OCDF		<	5	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	Total TCDD		<	1	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	Total PeCDD		<	1	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	Total HxCDD		<	2.5	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	Total HpCDD		<	2.5	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	Total TCDF	3.69		1	ng/kg	
BIO-5	3/16/99	BIO-5-FF-LB	Total PeCDF	5.35		1	ng/kg	
BIO-5	3/16/99	BIO-5-FF-LB	Total HxCDF		<	2.5	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	Total HpCDF		<	2.5	ng/kg	U
BIO-5	3/16/99	BIO-5-FF-LB	Total TEQ	0			ng/kg	
BIO-5	8/26/99	BIO-5-FF-LBR	2,3,7,8-TCDD		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	1,2,3,7,8-PeCDD		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-5	8/26/99	BIO-5-FF-LBR	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	1,2,3,4,6,7,8-HpCDD		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	1,2,3,4,6,7,8,9-OCDD		<	5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	2,3,7,8-TCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	1,2,3,4,7,8-HxCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	Total TCDD		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	Total PeCDD		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	Total HxCDD		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	Total HpCDD		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	Total TCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	Total PeCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	Total HxCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	Total HpCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LBR	Total TEQ	0			pg/g	
BIO-5	8/26/99	BIO-5-FF-LB	2,3,7,8-TCDD		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	1,2,3,7,8-PeCDD		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	1,2,3,4,6,7,8-HpCDD		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	1,2,3,4,6,7,8,9-OCDD		<	5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	2,3,7,8-TCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	1,2,3,4,7,8-HxCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	Total TCDD		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	Total PeCDD		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	Total HxCDD		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	Total HpCDD		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	Total TCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	Total PeCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	Total HxCDF	3.11		2.5	pg/g	
BIO-5	8/26/99	BIO-5-FF-LB	Total HpCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-FF-LB	Total TEQ	0			pg/g	
BIO-5	8/26/99	BIO-5-WF-GS	2,3,7,8-TCDD	1.1		1	pg/g	EMP
BIO-5	8/26/99	BIO-5-WF-GS	1,2,3,7,8-PeCDD		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-WF-GS	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-WF-GS	1,2,3,6,7,8-HxCDD	2.71		2.5	pg/g	
BIO-5	8/26/99	BIO-5-WF-GS	1,2,3,7,8,9-HxCDD	2.65		2.5	pg/g	
BIO-5	8/26/99	BIO-5-WF-GS	1,2,3,4,6,7,8-HpCDD	8.29		2.5	pg/g	

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-5	8/26/99	BIO-5-WF-GS	1,2,3,4,6,7,8,9-OCD	45.9		5	pg/g	
BIO-5	8/26/99	BIO-5-WF-GS	2,3,7,8-TCDF	3.73		1	pg/g	
BIO-5	8/26/99	BIO-5-WF-GS	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-WF-GS	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-WF-GS	1,2,3,4,7,8-HxCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-WF-GS	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-WF-GS	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-WF-GS	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-WF-GS	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-WF-GS	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-WF-GS	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-5	8/26/99	BIO-5-WF-GS	Total TCDD	13.8		1	pg/g	
BIO-5	8/26/99	BIO-5-WF-GS	Total PeCDD	2.99		1	pg/g	
BIO-5	8/26/99	BIO-5-WF-GS	Total HxCDD	5.36		2.5	pg/g	
BIO-5	8/26/99	BIO-5-WF-GS	Total HpCDD	11.4		2.5	pg/g	
BIO-5	8/26/99	BIO-5-WF-GS	Total TCDF	3.73		1	pg/g	
BIO-5	8/26/99	BIO-5-WF-GS	Total PeCDF		<	1	pg/g	U
BIO-5	8/26/99	BIO-5-WF-GS	Total HxCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-WF-GS	Total HpCDF		<	2.5	pg/g	U
BIO-5	8/26/99	BIO-5-WF-GS	Total TEQ	1.038			pg/g	
BIO-5	3/16/99	BIO-5-WF-LB	2,3,7,8-TCDD	1.94		1.33333333	ng/kg	EMP
BIO-5	3/16/99	BIO-5-WF-LB	1,2,3,7,8-PeCDD	2.11		1.33333333	ng/kg	EMP
BIO-5	3/16/99	BIO-5-WF-LB	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-LB	1,2,3,6,7,8-HxCDD	2.99		3.33333333	ng/kg	
BIO-5	3/16/99	BIO-5-WF-LB	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-LB	1,2,3,4,6,7,8-HpCDD	4.7		3.33333333	ng/kg	
BIO-5	3/16/99	BIO-5-WF-LB	1,2,3,4,6,7,8,9-OCD	10.9		6.66666666	ng/kg	
BIO-5	3/16/99	BIO-5-WF-LB	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-LB	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-LB	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-LB	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-LB	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-LB	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-LB	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-LB	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-LB	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-LB	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-LB	Total TCDD		<	1.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-LB	Total PeCDD		<	1.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-LB	Total HxCDD		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-LB	Total HpCDD	4.7		3.33333333	ng/kg	
BIO-5	3/16/99	BIO-5-WF-LB	Total TCDF	8.01		1.33333333	ng/kg	
BIO-5	3/16/99	BIO-5-WF-LB	Total PeCDF	5.93		1.33333333	ng/kg	
BIO-5	3/16/99	BIO-5-WF-LB	Total HxCDF	9.05		3.33333333	ng/kg	
BIO-5	3/16/99	BIO-5-WF-LB	Total HpCDF		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-LB	Total TEQ	0.357			ng/kg	
BIO-5	8/24/99	BIO-5-WF-LB	2,3,7,8-TCDD		<	1	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	1,2,3,7,8-PeCDD		<	1	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	1,2,3,4,6,7,8-HpCDD		<	2.5	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	1,2,3,4,6,7,8,9-OCDD		<	5	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	2,3,7,8-TCDF		<	1	pg/g	U

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-5	8/24/99	BIO-5-WF-LB	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	1,2,3,4,7,8-HxCDF		<	2.5	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	Total TCDD		<	1	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	Total PeCDD		<	1	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	Total HxCDD		<	2.5	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	Total HpCDD		<	2.5	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	Total TCDF		<	1	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	Total PeCDF		<	1	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	Total HxCDF		<	2.5	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	Total HpCDF		<	2.5	pg/g	U
BIO-5	8/24/99	BIO-5-WF-LB	Total TEQ	0			pg/g	
BIO-5	3/16/99	BIO-5-WF-SS	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-SS	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-SS	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-SS	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-SS	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-SS	1,2,3,4,6,7,8-HpCDD	4.52		3.33333333	ng/kg	
BIO-5	3/16/99	BIO-5-WF-SS	1,2,3,4,6,7,8,9-OCD	28.9		6.66666666	ng/kg	
BIO-5	3/16/99	BIO-5-WF-SS	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-SS	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-SS	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-SS	1,2,3,4,7,8-HxCDF	3.32		3.33333333	ng/kg	EMP
BIO-5	3/16/99	BIO-5-WF-SS	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-SS	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-SS	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-SS	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-SS	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-SS	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-SS	Total TCDD		<	1.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-SS	Total PeCDD		<	1.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-SS	Total HxCDD		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-SS	Total HpCDD	4.52		3.33333333	ng/kg	
BIO-5	3/16/99	BIO-5-WF-SS	Total TCDF	10.8		1.33333333	ng/kg	
BIO-5	3/16/99	BIO-5-WF-SS	Total PeCDF	12		1.33333333	ng/kg	
BIO-5	3/16/99	BIO-5-WF-SS	Total HxCDF		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-SS	Total HpCDF		<	3.3	ng/kg	U
BIO-5	3/16/99	BIO-5-WF-SS	Total TEQ	0.074			ng/kg	
BIO-6	3/17/99	BIO-6-FF-CF	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CF	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CF	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CF	1,2,3,6,7,8-HxCDD	3.86		3.3	ng/kg	EMP
BIO-6	3/17/99	BIO-6-FF-CF	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CF	1,2,3,4,6,7,8-HpCDD	4.7		3.3	ng/kg	EMP
BIO-6	3/17/99	BIO-6-FF-CF	1,2,3,4,6,7,8,9-OCD	8.02		6.7	ng/kg	EMP
BIO-6	3/17/99	BIO-6-FF-CF	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CF	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CF	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-6	3/17/99	BIO-6-FF-CF	1,2,3,4,7,8-HxCDF	4.54		3.3	ng/kg	
BIO-6	3/17/99	BIO-6-FF-CF	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CF	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CF	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CF	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CF	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CF	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CF	Total TCDD		<	1.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CF	Total PeCDD		<	1.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CF	Total HxCDD		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CF	Total HpCDD	4.76		3.3	ng/kg	
BIO-6	3/17/99	BIO-6-FF-CF	Total TCDF		<	1.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CF	Total PeCDF	29.4		1.3	ng/kg	
BIO-6	3/17/99	BIO-6-FF-CF	Total HxCDF	65		3.3	ng/kg	
BIO-6	3/17/99	BIO-6-FF-CF	Total HpCDF	9.46		3.3	ng/kg	
BIO-6	3/17/99	BIO-6-FF-CF	Total TEQ	0			ng/kg	
BIO-6	3/17/99	BIO-6-FF-CFR	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	1,2,3,4,6,7,8-HpCDD		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	1,2,3,4,6,7,8,9-OCDD		<	6.7	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	Total TCDD		<	1.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	Total PeCDD		<	1.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	Total HxCDD		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	Total HpCDD		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	Total TCDF	3.32		1.3	ng/kg	
BIO-6	3/17/99	BIO-6-FF-CFR	Total PeCDF		<	1.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	Total HxCDF		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	Total HpCDF		<	3.3	ng/kg	U
BIO-6	3/17/99	BIO-6-FF-CFR	Total TEQ	0			ng/kg	
BIO-6	3/16/99	BIO-6-FF-LB	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	1,2,3,7,8-PeCDD		<	1	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	1,2,3,4,6,7,8-HpCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	1,2,3,4,6,7,8,9-OCDD		<	6.7	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	2,3,7,8-TCDF		<	1	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	1,2,3,7,8-PeCDF		<	1	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	2,3,4,7,8-PeCDF		<	1	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-6	3/16/99	BIO-6-FF-LB	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	Total TCDD		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	Total PeCDD		<	1	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	Total HxCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	Total HpCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	Total TCDF	8.75		1	ng/kg	
BIO-6	3/16/99	BIO-6-FF-LB	Total PeCDF		<	1	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	Total HxCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	Total HpCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-FF-LB	Total TEQ	0			ng/kg	
BIO-6	3/16/99	BIO-6-WF-CF	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-CF	1,2,3,7,8-PeCDD	3.2		1.3	ng/kg	EMP
BIO-6	3/16/99	BIO-6-WF-CF	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-CF	1,2,3,6,7,8-HxCDD	5.16		3.3	ng/kg	
BIO-6	3/16/99	BIO-6-WF-CF	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-CF	1,2,3,4,6,7,8-HpCDD	5.3		3.3	ng/kg	EMP
BIO-6	3/16/99	BIO-6-WF-CF	1,2,3,4,6,7,8,9-OCD	19.9		6.7	ng/kg	
BIO-6	3/16/99	BIO-6-WF-CF	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-CF	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-CF	2,3,4,7,8-PeCDF	3.19		1.3	ng/kg	
BIO-6	3/16/99	BIO-6-WF-CF	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-CF	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-CF	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-CF	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-CF	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-CF	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-CF	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-CF	Total TCDD		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-CF	Total PeCDD		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-CF	Total HxCDD	5.16		3.3	ng/kg	
BIO-6	3/16/99	BIO-6-WF-CF	Total HpCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-CF	Total TCDF	9.2		1.3	ng/kg	
BIO-6	3/16/99	BIO-6-WF-CF	Total PeCDF	3.19		1.3	ng/kg	
BIO-6	3/16/99	BIO-6-WF-CF	Total HxCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-CF	Total HpCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-CF	Total TEQ	2.136			ng/kg	
BIO-6	3/16/99	BIO-6-WF-LB	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	1,2,3,4,6,7,8-HpCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	1,2,3,4,6,7,8,9-OCDD		<	6.7	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-6	3/16/99	BIO-6-WF-LB	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	Total TCDD		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	Total PeCDD		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	Total HxCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	Total HpCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	Total TCDF		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	Total PeCDF		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	Total HxCDF	3.5		3.3	ng/kg	
BIO-6	3/16/99	BIO-6-WF-LB	Total HpCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LB	Total TEQ	0			ng/kg	
BIO-6	3/16/99	BIO-6-WF-LBR	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LBR	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LBR	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LBR	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LBR	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LBR	1,2,3,4,6,7,8-HpCDD	3.34		3.3	ng/kg	
BIO-6	3/16/99	BIO-6-WF-LBR	1,2,3,4,6,7,8,9-OCD	12		6.7	ng/kg	
BIO-6	3/16/99	BIO-6-WF-LBR	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LBR	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LBR	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LBR	1,2,3,4,7,8-HxCDF	2.53		3.3	ng/kg	
BIO-6	3/16/99	BIO-6-WF-LBR	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LBR	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LBR	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LBR	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LBR	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LBR	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LBR	Total TCDD		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LBR	Total PeCDD		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LBR	Total HxCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-LBR	Total HpCDD	3.35		3.3	ng/kg	
BIO-6	3/16/99	BIO-6-WF-LBR	Total TCDF	14.7		1.3	ng/kg	
BIO-6	3/16/99	BIO-6-WF-LBR	Total PeCDF	8.98		1.3	ng/kg	
BIO-6	3/16/99	BIO-6-WF-LBR	Total HxCDF	25.3		3.3	ng/kg	
BIO-6	3/16/99	BIO-6-WF-LBR	Total HpCDF	5.78		3.3	ng/kg	
BIO-6	3/16/99	BIO-6-WF-LBR	Total TEQ	0.299			ng/kg	
BIO-6	3/16/99	BIO-6-WF-SM	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-SM	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-SM	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-SM	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-SM	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-SM	1,2,3,4,6,7,8-HpCDD	5.51		3.3	ng/kg	
BIO-6	3/16/99	BIO-6-WF-SM	1,2,3,4,6,7,8,9-OCD	54		6.7	ng/kg	
BIO-6	3/16/99	BIO-6-WF-SM	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-SM	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-SM	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-SM	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-SM	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-SM	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-SM	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-SM	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-SM	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U

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SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-6	3/16/99	BIO-6-WF-SM	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-SM	Total TCDD		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-SM	Total PeCDD		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-SM	Total HxCDD		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-SM	Total HpCDD	11.7		3.3	ng/kg	
BIO-6	3/16/99	BIO-6-WF-SM	Total TCDF		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-SM	Total PeCDF		<	1.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-SM	Total HxCDF	7.03		3.3	ng/kg	
BIO-6	3/16/99	BIO-6-WF-SM	Total HpCDF		<	3.3	ng/kg	U
BIO-6	3/16/99	BIO-6-WF-SM	Total TEQ	0.109			ng/kg	
BIO-7	3/19/99	BIO-7-FF-LB	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	1,2,3,4,6,7,8-HpCDD		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	1,2,3,4,6,7,8,9-OCDD		<	6.7	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	Total TCDD		<	1.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	Total PeCDD		<	1.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	Total HxCDD		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	Total HpCDD		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	Total TCDF		<	1.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	Total PeCDF		<	1.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	Total HxCDF		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	Total HpCDF		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-FF-LB	Total TEQ	0			ng/kg	
BIO-7	3/19/99	BIO-7-WF-LB	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-LB	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-LB	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-LB	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-LB	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-LB	1,2,3,4,6,7,8-HpCDD		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-LB	1,2,3,4,6,7,8,9-OCDD		<	6.7	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-LB	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-LB	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-LB	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-LB	1,2,3,4,7,8-HxCDF	3.7		3.3	ng/kg	
BIO-7	3/19/99	BIO-7-WF-LB	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-LB	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-LB	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-LB	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-LB	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-LB	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-LB	Total TCDD		<	1.3	ng/kg	U

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-7	3/19/99	BIO-7-WF-LB	Total PeCDD		<	1.3	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-LB	Total HxCDD		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-LB	Total HpCDD		<	3.3	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-LB	Total TCDF	5.48		1.3	ng/kg	
BIO-7	3/19/99	BIO-7-WF-LB	Total PeCDF	7.63		1.3	ng/kg	
BIO-7	3/19/99	BIO-7-WF-LB	Total HxCDF	3.7		3.3	ng/kg	
BIO-7	3/19/99	BIO-7-WF-LB	Total HpCDF	3.95		3.3	ng/kg	
BIO-7	3/19/99	BIO-7-WF-LB	Total TEQ	0.37			ng/kg	
BIO-7	3/19/99	BIO-7-WF-SM	2,3,7,8-TCDD		<	1	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-SM	1,2,3,7,8-PeCDD		<	1	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-SM	1,2,3,4,7,8-HxCDD		<	2.5	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-SM	1,2,3,6,7,8-HxCDD		<	2.5	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-SM	1,2,3,7,8,9-HxCDD		<	2.5	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-SM	1,2,3,4,6,7,8-HpCDD	10.5		2.5	ng/kg	
BIO-7	3/19/99	BIO-7-WF-SM	1,2,3,4,6,7,8,9-OCD	108		5	ng/kg	
BIO-7	3/19/99	BIO-7-WF-SM	2,3,7,8-TCDF		<	1	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-SM	1,2,3,7,8-PeCDF		<	1	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-SM	2,3,4,7,8-PeCDF		<	1	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-SM	1,2,3,4,7,8-HxCDF		<	2.5	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-SM	1,2,3,6,7,8-HxCDF		<	2.5	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-SM	2,3,4,6,7,8-HxCDF		<	2.5	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-SM	1,2,3,7,8,9-HxCDF		<	2.5	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-SM	1,2,3,4,6,7,8-HpCDF		<	2.5	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-SM	1,2,3,4,7,8,9-HpCDF		<	2.5	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-SM	1,2,3,4,6,7,8,9-OCDF	6.01		5	ng/kg	EMP
BIO-7	3/19/99	BIO-7-WF-SM	Total TCDD		<	1	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-SM	Total PeCDD		<	1	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-SM	Total HxCDD		<	2.5	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-SM	Total HpCDD	22.6		2.5	ng/kg	
BIO-7	3/19/99	BIO-7-WF-SM	Total TCDF	6.3		1	ng/kg	
BIO-7	3/19/99	BIO-7-WF-SM	Total PeCDF	5.3		1	ng/kg	
BIO-7	3/19/99	BIO-7-WF-SM	Total HxCDF		<	2.5	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-SM	Total HpCDF		<	2.5	ng/kg	U
BIO-7	3/19/99	BIO-7-WF-SM	Total TEQ	0.213			ng/kg	
BIO-8	3/19/99	BIO-8-FF-CF	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	1,2,3,7,8-PeCDD		<	1.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	1,2,3,4,6,7,8-HpCDD		<	3.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	1,2,3,4,6,7,8,9-OCDD		<	6.7	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	Total TCDD		<	1.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	Total PeCDD		<	1.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	Total HxCDD		<	3.3	ng/kg	U

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-8	3/19/99	BIO-8-FF-CF	Total HpCDD		<	3.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	Total TCDF		<	1.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	Total PeCDF		<	1.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	Total HxCDF		<	3.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	Total HpCDF		<	3.3	ng/kg	U
BIO-8	3/19/99	BIO-8-FF-CF	Total TEQ	0			ng/kg	
BIO-8	8/24/99	BIO-8-FF-CF	2,3,7,8-TCDD	1.38		1	pg/g	EMP
BIO-8	8/24/99	BIO-8-FF-CF	1,2,3,7,8-PeCDD		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	1,2,3,4,6,7,8-HpCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	1,2,3,4,6,7,8,9-OCDD		<	5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	2,3,7,8-TCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	1,2,3,4,7,8-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	Total TCDD		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	Total PeCDD		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	Total HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	Total HpCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	Total TCDF	2.41		1	pg/g	
BIO-8	8/24/99	BIO-8-FF-CF	Total PeCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	Total HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	Total HpCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-CF	Total TEQ	0			pg/g	
BIO-8	3/18/99	BIO-8-FF-LB	2,3,7,8-TCDD		<	1	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	1,2,3,7,8-PeCDD		<	1	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	1,2,3,4,7,8-HxCDD		<	2.5	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	1,2,3,6,7,8-HxCDD		<	2.5	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	1,2,3,7,8,9-HxCDD		<	2.5	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	1,2,3,4,6,7,8-HpCDD		<	2.5	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	1,2,3,4,6,7,8,9-OCDD		<	5	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	2,3,7,8-TCDF		<	1	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	1,2,3,7,8-PeCDF		<	1	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	2,3,4,7,8-PeCDF		<	1	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	1,2,3,4,7,8-HxCDF		<	2.5	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	1,2,3,6,7,8-HxCDF		<	2.5	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	2,3,4,6,7,8-HxCDF		<	2.5	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	1,2,3,7,8,9-HxCDF		<	2.5	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	1,2,3,4,6,7,8-HpCDF		<	2.5	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	1,2,3,4,7,8,9-HpCDF		<	2.5	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	1,2,3,4,6,7,8,9-OCDF		<	5	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	Total TCDD		<	1	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	Total PeCDD		<	1	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	Total HxCDD		<	2.5	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	Total HpCDD		<	2.5	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	Total TCDF		<	1	ng/kg	U

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-8	3/18/99	BIO-8-FF-LB	Total PeCDF		<	1	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	Total HxCDF		<	2.5	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	Total HpCDF		<	2.5	ng/kg	U
BIO-8	3/18/99	BIO-8-FF-LB	Total TEQ	0			ng/kg	
BIO-8	8/24/99	BIO-8-FF-LB	2,3,7,8-TCDD	1.23		1	pg/g	EMP
BIO-8	8/24/99	BIO-8-FF-LB	1,2,3,7,8-PeCDD		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	1,2,3,4,6,7,8-HpCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	1,2,3,4,6,7,8,9-OCDD		<	5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	2,3,7,8-TCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	1,2,3,4,7,8-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	Total TCDD		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	Total PeCDD		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	Total HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	Total HpCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	Total TCDF	4.88		1	pg/g	
BIO-8	8/24/99	BIO-8-FF-LB	Total PeCDF	5.5		1	pg/g	
BIO-8	8/24/99	BIO-8-FF-LB	Total HxCDF	8.25		2.5	pg/g	
BIO-8	8/24/99	BIO-8-FF-LB	Total HpCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-FF-LB	Total TEQ	0			pg/g	
BIO-8	3/18/99	BIO-8-WF-CF	2,3,7,8-TCDD		<	1.3	ng/kg	U
BIO-8	3/18/99	BIO-8-WF-CF	1,2,3,7,8-PeCDD	4.48		1.3	ng/kg	
BIO-8	3/18/99	BIO-8-WF-CF	1,2,3,4,7,8-HxCDD		<	3.3	ng/kg	U
BIO-8	3/18/99	BIO-8-WF-CF	1,2,3,6,7,8-HxCDD		<	3.3	ng/kg	U
BIO-8	3/18/99	BIO-8-WF-CF	1,2,3,7,8,9-HxCDD		<	3.3	ng/kg	U
BIO-8	3/18/99	BIO-8-WF-CF	1,2,3,4,6,7,8-HpCDD	4.92		3.3	ng/kg	
BIO-8	3/18/99	BIO-8-WF-CF	1,2,3,4,6,7,8,9-OCD	7.86		6.7	ng/kg	
BIO-8	3/18/99	BIO-8-WF-CF	2,3,7,8-TCDF		<	1.3	ng/kg	U
BIO-8	3/18/99	BIO-8-WF-CF	1,2,3,7,8-PeCDF		<	1.3	ng/kg	U
BIO-8	3/18/99	BIO-8-WF-CF	2,3,4,7,8-PeCDF		<	1.3	ng/kg	U
BIO-8	3/18/99	BIO-8-WF-CF	1,2,3,4,7,8-HxCDF		<	3.3	ng/kg	U
BIO-8	3/18/99	BIO-8-WF-CF	1,2,3,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-8	3/18/99	BIO-8-WF-CF	2,3,4,6,7,8-HxCDF		<	3.3	ng/kg	U
BIO-8	3/18/99	BIO-8-WF-CF	1,2,3,7,8,9-HxCDF		<	3.3	ng/kg	U
BIO-8	3/18/99	BIO-8-WF-CF	1,2,3,4,6,7,8-HpCDF		<	3.3	ng/kg	U
BIO-8	3/18/99	BIO-8-WF-CF	1,2,3,4,7,8,9-HpCDF		<	3.3	ng/kg	U
BIO-8	3/18/99	BIO-8-WF-CF	1,2,3,4,6,7,8,9-OCDF		<	6.7	ng/kg	U
BIO-8	3/18/99	BIO-8-WF-CF	Total TCDD		<	1.3	ng/kg	U
BIO-8	3/18/99	BIO-8-WF-CF	Total PeCDD		<	1.3	ng/kg	U
BIO-8	3/18/99	BIO-8-WF-CF	Total HxCDD		<	3.3	ng/kg	U
BIO-8	3/18/99	BIO-8-WF-CF	Total HpCDD	4.92		3.3	ng/kg	
BIO-8	3/18/99	BIO-8-WF-CF	Total TCDF	2.16		1.3	ng/kg	
BIO-8	3/18/99	BIO-8-WF-CF	Total PeCDF		<	1.3	ng/kg	U
BIO-8	3/18/99	BIO-8-WF-CF	Total HxCDF		<	3.3	ng/kg	U

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-8	3/18/99	BIO-8-WF-CF	Total HpCDF		<	3.3	ng/kg	U
BIO-8	3/18/99	BIO-8-WF-CF	Total TEQ	2.297			ng/kg	
BIO-8	8/24/99	BIO-8-WF-CF	2,3,7,8-TCDD	1.88		1	pg/g	EMP
BIO-8	8/24/99	BIO-8-WF-CF	1,2,3,7,8-PeCDD		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CF	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CF	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CF	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CF	1,2,3,4,6,7,8-HpCDD	4.72		2.5	pg/g	
BIO-8	8/24/99	BIO-8-WF-CF	1,2,3,4,6,7,8,9-OCD	6.68		5	pg/g	EMP
BIO-8	8/24/99	BIO-8-WF-CF	2,3,7,8-TCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CF	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CF	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CF	1,2,3,4,7,8-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CF	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CF	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CF	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CF	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CF	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CF	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CF	Total TCDD		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CF	Total PeCDD		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CF	Total HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CF	Total HpCDD	4.72		2.5	pg/g	
BIO-8	8/24/99	BIO-8-WF-CF	Total TCDF	1.35		1	pg/g	
BIO-8	8/24/99	BIO-8-WF-CF	Total PeCDF	1.49		1	pg/g	
BIO-8	8/24/99	BIO-8-WF-CF	Total HxCDF	10.5		2.5	pg/g	
BIO-8	8/24/99	BIO-8-WF-CF	Total HpCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CF	Total TEQ	0.047			pg/g	
BIO-8	8/24/99	BIO-8-WF-CFR	2,3,7,8-TCDD	1.61		1	pg/g	
BIO-8	8/24/99	BIO-8-WF-CFR	1,2,3,7,8-PeCDD	1.3		1	pg/g	EMP
BIO-8	8/24/99	BIO-8-WF-CFR	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CFR	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CFR	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CFR	1,2,3,4,6,7,8-HpCDD	5.15		2.5	pg/g	
BIO-8	8/24/99	BIO-8-WF-CFR	1,2,3,4,6,7,8,9-OCD	6.16		5	pg/g	EMP
BIO-8	8/24/99	BIO-8-WF-CFR	2,3,7,8-TCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CFR	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CFR	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CFR	1,2,3,4,7,8-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CFR	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CFR	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CFR	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CFR	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CFR	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CFR	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CFR	Total TCDD	1.61		1	pg/g	
BIO-8	8/24/99	BIO-8-WF-CFR	Total PeCDD		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CFR	Total HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CFR	Total HpCDD	5.15		2.5	pg/g	
BIO-8	8/24/99	BIO-8-WF-CFR	Total TCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CFR	Total PeCDF	1.66		1	pg/g	
BIO-8	8/24/99	BIO-8-WF-CFR	Total HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CFR	Total HpCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-CFR	Total TEQ	1.662			pg/g	

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-8	3/19/99	BIO-8-WF-LB	2,3,7,8-TCDD	2.1		1	ng/kg	
BIO-8	3/19/99	BIO-8-WF-LB	1,2,3,7,8-PeCDD	2.67		1	ng/kg	EMP
BIO-8	3/19/99	BIO-8-WF-LB	1,2,3,4,7,8-HxCDD		<	2.5	ng/kg	U
BIO-8	3/19/99	BIO-8-WF-LB	1,2,3,6,7,8-HxCDD		<	2.5	ng/kg	U
BIO-8	3/19/99	BIO-8-WF-LB	1,2,3,7,8,9-HxCDD		<	2.5	ng/kg	U
BIO-8	3/19/99	BIO-8-WF-LB	1,2,3,4,6,7,8-HpCDD		<	2.5	ng/kg	U
BIO-8	3/19/99	BIO-8-WF-LB	1,2,3,4,6,7,8,9-OCDD		<	5	ng/kg	U
BIO-8	3/19/99	BIO-8-WF-LB	2,3,7,8-TCDF		<	1	ng/kg	U
BIO-8	3/19/99	BIO-8-WF-LB	1,2,3,7,8-PeCDF		<	1	ng/kg	U
BIO-8	3/19/99	BIO-8-WF-LB	2,3,4,7,8-PeCDF		<	1	ng/kg	U
BIO-8	3/19/99	BIO-8-WF-LB	1,2,3,4,7,8-HxCDF		<	2.5	ng/kg	U
BIO-8	3/19/99	BIO-8-WF-LB	1,2,3,6,7,8-HxCDF		<	2.5	ng/kg	U
BIO-8	3/19/99	BIO-8-WF-LB	2,3,4,6,7,8-HxCDF		<	2.5	ng/kg	U
BIO-8	3/19/99	BIO-8-WF-LB	1,2,3,7,8,9-HxCDF		<	2.5	ng/kg	U
BIO-8	3/19/99	BIO-8-WF-LB	1,2,3,4,6,7,8-HpCDF		<	2.5	ng/kg	U
BIO-8	3/19/99	BIO-8-WF-LB	1,2,3,4,7,8,9-HpCDF		<	2.5	ng/kg	U
BIO-8	3/19/99	BIO-8-WF-LB	1,2,3,4,6,7,8,9-OCDF		<	5	ng/kg	U
BIO-8	3/19/99	BIO-8-WF-LB	Total TCDD	2.1		1	ng/kg	
BIO-8	3/19/99	BIO-8-WF-LB	Total PeCDD		<	1	ng/kg	U
BIO-8	3/19/99	BIO-8-WF-LB	Total HxCDD		<	2.5	ng/kg	U
BIO-8	3/19/99	BIO-8-WF-LB	Total HpCDD		<	2.5	ng/kg	U
BIO-8	3/19/99	BIO-8-WF-LB	Total TCDF	1.41		1	ng/kg	
BIO-8	3/19/99	BIO-8-WF-LB	Total PeCDF	3.73		1	ng/kg	
BIO-8	3/19/99	BIO-8-WF-LB	Total HxCDF	3.16		2.5	ng/kg	
BIO-8	3/19/99	BIO-8-WF-LB	Total HpCDF		<	2.5	ng/kg	U
BIO-8	3/19/99	BIO-8-WF-LB	Total TEQ	2.1			ng/kg	
BIO-8	8/24/99	BIO-8-WF-LB	2,3,7,8-TCDD	1.37		1	pg/g	EMP
BIO-8	8/24/99	BIO-8-WF-LB	1,2,3,7,8-PeCDD		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	1,2,3,4,6,7,8-HpCDD	3.02		2.5	pg/g	
BIO-8	8/24/99	BIO-8-WF-LB	1,2,3,4,6,7,8,9-OCDD		<	5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	2,3,7,8-TCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	1,2,3,4,7,8-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	Total TCDD		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	Total PeCDD		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	Total HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	Total HpCDD	3.02		2.5	pg/g	
BIO-8	8/24/99	BIO-8-WF-LB	Total TCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	Total PeCDF	2.41		1	pg/g	
BIO-8	8/24/99	BIO-8-WF-LB	Total HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	Total HpCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-LB	Total TEQ	0.03			pg/g	
BIO-8	8/24/99	BIO-8-WF-SM	2,3,7,8-TCDD	2.11		1	pg/g	
BIO-8	8/24/99	BIO-8-WF-SM	1,2,3,7,8-PeCDD		<	1	pg/g	U

Analytical Results of Fish Samples

SITE_ID	SAMP_DATE	SAMP_ID	NAME	CONC	DL_FLAG	DET_LIMIT	UNITS	ER_Q
BIO-8	8/24/99	BIO-8-WF-SM	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-SM	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-SM	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-SM	1,2,3,4,6,7,8-HpCDD	4.11		2.5	pg/g	
BIO-8	8/24/99	BIO-8-WF-SM	1,2,3,4,6,7,8,9-OCD	42.4		5	pg/g	
BIO-8	8/24/99	BIO-8-WF-SM	2,3,7,8-TCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-SM	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-SM	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-SM	1,2,3,4,7,8-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-SM	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-SM	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-SM	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-SM	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-SM	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-SM	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-SM	Total TCDD	2.11		1	pg/g	
BIO-8	8/24/99	BIO-8-WF-SM	Total PeCDD		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-SM	Total HxCDD		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-SM	Total HpCDD	6.82		2.5	pg/g	
BIO-8	8/24/99	BIO-8-WF-SM	Total TCDF	1.06		1	pg/g	
BIO-8	8/24/99	BIO-8-WF-SM	Total PeCDF		<	1	pg/g	U
BIO-8	8/24/99	BIO-8-WF-SM	Total HxCDF	3		2.5	pg/g	
BIO-8	8/24/99	BIO-8-WF-SM	Total HpCDF		<	2.5	pg/g	U
BIO-8	8/24/99	BIO-8-WF-SM	Total TEQ	2.194			pg/g	
BIO-9	8/26/99	BIO-9-WF-AM	2,3,7,8-TCDD	10.4		1	pg/g	
BIO-9	8/26/99	BIO-9-WF-AM	1,2,3,7,8-PeCDD		<	1	pg/g	U
BIO-9	8/26/99	BIO-9-WF-AM	1,2,3,4,7,8-HxCDD		<	2.5	pg/g	U
BIO-9	8/26/99	BIO-9-WF-AM	1,2,3,6,7,8-HxCDD		<	2.5	pg/g	U
BIO-9	8/26/99	BIO-9-WF-AM	1,2,3,7,8,9-HxCDD		<	2.5	pg/g	U
BIO-9	8/26/99	BIO-9-WF-AM	1,2,3,4,6,7,8-HpCDD	6.31		2.5	pg/g	
BIO-9	8/26/99	BIO-9-WF-AM	1,2,3,4,6,7,8,9-OCD	13.6		5	pg/g	
BIO-9	8/26/99	BIO-9-WF-AM	2,3,7,8-TCDF		<	1	pg/g	U
BIO-9	8/26/99	BIO-9-WF-AM	1,2,3,7,8-PeCDF		<	1	pg/g	U
BIO-9	8/26/99	BIO-9-WF-AM	2,3,4,7,8-PeCDF		<	1	pg/g	U
BIO-9	8/26/99	BIO-9-WF-AM	1,2,3,4,7,8-HxCDF		<	2.5	pg/g	U
BIO-9	8/26/99	BIO-9-WF-AM	1,2,3,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-9	8/26/99	BIO-9-WF-AM	2,3,4,6,7,8-HxCDF		<	2.5	pg/g	U
BIO-9	8/26/99	BIO-9-WF-AM	1,2,3,7,8,9-HxCDF		<	2.5	pg/g	U
BIO-9	8/26/99	BIO-9-WF-AM	1,2,3,4,6,7,8-HpCDF		<	2.5	pg/g	U
BIO-9	8/26/99	BIO-9-WF-AM	1,2,3,4,7,8,9-HpCDF		<	2.5	pg/g	U
BIO-9	8/26/99	BIO-9-WF-AM	1,2,3,4,6,7,8,9-OCDF		<	5	pg/g	U
BIO-9	8/26/99	BIO-9-WF-AM	Total TCDD	10.4		1	pg/g	
BIO-9	8/26/99	BIO-9-WF-AM	Total PeCDD		<	1	pg/g	U
BIO-9	8/26/99	BIO-9-WF-AM	Total HxCDD		<	2.5	pg/g	U
BIO-9	8/26/99	BIO-9-WF-AM	Total HpCDD	6.31		2.5	pg/g	
BIO-9	8/26/99	BIO-9-WF-AM	Total TCDF		<	1	pg/g	U
BIO-9	8/26/99	BIO-9-WF-AM	Total PeCDF	1.04		1	pg/g	
BIO-9	8/26/99	BIO-9-WF-AM	Total HxCDF	13.1		2.5	pg/g	
BIO-9	8/26/99	BIO-9-WF-AM	Total HpCDF		<	2.5	pg/g	U
BIO-9	8/26/99	BIO-9-WF-AM	Total TEQ	10.477			pg/g	

APPENDIX C

SAMPLING LOCATIONS, FIGURES FROM SURFACE WATER AND SEDIMENT DIOXIN DELINEATION REPORT

D1013				
CONSTITUENT	MATRIX	UNITS	D10130P1 04/09/97 Primary	D10135P1 04/09/97 Primary
Total TEQ	SED/SS	(ng/kg)	18.8	51.3
TCDD/TEQ Ratio	SED/SS	(%)	84	84

D1013			
CONSTITUENT	MATRIX	UNITS	D10136P1 04/09/97 Primary
Total TEQ	SW	(pg/l)	0.417
TCDD/TEQ Ratio	SW	(%)	0

D1012			
CONSTITUENT	MATRIX	UNITS	D10120P1 04/09/97 Primary
Total TEQ	SED	(ng/kg)	80.7
TCDD/TEQ Ratio	SED	(%)	62

D1011			
CONSTITUENT	MATRIX	UNITS	D1011D1P1 04/09/97 Primary
Total TEQ	SED	(ng/kg)	100
TCDD/TEQ Ratio	SED	(%)	68

D1009			
CONSTITUENT	MATRIX	UNITS	D10090P1 04/09/97 Primary
Total TEQ	SED	(ng/kg)	57.5
TCDD/TEQ Ratio	SED	(%)	70

D1008			
CONSTITUENT	MATRIX	UNITS	D1008D1P1 04/09/97 Primary
Total TEQ	SED/SS	(ng/kg)	52.9
TCDD/TEQ Ratio	SED/SS	(%)	53

D1008			
CONSTITUENT	MATRIX	UNITS	D1008W1P1 04/09/97 Primary
Total TEQ	SW	(pg/l)	0.486
TCDD/TEQ Ratio	SW	(%)	0

D1008			
CONSTITUENT	MATRIX	UNITS	D1008S1P1 04/09/97 Primary
Total TEQ	SED	(ng/kg)	23.3 J
TCDD/TEQ Ratio	SED	(%)	54

D1003				
CONSTITUENT	MATRIX	UNITS	D10033D1P1 04/10/97 Primary	D10033D1D1 04/10/97 Duplicate 1
Total TEQ	SED	(ng/kg)	122	156
TCDD/TEQ Ratio	SED	(%)	97	96

D1003				
CONSTITUENT	MATRIX	UNITS	D10033W1P1 04/10/97 Primary	D10033W1D1 04/10/97 Duplicate 1
Total TEQ	SW	(ng/l)	0	0.410
TCDD/TEQ Ratio	SW	(%)	0	0

D1007			
CONSTITUENT	MATRIX	UNITS	D1007D1P3 08/28/97 Primary
Total TEQ	SED	(ng/kg)	11.2 J
TCDD/TEQ Ratio	SED	(%)	88

D1005			
CONSTITUENT	MATRIX	UNITS	D1005W1P2 04/10/97 Primary
Total TEQ	SW	(pg/l)	0.023
TCDD/TEQ Ratio	SW	(%)	0

D1014			
CONSTITUENT	MATRIX	UNITS	D10140P3 08/28/97 Primary
Total TEQ	SED	(ng/kg)	42.3
TCDD/TEQ Ratio	SED	(%)	86

D1010				
CONSTITUENT	MATRIX	UNITS	D10105S1P1 04/09/97 Primary	D1010D1P3 08/28/97 Primary
Total TEQ	SS/SED	(ng/kg)	78.9	82.8
TCDD/TEQ Ratio	SS/SED	(%)	32	33

D1010			
CONSTITUENT	MATRIX	UNITS	D1010W1P1 04/09/97 Primary
Total TEQ	SW	(pg/l)	0.405
TCDD/TEQ Ratio	SW	(%)	0

D1016			
CONSTITUENT	MATRIX	UNITS	D1016D1P2 04/22/97 Primary
Total TEQ	SED	(ng/kg)	8.46 J
TCDD/TEQ Ratio	SED	(%)	0

D1015				
CONSTITUENT	MATRIX	UNITS	D1015D1P2 04/22/97 Primary	D1015D1D2 04/22/97 Duplicate 1
Total TEQ	SED	(ng/kg)	113 J	95.0 J
TCDD/TEQ Ratio	SED	(%)	80	80

D1006			
CONSTITUENT	MATRIX	UNITS	D10060P1 04/09/97 Primary
Total TEQ	SED	(ng/kg)	12.5
TCDD/TEQ Ratio	SED	(%)	78

D1002			
CONSTITUENT	MATRIX	UNITS	D10020P1 04/10/97 Primary
Total TEQ	SED	(ng/kg)	231
TCDD/TEQ Ratio	SED	(%)	84

D1001				
CONSTITUENT	MATRIX	UNITS	D1001P1P3 08/26/97 Primary	D1001D1D3 08/26/97 Duplicate 1
Total TEQ	SED	(ng/kg)	70.8	94.0
TCDD/TEQ Ratio	SED	(%)	82	83

D1001			
CONSTITUENT	MATRIX	UNITS	D1001W1P3 08/28/97 Primary
Total TEQ	SW	(pg/l)	6.71
TCDD/TEQ Ratio	SW	(%)	98

Drainage Area 1

Drainage Area 1

Site 8A

Site 8B

OUTFALL 3

OUTFALL 4

GATE #6

11th Street

10TH ST

COLBY AVE

BAINBRIDGE

Goodner Ave.

LEGEND

D1010 — Sample point

Drainage area

Drainage ditch

0 250 500

SCALE: 1 INCH = 500 FEET

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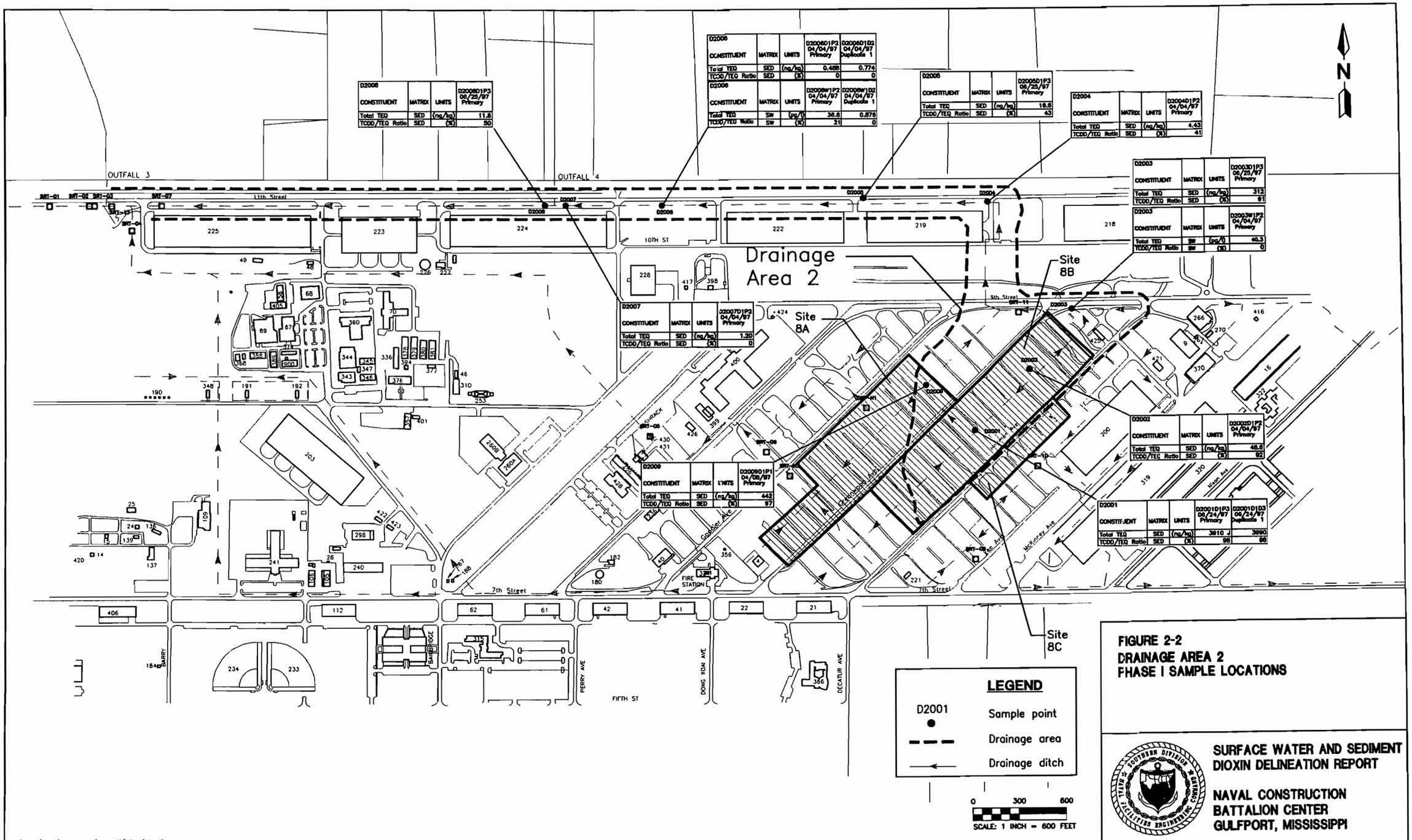
FIGURE 2-1
DRAINAGE AREA 1
PHASE I SAMPLE LOCATIONS

SURFACE WATER AND SEDIMENT
DIOXIN DELINEATION REPORT

NAVAL CONSTRUCTION
BATTALION CENTER
GULFPORT, MISSISSIPPI



D2008 CONSTITUENT	MATRIX	UNITS	D2008D1P3 06/25/97 Primary
Total TEQ	SED	(ng/kg)	11.6
TCDD/TEQ Ratio	SED	(%)	50

D2006 CONSTITUENT	MATRIX	UNITS	D2006D1P2 04/04/97 Primary	D2006D1D2 04/04/97 Duplicate 1
Total TEQ	SED	(ng/kg)	0.486	0.774
TCDD/TEQ Ratio	SED	(%)	0	0

D2006 CONSTITUENT	MATRIX	UNITS	D2006W1P2 04/04/97 Primary	D2006W1D2 04/04/97 Duplicate 1
Total TEQ	SW	(pg/l)	36.6	0.876
TCDD/TEQ Ratio	SW	(%)	21	0

D2005 CONSTITUENT	MATRIX	UNITS	D2005D1P3 06/25/97 Primary
Total TEQ	SED	(ng/kg)	18.6
TCDD/TEQ Ratio	SED	(%)	43

D2004 CONSTITUENT	MATRIX	UNITS	D2004D1P2 04/04/97 Primary
Total TEQ	SED	(ng/kg)	4.43
TCDD/TEQ Ratio	SED	(%)	41

D2003 CONSTITUENT	MATRIX	UNITS	D2003D1P3 06/25/97 Primary
Total TEQ	SED	(ng/kg)	312
TCDD/TEQ Ratio	SED	(%)	91

D2003 CONSTITUENT	MATRIX	UNITS	D2003W1P2 04/04/97 Primary
Total TEQ	SW	(pg/l)	40.3
TCDD/TEQ Ratio	SW	(%)	0

D2007 CONSTITUENT	MATRIX	UNITS	D2007D1P2 04/04/97 Primary
Total TEQ	SED	(ng/kg)	1.20
TCDD/TEQ Ratio	SED	(%)	0

D2009 CONSTITUENT	MATRIX	UNITS	D2009D1P1 04/08/97 Primary
Total TEQ	SED	(ng/kg)	442
TCDD/TEQ Ratio	SED	(%)	97

D2002 CONSTITUENT	MATRIX	UNITS	D2002D1P2 04/04/97 Primary
Total TEQ	SED	(ng/kg)	48.6
TCDD/TEQ Ratio	SED	(%)	92

D2001 CONSTITUENT	MATRIX	UNITS	D2001D1P3 06/24/97 Primary	D2001D1D3 06/24/97 Duplicate 1
Total TEQ	SED	(ng/kg)	3910 J	3990
TCDD/TEQ Ratio	SED	(%)	98	98

FIGURE 2-2
DRAINAGE AREA 2
PHASE I SAMPLE LOCATIONS

SURFACE WATER AND SEDIMENT DIOXIN DELINEATION REPORT

NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MISSISSIPPI

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Drainage Area 3

Site 8A

Site 8B

Site 8C

D3002			D3002D1P2 04/07/97 Primary	D3002D1D2 04/07/97 Duplicate 1
CONSTITUENT	MATRIX	UNITS		
Total TEQ	SED	(ng/kg)	3.30	3.86
TCDD/TEQ Ratio	SED	(%)	0	0

D3003			D3003D1P2 04/07/97 Primary
CONSTITUENT	MATRIX	UNITS	
Total TEQ	SED	(ng/kg)	7.11
TCDD/TEQ Ratio	SED	(%)	0

D3003			D3003W1P2 04/07/97 Primary
CONSTITUENT	MATRIX	UNITS	
Total TEQ	SW	(pg/l)	0.187 J
TCDD/TEQ Ratio	SW	(%)	0

D3001			D3001D1P2 04/07/97 Primary
CONSTITUENT	MATRIX	UNITS	
Total TEQ	SED	(ng/kg)	120
TCDD/TEQ Ratio	SED	(%)	67

D3004			D3004D1P2 04/07/97 Primary
CONSTITUENT	MATRIX	UNITS	
Total TEQ	SED	(ng/kg)	0.977
TCDD/TEQ Ratio	SED	(%)	0

D3005			D3005D1P2 04/07/97 Primary
CONSTITUENT	MATRIX	UNITS	
Total TEQ	SED	(ng/kg)	7.82
TCDD/TEQ Ratio	SED	(%)	58

D3005			D3005W1P2 04/07/97 Primary
CONSTITUENT	MATRIX	UNITS	
Total TEQ	SW	(pg/l)	8.61 J
TCDD/TEQ Ratio	SW	(%)	0

D3006			D3006D1P3 06/25/97 Primary
CONSTITUENT	MATRIX	UNITS	
Total TEQ	SED	(ng/kg)	0.228
TCDD/TEQ Ratio	SED	(%)	0

D3007			D3007D1P3 06/24/97 Primary
CONSTITUENT	MATRIX	UNITS	
Total TEQ	SED	(ng/kg)	7.17
TCDD/TEQ Ratio	SED	(%)	0

D3007			D3007W1P3 06/24/97 Primary	D3007W1D3 06/24/97 Duplicate 1
CONSTITUENT	MATRIX	UNITS		
Total TEQ	SW	(pg/l)	0.808	13.0
TCDD/TEQ Ratio	SW	(%)	0	33

D3008			D3008D1P2 04/07/97 Primary
CONSTITUENT	MATRIX	UNITS	
Total TEQ	SED	(ng/kg)	0.198
TCDD/TEQ Ratio	SED	(%)	0

LEGEND

D3005 ● Sample point

Drainage area

Drainage ditch

0 250 500

SCALE: 1 INCH = 500 FEET

FIGURE 2-3
DRAINAGE AREA 3
PHASE I SAMPLE LOCATIONS

SURFACE WATER AND SEDIMENT DIOXIN DELINEATION REPORT

NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MISSISSIPPI

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Site 8B

Drainage Area 4

D4001 CONSTITUENT	MATRIX	UNITS	D4001D1P2 04/07/97 Primary
Total TEQ	SED	(ng/kg)	3.34
TCDD/TEQ Ratio	SED	(%)	0

D4002 CONSTITUENT	MATRIX	UNITS	D4002D1P3 06/26/97 Primary
Total TEQ	SED	(ng/kg)	32.8
TCDD/TEQ Ratio	SED	(%)	4

D4003 CONSTITUENT	MATRIX	UNITS	D4003D1P2 04/07/97 Primary
Total TEQ	SED	(ng/kg)	3.87
TCDD/TEQ Ratio	SED	(%)	0

Site 8C

OUTFALL 2 SOUTH

0 150 300

SCALE: 1 INCH = 300 FEET

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LEGEND

D3005 ● Sample point

Drainage area

Drainage ditch

FIGURE 2-4
DARINAGE AREA 4
PHASE I SAMPLE LOCATIONS

SURFACE WATER AND SEDIMENT DIOXIN DELINEATION REPORT

NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MISSISSIPPI

N

OUTFALL 1

OUTFALL 3

D5015			
CONSTITUENT	MATRIX	UNITS	D5015D1P2 04/07/97 Primary
Total TEQ	SED	(ng/kg)	31.1 J
TCDD/TEQ Ratio	SED	(%)	0

D5014			
CONSTITUENT	MATRIX	UNITS	D5014D1P2 04/07/97 Primary
Total TEQ	SED	(ng/kg)	15.0
TCDD/TEQ Ratio	SED	(%)	0

D5013				
CONSTITUENT	MATRIX	UNITS	D5013D1P2 04/07/97 Primary	D5013W1P1 04/08/97 Primary
Total TEQ	SED/SS	(ng/kg)	10.3	2.44
TCDD/TEQ Ratio	SED/SS	(%)	0	0

D5013			
CONSTITUENT	MATRIX	UNITS	D5013W1P1 04/07/97 Primary
Total TEQ	SW	(pg/l)	2.75
TCDD/TEQ Ratio	SW	(%)	0

L4001			
CONSTITUENT	MATRIX	UNITS	L4001P1D2 04/28/97 Primary
Total TEQ	GW	(pg/l)	83.0
TCDD/TEQ Ratio	GW	(%)	17

GPT-04-05			
CONSTITUENT	MATRIX	UNITS	GPT4501P3 09/19/97 Primary
Vinyl chloride	GW	(ug/L)	52
1,2-Dichloroethene (total)	GW	(ug/L)	230
Trichloroethene	GW	(ug/L)	5.7 J

D5016			
CONSTITUENT	MATRIX	UNITS	D5016D1P2 04/08/97 Primary
Total TEQ	SED	(ng/kg)	4.56
TCDD/TEQ Ratio	SED	(%)	0

D5012			
CONSTITUENT	MATRIX	UNITS	D5012D1P3 08/24/97 Primary
Total TEQ	SED	(ng/kg)	30.3
TCDD/TEQ Ratio	SED	(%)	20

D5011				
CONSTITUENT	MATRIX	UNITS	D5011D1P2 04/07/97 Primary	D5011D1D2 04/07/97 Duplicate 1
Total TEQ	SED	(ng/kg)	18.4	13.5 J
TCDD/TEQ Ratio	SED	(%)	21	0

D5010			
CONSTITUENT	MATRIX	UNITS	D5010D1P2 04/07/97 Primary
Total TEQ	SED	(ng/kg)	0.370
TCDD/TEQ Ratio	SED	(%)	0

D5009			
CONSTITUENT	MATRIX	UNITS	D5009D1P2 04/07/97 Primary
Total TEQ	SED	(ng/kg)	2.90
TCDD/TEQ Ratio	SED	(%)	0

D5009			
CONSTITUENT	MATRIX	UNITS	D5009W1P3 08/24/97 Primary
Total TEQ	SW	(pg/l)	3.68
TCDD/TEQ Ratio	SW	(%)	67

GPT-05-04			
CONSTITUENT	MATRIX	UNITS	GPT54G1P1 05/20/97 Primary
Total TEQ	GW	(pg/l)	40.4
TCDD/TEQ Ratio	GW	(%)	10

D5003			
CONSTITUENT	MATRIX	UNITS	D5003D1P2 04/08/97 Primary
Total TEQ	SED	(ng/kg)	1.07 J
TCDD/TEQ Ratio	SED	(%)	0

D5017			
CONSTITUENT	MATRIX	UNITS	D5017D1P2 04/08/97 Primary
Total TEQ	SED	(ng/kg)	14.3 J
TCDD/TEQ Ratio	SED	(%)	19

D5001			
CONSTITUENT	MATRIX	UNITS	D5001D1P3 08/24/97 Primary
Total TEQ	SED	(ng/kg)	1570
TCDD/TEQ Ratio	SED	(%)	1

D5006			
CONSTITUENT	MATRIX	UNITS	D5006D1P2 04/08/97 Primary
Total TEQ	SED	(ng/kg)	2.44 J
TCDD/TEQ Ratio	SED	(%)	0

D5008			
CONSTITUENT	MATRIX	UNITS	D5008D1P2 04/07/97 Primary
Total TEQ	SED	(ng/kg)	0.942
TCDD/TEQ Ratio	SED	(%)	0

D5007				
CONSTITUENT	MATRIX	UNITS	D5007S1P1 04/08/97 Primary	D5007D1P3 08/24/97 Primary
Total TEQ	SS/SED	(ng/kg)	28.6	1.87 J
TCDD/TEQ Ratio	SS/SED	(%)	14	0

D5007			
CONSTITUENT	MATRIX	UNITS	D5007W1P2 04/08/97 Primary
Total TEQ	SW	(pg/l)	2.67
TCDD/TEQ Ratio	SW	(%)	0

D5005			
CONSTITUENT	MATRIX	UNITS	D5005D1P2 04/07/97 Primary
Total TEQ	SED	(ng/kg)	18.3
TCDD/TEQ Ratio	SED	(%)	80

D5004				
CONSTITUENT	MATRIX	UNITS	D5004D1P2 04/08/97 Primary	D5004S1P1 04/08/97 Primary
Total TEQ	SED/SS	(ng/kg)	0.348	0.462
TCDD/TEQ Ratio	SED/SS	(%)	0	0

D5004			
CONSTITUENT	MATRIX	UNITS	D5004W1P2 04/08/97 Primary
Total TEQ	SW	(pg/l)	0.942
TCDD/TEQ Ratio	SW	(%)	0

D5002			
CONSTITUENT	MATRIX	UNITS	D5002D1P3 08/24/97 Primary
Total TEQ	SED	(ng/kg)	16.6
TCDD/TEQ Ratio	SED	(%)	0

D5016 D5015 D5014 D5013 D5012 D5011 D5010 D5009 D5008 D5007 D5006 D5005 D5004 D5003 D5002 D5001

L4001 GPT-04-05 GPT-05-04 D5017

Site 4

Site 5

Site 10

Drainage Area 5

LEGEND

D3005 ●	Sample point
GPT-5-04 ◈	Monitoring well
▬ ▬ ▬	Drainage area
←——	Drainage ditch

0 300 600

SCALE: 1 INCH = 600 FEET

FIGURE 2-5
DRAINAGE AREA 5
PHASE I SAMPLE LOCATIONS

SURFACE WATER AND SEDIMENT DIOXIN DELINEATION REPORT

NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MISSISSIPPI

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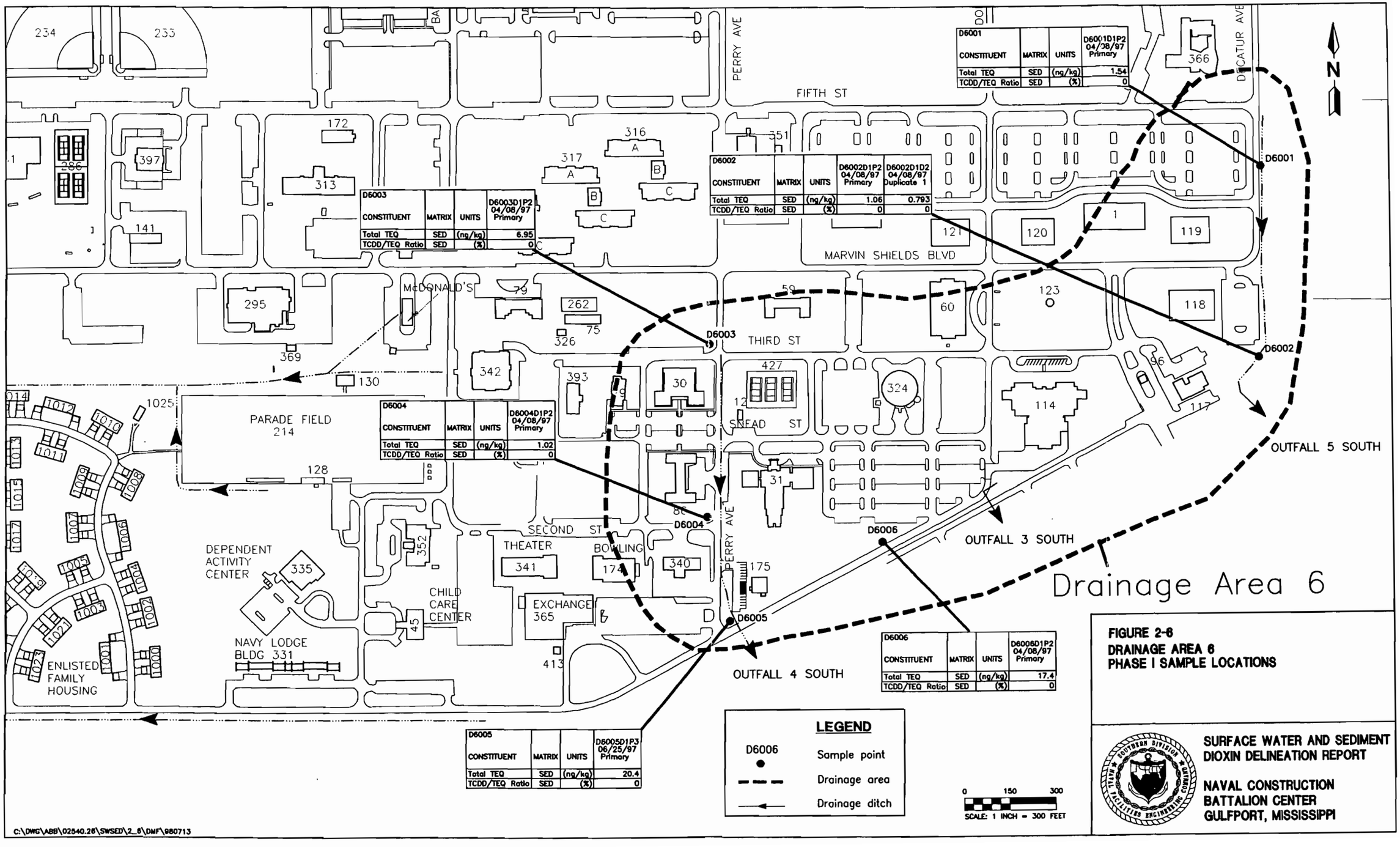


D6001 CONSTITUENT	MATRIX	UNITS	D6001D1P2 04/08/97 Primary
Total TEQ	SED	(ng/kg)	1.54
TCDD/TEQ Ratio	SED	(%)	0

D6002 CONSTITUENT	MATRIX	UNITS	D6002D1P2 04/08/97 Primary	D6002D1D2 04/08/97 Duplicate 1
Total TEQ	SED	(ng/kg)	1.06	0.793
TCDD/TEQ Ratio	SED	(%)	0	0

D6003 CONSTITUENT	MATRIX	UNITS	D6003D1P2 04/08/97 Primary
Total TEQ	SED	(ng/kg)	6.95
TCDD/TEQ Ratio	SED	(%)	0

D6004 CONSTITUENT	MATRIX	UNITS	D6004D1P2 04/08/97 Primary
Total TEQ	SED	(ng/kg)	1.02
TCDD/TEQ Ratio	SED	(%)	0

D6005 CONSTITUENT	MATRIX	UNITS	D6005D1P3 06/25/97 Primary
Total TEQ	SED	(ng/kg)	20.4
TCDD/TEQ Ratio	SED	(%)	0

D6006 CONSTITUENT	MATRIX	UNITS	D6006D1P2 04/08/97 Primary
Total TEQ	SED	(ng/kg)	17.4
TCDD/TEQ Ratio	SED	(%)	0

FIGURE 2-6
DRAINAGE AREA 6
PHASE I SAMPLE LOCATIONS

SURFACE WATER AND SEDIMENT DIOXIN DELINEATION REPORT

NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MISSISSIPPI

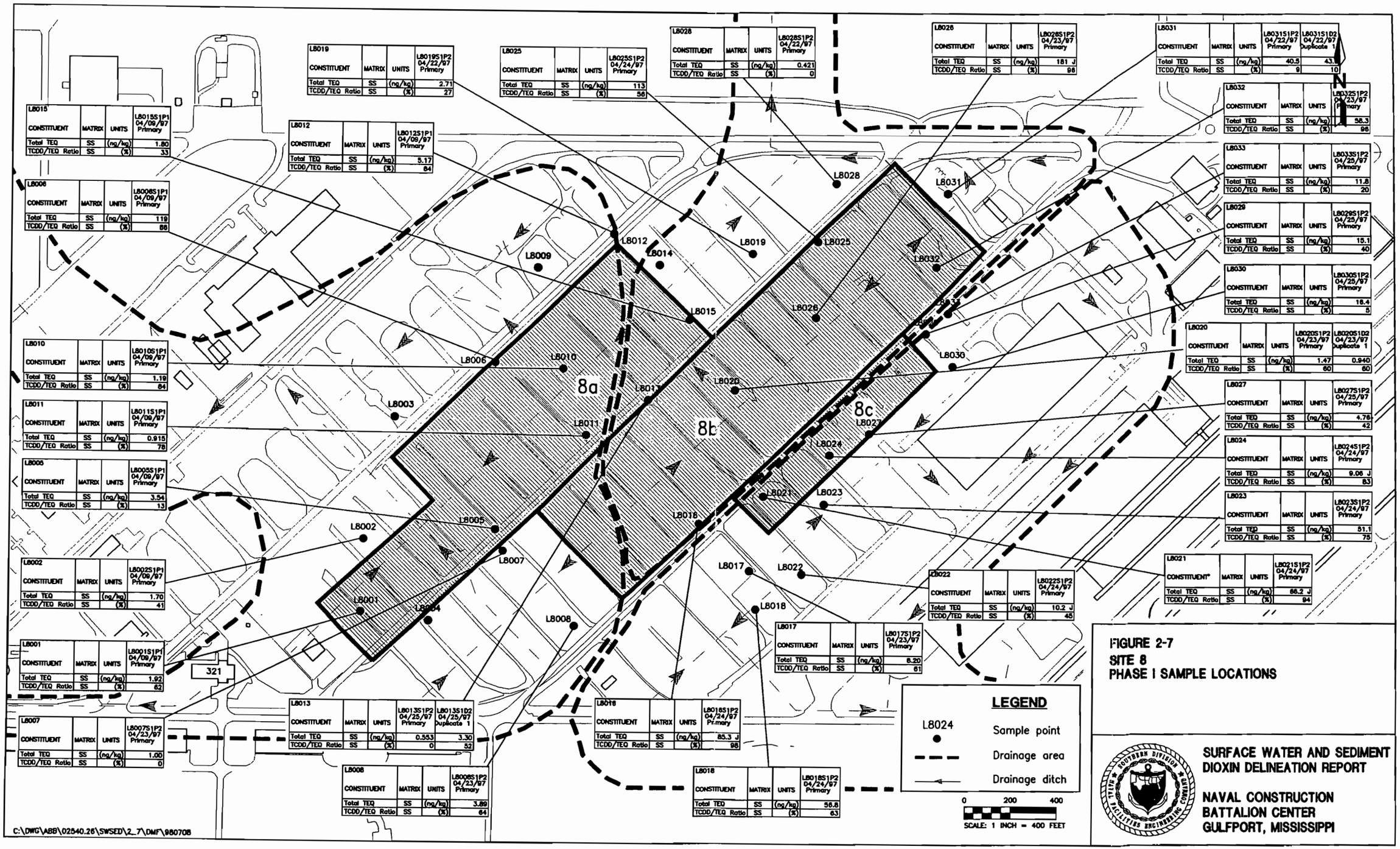
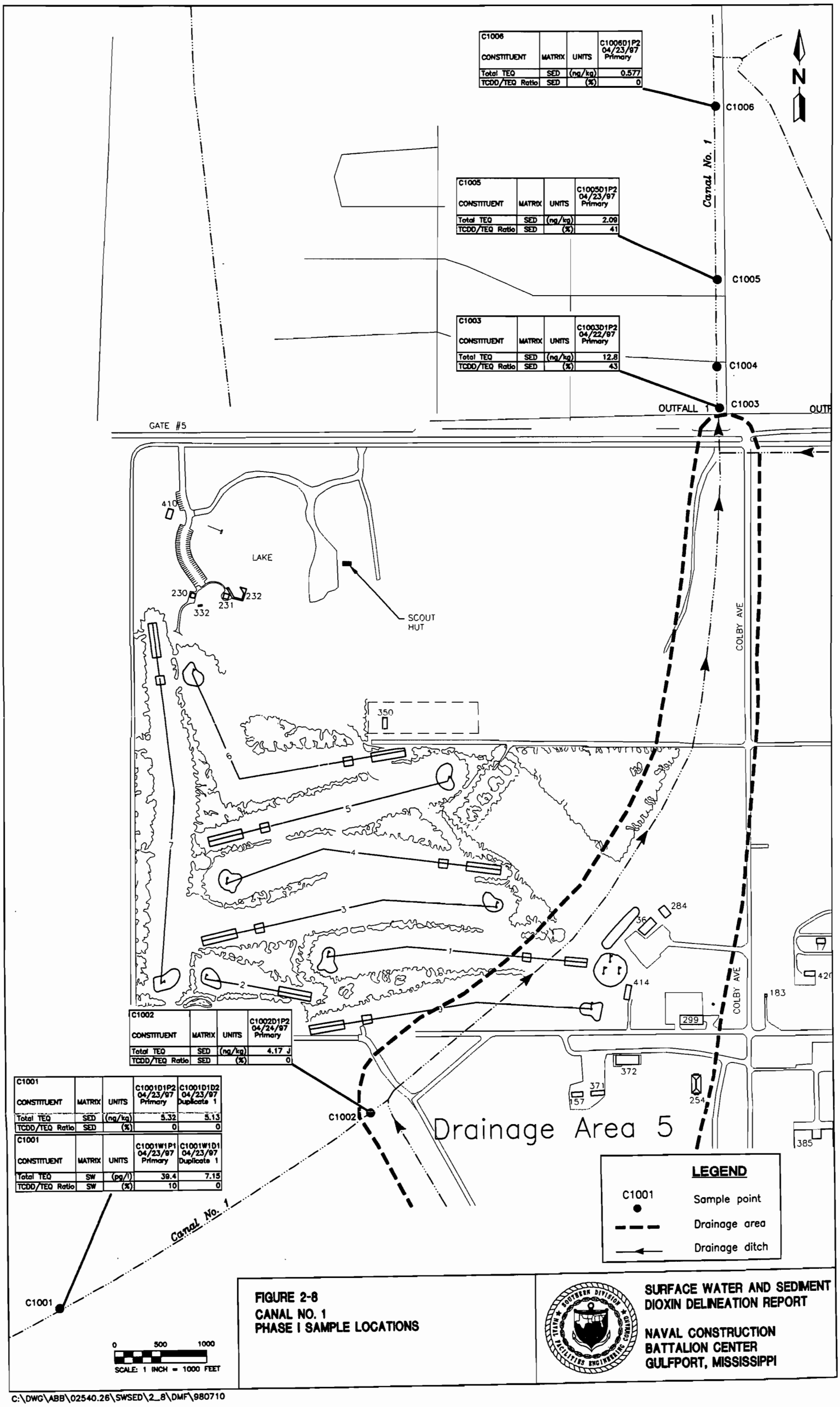


FIGURE 2-7
SITE 8
PHASE I SAMPLE LOCATIONS

SURFACE WATER AND SEDIMENT
DIOXIN DELINEATION REPORT

NAVAL CONSTRUCTION
BATTALION CENTER
GULFPORT, MISSISSIPPI


C1006
CONSTITUENT | MATRIX | UNITS | C1006D1P2 04/23/97 Primary
Total TEQ | SED | (ng/kg) | 0.577
TCDD/TEQ Ratio | SED | (%) | 0
C1006
C1005
CONSTITUENT | MATRIX | UNITS | C1005D1P2 04/23/97 Primary
Total TEQ | SED | (ng/kg) | 2.09
TCDD/TEQ Ratio | SED | (%) | 41
C1005
C1003
CONSTITUENT | MATRIX | UNITS | C1003D1P2 04/22/97 Primary
Total TEQ | SED | (ng/kg) | 12.8
TCDD/TEQ Ratio | SED | (%) | 43
C1003
C1004
C1002
CONSTITUENT | MATRIX | UNITS | C1002D1P2 04/24/97 Primary
Total TEQ | SED | (ng/kg) | 4.17 J
TCDD/TEQ Ratio | SED | (%) | 0
C1001
CONSTITUENT | MATRIX | UNITS | C1001D1P2 04/23/97 Primary | C1001D1D2 04/23/97 Duplicate 1
Total TEQ | SED | (ng/kg) | 5.32 | 5.13
TCDD/TEQ Ratio | SED | (%) | 0 | 0
C1001
CONSTITUENT | MATRIX | UNITS | C1001W1P1 04/23/97 Primary | C1001W1D1 04/23/97 Duplicate 1
Total TEQ | SW | (pg/l) | 39.4 | 7.15
TCDD/TEQ Ratio | SW | (%) | 10 | 0
C1001
Canal No. 1
Canal No. 1
OUTFALL 1
OUTF
GATE #5
410
LAKE
230
231
232
332
SCOUT HUT
COLBY AVE
350
6
5
4
3
1
2
7
284
36
414
420
183
299
372
371
157
254
385
Drainage Area 5
0 500 1000
SCALE: 1 INCH = 1000 FEET
LEGEND
C1001 Sample point
Drainage area
Drainage ditch
FIGURE 2-8
CANAL NO. 1
PHASE I SAMPLE LOCATIONS
SURFACE WATER AND SEDIMENT DIOXIN DELINEATION REPORT
NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI
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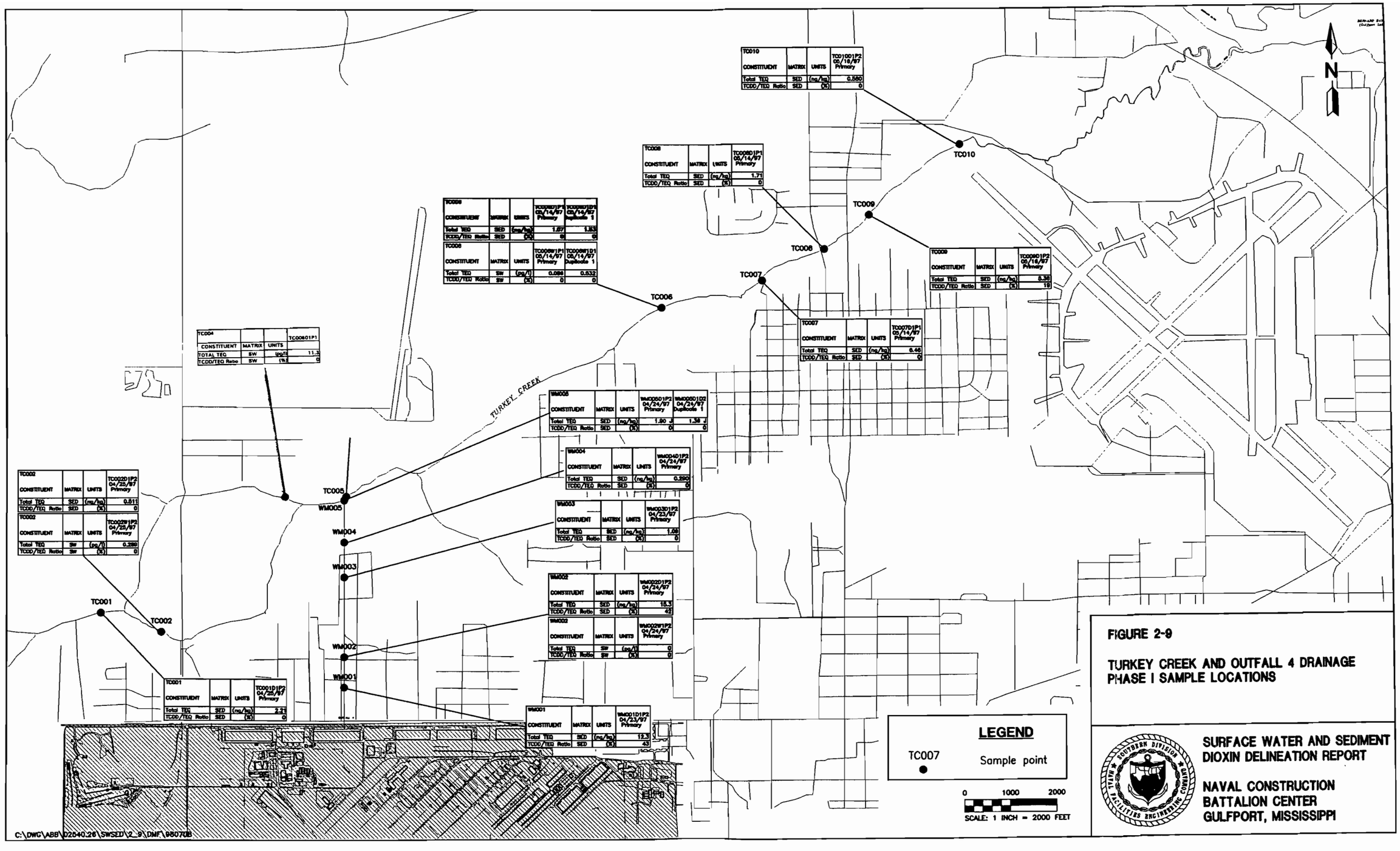

FIGURE 2-9

TURKEY CREEK AND OUTFALL 4 DRAINAGE PHASE I SAMPLE LOCATIONS

SURFACE WATER AND SEDIMENT DIOXIN DELINEATION REPORT

NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MISSISSIPPI

BC005 CONSTITUENT	MATRIX	UNITS	BC005D1P1 05/19/97 Primary
Total TEQ	SED	(ng/kg)	2.90
TCDD/TEQ Ratio	SED	(%)	0

BC004 CONSTITUENT	MATRIX	UNITS	BC004D1P1 05/19/97 Primary
Total TEQ	SED	(ng/kg)	18.4
TCDD/TEQ Ratio	SED	(%)	3

BC003 CONSTITUENT	MATRIX	UNITS	BC003D1P1 05/19/97 Primary
Total TEQ	SED	(ng/kg)	19.0
TCDD/TEQ Ratio	SED	(%)	0

BC003 CONSTITUENT	MATRIX	UNITS	BC003W1P1 05/19/97 Primary
Total TEQ	SW	(pg/l)	0.112
TCDD/TEQ Ratio	SW	(%)	0

BC002 CONSTITUENT	MATRIX	UNITS	BC002D1P2 04/29/97 Primary
Total TEQ	SED	(ng/kg)	0.851
TCDD/TEQ Ratio	SED	(%)	0

BC001 CONSTITUENT	MATRIX	UNITS	BC001D1P2 04/29/97 Primary
Total TEQ	SED	(ng/kg)	1.87 J
TCDD/TEQ Ratio	SED	(%)	0

N

BC005

BC004

BC003

BC002

BC001

SITE 88

SITE 8A

SITE 8C

BRICKYARD CREEK

LEGEND

BC001 ● Sample point

0 500 1000

SCALE: 1 INCH = 1000 FEET

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FIGURE 2-10
BRICKYARD BAYOU
PHASE I SAMPLE LOCATIONS

SURFACE WATER AND SEDIMENT DIOXIN DELINEATION REPORT

NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MISSISSIPPI

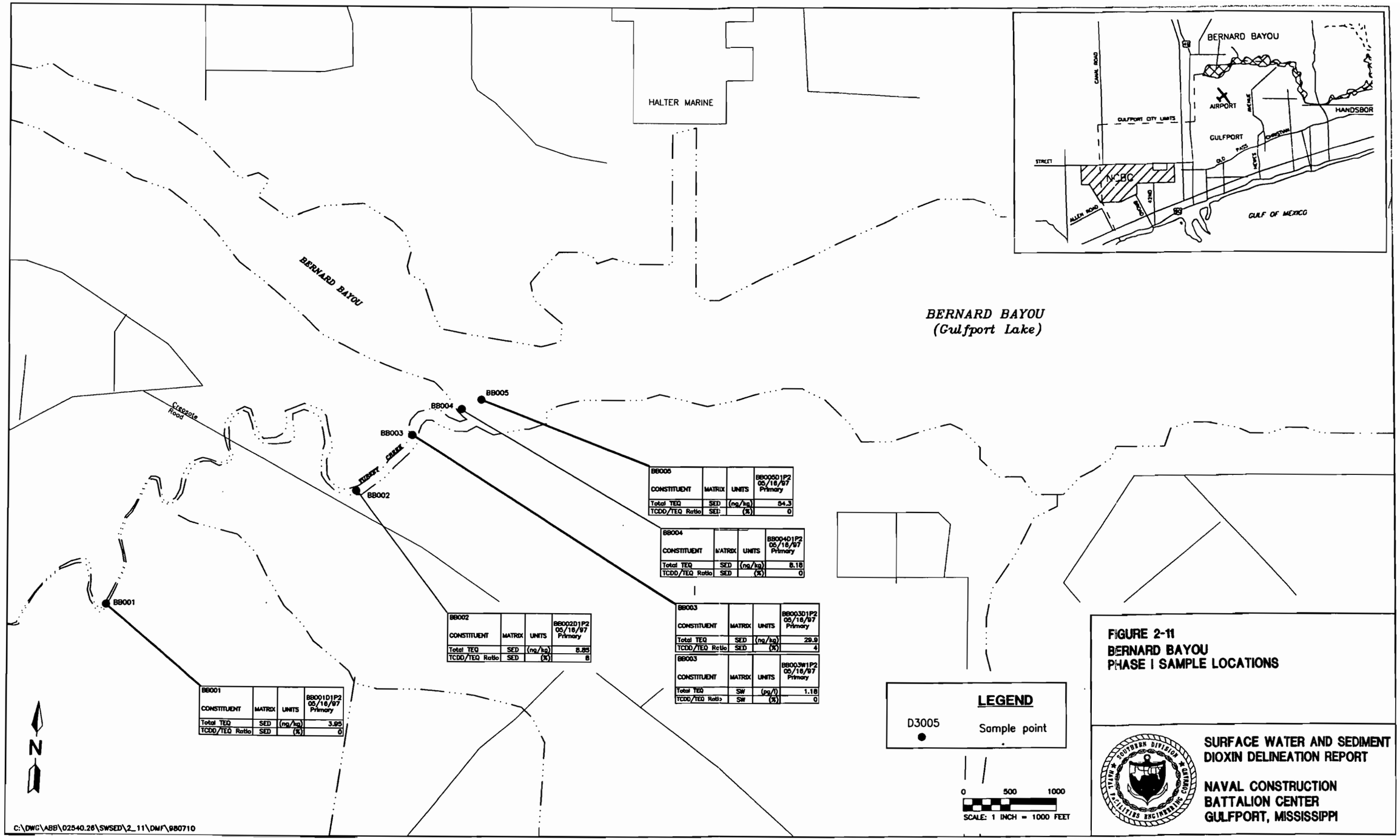

FIGURE 2-11
BERNARD BAYOU
PHASE I SAMPLE LOCATIONS

SURFACE WATER AND SEDIMENT
DIOXIN DELINEATION REPORT

NAVAL CONSTRUCTION
BATTALION CENTER
GULFPORT, MISSISSIPPI

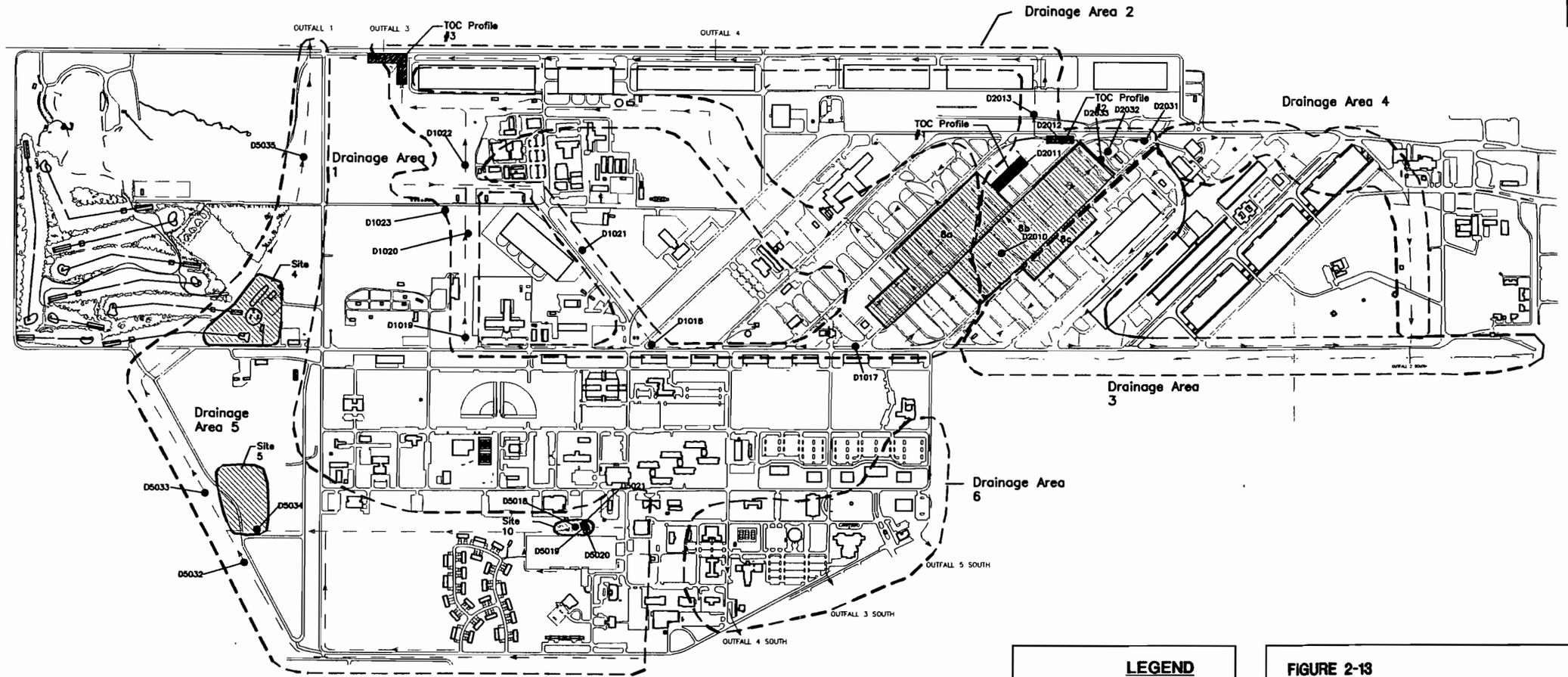

FIGURE 2-13
NAVAL CONSTRUCTION BATTALION CENTER
PHASE II ON-SITE SAMPLE LOCATIONS

SURFACE WATER AND SEDIMENT DIOXIN DELINEATION REPORT

NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MISSISSIPPI

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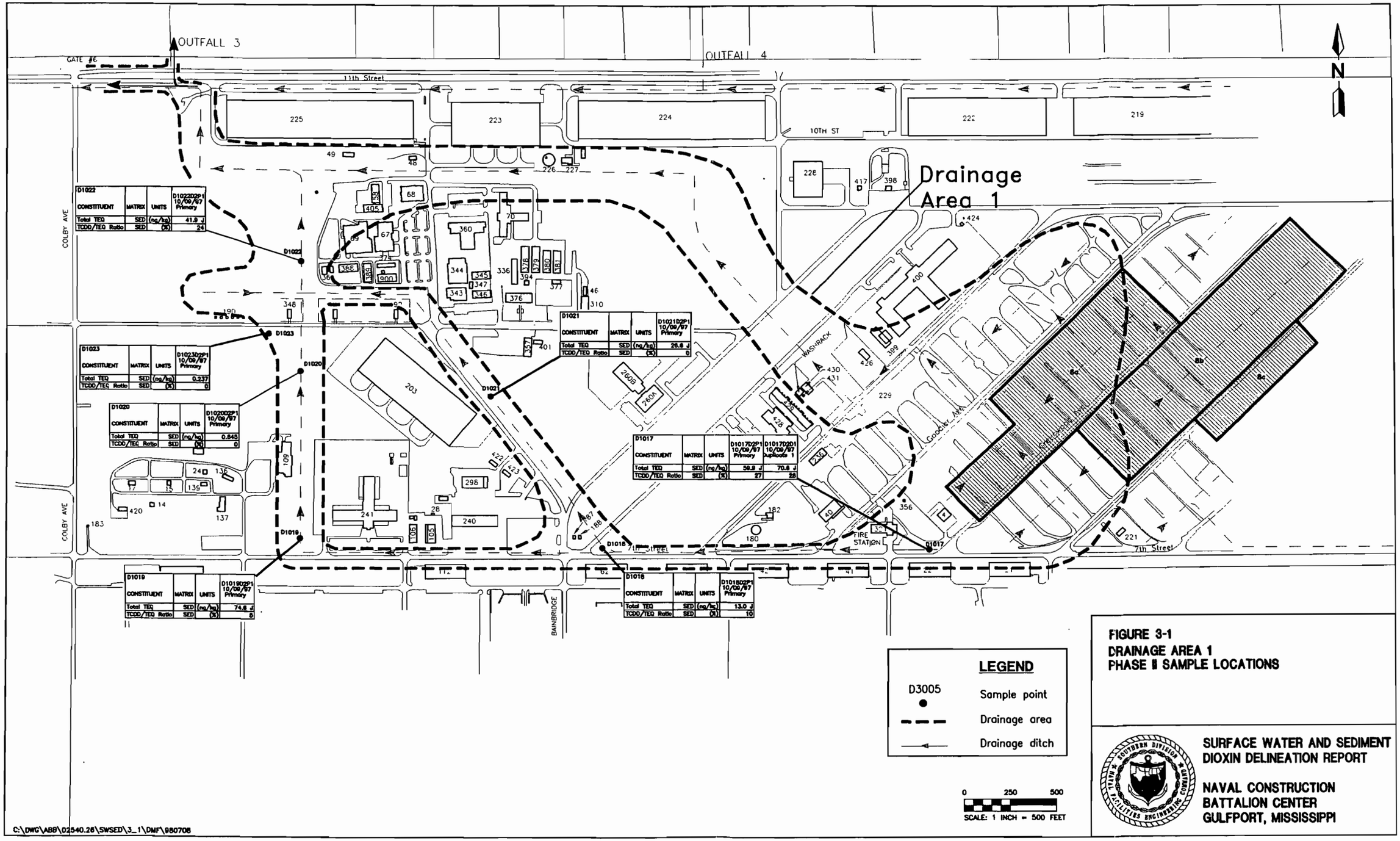

FIGURE 3-1
DRAINAGE AREA 1
PHASE II SAMPLE LOCATIONS

SURFACE WATER AND SEDIMENT DIOXIN DELINEATION REPORT

NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MISSISSIPPI

D2011 CONSTITUENT	MATRIX	UNITS	D2011D2P1 10/10/97 Primary
Total TEQ	SED	(ng/kg)	441 J
TCDD/TEQ Ratio	SED	(%)	92

D2013 CONSTITUENT	MATRIX	UNITS	D2013D2P1 10/10/97 Primary
Total TEQ	SED	(ng/kg)	3.32
TCDD/TEQ Ratio	SED	(%)	63

D2012 CONSTITUENT	MATRIX	UNITS	D2012D2P1 10/10/97 Primary	D2012D2D1 10/10/97 Duplicate 1
Total TEQ	SED	(ng/kg)	818 J	627 J
TCDD/TEQ Ratio	SED	(%)	93	89

D2033 CONSTITUENT	MATRIX	UNITS	D2033D2P1 11/07/97 Primary
Total TEQ	SED	(ng/kg)	783 J
TCDD/TEQ Ratio	SED	(%)	83

D2032 CONSTITUENT	MATRIX	UNITS	D2032D2P1 11/07/97 Primary
Total TEQ	SED	(ng/kg)	441 J
TCDD/TEQ Ratio	SED	(%)	44

D2031 CONSTITUENT	MATRIX	UNITS	D2031D2P1 11/07/97 Primary
Total TEQ	SED	(ng/kg)	1270 J
TCDD/TEQ Ratio	SED	(%)	87

D2010 CONSTITUENT	MATRIX	UNITS	D2010D2P1 10/10/97 Primary
Total TEQ	SED	(ng/kg)	489
TCDD/TEQ Ratio	SED	(%)	98

OUTFALL 4

Drainage Area 2

8a 8b 8c

11th Street 10TH ST 9th Street 7th Street FIFTH ST

Goodloe Ave Strickland Ave McKinney Ave Jee Ave Holmes Ave

WASH RACK BARRIDGE FIRE STATION

PERRY AVE DONG XOAI AVE DECATUR AVE

WHSC 20

LEGEND

D2031 ● Sample point

Drainage area

Drainage ditch

0 500 1000

SCALE: 1 INCH = 1000 FEET

FIGURE 3-2
DRAINAGE AREA 2
PHASE II SAMPLE LOCATIONS

SURFACE WATER AND SEDIMENT DIOXIN DELINEATION REPORT

NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MISSISSIPPI

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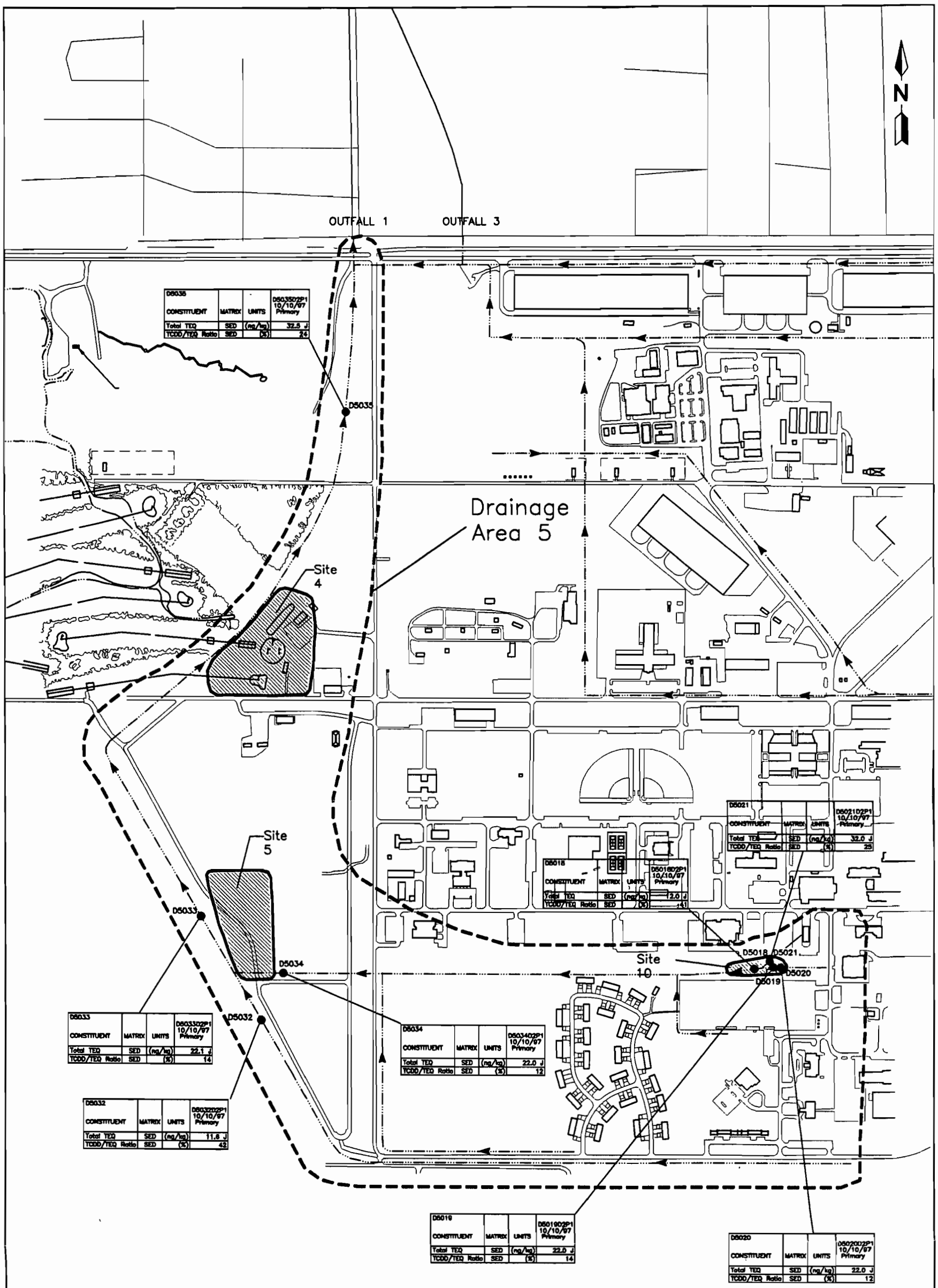

FIGURE 3-3
DRAINAGE AREA 5
PHASR II SAMPLE LOCATIONS

SURFACE WATER AND SEDIMENT DIOXIN DELINEATION REPORT

NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MISSISSIPPI

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Halter Marine

N

BERNARD BAYOU

BERNARD BAYOU
(Gulfport Lake)

TURKEY CREEK

CREOSOTE ROAD

BB006

BB007

BB008

BB009

BB010

BB006 CONSTITUENT	MATRIX	UNITS	BB006D2P1 10/15/97 Primary
Total TEQ	SED	(ng/kg)	60.7 J
TCDD/TEQ Ratio	SED	(%)	2

BB008 CONSTITUENT	MATRIX	UNITS	BB008D2P1 10/15/97 Primary
Total TEQ	SED	(ng/kg)	43.1 J
TCDD/TEQ Ratio	SED	(%)	3

BB007 CONSTITUENT	MATRIX	UNITS	BB007D2P1 10/15/97 Primary
Total TEQ	SED	(ng/kg)	33.7 J
TCDD/TEQ Ratio	SED	(%)	4

BB009 CONSTITUENT	MATRIX	UNITS	BB009D2P1 10/15/97 Primary
Total TEQ	SED	(ng/kg)	38.3 J
TCDD/TEQ Ratio	SED	(%)	5

BB010 CONSTITUENT	MATRIX	UNITS	BB010D2P1 10/15/97 Primary
Total TEQ	SED	(ng/kg)	27.9 J
TCDD/TEQ Ratio	SED	(%)	5

LEGEND

BB006 ● Sample point

0 150 300

SCALE: 1 INCH = 300 FEET

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FIGURE 3-4
BERNARD BAYOU
PHASE II SAMPLE LOCATIONS

SURFACE WATER AND SEDIMENT DIOXIN DELINEATION REPORT

NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MISSISSIPPI

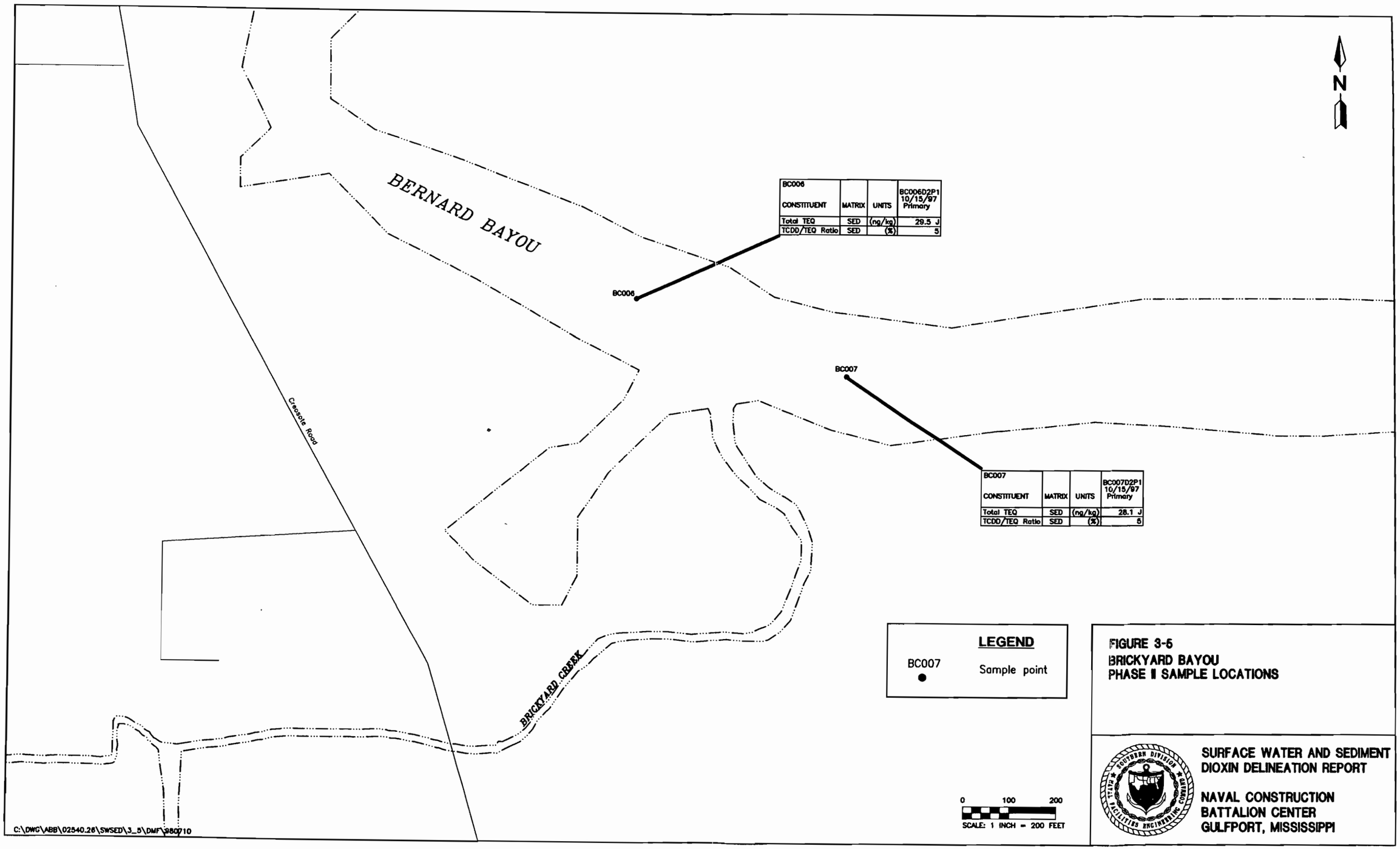

FIGURE 3-5
BRICKYARD BAYOU
PHASE II SAMPLE LOCATIONS

SURFACE WATER AND SEDIMENT
DIOXIN DELINEATION REPORT

NAVAL CONSTRUCTION
BATTALION CENTER
GULFPORT, MISSISSIPPI

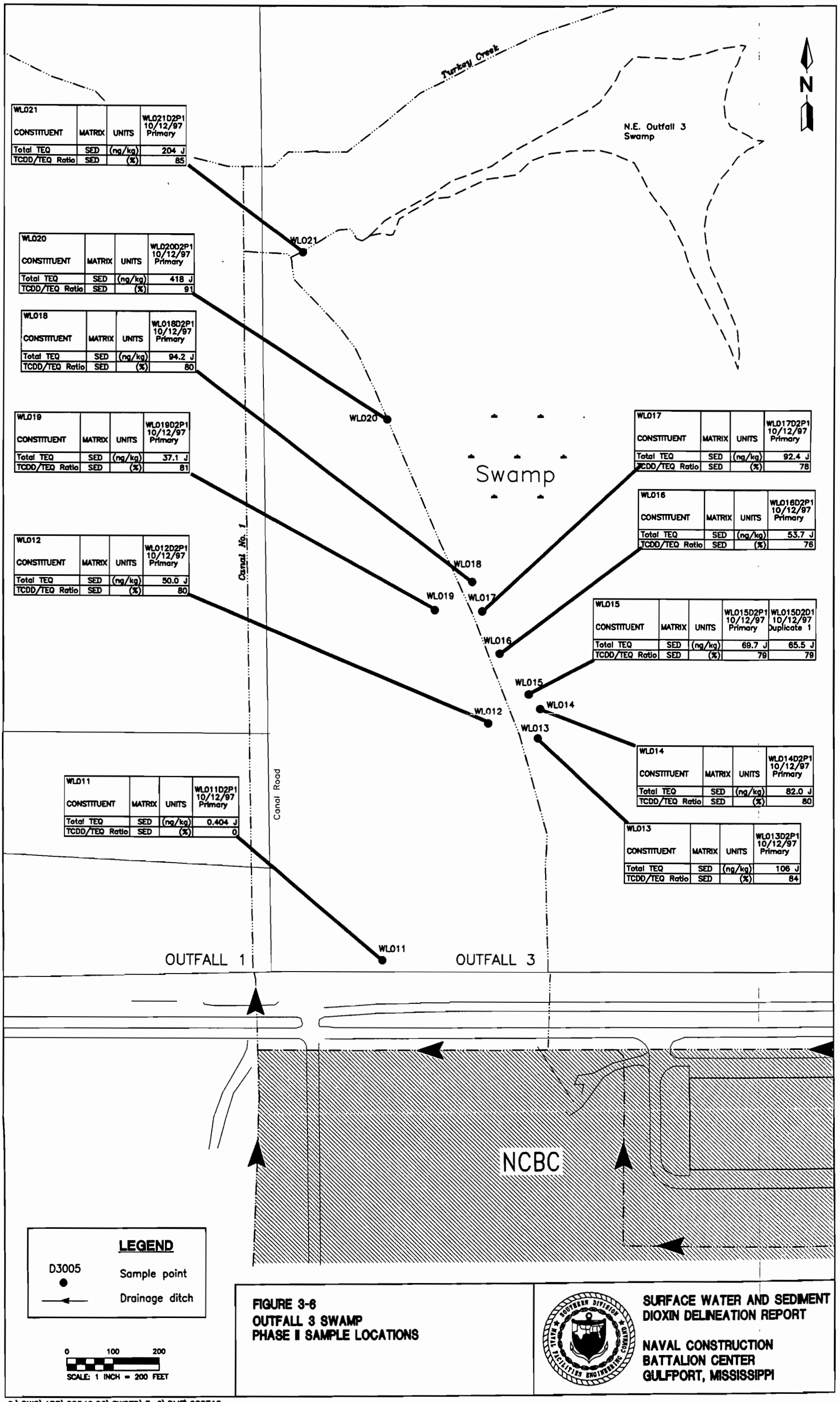

FIGURE 3-6
OUTFALL 3 SWAMP
PHASE II SAMPLE LOCATIONS

SURFACE WATER AND SEDIMENT DIOXIN DELINEATION REPORT

NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MISSISSIPPI

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APPENDIX D

APPENDIX D

HUMAN HEALTH RISK ASSESSMENT PARAMETERS AND CALCULATIONS

TABLE D-1

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADOLESCENT TRESPASSER
NCBC Gulfport
Gulfport Mississippi
Site 8

02-Oct-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	mg/day	USEPA, 1991
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
AGE-SPECIFIC SURFACE AREA	SA_i	age-specific	cm²	USEPA, 1989
ABSORPTION FRACTION	ABS_d	chemical-specific	unitless	USEPA, 1995
CONVERSION FACTOR	CF	1.00E-06	kg/mg	Inorganics
	CF	1.00E-09	kg/mg	Organics
BODY WEIGHT	BW	45	kg	USEPA, 1995
AGE-SPECIFIC BODY WEIGHT	BW_i	age-specific	kg	USEPA, 1989
EXPOSURE FREQUENCY	EF	30	days/year [1]	Assumption
EXPOSURE DURATION	ED	10	years	USEPA, 1995
AGE-SPECIFIC EXPOSURE DURATION	ED_i	age-specific	years	Assumption
AGE-WEIGHTED SURFACE AREA [2]	$SA_{soil/adj}$	1013	cm²-year/kg	Per USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	Per USEPA, 1992
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	10	years	USEPA, 1995

[1] Units for exposure frequency are in events/year in the calculation of the dermally absorbed dose.
[2] In estimating the dermally absorbed dose for children age 7 through 16, the time-weighted, bodyweight normalized surface area exposed is calculated from surface area, exposure duration, and body weight for each of 10 age periods, age 7 through 16, per USEPA, 1992.

USEPA, 1989. Exposure Factors Handbook;EPA/600/8-89/043; May 1989.
USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors"; OSWER Directive 9285.6-03.
USEPA, 1992. Dermal Exposure Assessment: Principles and Applications; EPA/600/8-91/011B; January 1992 and
USEPA, 1995. Supplemental Guidance to RAGS: Region 4 Bulletins, Bulletin No. 3, November 1995.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = (DA_{event} \times EF / AT \times 365\ days/year) \times SA_{soil/adj}$$

Where:

$SA_{soil/adj}$ = SUM $(SA_i \times ED_i / BW_i)$

DA_{event} = CS x AF x ABS_d x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL ONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF [1] $(mg/kg\text{-}day)^{-1}$	ANCER RIS INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [1,3] $(mg/kg\text{-}day)^{-1}$	CANCER RIS DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.0995	ug/kg	2.6E-12	150000	3.9E-07	0.01	1.2E-12	150000	1.8E-07	5.7E-07
				SUMMARY CANCER RISK		4E-07				2E-07	6E-07

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[3] Calculated from oral CSFs.

TABLE D-2

INHALATION OF PARTICULATES - SURFACE SOIL
ADOLESCENT TRESPASSER
NCBC Gulfport
Gulfport Mississippi
Site 8

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-	
PART. EMISSION FACTOR	PEF	1 25E+09	m³/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m³	
INHALATION RATE	IR	0 625	m³/hour	USEPA, 1995
BODY WEIGHT	BW	45	kg	USEPA, 1995
EXPOSURE TIME	ET	4	hours/day	Assumption
EXPOSURE FREQUENCY	EF	45	days/year	Assumption
EXPOSURE DURATION	ED	10	years	USEPA, 1995
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	10	years	USEPA, 1995

USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors"; OSWER Directive 9285 6-03
USEPA 1995 Supplemental Guidance to RAGS, Region 4 Bulletins, Bulletin No 3, November 1995

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR (mg/kg-day)$^{-1}$

$$\text{INTAKE} = \frac{\text{CA x IR x ET x EF x ED}}{\text{BW x AT x 365 days/yr}}$$

Where:

CA = C x CF x (1/PEF)

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL CONCENTRATIO	UNITS	AIR CONCENTRATIO (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)^-1	CANCER RISK
2,3,7,8-TCDD	O	0.0995	ug/kg	7 96E-14	7 8E-17	156000	1.2E-11
						SUMMARY CANCER RISK	1E-11

TABLE D-3

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADULT TRESPASSER
NCBC Gulfport
Gulfport Mississippi
Site 8

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1991
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS_d	chemical specific	unitless	USEPA, 1995
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1 00E-06	kg/mg	inorganics
	CF	1 00E-09	kg/ug	organics
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	24	days/year [1]	Assumption
EXPOSURE DURATION	ED	24	years	Assumption
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	24	years	Assumption

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, 1/92
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:
$DA_{event} = CS \times AF \times ABS_d \times CF$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] 150000	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.0995	ug/kg	1 6E-12	150000	2 4E-07	0 01	1 8E-12	150000	2 8E-07	5 2E-07
					SUMMARY CANCER RISK	2E-07				3E-07	5E-07

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[2] Calculated from oral CSFs

TABLE D-4

INHALATION OF PARTICULATES - SURFACE SOIL
ADULT TRESPASSER
NCBC Gulfport
Gulfport Mississippi
Site 8

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-	
PART. EMISSION FACTOR	PEF	1.25E+09	m^3/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m^3	
INHALATION RATE	IR	0.833	$m^3/hour$	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	4	hours/day	Assumption
EXPOSURE FREQUENCY	EF	45	days/year	Assumption
EXPOSURE DURATION	ED	20	years	Assumption
CONVERSION FACTOR	CF	0.001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	20	years	USEPA, 1991

USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors"; OSWER Directive 9285.6-03.
USEPA, 1995. Supplemental Guidance to RAGS : Region IV, Human Health Risk Assessment Bulletin No. 3.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$\textbf{INTAKE} = \frac{\textbf{CA x IR x ET x EF x ED}}{\textbf{BW x AT x 365 days/yr}}$$

Where:

CA = C x CF x (1/PEF)

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL CONCENTRATIO	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATIO CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK
2,3,7,8-TCDD	O	**0.0995**	ug/kg	7.96E-14	1.3E-16	**156000**	**2.1E-11**
					SUMMARY CANCER RIS		**2E-11**

TABLE D-5

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
OCCUPATIONAL WORKER
NCBC Gulfport
Gulfport Mississippi
Site 8

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	0 5	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS	chemical-specific	unitless	Assumption
SURFACE AREA EXPOSED	SA	2,300	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	250	days/year [1]	USEPA, 1995
EXPOSURE DURATION	ED	25	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment. Principles and Applications, EPA/600/8-91/011B, 1/92
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:
DA_{event} = CS x AF x ABS x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] 150000	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.0995	ug/kg	1 7E-11	150000	2.6E-06	0 01	4 0E-12	150000	6 0E-07	3 208E-06
SUMMARY CANCER RISK						3E-06				6E-07	3E-06

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[2] Calculated from oral CSFs.
NE = not evaluated

TABLE D-6

INHALATION OF PARTICULATES - SURFACE SOIL
OCCUPATIONAL WORKER
NCBC Gulfport
Gulfport Mississippi
Site 8

10-Apr-00

0

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	specific	
PART. EMISSION FACTOR	PEF	1 25E+09	m³/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m³	
INHALATION RATE	IR	2 5	m³/hour	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	8	hours/day	Assumption
EXPOSURE FREQUENCY	EF	250	days/year	Assumption
EXPOSURE DURATION	ED	25	years	USEPA, 1995
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

[1] PEF has been derived in the PEF Appendix to this report
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance
"Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1995. Supplemental Guidance to RAGS. Region 4 Bulletins, Bulletin No 3, November 1995.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR (mg/kg-day) [1]

$$\text{INTAKE} = \frac{\text{CA x IR x ET x EF x ED}}{\text{BW x AT x 365 days/yr}}$$

Where:

CA = C x CF x (1/PEF)

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)^-1	CANCER RISK
2,3,7,8-TCDD	O	0.0995	ug/kg	7.96E-14	5.6E-15	156000	8.7E-10
				SUMMARY CANCER RISK			9E-10

TABLE D-7

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
SITE MAINTENANCE WORKER
NCBC Gulfport
Gulfport Mississippi
Site 8

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1992
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS	chemical-specific	unitless	Assumption
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	24	days/year [1]	Assumption
EXPOSURE DURATION	ED	25	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors",
OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment. Principles and Applications, EPA/600/8-91/011B, 1/92
USEPA, 1995 Supplemental Guidance to RAGS . Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR (mg/kg-day)$^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:
DA_{event} = CS x AF x ABS x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF (mg/kg-day)$^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] 150000	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.0995	ug/kg	1 7E-12	150000	2 5E-07	0 01	1.9E-12	150000	2 9E-07	5 4E-07
SUMMARY CANCER RISK						3E-07				3E-07	5E-07

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[2] Calculated from oral CSFs
NE = not evaluated

TABLE D-8

INHALATION OF PARTICULATES - SURFACE SOIL
SITE MAINTENANCE WORKER
NCBC Gulfport
Gulfport Mississippi
Site 8

10-Apr-00

0

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	specific	
PART. EMISSION FACTOR	PEF	1 25E+09	m^3/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m^3	
INHALATION RATE	IR	2 5	$m^3/hour$	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	8	hours/day	Assumption
EXPOSURE FREQUENCY	EF	24	days/year	Assumption
EXPOSURE DURATION	ED	25	years	USEPA, 1995
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

[1] PEF has been derived in the PEF Appendix to this report
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance
"Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1995 Supplemental Guidance to RAGS: Region 4 Bulletins, Bulletin No 3, November 1995

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR (mg/kg-day) [1]

$$\text{INTAKE} = \frac{CA \times IR \times ET \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

$$CA = C \times CF \times (1/PEF)$$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION	INTAKE (mg/kg-day)	INHALATION CSF	CANCER RISK
2,3,7,8-TCDD	O	0.0995	ug/kg	7.96E-14	5.3E-16	156000	8.3E-11
				SUMMARY CANCER RISK			8E-11

TABLE D-9

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
EXCAVATION WORKER
NCBC Gulfport
Gulfport Mississippi
Site 8

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	480	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS	chemical-specific	unitless	Assumption
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	30	days/year [1]	Assumption
EXPOSURE DURATION	ED	1	years	USEPA, 1991
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	1	years	USEPA, 1991

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, 1/92
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR (mg/kg-day)$^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:
DA_{event} = CS x AF x ABS x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF (mg/kg-day)$^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] 150000	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.0995	ug/kg	8 0E-13	150000	1 20E-07	0 01	9 6E-14	150000	1 4E-08	1 35E-07
SUMMARY CANCER RISK						1E-07				1E-08	1E-07

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[2] Calculated from oral CSFs
NE = not evaluated

TABLE D-10

INHALATION OF PARTICULATES - SURFACE SOIL
EXCAVATION WORKER
NCBC Gulfport
Gulfport Mississippi
Site 8

10-Apr-00

0

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
			Chemicals	
SOIL CONCENTRATION	C	chemical-specific	specific	
PART. EMISSION FACTOR	PEF	1 25E+09	m^3/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m^3	
INHALATION RATE	IR	2 5	m^3/hour	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	8	hours/day	Assumption
EXPOSURE FREQUENCY	EF	30	days/year	Assumption
EXPOSURE DURATION	ED	1	years	Assumption
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	1	years	USEPA, 1991

[1] PEF has been derived in the PEF Appendix to this report
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance
Standard Default Exposure Factors, OSWER Directive 9285 6-03
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No. 3.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$\text{INTAKE} = \frac{CA \times IR \times ET \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

$$CA = C \times CF \times (1/PEF)$$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m^3)	INTAKE (mg/kg-day)	INHALATION CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK
2,3,7,8-TCDD	O	0.0995	ug/kg	7.96E-14	2.7E-17	156000	4.2E-12
SUMMARY CANCER RISK							4E-12

TABLE D-11

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
Child Resident
NCBC Gulfport
Gulfport Mississippi
Non-Site 8 On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	200	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
AGE-SPECIFIC SURFACE AREA	SA	age-specific	cm²	USEPA, 1989
ABSORPTION FRACTION	ABS	chemical-specific	unitless	USEPA, 1992b
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
BODY WEIGHT	BW	15	kg	USEPA, 1991
AGE-SPECIFIC BODY WEIGHT	BW	age-specific	kg	USEPA, 1989
EXPOSURE FREQUENCY	EF	350	days/year [1]	USEPA, 1995
EXPOSURE DURATION	ED	6	years	USEPA, 1995
AGE-SPECIFIC EXPOSURE DURATION	ED	age-specific	years	Assumption
AGE-WEIGHTED SURFACE AREA [2]	$SA_{soil/s6}$	1136 3	cm^2-year/kg	USEPA, 1992a
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm^2-event	USEPA, 1992a
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	6	years	USEPA, 1995

[1] Units for exposure frequency are in events/year in the calculation of the dermally absorbed dose
[2] In estimating the dermally absorbed dose for children age1 through 6, the time-weighted, bodyweight normalized surface area exposed is calculated from surface area, exposure duration, and body weight for each of 6 age periods, age 1 through 6, per USEPA, 1992
USEPA, 1989 Exposure Factors Handbook,EPA/600/8-89/043, May 1989
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992a Dermal Exposure Assessment Principles and Applications; EPA/600/8-91/011B, January 1992
USEPA, 1992b USEPA Region IV Guidance Memorandum, February 10, 1992
USEPA, 1995 Supplemental Guidance to RAGS · Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = AT \times 365\ days/year) \times SA_{soil/s6}$$

Where:
$SA_{soil/s6}$ = SUM (SA_i x ED_i / BW_i)
DA_{event} = CS x AF x ABS_d x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF [1] $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [1, 3] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0 079	ug/kg	8 7E-11	150000	1 3E-05	0 01	1 2E-11	150000	1.8E-06	1 5E-05
				SUMMARY CANCER RISK		1E-05				2E-06	1E-05

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs
ND = no data

TABLE D-12

INHALATION OF PARTICULATES - SURFACE SOIL
Child Resident
NCBC Gulfport
Gulfport Mississippi
Non-Site 8

10-Apr-00

0

EXPOSURE PARAMETERS

SOIL CONCENTRATION	C	chemical-specific	specific	
PART. EMISSION FACTOR	PEF	1 25E+09	m^3/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m^3	
INHALATION RATE	IR	0 625	m^3/hour	USEPA, 1995
BODY WEIGHT	BW	45	kg	USEPA, 1995
EXPOSURE TIME	ET	4	hours/day	Assumption
EXPOSURE FREQUENCY	EF	45	days/year	Assumption
EXPOSURE DURATION	ED	10	years	USEPA, 1995
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	10	years	USEPA, 1995

[1] PEF has been derived in the PEF Appendix to this report
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA 1995 Supplemental Guidance to RAGS, Region 4 Bulletins, Bulletin No 3, November 1995

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR (mg/kg-day)$^{-1}$

$$\textbf{INTAKE} = \frac{\textbf{CA x IR x ET x EF x ED}}{\textbf{BW x AT x 365 days/yr}}$$

Where:

CA = C x CF x (1/PEF)

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL CONCENTRATIO	UNITS	AIR CONCENTRATIO (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)^-1	CANCER RISK
	0						
2,3,7,8-TCDD	O	0.079	ug/kg	6 32E-14	6 2E-17	156000	9.6E-12
						SUMMARY CANCER RISK	1E-11

TABLE D-13

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
Adult Resident
NCBC Gulfport
Gulfport Mississippi
Non-Site 8 On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
ABSORPTION FRACTION	ABS_d	chemical-specific	unitless	USEPA, 1992b
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992a
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992a
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	350	days/year [1]	Assumption
EXPOSURE DURATION	ED	4	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	4	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, January 1992
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR (mg/kg-day)$^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:
$DA_{event} = CS \times AF \times ABS_d \times CF$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL ONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF (mg/kg-day)$^{-1}$	CANCER RISK INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [3] (mg/kg-day)$^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.079	ug/kg	6 2E-12	150000	9 3E-07	0 01	3 6E-12	150000	5 3E-07	1 5E-06
SUMMARY CANCER RISK						9E-07				5E-07	1E-06

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs
ND = no data available

TABLE D-14

INHALATION OF PARTICULATES - SURFACE SOIL
Adult Resident
NCBC Gulfport
Gulfport Mississippi
Non-Site 8

02-Oct-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-specific	
PART. EMISSION FACTOR	PEF	1.25E+09	m^3/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m^3	
INHALATION RATE	IR	0.833	m^3/hour	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	16	hours/day	Assumption
EXPOSURE FREQUENCY	EF	350	days/year	USEPA, 1995
EXPOSURE DURATION	ED	24	years	USEPA, 1995
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	24	years	USEPA, 1995

USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance. "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1995. Supplemental Guidance to RAGS : Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

$$\text{CANCER RISK} = \text{INTAKE (mg/kg-day)} \times \text{INHALATION CANCER SLOPE FACTOR (mg/kg-day)}^{-1}$$

$$\text{INTAKE} = \frac{\text{CA} \times \text{IR} \times \text{ET} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT} \times 365 \text{ days/yr}}$$

Where:

$$\text{CA} = \text{C} \times \text{CF} \times (1/\text{PEF})$$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)-1	CANCER RISK
2,3,7,8-TCDD	O	0 079	ug/kg	6 32E-14	4.0E-15	156000	6.2E-10
				SUMMARY CANCER RISK			6E-10

TABLE D-15

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADOLESCENT TRESPASSER
NCBC Gulfport
Gulfport Mississippi
Non-Site 8 On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	mg/day	USEPA, 1991
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
AGE-SPECIFIC SURFACE AREA	SA_i	age-specific	cm²	USEPA, 1989
ABSORPTION FRACTION	ABS_d	chemical-specific	unitless	USEPA, 1995
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganics
	CF	1 00E-09	kg/mg	Organics
BODY WEIGHT	BW	45	kg	USEPA, 1995
AGE-SPECIFIC BODY WEIGHT	BW_i	age-specific	kg	USEPA, 1989
EXPOSURE FREQUENCY	EF	30	days/year [1]	Assumption
EXPOSURE DURATION	ED	11	years	USEPA, 1995
AGE-SPECIFIC EXPOSURE DURATION	ED_i	age-specific	years	Assumption
AGE-WEIGHTED SURFACE AREA [2]	$SA_{soil/adj}$	1013	cm²-year/kg	Per USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	Per USEPA, 1992
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	11	years	USEPA, 1995

[1] Units for exposure frequency are in events/year in the calculation of the dermally absorbed dose
[2] In estimating the dermally absorbed dose for children age 7 through 16, the time-weighted, bodyweight normalized surface area exposed is calculated from surface area, exposure duration, and body weight for each of 10 age periods, age 7 through 16, per USEPA, 1992

USEPA, 1989 Exposure Factors Handbook,EPA/600/8-89/043, May 1989
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, January 1992 and

USEPA, 1995 Supplemental Guidance to RAGS Region 4 Bulletins, Bulletin No 3, November 1995

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = AT \times 365\ days/year) \times SA_{soil/adj}$$

Where:

$SA_{soil/adj}$ = SUM $(SA_i \times ED_i / BW_i)$

DA_{event} = CS x AF x ABS_d x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL ONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	ANCER RIS INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [1,3] $(mg/kg\text{-}day)^{-1}$	CANCER RIS DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0 079	ug/kg	2 3E-12	150000	3 4E-07	0 01	9 4E-13	150000	1 4E-07	4 8E-07
					SUMMARY CANCER RISK	3E-07				1E-07	5E-07

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs

TABLE D-16

INHALATION OF PARTICULATES - SURFACE SOIL
ADOLESCENT TRESPASSER
NCBC Gulfport
Gulfport Mississippi
Non-Site 8

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-	
PART. EMISSION FACTOR	PEF	1 25E+09	m³/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m³	
INHALATION RATE	IR	0 625	m³/hour	USEPA, 1995
BODY WEIGHT	BW	45	kg	USEPA, 1995
EXPOSURE TIME	ET	4	hours/day	Assumption
EXPOSURE FREQUENCY	EF	45	days/year	Assumption
EXPOSURE DURATION	ED	10	years	USEPA, 1995
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	10	years	USEPA, 1995

[1] PEF has been derived in the PEF Appendix to this report
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance. "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA 1995. Supplemental Guidance to RAGS, Region 4 Bulletins, Bulletin No 3, November 1995

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR (mg/kg-day)$^{-1}$

INTAKE = $\frac{CA \times IR \times ET \times EF \times ED}{BW \times AT \times 365\ days/yr}$

Where:

CA = C x CF x (1/PEF)

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL CONCENTRATIO	UNITS	AIR CONCENTRATIO (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)^-1	CANCER RISK
2,3,7,8-TCDD	O	0.079	ug/kg	6 32E-14	6 2E-17	156000	9.6E-12
						SUMMARY CANCER RISK	1E-11

TABLE D-17

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
ADULT TRESPASSER
NCBC Gulfport
Gulfport Mississippi
Non-Site 8 On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1991
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS_d	chemical specific	unitless	USEPA, 1995
SURFACE AREA EXPOSED	SA	5,750	cm^2	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1 00E-06	kg/mg	inorganics
	CF	1 00E-09	kg/ug	organics
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	24	days/year [1]	Assumption
EXPOSURE DURATION	ED	24	years	Assumption
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	24	years	Assumption

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, 1/92
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

$DA_{event} = CS \times AF \times ABS_d \times CF$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.079	ug/kg	1 3E-12	150000	1 9E-07	0 01	1 5E-12	150000	2 2E-07	4 1E-07
					SUMMARY CANCER RISK	2E-07				2E-07	4E-07

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[2] Calculated from oral CSFs

TABLE D-18

INHALATION OF PARTICULATES - SURFACE SOIL
ADULT TRESPASSER
NCBC Gulfport
Gulfport Mississippi
Non-Site 8

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-	
PART. EMISSION FACTOR	PEF	1 25E+09	m^3/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m^3	
INHALATION RATE	IR	0 833	m^3/hour	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	4	hours/day	Assumption
EXPOSURE FREQUENCY	EF	45	days/year	Assumption
EXPOSURE DURATION	ED	20	years	Assumption
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	20	years	USEPA, 1991

USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1995. Supplemental Guidance to RAGS - Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$\textbf{INTAKE} = \frac{\textbf{CA x IR x ET x EF x ED}}{\textbf{BW x AT x 365 days/yr}}$$

Where:

CA = C x CF x (1/PEF)

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL CONCENTRATIO	UNITS	AIR CONCENTRATION (mg/m^3)	INTAKE (mg/kg-day)	INHALATIO CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK
2,3,7,8-TCDD	O	0.079	ug/kg	6 32E-14	1 1E-16	156000	1.7E-11
SUMMARY CANCER RISK							2E-11

TABLE D-19

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
OCCUPATIONAL WORKER
NCBC Gulfport
Gulfport Mississippi
Non-Site 8 On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	0 5	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS	chemical-specific	unitless	Assumption
SURFACE AREA EXPOSED	SA	2,300	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	250	days/year [1]	USEPA, 1995
EXPOSURE DURATION	ED	25	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors";
OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, 1/92
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

$$DA_{event} = CS \times AF \times ABS \times CF$$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.079	ug/kg	1 4E-11	150000	2.1E-06	0 01	3 2E-12	150000	4 8E-07	2 5E-06
					SUMMARY CANCER RISK	2E-06				5E-07	3E-06

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[2] Calculated from oral CSFs
NE = not evaluated

TABLE D-20

INHALATION OF PARTICULATES - SURFACE SOIL
OCCUPATIONAL WORKER
NCBC Gulfport
Gulfport Mississippi
Non-Site 8

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-	
PART. EMISSION FACTOR	PEF	1 25E+09	m³/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m³	
INHALATION RATE	IR	2 5	m³/hour	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	8	hours/day	Assumption
EXPOSURE FREQUENCY	EF	250	days/year	Assumption
EXPOSURE DURATION	ED	25	years	USEPA, 1995
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance
"Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1995 Supplemental Guidance to RAGS: Region 4 Bulletins, Bulletin No. 3, November 1995

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR (mg/kg-day)$^{-1}$

$$\text{INTAKE} = \frac{\text{CA x IR x ET x EF x ED}}{\text{BW x AT x 365 days/yr}}$$

Where:

CA = C x CF x (1/PEF)

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL CONCENTRATIO	UNITS	AIR CONCENTRATIO (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)^-1	CANCER RISK
2,3,7,8-TCDD	O	0.079	ug/kg	6 32E-14	4 4E-15	156000	6.9E-10
				SUMMARY CANCER RISK			7E-10

TABLE D-21

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
SITE MAINTENANCE WORKER
NCBC Gulfport
Gulfport Mississippi
Non-Site 8 On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1992
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS	chemical-specific	unitless	Assumption
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992
DOSE ABSORBED PER EV	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	24	days/year [1]	Assumption
EXPOSURE DURATION	ED	25	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, 1/92
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

$$\text{CANCER RISK} = \text{INTAKE (mg/kg-day)} \times \text{CANCER SLOPE FACTOR (mg/kg-day)}^{-1}$$

$$\text{INTAKE}_{\text{INGESTION}} = \frac{\text{CS} \times \text{IR} \times \text{FI} \times \text{CF} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT} \times 365 \text{ days/yr}}$$

$$\text{INTAKE}_{\text{DERMAL}} = \frac{DA_{event} \times \text{SA} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT} \times 365 \text{ days/yr}}$$

Where:

$$DA_{event} = \text{CS} \times \text{AF} \times \text{ABS} \times \text{CF}$$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.079	ug/kg	1.3E-12	150000	2.0E-07	0 01	1 5E-12	150000	2 3E-07	4 3E-07
SUMMARY CANCER RISK						2E-07				2E-07	4E-07

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[2] Calculated from oral CSFs
NE = not evaluated.

TABLE D-22

INHALATION OF PARTICULATES - SURFACE SOIL
SITE MAINTENANCE WORKER
NCBC Gulfport
Gulfport Mississippi
Non-Site 8

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-specific	
PART. EMISSION FACTOR	PEF	1.25E+09	m³/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m³	
INHALATION RATE	IR	2.5	m³/hour	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	8	hours/day	Assumption
EXPOSURE FREQUENCY	EF	24	days/year	Assumption
EXPOSURE DURATION	ED	25	years	USEPA, 1995
CONVERSION FACTOR	CF	0.001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance
"Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1995 Supplemental Guidance to RAGS Region 4 Bulletins, Bulletin No 3, November 1995

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR (mg/kg-day) [1]

$$\text{INTAKE} = \frac{\text{CA x IR x ET x EF x ED}}{\text{BW x AT x 365 days/yr}}$$

Where:

CA = C x CF x (1/PEF)

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION	INTAKE (mg/kg-day)	INHALATION CSF	CANCER RISK
2,3,7,8-TCDD	O	0.079	ug/kg	6.32E-14	4.2E-16	156000	6.6E-11
				SUMMARY CANCER RISK			7E-11

TABLE D-23

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
EXCAVATION WORKER
NCBC Gulfport
Gulfport Mississippi
Non-Site 8 On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	480	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS	chemical-specific	unitless	Assumption
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	30	days/year [1]	Assumption
EXPOSURE DURATION	ED	1	years	USEPA, 1991
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	1	years	USEPA, 1991

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, 1/92
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:
DA_{event} = CS x AF x ABS x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.079	ug/kg	6 4E-13	150000	9 54E-08	0 01	7 6E-14	150000	1 1E-08	1 07E-07
			SUMMARY CANCER RISK			1E-07				1E-08	1E-07

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[2] Calculated from oral CSFs
NE = not evaluated

TABLE D-24

INHALATION OF PARTICULATES - SURFACE SOIL
EXCAVATION WORKER
NCBC Gulfport
Gulfport Mississippi
Non-Site 8

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-	
PART. EMISSION FACTOR	PEF	1 25E+09	m^3/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m^3	
INHALATION RATE	IR	2 5	$m^3/hour$	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	8	hours/day	Assumption
EXPOSURE FREQUENCY	EF	30	days/year	Assumption
EXPOSURE DURATION	ED	1	years	Assumption
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	1	years	USEPA, 1991

USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance
Standard Default Exposure Factors, OSWER Directive 9285 6-03
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$\textbf{INTAKE} = \frac{\textbf{CA x IR x ET x EF x ED}}{\textbf{BW x AT x 365 days/yr}}$$

Where:

CA = C x CF x (1/PEF)

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL CONCENTRATIO	UNITS	AIR CONCENTRATION (mg/m^3)	INTAKE (mg/kg-day)	INHALATION CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK
2,3,7,8-TCDD	**O**	**0.079**	ug/kg	6 32E-14	2 1E-17	**156000**	**3.3E-12**
				SUMMARY CANCER RISK			**3E-12**

TABLE D-25

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SEDIMENT
CHILD RESIDENT
NCBC Gulfport
Gulfport Mississippi
On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	200	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
AGE-SPECIFIC SURFACE AREA	SA	age-specific	cm²	USEPA, 1989
ABSORPTION FRACTION	ABS	chemical-specific	unitless	USEPA, 1992b
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
BODY WEIGHT	BW	15	kg	USEPA, 1991
AGE-SPECIFIC BODY WEIGHT	BW	age-specific	kg	USEPA, 1989
EXPOSURE FREQUENCY	EF	30	days/year [1]	USEPA, 1995
EXPOSURE DURATION	ED	6	years	USEPA, 1995
AGE-SPECIFIC EXPOSURE DURATION	ED	age-specific	years	Assumption
AGE-WEIGHTED SURFACE AREA [2]	$SA_{wa/a6}$	1136 3	cm^2-year/kg	USEPA, 1992a
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm^2-event	USEPA, 1992a
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	6	years	USEPA, 1995

[1] Units for exposure frequency are in events/year in the calculation of the dermally absorbed dose
[2] In estimating the dermally absorbed dose for children age1 through 6, the time-weighted, bodyweight normalized surface area exposed is calculated from surface area, exposure duration, and body weight for each of 6 age periods, age 1 through 6, per USEPA, 1992
USEPA, 1989 Exposure Factors Handbook,EPA/600/8-89/043, May 1989
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992a Dermal Exposure Assessment. Principles and Applications; EPA/600/8-91/011B, January 1992
USEPA, 1992b USEPA Region IV Guidance Memorandum, February 10, 1992
USEPA, 1995. Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR (mg/kg-day)$^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = AT \times 365\ days/year) \times SA_{wa/a6}$$

Where:
$SA_{wa/a6}$ = SUM (SA_i x ED_i / BW_i)
DA_{event} = CS x AF x ABS_d x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF (mg/kg-day)$^{-1}$	CANCER RISK INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [1, 3] (mg/kg-day)$^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.365	ug/kg	3 4E-11	150000	5 1E-06	0 01	4 9E-12	150000	7 3E-07	5 9E-06
					SUMMARY CANCER RISK	5E-06				7E-07	6E-06

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs
ND = no data

TABLE D-26

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SEDIMENT
ADULT RESIDENT
NCBC Gulfport
Gulfport Mississippi
On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
ABSORPTION FRACTION	ABS_d	chemical-specific	unitless	USEPA, 1992b
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992a
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992a
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	30	days/year [1]	Assumption
EXPOSURE DURATION	ED	24	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	24	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, January 1992
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:
$DA_{event} = CS \times AF \times ABS_d \times CF$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF [1] $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [3] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.365	ug/kg	1 5E-11	150000	2 2E-06	0 01	8 4E-12	150000	1 3E-06	3 5E-06
SUMMARY CANCER RISK						2E-06				1E-06	3E-06

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs
ND = no data available

TABLE D-27

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SEDIMENT
ADOLESCENT TRESPASSER
NCBC Gulfport
Gulfport Mississippi
On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	mg/day	USEPA, 1991
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
AGE-SPECIFIC SURFACE AREA	SA_i	age-specific	cm²	USEPA, 1989
ABSORPTION FRACTION	ABS_d	chemical-specific	unitless	USEPA, 1995
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganics
	CF	1 00E-09	kg/mg	Organics
BODY WEIGHT	BW	45	kg	USEPA, 1995
AGE-SPECIFIC BODY WEIGHT	BW_i	age-specific	kg	USEPA, 1989
EXPOSURE FREQUENCY	EF	30	days/year [1]	Assumption
EXPOSURE DURATION	ED	11	years	USEPA, 1995
AGE-SPECIFIC EXPOSURE DURATION	ED_i	age-specific	years	Assumption
AGE-WEIGHTED SURFACE AREA [2]	$SA_{wa/ed}$	1013	cm²-year/kg	Per USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	Per USEPA, 1992
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	11	years	USEPA, 1995

[1] Units for exposure frequency are in events/year in the calculation of the dermally absorbed dose
[2] In estimating the dermally absorbed dose for children age 7 through 16, the time-weighted, bodyweight normalized surface area exposed is calculated from surface area, exposure duration, and body weight for each of 10 age periods, age 7 through 16, per USEPA, 1992
USEPA, 1989 Exposure Factors Handbook,EPA/600/8-89/043, May 1989
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors", OSWER Directive 9285.6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications; EPA/600/8-91/011B, January 1992 and
USEPA, 1995 Supplemental Guidance to RAGS Region 4 Bulletins, Bulletin No 3, November 1995

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = AT \times 365\ days/year) \times SA_{wa/ed}$$

Where:

$SA_{wa/ed}$ = SUM $(SA_i \times ED_i / BW_i)$

DA_{event} = CS x AF x ABS_d x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF [1] $(mg/kg\text{-}day)^{-1}$	ANCER RIS INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [1,3] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.365	ug/kg	1 0E-11	150000	1 6E-06	0 01	4 3E-12	150000	6 5E-07	2 2E-06
SUMMARY CANCER RISK						2E-06				7E-07	2E-06

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs

TABLE D-28

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SEDIMENT
ADULT TRESPASSER
NCBC Gulfport
Gulfport Mississippi
On Base

10-Apr-00

April 1999

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1991
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS_d	chemical specific	unitless	USEPA, 1995
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1 00E-06	kg/mg	inorganics
	CF	1 00E-09	kg/ug	organics
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	24	days/year [1]	Assumption
EXPOSURE DURATION	ED	19	years	Assumption
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	19	years	Assumption

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, 1/92.
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:
$DA_{event} = CS \times AF \times ABS_d \times CF$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.365	ug/kg	4 7E-12	150000	7 0E-07	0 01	5 4E-12	150000	8 0E-07	1 5E-06
				SUMMARY CANCER RISK		7E-07				8E-07	2E-06

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[2] Calculated from oral CSFs

TABLE D-29

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SEDIMENT
OCCUPATIONAL WORKER
NCBC Gulfport
Gulfport Mississippi
On Base

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS	chemical-specific	unitless	Assumption
SURFACE AREA EXPOSED	SA	2,300	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	30	days/year [1]	USEPA, 1995
EXPOSURE DURATION	ED	25	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose

USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285.6-03

USEPA, 1992 Dermal Exposure Assessment Principles and Applications; EPA/600/8-91/011B, 1/92

USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{-INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{-DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

DA_{event} = CS x AF x ABS x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.365	ug/kg	7.7E-12	150000	1 1E-06	0 01	3 5E-12	150000	5 3E-07	1 7E-06
SUMMARY CANCER RISK						1E-06				5E-07	2E-06

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)

[2] Calculated from oral CSFs

NE = not evaluated

TABLE D-30

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SEDIMENT
SITE MAINTENANCE WORKER
NCBC Gulfport
Gulfport Mississippi
On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1992
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS	chemical-specific	unitless	Assumption
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	12	days/year [1]	Assumption
EXPOSURE DURATION	ED	25	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, 1/92
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

DA_{event} = CS x AF x ABS x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.365	ug/kg	3 1E-12	150000	4 6E-07	0 01	3 5E-12	150000	5 3E-07	9 9E-07
SUMMARY CANCER RISK						5E-07				5E-07	1E-06

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[2] Calculated from oral CSFs
NE = not evaluated

TABLE D-31

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SEDIMENT
EXCAVATION WORKER
NCBC Gulfport
Gulfport Mississippi
On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	480	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS	chemical-specific	unitless	Assumption
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	30	days/year [1]	Assumption
EXPOSURE DURATION	ED	1	years	USEPA, 1991
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	1	years	USEPA, 1991

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose

USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03

USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, 1/92

USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{-INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{-DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

DA_{event} = CS x AF x ABS x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.365	ug/kg	2 9E-12	150000	4 41E-07	0 01	3 5E-13	150000	5 3E-08	4 94E-07
SUMMARY CANCER RISK						4E-07				5E-08	5E-07

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[2] Calculated from oral CSFs
NE = not evaluated

TABLE D-32

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SEDIMENT
CHILD RESIDENT
NCBC Gulfport
Gulfport Mississippi
Off Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	200	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
AGE-SPECIFIC SURFACE AREA	SA	age-specific	cm²	USEPA, 1989
ABSORPTION FRACTION	ABS	chemical-specific	unitless	USEPA, 1992b
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
BODY WEIGHT	BW	15	kg	USEPA, 1991
AGE-SPECIFIC BODY WEIGHT	BW	age-specific	kg	USEPA, 1989
EXPOSURE FREQUENCY	EF	30	days/year [1]	USEPA, 1995
EXPOSURE DURATION	ED	6	years	USEPA, 1995
AGE-SPECIFIC EXPOSURE DURATION	ED	age-specific	years	Assumption
AGE-WEIGHTED SURFACE AREA [2]	$SA_{wt/adj}$	1136 3	cm²-year/kg	USEPA, 1992a
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992a
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	6	years	USEPA, 1995

[1] Units for exposure frequency are in events/year in the calculation of the dermally absorbed dose
[2] In estimating the dermally absorbed dose for children age1 through 6, the time-weighted, bodyweight normalized surface area exposed is calculated from surface area, exposure duration, and body weight for each of 6 age periods, age 1 through 6, per USEPA, 1992

USEPA, 1989 Exposure Factors Handbook;EPA/600/8-89/043; May 1989
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992a Dermal Exposure Assessment· Principles and Applications; EPA/600/8-91/011B, January 1992
USEPA, 1992b USEPA Region IV Guidance Memorandum, February 10, 1992
USEPA, 1995 Supplemental Guidance to RAGS : Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR (mg/kg-day)$^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = AT \times 365\ days/year) \times SA_{wt/adj}$$

Where:
$SA_{wt/adj}$ = SUM (SA_i x ED_i / BW_i)
DA_{event} = CS x AF x ABS_d x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF [1] $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [1, 3] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.03	ug/kg	2 8E-12	150000	4.2E-07	0 01	4 0E-13	150000	6 0E-08	4 8E-07
SUMMARY CANCER RISK						4E-07				6E-08	5E-07

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs
ND = no data.

TABLE D-33

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SEDIMENT
ADULT RESIDENT
NCBC Gulfport
Gulfport Mississippi
Off Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
ABSORPTION FRACTION	ABS_d	chemical-specific	unitless	USEPA, 1992b
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992a
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992a
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	30	days/year [1]	Assumption
EXPOSURE DURATION	ED	24	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	24	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose

USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03

USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, January 1992

USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR (mg/kg-day)$^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

$DA_{event} = CS \times AF \times ABS_d \times CF$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF [1] (mg/kg-day)$^{-1}$	CANCER RISK INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [3] (mg/kg-day)$^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.03	ug/kg	1 2E-12	150000	1 8E-07	0 01	6 9E-13	150000	1 0E-07	2 9E-07
SUMMARY CANCER RISK						2E-07				1E-07	3E-07

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs
ND = no data available

TABLE D-34

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SEDIMENT
ADOLESCENT TRESPASSER
NCBC Gulfport
Gulfport Mississippi
Off Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	mg/day	USEPA, 1991
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
AGE-SPECIFIC SURFACE AREA	SA_i	age-specific	cm²	USEPA, 1989
ABSORPTION FRACTION	ABS_d	chemical-specific	unitless	USEPA, 1995
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganics
	CF	1 00E-09	kg/mg	Organics
BODY WEIGHT	BW	45	kg	USEPA, 1995
AGE-SPECIFIC BODY WEIGHT	BW_i	age-specific	kg	USEPA, 1989
EXPOSURE FREQUENCY	EF	30	days/year [1]	Assumption
EXPOSURE DURATION	ED	11	years	USEPA, 1995
AGE-SPECIFIC EXPOSURE DURATION	ED_i	age-specific	years	Assumption
AGE-WEIGHTED SURFACE AREA [2]	SA_{weight}	1013	cm²-year/kg	Per USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	Per USEPA, 1992
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	11	years	USEPA, 1995

[1] Units for exposure frequency are in events/year in the calculation of the dermally absorbed dose
[2] In estimating the dermally absorbed dose for children age 7 through 16, the time-weighted, bodyweight normalized surface area exposed is calculated from surface area, exposure duration, and body weight for each of 10 age periods, age 7 through 16, per USEPA, 1992
USEPA, 1989 Exposure Factors Handbook,EPA/600/8-89/043, May 1989.
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, January 1992 and

USEPA, 1995 Supplemental Guidance to RAGS Region 4 Bulletins, Bulletin No 3, November 1995

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = AT \times 365\ days/year) \times SA_{weight}$$

Where:

SA_{weight} = SUM $(SA_i \times ED_i / BW_i)$

DA_{event} = CS x AF x ABS_d x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL ONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF [1] $(mg/kg\text{-}day)^{-1}$	ANCER RIS INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [1,3] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.03	ug/kg	8 6E-13	150000	1 3E-07	0 01	3 6E-13	150000	5 4E-08	1 8E-07
				SUMMARY CANCER RISK		1E-07				5E-08	2E-07

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs.

TABLE D-35

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SEDIMENT
ADULT TRESPASSER
NCBC Gulfport
Gulfport Mississippi
Off Base

10-Apr-00

April 1999

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1991
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS_d	chemical specific	unitless	USEPA, 1995
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1 00E-06	kg/mg	inorganics
	CF	1 00E-09	kg/ug	organics
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	24	days/year [1]	Assumption
EXPOSURE DURATION	ED	19	years	Assumption
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	19	years	Assumption

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose

USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03

USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, 1/92

USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

$$\text{CANCER RISK} = \text{INTAKE (mg/kg-day)} \times \text{CANCER SLOPE FACTOR (mg/kg-day)}^{-1}$$

$$\text{INTAKE}_{\text{INGESTION}} = \frac{\text{CS} \times \text{IR} \times \text{FI} \times \text{CF} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT} \times 365 \text{ days/yr}}$$

$$\text{INTAKE}_{\text{DERMAL}} = \frac{\text{DA}_{event} \times \text{SA} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT} \times 365 \text{ days/yr}}$$

Where:

$$\text{DA}_{event} = \text{CS} \times \text{AF} \times \text{ABS}_d \times \text{CF}$$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.03	ug/kg	3 8E-13	150000	5 7E-08	0 01	4 4E-13	150000	6 6E-08	1 2E-07
SUMMARY CANCER RISK						6E-08				7E-08	1E-07

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)

[2] Calculated from oral CSFs

TABLE D-36

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SEDIMENT
OCCUPATIONAL WORKER
NCBC Gulfport
Gulfport Mississippi
Off Base

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	0 5	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS	chemical-specific	unitless	Assumption
SURFACE AREA EXPOSED	SA	2,300	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	30	days/year [1]	USEPA, 1995
EXPOSURE DURATION	ED	25	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285.6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, 1/92
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR (mg/kg-day)$^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

DA_{event} = CS x AF x ABS x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF (mg/kg-day)$^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] (mg/kg-day)$^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.03	ug/kg	6.3E-13	150000	9 4E-08	0 01	1 4E-13	150000	2 2E-08	1 2E-07
SUMMARY CANCER RISK						9E-08				2E-08	1E-07

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[2] Calculated from oral CSFs
NE = not evaluated.

TABLE D-37

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SEDIMENT
SITE MAINTENANCE WORKER
NCBC Gulfport
Gulfport Mississippi
Off Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1992
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS	chemical-specific	unitless	Assumption
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1.00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1.00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	12	days/year [1]	Assumption
EXPOSURE DURATION	ED	25	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose.
USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285.6-03
USEPA, 1992. Dermal Exposure Assessment: Principles and Applications, EPA/600/8-91/011B, 1/92
USEPA, 1995. Supplemental Guidance to RAGS: Region IV, Human Health Risk Assessment Bulletin No. 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR (mg/kg-day)$^{-1}$

$$\text{INTAKE}_{\text{INGESTION}} = \frac{\text{CS x IR x FI x CF x EF x ED}}{\text{BW x AT x 365 days/yr}}$$

$$\text{INTAKE}_{\text{DERMAL}} = \frac{\text{DA}_{\text{event}} \text{ x SA x EF x ED}}{\text{BW x AT x 365 days/yr}}$$

Where:
DA_{event} = **CS x AF x ABS x CF**

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF (mg/kg-day)$^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] (mg/kg-day)$^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	**O**	**0.03**	ug/kg	2.5E-13	**150000**	3.8E-08	0.01	2.9E-13	**150000**	4.3E-08	8.1E-08
					SUMMARY CANCER RISK	**4E-08**				**4E-08**	**8E-08**

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral CSFs.
NE = not evaluated.

TABLE D-38

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SEDIMENT
EXCAVATION WORKER
NCBC Gulfport
Gulfport Mississippi
Off Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	480	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS	chemical-specific	unitless	Assumption
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	10	days/year [1]	Assumption
EXPOSURE DURATION	ED	1	years	USEPA, 1991
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	1	years	USEPA, 1991

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors";
OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, 1/92
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:
DA_{event} = CS x AF x ABS x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.03	ug/kg	2 4E-13	150000	3 62E-08	0 01	2 9E-14	150000	4 3E-09	4 06E-08
SUMMARY CANCER RISK						4E-08				4E-09	4E-08

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[2] Calculated from oral CSFs.
NE = not evaluated.

TABLE D-39

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
Future Hypothetical Child Resident
NCBC Gulfport
Gulfport Mississippi
Site 8

10-Apr-00

April 1999

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	200	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
AGE-SPECIFIC SURFACE AREA	SA	age-specific	cm^2	USEPA, 1989
ABSORPTION FRACTION	ABS	chemical-specific	unitless	USEPA, 1992b
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
BODY WEIGHT	BW	15	kg	USEPA, 1991
AGE-SPECIFIC BODY WEIGHT	BW	age-specific	kg	USEPA, 1989
EXPOSURE FREQUENCY	EF	350	days/year [1]	USEPA, 1995
EXPOSURE DURATION	ED	6	years	USEPA, 1995
AGE-SPECIFIC EXPOSURE DURATION	ED	age-specific	years	Assumption
AGE-WEIGHTED SURFACE AREA [2]	$SA_{soil/adj}$	1136 3	cm^2-year/kg	USEPA, 1992a
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm^2-event	USEPA, 1992a
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	6	years	USEPA, 1995

[1] Units for exposure frequency are in events/year in the calculation of the dermally absorbed dose
[2] In estimating the dermally absorbed dose for children age1 through 6, the time-weighted, bodyweight normalized surface area exposed is calculated from surface area, exposure duration, and body weight for each of 6 age periods, age 1 through 6, per USEPA, 1992
USEPA, 1989 Exposure Factors Handbook,EPA/600/8-89/043; May 1989
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992a Dermal Exposure Assessment Principles and Applications; EPA/600/8-91/011B, January 1992
USEPA, 1992b. USEPA Region IV Guidance Memorandum, February 10, 1992
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = AT \times 365\ days/year) \times SA_{soil/adj}$$

Where:

$SA_{soil/adj}$ = SUM $(SA_i \times ED_i / BW_i)$

DA_{event} = $CS \times AF \times ABS_d \times CF$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF [1] $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [1, 3] 150000	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.0995	ug/kg	1 1E-10	150000	1.6E-05	0 01	1 5E-11	150000	2 3E-06	1 9E-05
					SUMMARY CANCER RISK	2E-05				2E-06	2E-05

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs
ND = no data

TABLE D-40

INHALATION OF PARTICULATES - SURFACE SOIL
FUTURE HYPOTHETICAL CHILD RESIDENT
NCBC Gulfport
Gulfport Mississippi
Site 8

10-Apr-00

EXPOSURE PARAMETERS

SOIL CONCENTRATION	C	chemical-specific	chemical-	
PART. EMISSION FACTOR	PEF	1.25E+09	m^3/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m^3	
INHALATION RATE	IR	0 625	m^3/hour	USEPA, 1995
BODY WEIGHT	BW	45	kg	USEPA, 1995
EXPOSURE TIME	ET	4	hours/day	Assumption
EXPOSURE FREQUENCY	EF	45	days/year	Assumption
EXPOSURE DURATION	ED	10	years	USEPA, 1995
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	10	years	USEPA, 1995

[1] PEF has been derived in the PEF Appendix to this report
USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors"; OSWER Directive 9285 6-03.
USEPA 1995 Supplemental Guidance to RAGS, Region 4 Bulletins, Bulletin No 3, November 1995

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$\textbf{INTAKE} = \frac{\textbf{CA x IR x ET x EF x ED}}{\textbf{BW x AT x 365 days/yr}}$$

Where:

CA = C x CF x (1/PEF)

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL CONCENTRATIO	UNITS	AIR CONCENTRATIO (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)^-1	CANCER RISK
2,3,7,8-TCDD	O	0.0995	ug/kg	7 96E-14	7 8E-17	156000	1.2E-11
						SUMMARY CANCER RISK	1E-11

TABLE D-41

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
Future Hypothetical Adult Resident
NCBC Gulfport
Gulfport Mississippi
Site 8

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
ABSORPTION FRACTION	ABS_d	chemical-specific	unitless	USEPA, 1992b
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992a
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992a
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	350	days/year [1]	Assumption
EXPOSURE DURATION	ED	24	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	24	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, January 1992
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR (mg/kg-day)$^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:
$DA_{event} = CS \times AF \times ABS_d \times CF$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF [1] (mg/kg-day)$^{-1}$	CANCER RISK INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [3] 150000	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.0995	ug/kg	4 7E-11	150000	7 0E-06	0 01	2 7E-11	150000	4 0E-06	1 1E-05
SUMMARY CANCER RISK						7E-06				4E-06	1E-05

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs
ND = no data available

TABLE D-42

INHALATION OF PARTICULATES - SURFACE SOIL
Future Hypothetical Adult Resident
NCBC Gulfport
Gulfport Mississippi
Site 8

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-	
PART. EMISSION FACTOR	PEF	1 25E+09	m³/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m³	
INHALATION RATE	IR	0 833	m³/hour	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	24	hours/day	Assumption
EXPOSURE FREQUENCY	EF	350	days/year	USEPA, 1995
EXPOSURE DURATION	ED	24	years	USEPA, 1995
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	24	years	USEPA, 1995

[1] PEF has been derived in the PEF Appendix to this report
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1995. Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR (mg/kg-day)$^{-1}$

$$\textbf{INTAKE} = \frac{\textbf{CA x IR x ET x EF x ED}}{\textbf{BW x AT x 365 days/yr}}$$

Where:

CA = C x CF x (1/PEF)

CARCINOGENIC EFFECTS

COMPOUND	ORGANIC	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)-1	CANCER RISK
2,3,7,8-TCDD	O	0 0995	ug/kg	7 96E-14	7 5E-15	156000	1.2E-09
				SUMMARY CANCER RISK			1E-09

TABLE D-43

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
FUTURE HYPOTHETICAL ADULT RESIDENT
NCBC Gulfport
Gulfport Mississippi
Non-Site 8 On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
ABSORPTION FRACTION	ABS_d	chemical-specific	unitless	USEPA, 1992b
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992a
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992a
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	350	days/year [1]	Assumption
EXPOSURE DURATION	ED	24	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	24	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose

USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03

USEPA, 1992 Dermal Exposure Assessment Principles and Applications· EPA/600/8-91/011B, January 1992

USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

$$\text{CANCER RISK} = \text{INTAKE (mg/kg-day)} \times \text{CANCER SLOPE FACTOR (mg/kg-day)}^{-1}$$

$$\text{INTAKE}_{\text{-INGESTION}} = \frac{\text{CS} \times \text{IR} \times \text{FI} \times \text{CF} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT} \times 365 \text{ days/yr}}$$

$$\text{INTAKE}_{\text{-DERMAL}} = \frac{\text{DA}_{event} \times \text{SA} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT} \times 365 \text{ days/yr}}$$

Where:

$$\text{DA}_{event} = \text{CS} \times \text{AF} \times \text{ABS}_d \times \text{CF}$$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF [1] (mg/kg-day)⁻¹	CANCER RISK INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [3] (mg/kg-day)⁻¹	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.079	ug/kg	3 7E-11	150000	5 6E-06	0.01	2 1E-11	150000	3 2E-06	8 8E-06
SUMMARY CANCER RISK						6E-06				3E-06	9E-06

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs
ND = no data available

TABLE D-44

INHALATION OF PARTICULATES - SURFACE SOIL
FUTURE HYPOTHETICAL CHILD RESIDENT
NCBC Gulfport
Gulfport Mississippi
Non-Site 8

10-Apr-00

EXPOSURE PARAMETERS

SOIL CONCENTRATION	C	chemical-specific	specific	
PART. EMISSION FACTOR	PEF	1 25E+09	m³/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m³	
INHALATION RATE	IR	0 625	m³/hour	USEPA, 1995
BODY WEIGHT	BW	45	kg	USEPA, 1995
EXPOSURE TIME	ET	4	hours/day	Assumption
EXPOSURE FREQUENCY	EF	45	days/year	Assumption
EXPOSURE DURATION	ED	10	years	USEPA, 1995
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	10	years	USEPA, 1995

USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA 1995 Supplemental Guidance to RAGS, Region 4 Bulletins, Bulletin No 3 November 1995

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR (mg/kg-day)$^{-1}$

$$\text{INTAKE} = \frac{CA \times IR \times ET \times EF \times ED}{BW \times AT \times 365\ \text{days/yr}}$$

Where:

$$CA = C \times CF \times (1/PEF)$$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)^-1	CANCER RISK
2,3,7,8-TCDD	O	0.079	ug/kg	6 32E-14	6 2E-17	156000	9.6E-12
					SUMMARY CANCER RISK		1E-11

TABLE D-45

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL
FUTURE HYPOTHETICAL ADULT RESIDENT
NCBC Gulfport
Gulfport Mississippi
Non-Site 8 On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
ABSORPTION FRACTION	ABS_d	chemical-specific	unitless	USEPA, 1992b
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992a
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992a
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	350	days/year [1]	Assumption
EXPOSURE DURATION	ED	24	years	USEPA 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	24	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors"
OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, January 1992
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

$$\text{CANCER RISK} = \text{INTAKE (mg/kg-day)} \times \text{CANCER SLOPE FACTOR (mg/kg-day)}^{-1}$$

$$\text{INTAKE}_{\text{INGESTION}} = \frac{\text{CS} \times \text{IR} \times \text{FI} \times \text{CF} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT} \times 365 \text{ days/yr}}$$

$$\text{INTAKE}_{\text{DERMAL}} = \frac{DA_{event} \times \text{SA} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT} \times 365 \text{ days/yr}}$$

Where:

$$DA_{event} = \text{CS} \times \text{AF} \times ABS_d \times \text{CF}$$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF [1] (mg/kg-day)⁻¹	CANCER RISK INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [3] (mg/kg-day)⁻¹	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.079	ug/kg	3 7E-11	150000	5 6E-06	0 01	2 1E-11	150000	3 2E-06	8 8E-06
SUMMARY CANCER RISK						6E-06				3E-06	9E-06

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs
ND = no data available

TABLE D-46

INHALATION OF PARTICULATES - SURFACE SOIL
FUTURE HYPOTHETICAL ADULT RESIDENT
NCBC Gulfport
Gulfport Mississippi
Non-Site 8

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-	
PART. EMISSION FACTOR	PEF	1 25E+09	m^3/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m^3	
INHALATION RATE	IR	0 833	m^3/hour	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	24	hours/day	Assumption
EXPOSURE FREQUENCY	EF	350	days/year	USEPA, 1995
EXPOSURE DURATION	ED	24	years	USEPA, 1995
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	24	years	USEPA, 1995

USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285.6-03
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE = \frac{CA \times IR \times ET \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

$$CA = C \times CF \times (1/PEF)$$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)-1	CANCER RISK
2,3,7,8-TCDD	O	0 079	ug/kg	6 32E-14	5 9E-15	156000	9.3E-10
				SUMMARY CANCER RISK			9E-10

Table D-47

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (Central Tendancy)
OCCUPATIONAL WORKER
NCBC Gulfport
Gulfport Mississippi
Site 8

April 10, 2000

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS	chemical-specific	unitless	Assumption
SURFACE AREA EXPOSED	SA	2,300	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1.00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1.00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	250	days/year [1]	USEPA, 1995
EXPOSURE DURATION	ED	25	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose.

USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors";
OSWER Directive 9285.6-03.
USEPA, 1992. Dermal Exposure Assessment: Principles and Applications; EPA/600/8-91/011B; 1/92.
USEPA, 1995. Supplemental Guidance to RAGS : Region IV, Human Health Risk Assessment Bulletin No. 3.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

DA_{event} = CS x AF x ABS x CF

CARCINOGENIC EFFECTS
April 10, 2000

COMPOUND	INORGANIC O ORGANIC I/O	SOIL ONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RIS INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day	DERMAL CSF [2] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.0288	ug/kg	5.0E-12	156000	7.9E-07	0.01	2.3E-12	150000	3.5E-07	1.1E-06
SUMMARY CANCER RISK						8E-07				3E-07	1E-06

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral CSFs.
NE = not evaluated.

TABLE D-48

INHALATION OF PARTICULATES - SURFACE SOIL (Central Tendancy)
OCCUPATIONAL WORKER
NCBC Gulfport
Gulfport Mississippi
Site 8

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-specific	
PART. EMISSION FACTOR	PEF	1 25E+09	m³/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m³	
INHALATION RATE	IR	2 5	m³/hour	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	8	hours/day	Assumption
EXPOSURE FREQUENCY	EF	250	days/year	Assumption
EXPOSURE DURATION	ED	25	years	USEPA, 1995
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance
"Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1995 Supplemental Guidance to RAGS Region 4 Bulletins, Bulletin No. 3, November 1995

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR (mg/kg-day)$^{-1}$

$$\text{INTAKE} = \frac{\text{CA x IR x ET x EF x ED}}{\text{BW x AT x 365 days/yr}}$$

Where:

CA = C x CF x (1/PEF)

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)^-1	CANCER RISK
2,3,7,8-TCDD	O	0.0288	ug/kg	2 30E-14	1 6E-15	156000	2.5E-10
				SUMMARY CANCER RISK			3E-10

TABLE D-49

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (Central Tendancy)
Child Resident
NCBC Gulfport
Gulfport Mississippi
Non-Site 8 On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	200	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
AGE-SPECIFIC SURFACE AREA	SA	age-specific	cm²	USEPA, 1989
ABSORPTION FRACTION	ABS	chemical-specific	unitless	USEPA, 1992b
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
BODY WEIGHT	BW	15	kg	USEPA, 1991
AGE-SPECIFIC BODY WEIGHT	BW	age-specific	kg	USEPA, 1989
EXPOSURE FREQUENCY	EF	350	days/year [1]	USEPA, 1995
EXPOSURE DURATION	ED	6	years	USEPA, 1995
AGE-SPECIFIC EXPOSURE DURATION	ED	age-specific	years	Assumption
AGE-WEIGHTED SURFACE AREA [2]	$SA_{soil/adj}$	1136 3	cm^2-year/kg	USEPA, 1992a
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm^2-event	USEPA, 1992a
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	6	years	USEPA, 1995

[1] Units for exposure frequency are in events/year in the calculation of the dermally absorbed dose
[2] In estimating the dermally absorbed dose for children age1 through 6, the time-weighted, bodyweight normalized surface area exposed is calculated from surface area, exposure duration, and body weight for each of 6 age periods, age 1 through 6, per USEPA, 1992
USEPA, 1989 Exposure Factors Handbook,EPA/600/8-89/043, May 1989
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992a. Dermal Exposure Assessment Principles and Applications; EPA/600/8-91/011B, January 1992
USEPA, 1992b. USEPA Region IV Guidance Memorandum, February 10, 1992
USEPA, 1995 Supplemental Guidance to RAGS · Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = / AT \times 365\ days/year) \times SA_{soil/adj}$$

Where:
$SA_{soil/adj}$ = SUM $(SA_i \times ED_i / BW_i)$
DA_{event} = CS x AF x ABS_d x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF [1] $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [1, 3] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.0263	ug/kg	2 9E-11	150000	4 3E-06	0 01	4 1E-12	150000	6 1E-07	4 9E-06
				SUMMARY CANCER RISK		4E-06				6E-07	5E-06

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs
ND = no data.

TABLE D-50

INHALATION OF PARTICULATES - SURFACE SOIL (Central Tendancy)
Child Resident
NCBC Gulfport
Gulfport Mississippi
Non-Site 8

10-Apr-00

EXPOSURE PARAMETERS

SOIL CONCENTRATION	C	chemical-specific	chemical-	
PART. EMISSION FACTOR	PEF	1 25E+09	m³/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m³	
INHALATION RATE	IR	0 625	m³/hour	USEPA, 1995
BODY WEIGHT	BW	45	kg	USEPA, 1995
EXPOSURE TIME	ET	4	hours/day	Assumption
EXPOSURE FREQUENCY	EF	45	days/year	Assumption
EXPOSURE DURATION	ED	10	years	USEPA, 1995
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	10	years	USEPA, 1995

USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA 1995 Supplemental Guidance to RAGS, Region 4 Bulletins, Bulletin No. 3, November 1995

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR (mg/kg-day)[1]

$$\text{INTAKE} = \frac{\text{CA x IR x ET x EF x ED}}{\text{BW x AT x 365 days/yr}}$$

Where:

CA = C x CF x (1/PEF)

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL CONCENTRATIO	UNITS	AIR CONCENTRATIO (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)^-1	CANCER RISK
2,3,7,8-TCDD	O	0.0263	ug/kg	2 10E-14	2 1E-17	156000	3.2E-12
					SUMMARY CANCER RISK		3E-12

TABLE D-51

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (Central Tendancy)
Adult Resident
NCBC Gulfport
Gulfport Mississippi
Non-Site 8 On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
ABSORPTION FRACTION	ABS_d	chemical-specific	unitless	USEPA, 1992b
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992a
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992a
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	350	days/year [1]	Assumption
EXPOSURE DURATION	ED	4	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	4	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, January 1992
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:
DA_{event} = CS x AF x ABS_d x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL ONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF [1] $(mg/kg\text{-}day)^{-1}$	CANCER RIS INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [3] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.0263	ug/kg	2 1E-12	150000	3 1E-07	0 01	1 2E-12	150000	1 8E-07	4 9E-07
SUMMARY CANCER RISK						3E-07				2E-07	5E-07

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs
ND = no data available

TABLE D-52

INHALATION OF PARTICULATES - SURFACE SOIL (Central Tendancy)
Future Hypothetical Adult Resident
NCBC Gulfport
Gulfport Mississippi
Non-Site 8

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-	
PART. EMISSION FACTOR	PEF	1 25E+09	m^3/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m^3	
INHALATION RATE	IR	0 833	m^3/hour	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	24	hours/day	Assumption
EXPOSURE FREQUENCY	EF	350	days/year	USEPA, 1995
EXPOSURE DURATION	ED	24	years	USEPA, 1995
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	24	years	USEPA, 1995

USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1995. Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No. 3.

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR (mg/kg-da

$$\text{INTAKE} = \frac{\text{CA x IR x ET x EF x ED}}{\text{BW x AT x 365 days/yr}}$$

Where:

CA = C x CF x (1/PEF)

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR ONCENTRATIO (mg/m³)	INTAKE (mg/kg-day)	INHALATIO CSF (mg/kg-day)-1	CANCER RISK
2,3,7,8-TCDD	O	0 0263	ug/kg	2 10E-14	2 0E-15	156000	3.1F-10
				SUMMARY CANCER RISK			3E-10

TABLE D-53

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (Central Tendancy)
OCCUPATIONAL WORKER
NCBC Gulfport
Gulfport Mississippi
Non-Site 8 On Base

April 1999

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS	chemical-specific	unitless	Assumption
SURFACE AREA EXPOSED	SA	2,300	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	250	days/year [1]	USEPA, 1995
EXPOSURE DURATION	ED	25	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6 03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications; EPA/600/8-91/011B, 1/92
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

$$\text{CANCER RISK} = \text{INTAKE (mg/kg-day)} \times \text{CANCER SLOPE FACTOR (mg/kg-day)}^{-1}$$

$$\text{INTAKE}_{\text{INGESTION}} = \frac{\text{CS} \times \text{IR} \times \text{FI} \times \text{CF} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT} \times 365 \text{ days/yr}}$$

$$\text{INTAKE}_{\text{DERMAL}} = \frac{DA_{event} \times \text{SA} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT} \times 365 \text{ days/yr}}$$

Where:

$$DA_{event} = \text{CS} \times \text{AF} \times \text{ABS} \times \text{CF}$$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0 0263	ug/kg	4 6E-12	150000	6 9E-07	0 01	2 1E-12	150000	3 2E-07	1 0E-06
SUMMARY CANCER RISK						7E-07				3E-07	1E-06

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[2] Calculated from oral CSFs
NE = not evaluated

TABLE D 54

INHALATION OF PARTICULATES - SURFACE SOIL (Central Tendancy)
OCCUPATIONAL WORKER
NCBC Gulfport
Gulfport Mississippi
Non-Site 8

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATIO	C	chemical-specific	chemical-	
PART. EMISSION FAC	PEF	1.25E+09	m^3/kg	default [1]
CONCENTRATION AI	CA	chemical-specific	mg/m^3	
INHALATION RATE	IR	2 5	m^3/hour	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	8	hours/day	Assumption
EXPOSURE FREQUEN	EF	250	days/year	Assumption
EXPOSURE DURATIO	ED	25	years	USEPA, 1995
CONVERSION FACTO	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance
"Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1995 Supplemental Guidance to RAGS Region 4 Bulletins, Bulletin No 3, November 1995

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE = \frac{CA \times IR \times ET \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

$$CA = C \times CF \times (1/PEF)$$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL CONCENTRATIO	UNITS	AIR CONCENTRATIO (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)^-1	CANCER RISK
2,3,7,8-TCDD	O	0.0263	ug/kg	2 10E-14	1 5E-15	156000	2.3E-10
SUMMARY CANCER RISK							2E-10

TABLE D-55

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SEDIMENT(Central Tendency)
Child Resident
NCBC Gulfport
Gulfport Mississippi
On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	200	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
AGE-SPECIFIC SURFACE AREA	SA	age-specific	cm²	USEPA, 1989
ABSORPTION FRACTION	ABS	chemical-specific	unitless	USEPA, 1992b
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
BODY WEIGHT	BW	15	kg	USEPA, 1991
AGE-SPECIFIC BODY WEIGHT	BW	age-specific	kg	USEPA, 1989
EXPOSURE FREQUENCY	EF	30	days/year [1]	USEPA, 1995
EXPOSURE DURATION	ED	6	years	USEPA, 1995
AGE-SPECIFIC EXPOSURE DURATION	ED	age-specific	years	Assumption
AGE-WEIGHTED SURFACE AREA [2]	$SA_{soil/d}$	1136 3	cm²-year/kg	USEPA, 1992a
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992a
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	6	years	USEPA, 1995

[1] Units for exposure frequency are in events/year in the calculation of the dermally absorbed dose
[2] In estimating the dermally absorbed dose for children age1 through 6, the time-weighted, bodyweight normalized surface area exposed is calculated from surface area, exposure duration, and body weight for each of 6 age periods, age 1 through 6, per USEPA, 1992
USEPA, 1989 Exposure Factors Handbook,EPA/600/8-89/043, May 1989
USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992a Dermal Exposure Assessment: Principles and Applications; EPA/600/8-91/011B, January 1992
USEPA, 1992b USEPA Region IV Guidance Memorandum, February 10, 1992
USEPA, 1995 Supplemental Guidance to RAGS : Region IV, Human Health Risk Assessment Bulletin No. 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR (mg/kg-day)$^{-1}$

$$\text{INTAKE}_{\text{INGESTION}} = \frac{\text{CS x IR x FI x CF x EF x ED}}{\text{BW x AT x 365 days/yr}}$$

$$\text{INTAKE}_{\text{DERMAL}} = \text{AT x 365 days/year) x } SA_{soil/d}$$

Where:
$SA_{soil/d}$ = SUM (SA_i x ED_i / BW_i)
DA_{event} = CS x AF x ABS_d x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL ONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF [1] (mg/kg-day)$^{-1}$	CANCER RISK INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [1, 3] (mg/kg-day)$^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.18	ug/kg	1 7E-11	150000	2 5E-06	0 01	2 4E-12	150000	3 6E-07	2 9E-06
				SUMMARY CANCER RISK		3E-06				4E-07	3E-06

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs
ND = no data.

TABLE D-56

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SEDIMENT (Central Tendency)
Adult Resident
NCBC Gulfport
Gulfport Mississippi
On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
ABSORPTION FRACTION	ABS_d	chemical-specific	unitless	USEPA, 1992b
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992a
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992a
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	30	days/year [1]	Assumption
EXPOSURE DURATION	ED	24	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	24	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose

USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03

USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, January 1992

USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

$$\text{CANCER RISK} = \text{INTAKE (mg/kg-day)} \times \text{CANCER SLOPE FACTOR (mg/kg-day)}^{-1}$$

$$\text{INTAKE}_{\text{INGESTION}} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ \text{days/yr}}$$

$$\text{INTAKE}_{\text{DERMAL}} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ \text{days/yr}}$$

Where:

$$DA_{event} = CS \times AF \times ABS_d \times CF$$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL ONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF [1] $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [3] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.18	ug/kg	7 2E-12	150000	1 1E-06	0 01	4 2E-12	150000	6 2E-07	1 7E-06
SUMMARY CANCER RISK						1E-06				6E-07	2E-06

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs
ND = no data available

TABLE D-57

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SEDIMENT(Central Tendency)
ADOLESCENT TRESPASSER
NCBC Gulfport
Gulfport Mississippi
On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	mg/day	USEPA, 1991
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
AGE-SPECIFIC SURFACE AREA	SA_i	age-specific	cm²	USEPA, 1989
ABSORPTION FRACTION	ABS_d	chemical-specific	unitless	USEPA, 1995
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganics
	CF	1 00E-09	kg/mg	Organics
BODY WEIGHT	BW	45	kg	USEPA, 1995
AGE-SPECIFIC BODY WEIGHT	BW_i	age-specific	kg	USEPA, 1989
EXPOSURE FREQUENCY	EF	30	days/year [1]	Assumption
EXPOSURE DURATION	ED	11	years	USEPA, 1995
AGE-SPECIFIC EXPOSURE DURATION	ED_i	age-specific	years	Assumption
AGE-WEIGHTED SURFACE AREA [2]	SA_{weight}	1013	cm²-year/kg	Per USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	Per USEPA, 1992
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	11	years	USEPA, 1995

[1] Units for exposure frequency are in events/year in the calculation of the dermally absorbed dose
[2] In estimating the dermally absorbed dose for children age 7 through 16, the time-weighted, bodyweight normalized surface area exposed is calculated from surface area, exposure duration, and body weight for each of 10 age periods, age 7 through 16, per USEPA, 1992
USEPA, 1989 Exposure Factors Handbook,EPA/600/8-89/043, May 1989
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications; EPA/600/8-91/011B, January 1992 and
USEPA, 1995 Supplemental Guidance to RAGS Region 4 Bulletins, Bulletin No 3, November 1995

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR (mg/kg-day)$^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = AT \times 365\ days/year) \times SA_{weight}$$

Where:
SA_{weight} = SUM (SA_i x ED_i / BW_i)
DA_{event} = CS x AF x ABS_d x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL ONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF [1] (mg/kg-day)$^{-1}$	ANCER RIS INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [1,3] (mg/kg-day)$^{-1}$	CANCER RIS DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.18	ug/kg	5 2E-12	150000	7 7E-07	0 01	2 1E-12	150000	3 2E-07	1 1E-06
					SUMMARY CANCER RISK	8E-07				3E-07	1E-06

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs.

TABLE D-58

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SEDIMENT(Central Tendency)
ADULT TRESPASSER
NCBC Gulfport
Gulfport Mississippi
On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1991
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS_d	chemical specific	unitless	USEPA, 1995
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1 00E-06	kg/mg	inorganics
	CF	1 00E-09	kg/ug	organics
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	24	days/year [1]	Assumption
EXPOSURE DURATION	ED	19	years	Assumption
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	19	years	Assumption

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, 1/92
USEPA, 1995 Supplemental Guidance to RAGS . Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:
$DA_{event} = CS \times AF \times ABS_d \times CF$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.18	ug/kg	2 3E-12	150000	3 4E-07	0 01	2 6E-12	150000	4 0E-07	7 4E-07
				SUMMARY CANCER RISK		3E-07				4E-07	7E-07

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[2] Calculated from oral CSFs

Table D-59

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (Central Tendancy)
Future Hypothetical Child Resident
NCBC Gulfport
Gulfport Mississippi
Site 8

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	200	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
AGE-SPECIFIC SURFACE AREA	SA	age-specific	cm²	USEPA, 1989
ABSORPTION FRACTION	ABS	chemical-specific	unitless	USEPA, 1992b
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
CONVERSION FACTOR	CF	1.00E-09	kg/ug	Organic conversion
BODY WEIGHT	BW	15	kg	USEPA, 1991
AGE-SPECIFIC BODY WEIGHT	BW	age-specific	kg	USEPA, 1989
EXPOSURE FREQUENCY	EF	350	days/year [1]	USEPA, 1995
EXPOSURE DURATION	ED	6	years	USEPA, 1995
AGE-SPECIFIC EXPOSURE DURATION	ED	age-specific	years	Assumption
AGE-WEIGHTED SURFACE AREA [2]	$SA_{wt/kg}$	1136 3	cm²-year/kg	USEPA, 1992a
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992a
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	6	years	USEPA, 1995

[1] Units for exposure frequency are in events/year in the calculation of the dermally absorbed dose
[2] In estimating the dermally absorbed dose for children age1 through 6, the time-weighted, bodyweight normalized surface area exposed is calculated from surface area, exposure duration, and body weight for each of 6 age periods, age 1 through 6, per USEPA, 1992
USEPA, 1989 Exposure Factors Handbook,EPA/600/8-89/043, May 1989
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992a. Dermal Exposure Assessment Principles and Applications; EPA/600/8-91/011B, January 1992
USEPA, 1992b USEPA Region IV Guidance Memorandum, February 10, 1992
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

$$\text{CANCER RISK} = \text{INTAKE (mg/kg-day)} \times \text{CANCER SLOPE FACTOR (mg/kg-day)}^{-1}$$

$$\text{INTAKE}_{\text{INGESTION}} = \frac{\text{CS} \times \text{IR} \times \text{FI} \times \text{CF} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT} \times 365 \text{ days/yr}}$$

$$\text{INTAKE}_{\text{DERMAL}} = / \text{AT} \times 365 \text{ days/year}) \times SA_{wt/kg}$$

Where:

$$SA_{wt/kg} = \text{SUM}(SA_i \times ED_i / BW_i)$$

$$DA_{event} = \text{CS} \times \text{AF} \times ABS_d \times \text{CF}$$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF [1] (mg/kg-day)$^{-1}$	CANCER RISK INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [1, 3] (mg/kg-day)$^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.0288	ug/kg	3 2E-11	150000	4 7E-06	0 01	4 5E-12	150000	6 7E-07	5 4E-06
					SUMMARY CANCER RISK	5E-06				7E-07	5E-06

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs
ND = no data.

TABLE D-60

INHALATION OF PARTICULATES - SURFACE SOIL (Central Tendancy)
Future Hypothetical Child Resident
NCBC Gulfport
Gulfport Mississippi
Site 8

10-Apr-00

EXPOSURE PARAMETERS

SOIL CONCENTRATION	C	chemical-specific	chemical-	
PART. EMISSION FACTOR	PEF	1 25E+09	m³/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m³	
INHALATION RATE	IR	0 625	m³/hour	USEPA, 1995
BODY WEIGHT	BW	45	kg	USEPA, 1995
EXPOSURE TIME	ET	4	hours/day	Assumption
EXPOSURE FREQUENCY	EF	45	days/year	Assumption
EXPOSURE DURATION	ED	10	years	USEPA, 1995
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	10	years	USEPA, 1995

USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA 1995. Supplemental Guidance to RAGS, Region 4 Bulletins, Bulletin No 3, November 1995

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR (mg/kg-day)[1]

$$\text{INTAKE} = \frac{\text{CA x IR x ET x EF x ED}}{\text{BW x AT x 365 days/yr}}$$

Where:

CA = C x CF x (1/PEF)

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)^-1	CANCER RISK
2,3,7,8-TCDD	O	0.0288	ug/kg	2 30E-14	2 3E-17	156000	3.5E-12
						SUMMARY CANCER RISK	4E-12

Table D-61

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (Central Tendancy)
Future Hypothetical Adult Resident
NCBC Gulfport
Gulfport Mississippi
Site 8

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
ABSORPTION FRACTION	ABS_d	chemical-specific	unitless	USEPA, 1992b
SURFACE AREA EXPOSED	SA	5,750	cm^2	USEPA, 1992a
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm^2-event	USEPA, 1992a
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	350	days/year [1]	Assumption
EXPOSURE DURATION	ED	24	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	24	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, January 1992
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:
$DA_{event} = CS \times AF \times ABS_d \times CF$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [3] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.0288	ug/kg	1 4E-11	150000	2 0E-06	0 01	7 8E-12	150000	1 2E-06	3 2E-06
SUMMARY CANCER RISK						2E-06				1E-06	3E-06

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs
ND = no data available

TABLE D-62

INHALATION OF PARTICULATES - SURFACE SOIL (Central Tendancy)
Future Hypothetical Adult Resident
NCBC Gulfport
Gulfport Mississippi
Site 8

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-	
PART. EMISSION FACTOR	PEF	1.25E+09	m^3/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m^3	
INHALATION RATE	IR	0 833	m^3/hour	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	24	hours/day	Assumption
EXPOSURE FREQUENCY	EF	350	days/year	USEPA, 1995
EXPOSURE DURATION	ED	24	years	USEPA, 1995
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	24	years	USEPA, 1995

USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors"; OSWER Directive 9285 6-03
USEPA, 1995. Supplemental Guidance to RAGS . Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$\text{INTAKE} = \frac{CA \times IR \times ET \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

CA = C x CF x (1/PEF)

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR CONCENTRATION (mg/m^3)	INTAKE (mg/kg-day)	INHALATIO CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK
	I						
2,3,7,8-TCDD	O	0 0288	ug/kg	2.30E-14	2 2E-15	156000	3.4E-10
				SUMMARY CANCER RISK			3E-10

TABLE D-63

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (Central Tendency)
Future Hypothetical Child Resident
NCBC Gulfport
Gulfport Mississippi
Non-Site 8 On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	200	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
AGE-SPECIFIC SURFACE AREA	SA	age-specific	cm²	USEPA, 1989
ABSORPTION FRACTION	ABS	chemical-specific	unitless	USEPA, 1992b
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
BODY WEIGHT	BW	15	kg	USEPA, 1991
AGE-SPECIFIC BODY WEIGHT	BW	age-specific	kg	USEPA, 1989
EXPOSURE FREQUENCY	EF	350	days/year [1]	USEPA, 1995
EXPOSURE DURATION	ED	6	years	USEPA, 1995
AGE-SPECIFIC EXPOSURE DURATION	ED	age-specific	years	Assumption
AGE-WEIGHTED SURFACE AREA [2]	$SA_{wt/wt}$	1136 3	cm²-year/kg	USEPA, 1992a
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992a
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	6	years	USEPA, 1995

[1] Units for exposure frequency are in events/year in the calculation of the dermally absorbed dose.
[2] In estimating the dermally absorbed dose for children age1 through 6, the time-weighted, bodyweight normalized surface area exposed is calculated from surface area, exposure duration, and body weight for each of 6 age periods, age 1 through 6, per USEPA, 1992

USEPA, 1989 Exposure Factors Handbook,EPA/600/8-89/043, May 1989
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors", OSWER Directive 9285 6-03
USEPA, 1992a Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, January 1992
USEPA, 1992b USEPA Region IV Guidance Memorandum, February 10, 1992
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = AT \times 365\ days/year) \times SA_{wt/wt}$$

Where:
$SA_{wt/wt}$ = SUM $(SA_i \times ED_i / BW_i)$
DA_{event} = CS x AF x ABS_d x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF [1] $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [1, 3] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0 0263	ug/kg	2 9E-11	150000	4 3E-06	0 01	4 1E-12	150000	6 1E-07	4 9E-06
				SUMMARY CANCER RISK		4E-06				6E-07	5E-06

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs

TABLE D-64

INHALATION OF PARTICULATES - SURFACE SOIL (Central Tendancy)
Future Hypothetical Child Resident
NCBC Gulfport
Gulfport Mississippi
Non-Site 8

10-Apr-00

EXPOSURE PARAMETERS

SOIL CONCENTRATION	C	chemical-specific	chemical-	
PART. EMISSION FACTOR	PEF	1 25E+09	m³/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m³	
INHALATION RATE	IR	0 625	m³/hour	USEPA, 1995
BODY WEIGHT	BW	45	kg	USEPA, 1995
EXPOSURE TIME	ET	4	hours/day	Assumption
EXPOSURE FREQUENCY	EF	45	days/year	Assumption
EXPOSURE DURATION	ED	10	years	USEPA, 1995
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	10	years	USEPA, 1995

USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors"; OSWER Directive 9285 6-03
USEPA 1995 Supplemental Guidance to RAGS, Region 4 Bulletins, Bulletin No 3, November 1995

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR (mg/kg-day)[1]

$$\text{INTAKE} = \frac{CA \times IR \times ET \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:

$$CA = C \times CF \times (1/PEF)$$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL CONCENTRATIO	UNITS	AIR CONCENTRATIO (mg/m³)	INTAKE (mg/kg-day)	INHALATION CSF (mg/kg-day)^-1	CANCER RISK
2,3,7,8-TCDD	O	0.0263	ug/kg	2 10E-14	2 1E-17	156000	3.2E-12
				SUMMARY CANCER RISK			3E-12

TABLE D-65

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SURFACE SOIL (Central Tendency)
Future Hypothetical Adult Resident
NCBC Gulfport
Gulfport Mississippi
Non-Site 8 On Base

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	100	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	USEPA, 1995
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1995
ABSORPTION FRACTION	ABS_d	chemical-specific	unitless	USEPA, 1992b
SURFACE AREA EXPOSED	SA	5,750	cm²	USEPA, 1992a
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992a
CONVERSION FACTOR	CF	1 00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1 00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	350	days/year [1]	Assumption
EXPOSURE DURATION	ED	24	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	24	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose
USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors".
OSWER Directive 9285 6-03
USEPA, 1992 Dermal Exposure Assessment Principles and Applications, EPA/600/8-91/011B, January 1992
USEPA, 1995 Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x CANCER SLOPE FACTOR $(mg/kg\text{-}day)^{-1}$

$$INTAKE_{INGESTION} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

$$INTAKE_{DERMAL} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365\ days/yr}$$

Where:
DA_{event} = CS x AF x ABS_d x CF

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC O ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF [1] $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [2]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [3] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.0263	ug/kg	1 2E-11	150000	1 9E-06	0 01	7 1E-12	150000	1 1E-06	2 9E-06
SUMMARY CANCER RISK						2E-06				1E-06	3E-06

[2] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0 1% for inorganics (November 1995)
[3] Calculated from oral CSFs
ND = no data available.

TABLE D-66

INHALATION OF PARTICULATES - SURFACE SOIL (Central Tendancy)
Future Hypothetical Adult Resident
NCBC Gulfport
Gulfport Mississippi
Non-Site 8

10-Apr-00

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
SOIL CONCENTRATION	C	chemical-specific	chemical-	
PART. EMISSION FACTOR	PEF	1 25E+09	m^3/kg	default [1]
CONCENTRATION AIR	CA	chemical-specific	mg/m^3	
INHALATION RATE	IR	0 833	m^3/hour	USEPA, 1995
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE TIME	ET	24	hours/day	Assumption
EXPOSURE FREQUENCY	EF	350	days/year	USEPA, 1995
EXPOSURE DURATION	ED	24	years	USEPA, 1995
CONVERSION FACTOR	CF	0 001	mg/ug	Organics only
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	24	years	USEPA, 1995

USEPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors"; OSWER Directive 9285 6-03
USEPA, 1995. Supplemental Guidance to RAGS Region IV, Human Health Risk Assessment Bulletin No 3

EQUATIONS

CANCER RISK = INTAKE (mg/kg-day) x INHALATION CANCER SLOPE FACTOR (mg/kg-da

$$\text{INTAKE} = \frac{\text{CA x IR x ET x EF x ED}}{\text{BW x AT x 365 days/yr}}$$

Where:

CA = C x CF x (1/PEF)

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	AIR ONCENTRATIO (mg/m³)	INTAKE (mg/kg-day)	INHALATIO CSF (mg/kg-day)-1	CANCER RISK
2,3,7,8-TCDD	O	0 0263	ug/kg	2 10E-14	2 0E-15	156000	3.1E-10
				SUMMARY CANCER RISK			3E-10

TABLE D-67

DIRECT CONTACT WITH AND INCIDENTAL INGESTION OF SEDIMENT (Central Tendency)
OCCUPATIONAL WORKER
NCBC Gulfport
Gulfport Mississippi
On Base

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE
CONCENTRATION SOIL	CS	chemical-specific	chemical-specific	
INGESTION RATE	IR	50	mg/day	USEPA, 1995
FRACTION INGESTED	FI	100%	unitless	Assumption
ADHERENCE FACTOR	AF	1	mg/cm²-event	USEPA, 1992
ABSORPTION FRACTION	ABS	chemical-specific	unitless	Assumption
SURFACE AREA EXPOSED	SA	2,300	cm²	USEPA, 1992
DOSE ABSORBED PER EVENT	DA_{event}	chemical-specific	mg/cm²-event	USEPA, 1992
CONVERSION FACTOR	CF	1.00E-09	kg/ug	Organic conversion
CONVERSION FACTOR	CF	1.00E-06	kg/mg	Inorganic conversion
BODY WEIGHT	BW	70	kg	USEPA, 1991
EXPOSURE FREQUENCY	EF	30	days/year [1]	USEPA, 1995
EXPOSURE DURATION	ED	25	years	USEPA, 1995
AVERAGING TIME				
CANCER	AT	70	years	USEPA, 1991
NONCANCER	AT	25	years	USEPA, 1995

[1] Units for exposure frequency are events/year in the calculation of the dermally absorbed dose.
USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors"; OSWER Directive 9285.6-03.
USEPA, 1992. Dermal Exposure Assessment: Principles and Applications; EPA/600/8-91/011B; 1/92.
USEPA, 1995. Supplemental Guidance to RAGS : Region IV, Human Health Risk Assessment Bulletin No. 3.

EQUATIONS

$$\text{CANCER RISK} = \text{INTAKE (mg/kg-day)} \times \text{CANCER SLOPE FACTOR (mg/kg-day)}^{-1}$$

$$\text{INTAKE}_{\text{INGESTION}} = \frac{CS \times IR \times FI \times CF \times EF \times ED}{BW \times AT \times 365 \text{ days/yr}}$$

$$\text{INTAKE}_{\text{DERMAL}} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT \times 365 \text{ days/yr}}$$

Where:

$$DA_{event} = CS \times AF \times ABS \times CF$$

CARCINOGENIC EFFECTS

COMPOUND	INORGANIC OR ORGANIC I/O	SOIL CONCENTRATION	UNITS	INTAKE INGESTION (mg/kg-day)	ORAL CSF $(mg/kg\text{-}day)^{-1}$	CANCER RISK INGESTION	DERMAL ABS [1]	INTAKE DERMAL (mg/kg-day)	DERMAL CSF [2] $(mg/kg\text{-}day)^{-1}$	CANCER RISK DERMAL	TOTAL CANCER RISK
2,3,7,8-TCDD	O	0.18	ug/kg	3.8E-12	150000	5.7E-07	0.01	1.7E-12	150000	2.6E-07	8.3E-07
SUMMARY CANCER RISK						6E-07				3E-07	8E-07

[1] USEPA Region IV guidance specifies absorption factors of 1% for organics and 0.1% for inorganics (November 1995).
[2] Calculated from oral CSFs.
NE = not evaluated.

APPENDIX E

ECOLOGICAL INFORMATION

APPENDIX E
CHECKLIST FOR ECOLOGICAL ASSESSMENT SAMPLING

I. SITE DESCRIPTION

1. **Site Name:** NCBC Gulfport
   Location: Gulfport, Mississippi
   County: Harrison
   City: Gulfport
   State: Mississippi

2. **Latitude:** 30° 22' 30" North
   Longitude: 89° 07' 30" West

3. **What is the approximate area of the site?:** The NCBC Gulfport facility is approximately 1,100 acres in areal extent; off site drainage features that may have been impacted encompass an area of several square miles

4. **Is this the first site visit?:** No, a previous site visit was conducted between 15 – 19 March 1999 to collect fish tissue samples. A summary of relevant field observations is included in the *Ecological Sampling Services* report (C^2 Environmental Services, Inc) which is appended in Appendix.

5. **Please attach to the checklist USGS topographic map(s) of the site, if available.** USGS Topographic maps for the Gulfport NW, Gulfport North, and Pass Christian, Mississippi quadrangles are included in Appendix A.

6. **Are aerial or other site photographs available?** See below.

7. **The land use of the site**: The NCBC Gulfport Long Range Natural Resources Management Plan discusses maintenance use categories for the facility (Fleming, 1986). The facility consists primarily of developed areas and buildings to support the base mission with area categorized into improved grounds (i.e., landscaped and mowed), semi-improved grounds (routinely maintained to limit erosion, weed control, and reduce fire hazard), unimproved grounds, and other (including buildings, streets, parking areas, and other paved areas). Approximately 15% of the total area is devoted to forest management.

   The land use surrounding the site: Landuse in the vicinity of the site is multipurpose: residential, commercial, light industrial, and open space (including riparian and forested swamp). Two offsite migration pathways leading off-facility exist to the northwest (Turkey Creek) and southeast (Brickyard Bayou). Landuse along these water body corridors are primarily a mixture of residential and open space.

8. **Has any movement of soil taken place at the site?** Extensive movement of soil has occurred at Site 8 (Former Area) as part of the soil remedial activities.

9. **Do any potentially sensitive environmental areas exist adjacent or in proximity to the site?** Surface water bodies at NCBC Gulfport consist of a lake and a series of storm-water conveyance ditches and canal. Stormwater is conveyed off-facility to the northwest and the southeast discharging into Turkey Creek via an extensive cypress/black gum floodplain forest and Brickyard Bayou, respectively.

10. **What type of facility is located at the site?** The Naval Construction Battalion Center exists to support four battalions of the Naval Construction Force (NCF) and the storage and maintenance of pre-positioned Ware Reserve Material Stock. NCF support consists of both homeport services and

deployed support. Secondary missions are tenant support, and support to other installations in the region.

11. **What are the suspected contaminants of concern at the site?** The principal contaminants of concern are dioxin and furan compounds although VOCs and gasoline/heating oil contamination of groundwater are also being investigated.

What are the maximum concentration levels? Refer to the *Surface Water and Sediment Dioxin Delineation Report* (HLA, 1999).

12. **Potential routes of off-site migration of contaminants observed at the site include the following:** Drainage ditches in the northwest and southeast of the facility; groundwater migration and subsequent discharge to surface water.

13. **What is the approximate depth to the water table?** Variable.

14. **Is the direction of surface runoff apparent from site observations?** Yes. Stormwater is conveyed off-base via a series of drainage ditches.

If yes, where does the surface runoff discharge? Drainage ditch outfalls located in the northwest and southeast of the facility. See Figure 2-9, 2-12, and 2-13 in the *Surface Water and Sediment Dioxin Delineation Report* (HLA, 1999)..

15. **Is there a navigable waterbody or tributary to a navigable waterbody?** Yes.

16. **Is there a waterbody on or in the vicinity of the site?** Yes. Stormwater conveyance ditches and canals contain water permanently. A number of fish ponds are also located on the facility.

17. **Is there evidence of flooding?** No evidence of flooding on NCBC Gulfport; however, the cypress/black gum swamp located north of the facility is a forested floodplain and floods periodically.

18. **If a field guide was used to aid any of the identification, please provide a reference.** Also estimate, the time spent identifying the fauna. Dr. Allen Tubbs, a local naturalist, participated in the site visit and assisted in the characterization of flora and fauna encountered during the weeklong biological characterization. Tables E-1 and E-2 summarize the plant and wildlife species observed during this characterization, respectively.

19. **Are any threatened and/or endangered species (plant or animal) known to inhabit the area of the site?** Fleming (1986) identified only the American Alligator (*Alligator mississipiensis*).

20. **Record weather conditions at the time this checklist was prepared**:

Date:	24-27 August 1999
Temperature:	25 - 30° C
Normal daily high temperature:	30° C
Wind (direction/speed):	southeasterly/southwesterly (approximately 10 miles/hour)
Precipitation:	daily thunderstorms
Cloud cover:	cloudless to overcast

IA. **Summary of Observations and Site Setting:** The primary dioxin source area on the NCBC Gulfport facility is Site 8, the former herbicide orange storage area. As a result of historical practices, a series of drainage ditches that convey stormwater from the site have secondarily become contaminated. The ERA focussed on surface water and sediment exposures in these drainage ditches and in off-facility downgradient creeks and bayous. Surface water leaves the facility boundary through four outfalls, specifically Outfalls 1 North, 3 North, 4 North, and 2

South. The three outfalls located along the northwest corner of the facility discharge into a large forested swamp, itself a floodplain associated with Turkey Creek. Turkey Creek discharges into Bernard Bayou. Outfall 2 South discharges into Brickyard Creek, which in turn discharges also into Bernard Bayou.

The Phase I and II fish tissue sampling reports (C2 Environmental Services, 1999a, b) provide a characterization of these waterbodies at a series of sampling locations. These reports are attached to this appendix.

Completed by: Norman Richardson
Senior Ecologist

II. **TERRESTRIAL HABITAT CHECKLIST** – Not completed because the ERA focussed only on sediment and surface water exposures.

IIA. **WOODED**

1. **Are there any wooded areas at the site?**

IIB. **SHRUB/SCRUB**

1. **Is the shrub/scrub vegetation present at the site?**

2. **What percentage of the site is covered by scrub/shrub vegetation?**

3. **What is the dominant type of scrub/shrub vegetation, if known?**

4. **What is the approximate average height of the scrub/shrub vegetation?**

5. **Based on site observations, how dense is the scrub/shrub vegetation?**

IIC. **OPEN FIELD**

1. **Are there open (bare, barren) field areas at the site?**

IID. **MISCELLANEOUS**

1. **Are other types of terrestrial habitats present at the site, other than woods, scrub/shrub, and open field?**

III. AQUATIC HABITAT CHECKLIST – NON-FLOWING SYSTEMS

1. **What type of open-water, non-flowing system is present at the site?** A series of fish ponds are located at NCBC Gulfport.

IV. AQUATIC HABITAT CHECKLIST – FLOWING SYSTEMS

1. **What type of flowing water system is present at the site?** A series of drainage ditches and canals collect and direct stormwater off the facility.

2. **If known, what is the name of the waterbody?** The ditches and canals are nominally identified in the *Surface Water and Sediment Dioxin Delineation Report* (HLA, 1999).

3. **For natural systems, are there any indicators of physical alteration (e.g., channeling, debris, etc.)?** There are no natural flowing water bodies located on NCBC Gulfport.

4. **What is the general composition of the substrate?** Substrate composition varies from grass-lined swales that hold water intermittently to silty and organic rich sediments that accumulate behind outfalls and a series of check dams that were installed to inhibit the off-facility migration of dioxin compounds.

5. **What is the conditions of the bank (e.g., height, slope, extent of vegetation)?** The grass-line swales are typically shallow, with gentle slopes that are vegetated with regularly mown grasses. The bank canal located in the northwest corner of the facility

6. **Is the system influenced by tides?** Only Bernard Bayou downgradient of Turkey Creek and Brickyard Bayous is tidally influenced.

7. **Is the flow intermittent?** Yes, in the majority of the grass-lined swales.

8. **Is there discharge from the site to the waterbody?** Yes.

9. **Is there a discharge from the waterbody?** No.

10. **Identify any field measurements and observations of water quality that were made?** No water quality measurement data were collected during the ecological site characterization. Table 2 of the *Ecological Sampling Services* report (C^2 Environmental Services, 1999) summarizes pH, water temperature, salinity, dissolved, and specific conductance data collected during the fish tissue sampling program.

11. **Describe observed color and area of coloration?** No unusual water colors were reported during the fish tissue sampling program.

12. **Is any aquatic vegetation present?** Yes.

13. **Mark the flowing water system on the attached site map.** See Figure 1 in the *Ecological Sampling Services* report (C^2 Environmental Services, 1999), which is attached to this appendix.

14. **What observations were made at the waterbody regarding the presence and/or absence of benthic macroinvertebrates, fish, birds, mammals, etc.?** See Table A-1 and A-2 for bird and wildlife fauna identified during the ecological site characterization. Table 3 in the *Ecological Sampling Services* report (C^2 Environmental Services, 1999) provides a summary of fish species identified during the fish tissue sampling program. No information on the benthic macroinvertebrate fauna in the potentially affected water bodies is available.

V. WETLAND HABITAT CHECKLIST

1. **Based on observations and/or available information, are designated or known wetlands definitely present at the site?** Permanently flooded ditches and canals located on NCBC Gulfport contain riparian wetland vegetation, which also occurs in downgradient waterbodies such as Turkey Creek, Bernard Bayou, and Brickyard Creek. The cypress/black gum floodplain located north of the facility is a palustrine forested wetland.

   Please note the sources of observations and information used (e.g., USGS Topographic Maps, National Wetland Inventory, Federal or State Agency, etc.) to make this determination. U.S.G.S topographic maps. National Wetland Inventory maps.

2. **Based on the location of the site (e.g., along a waterbody, in a floodplain) and site conditions (e.g., standing water; dark, wet soils; mud cracks), are wetland habitats suspected?** Yes.

3. **What type(s) of vegetation are present in the wetland?** See Table A-1 in Appendix A for a listing of dominant and common plant species identified during the ecological characterization.

4. **Provide a general description of the vegetation present in and around the wetland (height, color, etc.). Provide a photograph of the known or suspected wetlands, if available.** The forested wetland north of North Outfalls 3 and 4 is dominated by pond cypress (*Taxodium distichum*) and black gum (*Nyssa sylvatica*). Canopy height is variable but ranges from 15 – 25 meters. Southern magnolia (*Magnolia virginiana*), loblolly pine (*Pinus taeda*), and water oak (*Quercus nigra*) are common canopy elements of this forest as well. The shrub layer includes yaupon (*Ilex vomitoria*), titi (*Cyrilla racemiflora*), and southern bayberry (*Myrica cerifera*).

5. **Is standing water present?** Yes. However, water flow through the forested floodplain is intermittent and periodically only standing pools of water are present.

   If yes, is the water fresh or brackish? All surface water is fresh with the exception of portions of Brickyard Bayou.

   What is the approximate area of the water (sq. ft.)? Turkey Creek – approximately 500,000 square feet; Brickyard Bayou – approximately 450,000 square feet.

   Please complete questions 4, 11, 12 in Checklist III – Aquatic Habitat – Non-Flowing Systems. See above.

6. **Is there evidence of flooding at the site? What observations were noted?** No observations of flooding in the facility were noted. As mentioned previously, the forested cypress/black gum swamp located north of the facility regularly floods. Observations include buttressed roots systems, cypress "knees", stained leaves, sediment deposits, erosional areas along banks.

7. **If known, what is the source of the water in the wetland?** Surface runoff from the northern portion of NCBC Gulfport contributes flowage to the forested swamp; in addition, local groundwater discharge also undoubtedly occurs.

8. **Is there a discharge from the site to a known or suspected wetland? If yes, please describe.** See above.

9. **Is there a discharge from the wetland? If yes, what waterbody is discharge released?** Water in the forested swamp discharges to Turkey Creek.

10. **If a soil sample was collected, described the appearance of the soil in the wetland area?** No surface soil samples were collected during the site visit Information presented in the *Swamp*

Delineation Sampling, Phases V and VI (HLA, 1999) report indicate that the soils in this wetland consist of organic rich silts and clays (muck) overlying sands. Soils correlate to the Ponzer Series.

11. **Mark the observed wetland area(s) on the attached site map.** See Figures 2 and 3 in the *Swamp Delineation Sampling, Phases V and VI* report.

Table E-1
Plants Observed During the Ecological Characterization Survey[1]

Screening - Level Ecological Risk Evaluation
Naval Construction Battalion Center
Gulfport, Mississippi

Common Name	Scientific Name	Habitats[2]			
		Onsite Ditches	Swamp	Site 8	Riparian/Aquatic
Common ragweed	*Ambrosia artemisiifolia*			x	
Fennel	*Eupatorium capellifolium*	x			
Muscadine grape	*Vitis rotundifolia*	x			x
Meadowsweet	*Spiraea* sp.	x			
Knotweed/Smartweed	*Polygonum* sp.	x	x		
Grass	*Poa* sp.	x		x	
Rabbit bells	*Crotalaria rotundifolia*			x	
Blackberry	*Rubus* sp.	x	x		
Bindweed	*Convolvulus* sp.	x			
Vervain	*Verbena brasiliensis*	x	x		
Goldenrod	*Solidago* sp.	x		x	
Primrose willow	*Ludwigia peruviana*	x			
Daisy fleabane	*Erigeron annuus*	x		x	
Aster	*Aster* sp.			x	
Water lily	*Nymphaea odorata*		x		
Primrose	*Primula* sp.				
Mistletoe	*Phoradendron flavescens*			x	
Chain fern	*Woodwardia areolata*		x		
Marsh fern	*Thelypterus palustris*		x		
Royal fern	*Osmunda regalis*		x		
Greenbrier	*Smilax bona-nox*		x		x
Cinnamon fern	*Osmunda cinnamomea*		x		
Sedge	*Carex* spp.		x	x	
Sedge	*Cyperus* spp.		x		

Table E-1
Plants Observed During the Ecological Characterization Survey[1]

Screening - Level Ecological Risk Evaluation
Naval Construction Battalion Center
Gulfport, Mississippi

Common Name	Scientific Name	Habitats[2]			
		Onsite Ditches	Swamp	Site 8	Riparian/Aquatic
Climbing fern	*Lygodium japonicum*		x		
Trumpet-creeper	*Campsis radicans*		x		x
Louisiana blue flag	*Iris virginica*		x		
Wood nettle	*Laportea canadensis*		x		
Resurrection fern	*Polypodium polypodioides*		x		
Peppervine	*Ampelopsis arborea*		x	x	
Oxeye daisy	*Chrysanthemum leucanthemum*			x	
St. Johnswort	*Hypericum* sp.			x	
Bush clover	*Lespedeza* sp.			x	
Queen Anne's lace	*Daucas carota*			x	
Rabbit-foot clover	*Trifolium arvense*			x	
Butter-and-eggs	*Linaria vulgaris*			x	
English plantain	*Plantago lanceolata*			x	
Virginia creeper	*Parthenocissus quinquefolia*			x	
Deptford pink	*Dianthus armeria*			x	
Paspalum Grass	*Paspalum* sp.			x	
Cattail	*Typha* sp.			x	
Rush	*Juncus* sp.			x	
Spike-rush	*Eleocharis* sp.			x	
Pampas grass	*Cortaderia selloana*			x	
Black rush	*Juncus roemarianus*				x
Cardinal flower	*Lobelia cardinalis*				x
Common morning glory	*Ipomoea purpurea*	x			x
Arrowhead	*Sagittaria* sp.				x
Gaillardia	*Gaillardia puchella*			x	

Table E-1
Plants Observed During the Ecological Characterization Survey[1]

Screening - Level Ecological Risk Evaluation
Naval Construction Battalion Center
Gulfport, Mississippi

Common Name	Scientific Name	Habitats[2]			
		Onsite Ditches	Swamp	Site 8	Riparian/Aquatic
Trees/Shrubs					
Black cherry	*Prunus serotina*	x		x	
Black willow	*Salix nigra*	x		x	x
Longleaf pine	*Pinus palustris*	x	x	x	
Water oak	*Quercus nigra*	x	x		x
Red Maple	*Acer rubrum*	x	x		x
Common elderberry	*Sambucus canadensis*			x	
Live oak	*Quercus virginiana*			x	x
Privet	*Ligustrum* sp.		x	x	
Pondcypress	*Taxodium distichum*		x		
Yaupon	*Ilex vomitoria*		x		x
Poison oak	*Toxocodendron toxicodendron*		x		
Southern bayberry	*Myrica cerifera*	x	x		x
Slash pine	*Pinus elliottii*		x		x
Blackgum	*Nyssa sylvatica*		x		x
Sweetbay	*Magnolia virginiana*		x		x
Winged sumac	*Rhus copallina*		x		
Southern magnolia	*Magnolia grandiflora*		x		
Overcup oak	*Quercus lyrata*		x		
Loblolly pine	*Pinus taeda*		x		
Saw palmetto	*Serenoa repens*		x		
Titi	*Cyrilla racemiflora*		x		
Hickory	*Carya* sp.		x		
Eastern cottonwood	*Populus deltoides*				x

Table E-1
Plants Observed During the Ecological Characterization Survey[1]

Screening - Level Ecological Risk Evaluation
Naval Construction Battalion Center
Gulfport, Mississippi

Common Name	Scientific Name	Habitats[2]			
		Onsite Ditches	Swamp	Site 8	Riparian/Aquatic
Sweetgum	*Liquidambar styraciflua*				x

Notes:
1. Observations were made during Biological Assessment conducted at the Naval Construction Battalion Center Gulfport, Mississippi August 24-27, 1999.
2. Habitats surveyed include:

Onsite Ditches	NCBC Gulfport facility in areas associated with the stormwater ditch system.
Forested Swamp	Cypress/tupelo forested floodplain located north of Northern Outfalls 3 and 4.
Site 8	Dioxin source area located in the NCBC Gulfport facility
Riparian/Aquatic	Downgradient (off-facility) creeks and bayous include Turkey Creek, Bernard Bayou and Brickyard Bayou.

Table E-2
Wildlife or Signs Observed During the Ecological Characterization Survey[1]

Screening - Level Ecological Risk Evaluation
Naval Construction Battalion Center
Gulfport, Mississippi

Common Name	Scientific Name	Frequency	Habitats[2]			
			Forested Swamp	Riparian/ Aquatic	Upland/ Open field	Onsite Ditches
Reptilia						
Ornate Box Turtle	*Terrapene ornata*	1	x			
Three-toed Box Turtle	*Terrapene carolina*	3	x			
Musk or Mud Turtle	Family Kinosternidae	1	x			
Green Anole	*Anolis carolinensis*	2	x			x
Five-lined Skink	*Eumeces fasciatus*	2	x	x		
Water Snake	*Natrix sp.*	1	x			
American Alligator	*Alligator mississipiensis*	1				x
Amphibia						
Eastern Narrow-mouthed Toad	*Gastrophryne carolinensis*	>50		x		
Southern Toad	*Bufo terrestris*	1	x			
Greater Gray Treefrog	*Hyla versicolor*	2	x	x		
Aves						
Great Blue Heron	*Ardea herodias*	1		x		
Snowy egret	*Egretta thula*	1		x		
Yellow-crowned Night-Heron	*Nyctanassa violacea*	1		x		
Mallard	*Anas platyrhynchos*	4		x		x
Red-shouldered Hawk	*Buteo lineatus*	2			x	
Northern Bobwhite	*Colinus virginianus*	1			x	
Laughing Gull	*Larus atricilla*	2		x		
Gull-billed Tern	*Sterna nilotica*	2		x		
Royal Tern	*Sterna maxima*	2		x		
Forester's Tern	*Sterna forsteri*	1		x		
Mourning Dove	*Zenadia macroura*	3			x	x
Belted Kingfisher	*Cerlye alcyon*	1		x		

Table E-2
Wildlife or Signs Observed During the Ecological Characterization Survey[1]

Screening - Level Ecological Risk Evaluation
Naval Construction Battalion Center
Gulfport, Mississippi

Common Name	Scientific Name	Frequency	Habitats[2]			
			Forested Swamp	Riparian/ Aquatic	Upland/ Open field	Onsite Ditches
Red-bellied Woodpecker	*Melanerpes carolinus*	3			x	
Downy Woodpecker	*Picoides pubescens*	1			x	
Northern Flicker	*Colaptes auratus*	1	x			
Pileated Wooodpecker	*Dryocopus pileatus*	2	x			
Blue Jay	*Cyanocitta cristata*	5			x	
American Crow	*Corvus brachyrhynchos*	3		x	x	
Carolina Chickadee	*Parus carolinensis*	9	x	x		
Tufted Titmouse	*Parus bicolor*	5	x			
Carolina Wren	*Thryothorus ludovicianus*	6	x			
Blue-gray Gnatcatcher	*Polioptila caerulea*	3	x			
Eastern Bluebird	*Sialia sialis*	>30			x	
Wood thrush	*Catharus mustelinus*	1	x			
Northern Mockingbird	*Mimus polyglottos*	2			x	
White-eyed Vireo	*Vireo griseus*	1	x			
Pine Warbler	*Dendroica pinus*	1	x			
Black-and-White Warbler	*Mniotilta varia*	2	x			
Hooded Warbler	*Wilsonia citrina*	1	x			
Northern Cardinal	*Cardinalia cardinalis*	2			x	
Eastern Towhee (Rufous-sided)	*Pipilo erythrophthalmus*	1			x	
Red-winged Blackbird	*Agelaius phoeniceus*	5		x		x
Mammalia						
Raccoon	*Procyon lotor*	Tracks	x			
Eastern Gray Squirrel	*Sciurus carolinensis*	1	x			
Armadillo	*Dasypus novemcinctus*	Tracks, diggings	x			

Table E-2
Wildlife or Signs Observed During the Ecological Characterization Survey[1]

Screening - Level Ecological Risk Evaluation
Naval Construction Battalion Center
Gulfport, Mississippi

Common Name	Scientific Name	Frequency	Habitats[2]			
			Forested Swamp	Riparian/ Aquatic	Upland/ Open field	Onsite Ditches

Notes:
1. Observations were made during Biological Assessment conducted at the Naval Construction Battalion Center Gulfport, Mississippi August 24-27, 1999.
2. Habitats surveyed include:

Forested Swamp	Cypress/tupelo forested floodplain located north of Northern Outfalls 3 and 4.
Riparian/Aquatic	Downgradient (off-facility) creeks and bayous include Turkey Creek, Bernard Bayou and Brickyard Bayou.
Upland/Open	NCBC Gulfport facility in upland areas not associated with the stormwater ditch system.
Onsite Ditches	NCBC Gulfport facility in areas associated with the stormwater ditch system.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
P. O. Drawer 1190
Daphne, Alabama 36526

IN REPLY REFER TO

00-0331a

January 4, 2000

Mr. Charles H. Lyman
Harding Lawson Associates
107 Audubon Road, Suite 301
Wakefield, Massachusetts 01880

Dear Mr. Lyman:

We are responding to your letter, dated November 2, 1999, requesting comments on an ecological assessment of a project site in Gulfport, Mississippi. We have reviewed the information and are providing the following comments in accordance with the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

A. Fish and Wildlife Coordination Act

We recommend the area be evaluated by either the U.S. Army Corps of Engineers (COE) or a COE-certified wetland delineator to verify presence/absence of wetlands that would require a Section 404 permit. We recommend that the proposed project be designed to avoid wetland habitats and that Best Management Practices are implemented during operations to protect water quality from contamination in the project area. If wetland habitats cannot be avoided, we recommend a mitigation plan be developed and incorporated into your project plans.

B. Endangered Species Act

We have determined that the following Federally listed species may occur in your project area:

1. Gopher tortoise (*Gopherus polyphemus*) T.

The gopher tortoise is a burrowing terrestrial reptile. This species is generally restricted to deep well-drained sandy soils in open forests or savannas of the extreme southeastern United States. It is commonly associated with pine forests (historically longleaf pine) having an open understory with grass and forb groundcover. The species is herbivorous (primarily herbs, berries, and wiregrass) and highly colonial with burrows reported more than 25 feet long. Nesting occurs primarily from May to July and between 3 and 11 eggs are buried usually near the burrow entrance. Thirty-nine invertebrate and 42 vertebrate species are known to utilize gopher tortoise shelter/breeding burrows to varying degrees, including the federally threatened eastern indigo snake. We recommend that surveys for gopher tortoises and their burrows

(active and inactive) be conducted if potential gopher tortoise habitat occurs within and for at least 100 feet outside of the project construction zone.

2. Eastern indigo snake (*Drymarchon corais couperi*) T.

The eastern indigo snake is a large, relatively slow, conspicuous, heavy-bodied snake attaining a length of about 7.5 feet. This species is often associated with the same xeric habitats that support gopher tortoise populations. We recommend that surveys for the eastern indigo snake be conducted if this habitat occurs within the project construction zone.

3. Louisiana quillwort (*Isoetes louisianensis*) E.

The Louisiana quillwort is a nonflowering grasslike plant that appears to be restricted to sandy soils and gravel bars in or near shallow blackwater streams and overflow channels in riparian woodland/bayhead forests of pine flatwoods and upland longleaf pine. Plants grow in stable sand and gravel bars and moist overflow channels with silty sand substrate, and on low, sloping banks near and below water levels. They occur in a relatively firm substrate of fine sandy loam, and sometimes coarser sands and small to medium-sized gravel. Mature plants are six to ten inches long, mostly evergreen, with spore-bearing structures below ground. During summer dry periods, plants may remain evergreen if growing in water, or wither and die back if growing in areas such as overflow channels that become dry if located at a distance from the main channel. Therefore, it may not be possible to conclude that a particular stream does not have quillworts if one is searching during the hotter and drier summer months. We recommend that surveys for the Louisiana quillwort be conducted by qualified botanists if this habitat occurs within the project impact zone.

If you have any questions or need additional information, please contact Mr. Bert W. Steen at (334) 441-5181, ext. 38. Please refer to the reference number located at the top of this letter.

Sincerely,

Larry E. Goldman
Field Supervisor

MISSISSIPPI
DEPARTMENT OF WILDLIFE, FISHERIES AND PARKS
SAM POLLES, Ph.D.
Executive Director

November 29, 1999

Charles H. Lyman
Harding Lawson Associates
107 Audubon Road, Suite 301
Wakefield, Massachusetts 01880

RE: Gulfport North, and Pass Christian, Mississippi

Dear Mr. Lyman:

In response to your request for information dated November 2, 1999, I have searched our database for occurrences of state or federally listed or proposed endangered, threatened, rare or otherwise significant animals and plants on the site referenced above. Listed below are occurrences of special concern species located on the enclosed maps. In addition I have included special concern species within or adjacent to Bernard Bayou and Turkey Creek located on the Gulfport NW quad (map not enclosed).

Quad Map	Species # or Sec #	Common Name	Species Name	Federal Status	State Status	Global Ranking	State Ranking
Gulfport North	#1	Least Tern	*Sterna antillarum*			G4	S3BSZN
Gulfport North	#2	Myrtle-Leaf Oak	*Quercus myrtifolia*			G5	S1?
Gulfport North	#3	Large Beakrush	*Rhynchospora macra*			G3	S3
		Dangleberry	*Gaylussacia frondosa*			G5	S2S3
		Large White Fringe Orchid	*Platanthera blephariglottis*			G4G5	S2
		Crested Fringed Orchid	*Platanthera cristata*			G5	S3
		Hooker's Milkwort	*Polygala hookeri*			G3	S3S4
Pass Christian	#4	Scarlet Kingsnake	*Lampropeltis triangulum elapsoides*			G5T5	S4
Pass Christian	#5	Least Tern	*Sterna antillarum*			G4	S3BSZN
Gulfport North (Bernard Bayou)	Sec 16	Pine Woods Snake	*Rhadinaea flavilata*			G4	S3?
		Carolina Lilaeopsis	*Lilaeopsis carolinensis*			G3?	S2S3
		Giant Spiral Ladies'-Tresses	*Spiranthes longilabris*			G3	S2S3

Quad Map	Species # or Sec #	Common Name	Species Name	Federal Status	State Status	Global Ranking	State Ranking
Gulfport NW (Turkey Creek)	Sec 24	Stalked Adders-Tongue	*Ophioglossum petiolatum*			G5	S3S4
Gulfport NW (Bernard Bayou)	Sec 12	Lavender Burrowing Crayfish	*Fallicambarus byersi*			G4	S3
		Large Beakrush	*Rhynchospora macra*			G3G4	S3
		Coastal Plain False-Foxglove	*Agalinis aphylla*			G3G4	S2S3

The Mississippi Natural Heritage Program has compiled a database that is the most complete, single source of information about Mississippi's rare, threatened, endangered or otherwise significant animals, plants, plant communities and natural features. The quantity and quality of data collected by the MNHP are dependent upon the research and observations of many individuals and organizations. In many cases, this information is not the result of comprehensive or site-specific field surveys; most natural areas in Mississippi have not been thoroughly surveyed, and new occurrences of plant and animal species are often discovered. Heritage reports summarize existing information known to the MNHP at the time of the request and cannot always be considered a definitive statement regarding the presence, absence or condition of biological elements at a particular site. Please feel free to contact us if we can provide any additional information.

Sincerely,

Cynthia Rickis-Gordon

Cynthia Rickis-Gordon, Environmental Assistant
Mississippi Natural Heritage Program

APPENDIX F

BIOLOGICAL TISSUE ANALYTICAL INFORMATION

Table F-1

Summary of Biological Tissue (Whole Body) Submitted for Analysis[a]

Tier I/II Screening Level Fish/Sediment Sampling Results
Naval Construction Battalion Center
Gulfport, Mississippi

Sample Location	Sampling Date (1997)	Sample Identification	Species	Trophic Level[b]	Length (mm)	Weight (g)	Fillet Weight (g)	Anomalies
BIO-2	15-19 Mar	BIO-2-WF-GS	Gizzard shad	P/S	110	13		None
BIO-2	15-19 Mar	BIO-2-WF-GS	Gizzard shad	P/S	150	34		None
BIO-2	15-19 Mar	BIO-2-WF-GS	Gizzard shad	P/S	160	41		None
BIO-2	15-19 Mar	BIO-2-WF-GS	Gizzard shad	P/S	170	57		None
BIO-2	15-19 Mar	BIO-2-WF-CF	Brown bullhead	BF	373	775		None
BIO-2	15-19 Mar	BIO-2-WF-LB	Largemouth bass	T	233	156		None
BIO-2	23-27 Aug	BIO-2-WF-CF[c]	Brown bullhead	BF	346	820	177	None
BIO-2	23-27 Aug	BIO-2-WF-BG	Bluegill sunfish	T	125	35		None
BIO-2	23-27 Aug	BIO-2-WF-BG	Bluegill sunfish	T	155	70		None
BIO-2	23-27 Aug	BIO-2-WF-BG	Bluegill sunfish	T	142	56		None
BIO-2	23-27 Aug	BIO-2-WF-GS	Gizzard shad	P/S	160	41		None
BIO-2	23-27 Aug	BIO-2-WF-GS	Gizzard shad	P/S	173	55		None
BIO-2	23-27 Aug	BIO-2-WF-GS	Gizzard shad	P/S	172	54		None
BIO-2	23-27 Aug	BIO-2-WF-GSR[d]	Gizzard shad	P/S	173	53		None
BIO-2	23-27 Aug	BIO-2-WF-GSR[d]	Gizzard shad	P/S	154	38		None
BIO-2	23-27 Aug	BIO-2-WF-GSR[d]	Gizzard shad	P/S	136	26		None
BIO-3	15-19 Mar	BIO-3-WF-CS	Lake chubsucker	P/S	155	56		Eroded caudal fin
BIO-3	15-19 Mar	BIO-3-WF-CS	Lake chubsucker	P/S	162	63		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	88	14		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	80	9		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	90	12		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	88	11		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	68	6		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	80	8		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	70	6		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	70	6		None

Table F-1
Summary of Biological Tissue (Whole Body) Submitted for Analysis[a]

Tier I/II Screening Level Fish/Sediment Sampling Results
Naval Construction Battalion Center
Gulfport, Mississippi

Sample Location	Sampling Date (1997)	Sample Identification	Species	Trophic Level[b]	Length (mm)	Weight (g)	Fillet Weight (g)	Anomalies
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	73	6		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	80	8		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	72	6		None
BIO-3	15-19 Mar	BIO-3-WF-BG	Bluegill sunfish	T	66	5		None
BIO-3	23-27 Aug	BIO-3-WF-BG	Bluegill sunfish	T	115	21		None
BIO-3	23-27 Aug	BIO-3-WF-BG	Bluegill sunfish	T	107	20		None
BIO-3	23-27 Aug	BIO-3-WF-BG	Bluegill sunfish	T	70	6		None
BIO-3	23-27 Aug	BIO-3-WF-PP	Pirate perch	P/S	64	4		None
BIO-3	23-27 Aug	BIO-3-WF-PP	Pirate perch	P/S	60	4		None
BIO-3	23-27 Aug	BIO-3-WF-PP	Pirate perch	P/S	45	2		None
BIO-3	23-27 Aug	BIO-3-WF-PP	Pirate perch	P/S	50	2		None
BIO-3	23-27 Aug	BIO-3-WF-PP	Pirate perch	P/S	55	3		None
BIO-3	23-27 Aug	BIO-3-WF-PP	Pirate perch	P/S	45	1		None
BIO-3	23-27 Aug	BIO-3-WF-PP	Pirate perch	P/S	118	18		None
BIO-4	15-19 Mar	BIO-4-WF-CF	Channel catfish	BF	300	440		Abrasion near dorsal fin
BIO-4	15-19 Mar	BIO-4-WF-BG	Bluegill sunfish	T	135	52		None
BIO-4	23-27 Aug	BIO-4-WF-BG	Bluegill sunfish	T	110	20		None
BIO-4	23-27 Aug	BIO-4-WF-BG	Bluegill sunfish	T	98	16		None
BIO-4	23-27 Aug	BIO-4-WF-BG	Bluegill sunfish	T	122	30		None
BIO-4	23-27 Aug	BIO-4-WF-BT	Blackspotted topminnow	P/S	70	3		None
BIO-4	23-27 Aug	BIO-4-WF-BT	Blackspotted topminnow	P/S	68	3		None
BIO-4	23-27 Aug	BIO-4-WF-BT	Blackspotted topminnow	P/S	68	3		None
BIO-4	23-27 Aug	BIO-4-WF-BT	Blackspotted topminnow	P/S	45	1		None
BIO-4	23-27 Aug	BIO-4-WF-BT	Blackspotted topminnow	P/S	44	1		None
BIO-4	23-27 Aug	BIO-4-WF-BT	Blackspotted topminnow	P/S	48	1		None
BIO-4	23-27 Aug	BIO-4-WF-BT	Blackspotted topminnow	P/S	45	1		None

Table F-1
Summary of Biological Tissue (Whole Body) Submitted for Analysis[a]

Tier I/II Screening Level Fish/Sediment Sampling Results
Naval Construction Battalion Center
Gulfport, Mississippi

Sample Location	Sampling Date (1997)	Sample Identification	Species	Trophic Level[b]	Length (mm)	Weight (g)	Fillet Weight (g)	Anomalies
BIO-5	15-19 Mar	BIO-5-WF-SS	Brook silverside	P/S	7 @ 80	7 @ 19		None
BIO-5	15-19 Mar	BIO-5-WF-SS	Shiner	P/S	9 @ 60	9 @ 21		None
BIO-5	15-19 Mar	BIO-5-WF-LB	Largemouth bass	T	265	242		None
BIO-5	23-27 Aug	BIO-5-WF-LB	Largemouth bass	T	295	410		None
BIO-5	23-27 Aug	BIO-5-WF-LB	Largemouth bass	T	235	170		None
BIO-5	23-27 Aug	BIO-5-WF-CF[c]	Channel catfish	BF	450	1070	234	None
BIO-5	23-27 Aug	BIO-5-WF-GS	Gizzard shad	P/S	140	24		None
BIO-5	23-27 Aug	BIO-5-WF-GS	Gizzard shad	P/S	155	35		None
BIO-5	23-27 Aug	BIO-5-WF-GS	Gizzard shad	P/S	150	35		None
BIO-5	23-27 Aug	BIO-5-WF-SM[d]	Striped mullet	P/S	310	350		None
BIO-5	23-27 Aug	BIO-5-WF-SM[d]	Striped mullet	P/S	314	355		Contusions
BIO-6	15-19 Mar	BIO-6-WF-SM	Striped mullet	P/S	172	60		None
BIO-6	15-19 Mar	BIO-6-WF-SM	Striped mullet	P/S	180	64		None
BIO-6	15-19 Mar	BIO-6-WF-SM	Striped mullet	P/S	175	62		None
BIO-6	15-19 Mar	BIO-6-WF-SM	Striped mullet	P/S	163	52		None
BIO-6	15-19 Mar	BIO-6-WF-CF	Channel catfish	BF	280	210		None
BIO-6	15-19 Mar	BIO-6-WF-CF	Channel catfish	BF	395	700		None
BIO-6	15-19 Mar	BIO-6-WF-LB	Largemouth bass	T	258	252		None
BIO-6	15-19 Mar	BIO-6-WF-LB	Largemouth bass	T	230	152		None
BIO-6	15-19 Mar	BIO-6-WF-LBR[d]	Largemouth bass	T	310	490		Contusions from electrode
BIO-7	15-19 Mar	BIO-7-WF-SM	Striped mullet	P/S	178	50		None
BIO-7	15-19 Mar	BIO-7-WF-SM	Striped mullet	P/S	163	48		None
BIO-7	15-19 Mar	BIO-7-WF-LB	Largemouth bass	T	188	80		None
BIO-7	15-19 Mar	BIO-7-WF-LB	Largemouth bass	T	225	162		None
BIO-8	15-19 Mar	BIO-8-WF-CF	Black bullhead	BF	175	95		None
BIO-8	15-19 Mar	BIO-8-WF-CF	Black bullhead	BF	198	112		None

Table F-1

Summary of Biological Tissue (Whole Body) Submitted for Analysis[a]

Tier I/II Screening Level Fish/Sediment Sampling Results
Naval Construction Battalion Center
Gulfport, Mississippi

Sample Location	Sampling Date (1997)	Sample Identification	Species	Trophic Level[b]	Length (mm)	Weight (g)	Fillet Weight (g)	Anomalies
BIO-8	15-19 Mar	BIO-8-WF-LB	Largemouth bass	T	260	254		None
BIO-8	15-19 Mar	BIO-8-WF-LB	Largemouth bass	T	230	170		None
BIO-8	23-27 Aug	BIO-8-WF-CF	Brown bullhead	BF	210	120		None
BIO-8	23-27 Aug	BIO-8-WF-CF	Brown bullhead	BF	190	100		None
BIO-8	23-27 Aug	BIO-8-WF-CF	Brown bullhead	BF	175	75		None
BIO-8	23-27 Aug	BIO-8-WF-CFR[d]	Brown bullhead	BF	170	65		None
BIO-8	23-27 Aug	BIO-8-WF-CFR[d]	Brown bullhead	BF	185	100		None
BIO-8	23-27 Aug	BIO-8-WF-LB	Largemouth bass	T	95	10		None
BIO-8	23-27 Aug	BIO-8-WF-LB	Largemouth bass	T	85	9		None
BIO-8	23-27 Aug	BIO-8-WF-LB	Largemouth bass	T	80	6		None
BIO-8	23-27 Aug	BIO-8-WF-SM	Sailfin molly	P/S	av. = 45	av. = 2.4		None
BIO-9	23-27 Aug	BIO-9-WF-AM	Two-toed amphiuma	Other	~600	~5,000		None

Notes:
a. Information summarized from two Ecological Sampling Services reports prepared by C^2 Environmental Services; reports dated June and November 1999.
b. Trophic level categories include: P/S - primary/secondary consumer; T - tertiary consumer; BF - bottom feeder.
c. Carcass and fillet samples used for whole body analytical tissue reconstruction.
d. Replicate sample.

Table F-2
Analytical Data for Biological Tissue (Whole Body)

Tiers I/II Screening Level Fish/Sediment Sampling Results
Naval Construction Battalion Center
Gulfport, Mississippi

Sample Identification	Sample Date (1997)	Species	Trophic Level[a]	2,3,7,8-TCDD (ppt)		1,2,3,7,8-PeCDD (ppt)		Total TEQ[b] (ppt)	Percent Lipid (%)
BIO-2-WF-GS	18-Mar-99	Gizzard shad	P/S	0.24	U	0.45	U	0.39	7.72
BIO-2-WF-GS	26-Aug-99	Gizzard shad	P/S	5.39		1	EMPC	7.36	11.85
BIO-2-WF-GSR	26-Aug-99	Gizzard shad	P/S	4.3		1.44	EMPC	5.26	na
BIO-2-WF-GS[c]	26-Aug-99	Gizzard shad	P/S	4.85		1.22	EMPC	6.31	11.85
BIO-2-WF-CF	17-Mar-99	Brown bullhead	BF	0.78	U	0.89	U	0	1.29
BIO-2-WF-CF[d]	26-Aug-99	Brown bullhead	BF	3.29	EMPC	0.63	U	3.31	4.8
BIO-2-WF-LB	18-Mar-99	Largemouth bass	T	3.08		1.44	U	3.12	1.8
BIO-2-WF-BG	26-Aug-99	Bluegill sunfish	T	2.56		0.78	U	3.25	1.92
BIO-3-WF-CS	17-Mar-99	Lake chubsucker	P/S	0.72	U	0.8	U	0.01	1.78
BIO-3-WF-PP	24-Aug-99	Pirate perch	P/S	0.85	U	0.66	U	0.01	0.95
BIO-3-WF-BG	18-Mar-99	Bluegill sunfish	T	0.72	U	0.8	U	0.02	2.92
BIO-3-WF-BG	24-Aug-99	Bluegill sunfish	T	0.8	U	0.51	U	0.01	1.88
BIO-4-WF-BT	24-Aug-99	Blackspotted topminnow	P/S	1.4	U	1.24	U	0.04	1.54
BIO-4-WF-CF	18-Mar-99	Channel catfish	BF	2.15	EMPC	0.85	U	2.21	0.95
BIO-4-WF-BG	18-Mar-99	Bluegill sunfish	T	0.38	U	1	U	0.01	4.52
BIO-4-WF-BG	24-Aug-99	Bluegill sunfish	T	0.35	U	0.29	U	0.03	1.95
BIO-5-WF-SS	16-Mar-99	Brook silverside/shiner	P/S	1.17	U	2.42	U	0.07	3.00
BIO-5-WF-GS	26-Aug-99	Gizzard shad	P/S	1.1	EMPC	0.93	U	2.14	6.6
BIO-5-WF-CF[d]	26-Aug-99	Channel catfish	BF	1.68	EMPC	0.7	U	2.42	6.5
BIO-5-WF-LB	16-Mar-99	Largemouth bass	T	1.94	EMPC	2.11	EMPC	3.36	1.47
BIO-5-WF-LB	24-Aug-99	Largemouth bass	T	1	U	0.25	U	0	2.08
BIO-6-WF-SM	16-Mar-99	Striped mullet	P/S	0.73	U	0.75	U	0.11	7.15
BIO-6-WF-CF	16-Mar-99	Channel catfish	BF	0.18	U	3.2	EMPC	3.74	9.65
BIO-6-WF-LB	16-Mar-99	Largemouth bass	T	0.19	U	0.71	U	0	1.6
BIO-6-WF-LBR	16-Mar-99	Largemouth bass	T	0.97	U	0.76	U	0.3	2.28

Table F-2
Analytical Data for Biological Tissue (Whole Body)

Tiers I/II Screening Level Fish/Sediment Sampling Results
Naval Construction Battalion Center
Gulfport, Mississippi

Sample Identification	Sample Date (1997)	Species	Trophic Level[a]	2,3,7,8-TCDD (ppt)		1,2,3,7,8-PeCDD (ppt)		Total TEQ[b] (ppt)	Percent Lipid (%)
BIO-6-WF-LB[c]	16-Mar-99	Largemouth bass	T	0.58	U	0.74	U	0.15	1.94
BIO-7-WF-SM	19-Mar-99	Striped mullet	P/S	0.12	U	1.08	U	0.21	4.51
BIO-7-WF-LB	19-Mar-99	Largemouth bass	T	0.9	U	0.7	U	0.37	1.36
BIO-8-WF-SM	24-Aug-99	Sailfin molly	P/S	2.11		0	U	2.19	6.81
BIO-8-WF-CF	18-Mar-99	Black bullhead	BF	0.88	U	4.48		2.29	4.18
BIO-8-WF-CF	24-Aug-99	Brown bullhead	BF	1.88	EMPC	0	U	1.93	5.1
BIO-8-WF-CFR	24-Aug-99	Brown bullhead	BF	1.61		1.3	EMPC	2.31	na
BIO-8-WF-CF[c]	24-Aug-99	Brown bullhead	BF	1.75	EMPC	0.65	EMPC	2.12	5.1
BIO-8-WF-LB	19-Mar-99	Largemouth bass	T	2.1		2.67	EMPC	3.44	3.32
BIO-8-WF-LB	24-Aug-99	Largemouth bass	T	1.37	EMPC	0	U	1.40	2.08
BIO-9-WF-AM	26-Aug-99	Two-toed amphiuma	P/S	10.4		0.64	U	10.4	0.74

Notes:

a. Trophic level categories include: P/S - primary/secondary consumer; T - tertiary consumer; BF - bottom feeder.
b. Values of 2,3,7,8-TCDD, 1,2,3,7,8-PeCDD, and 2,3,7,8-TCDF qualified as EMPCs were included in the TEQ calculations using TEFs of 1.0, 0.5, and 0.01 (USEPA, 1989), respectively.
c. Average of sample and replicate; one half of detection level used if one of two samples reported as U.
d. Whole body concentrations reconstructed based on weight and tissue concentrations in carcass and fillet sections.

na = lipid data are not available
TCDD = tetrachloro-p-dioxin
ppt = parts per trillion
PeCDD = pentachloro-p-dioxin
% = percent
U = undetected
EMPC = estimated maximum possible concentration

Figure F-1
Relationship Between Sediment and Whole Fish Tissue TCDD TEQs

Naval Construction Battalion Center
Gulfport, Mississippi

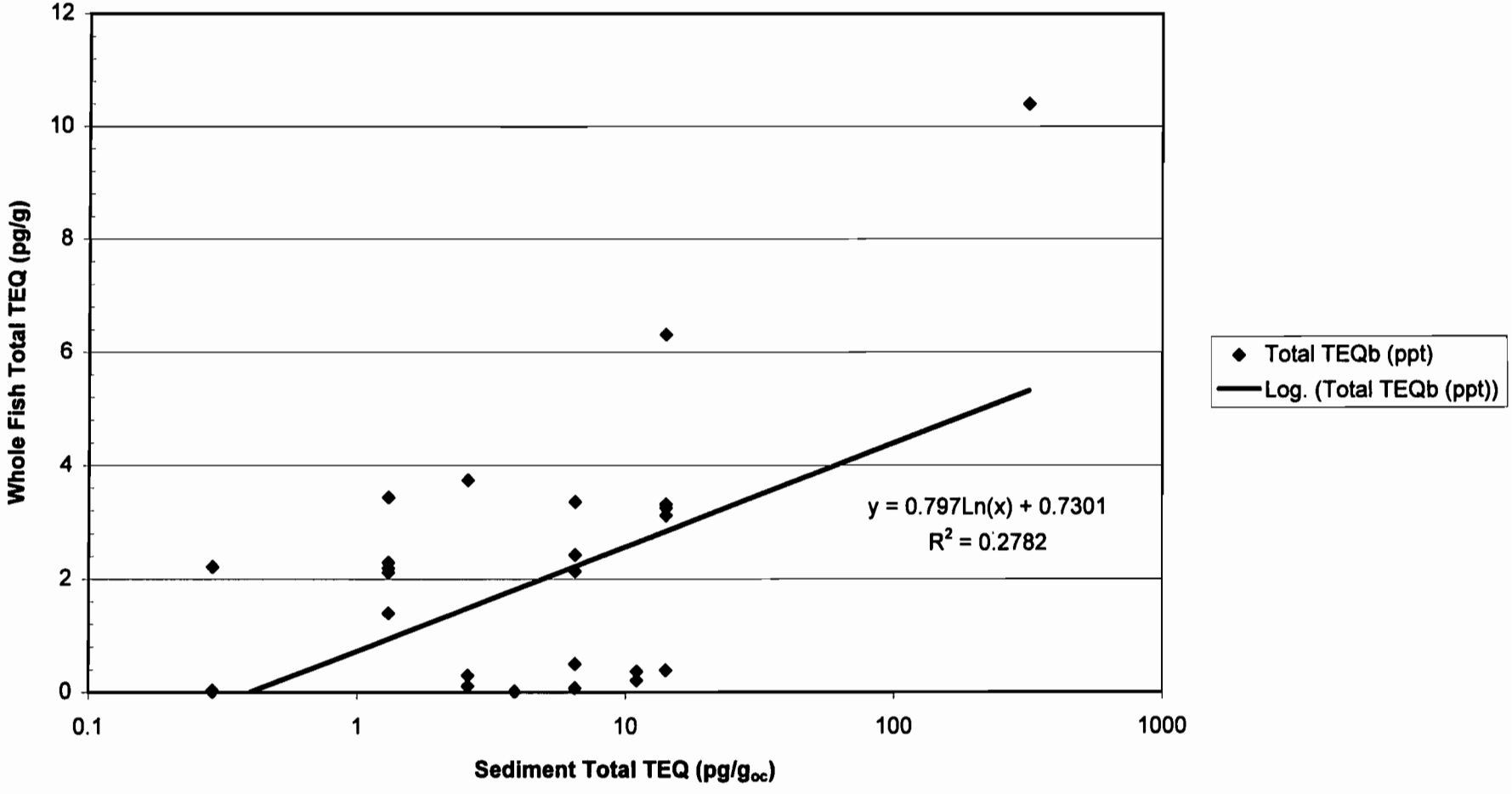


Figure F-2
Relationship Between Sediment and Whole Fish TCDD TEQs - Sampling Phase

Naval Construction Battalion Center
Gulfport, Mississippi

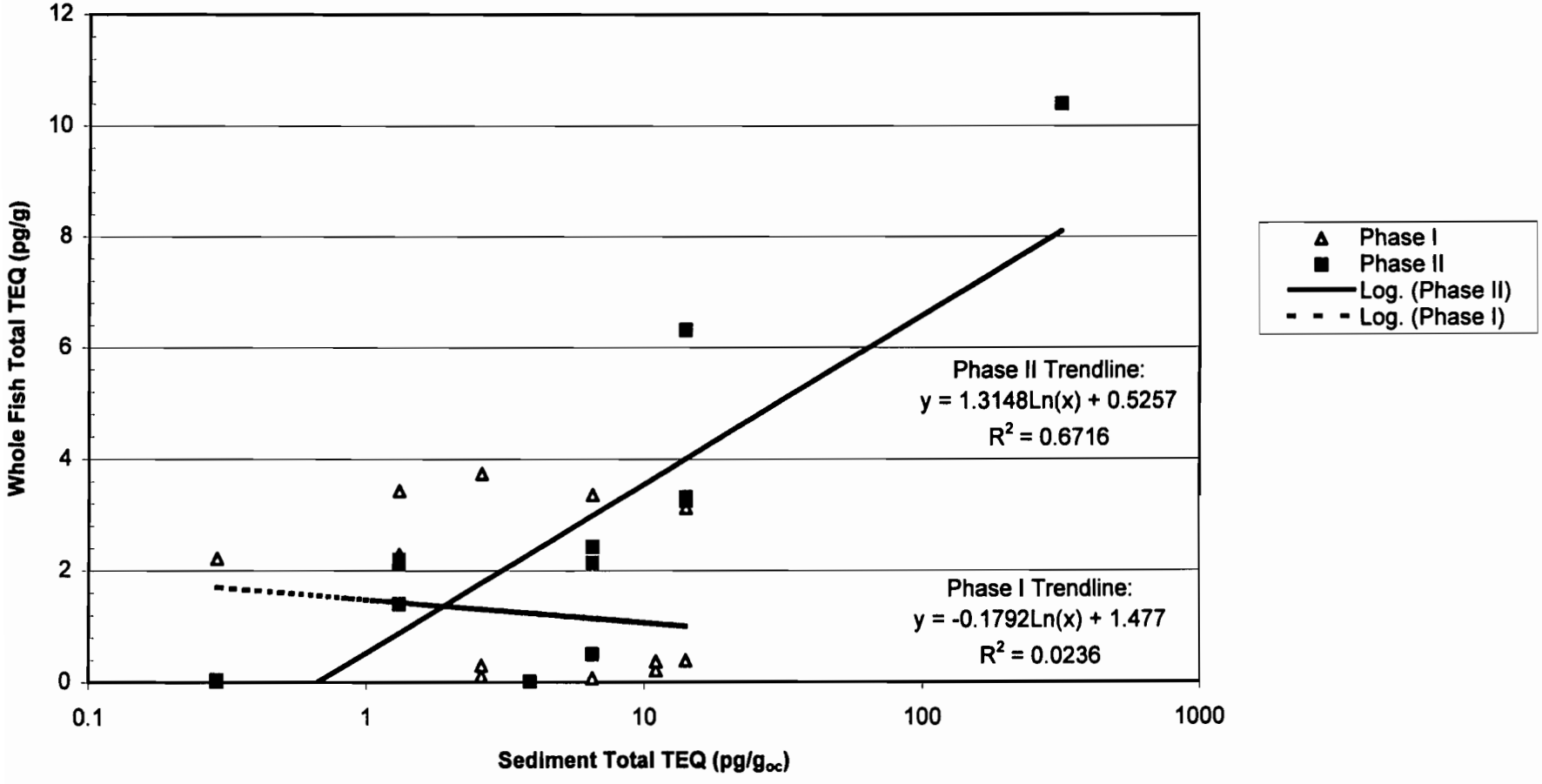
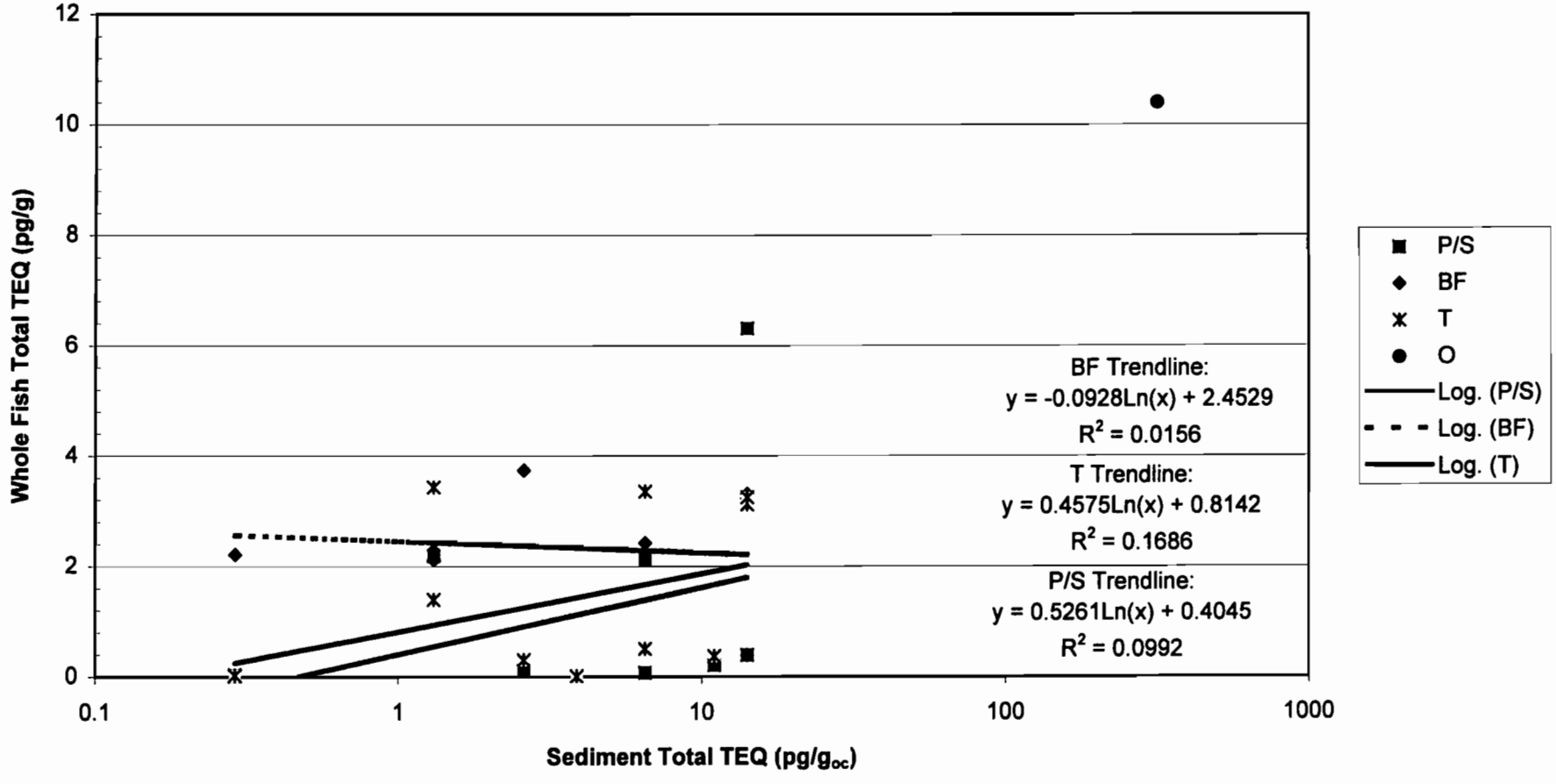


Figure F-3
Relationship Between Sediment and Whole Fish Tissue Dioxin TEQs - Trophic Levels

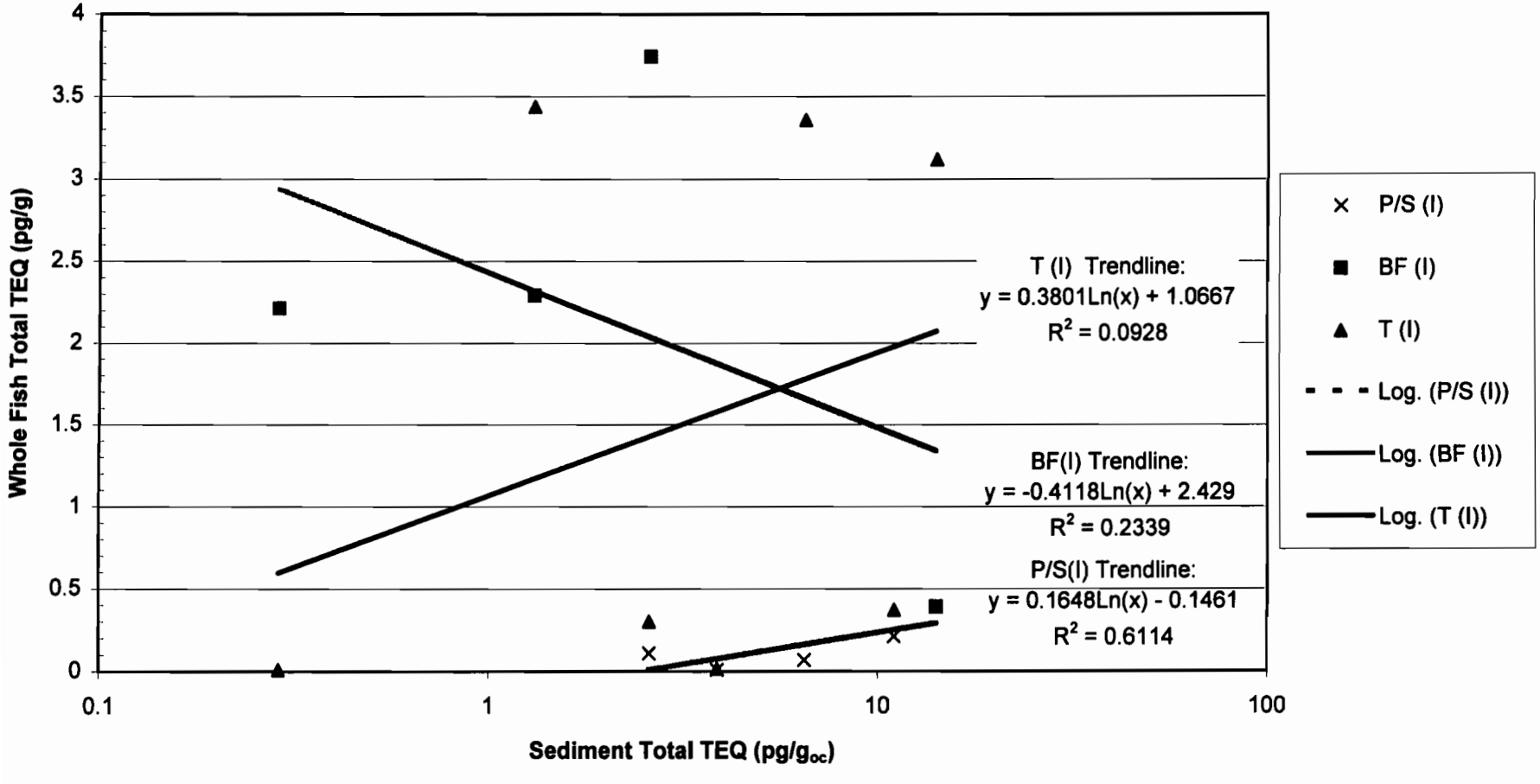
Naval Construction Battalion Center
Gulfport, Mississippi



P/S = primary/secondary consumer, BF=bottom feeder, T=tertiary consumer, O=other

Figure F-4
Relationship Between Sediment and Whole Fish Tissue TCDD TEQs by Trophic Level
(Phase I)

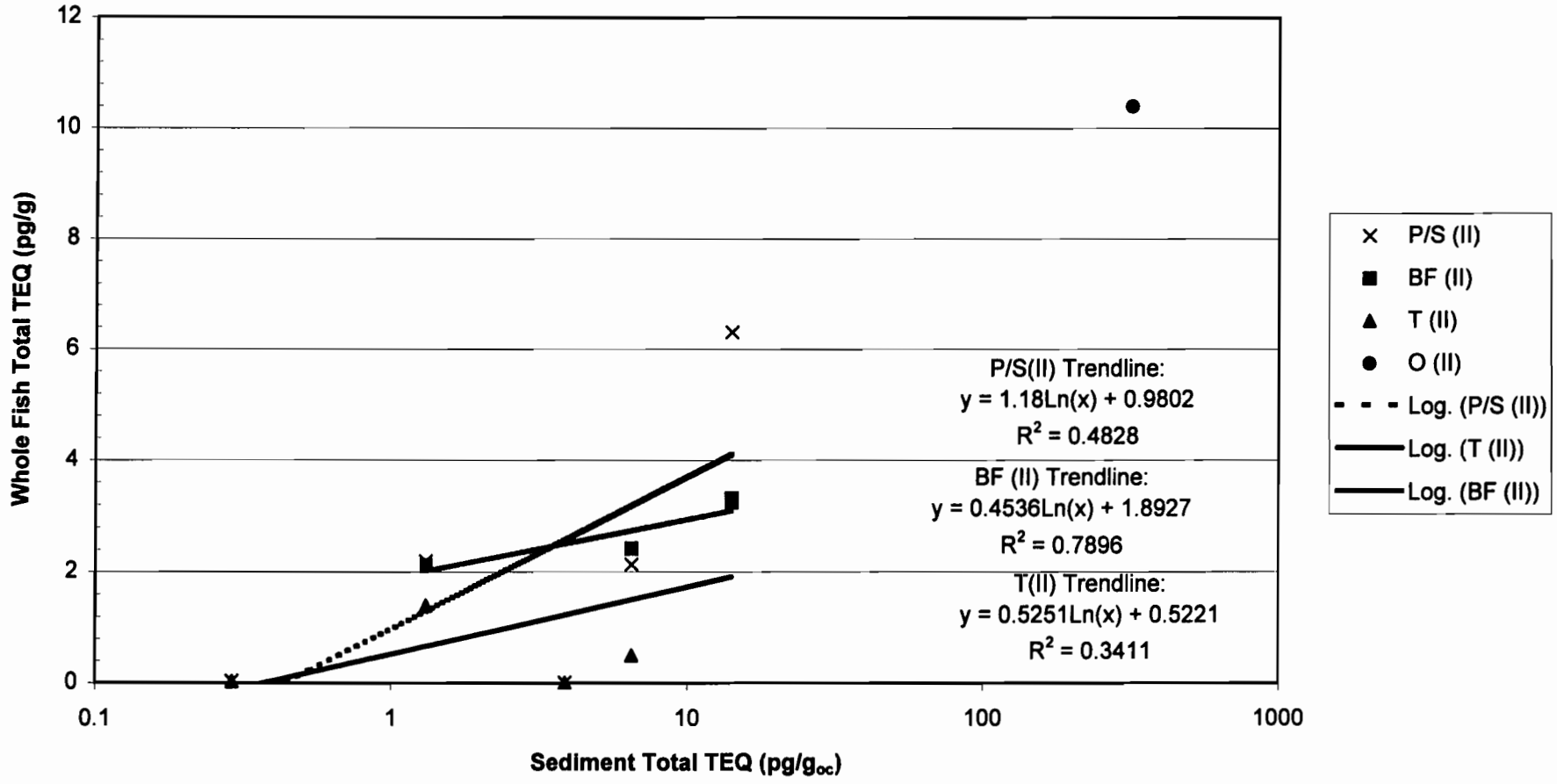
Naval Construction Battalion Center
Gulfport, Mississippi



P/S=primary/secondary consumer, BF=bottom feeder, T=tertiary feeder

Figure F-5
Relationship Between Sediment and Whole Fish Tissue TCDD TEQs by Trophic Level
(Phase II)

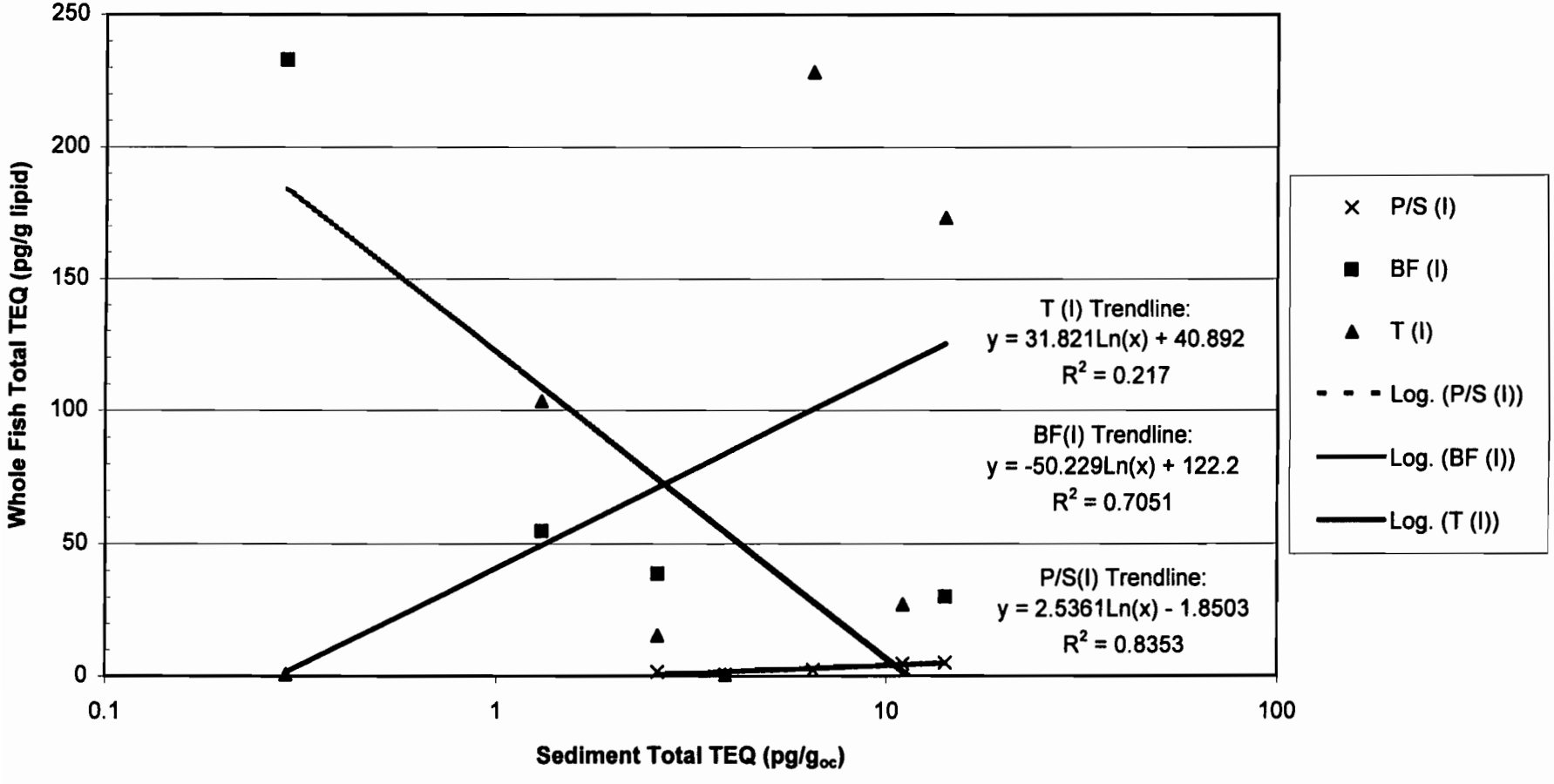
Naval Construction Battalion Center
Gulfport, Mississippi



P/S=primary/secondary consumer, BF=bottom feeder, T=tertiary consumer, O=other

Figure F-6
Relationship Between Sediment and Lipid-normalized Whole Fish Tissue TCDD TEQs by Trophic Level (Phase I)

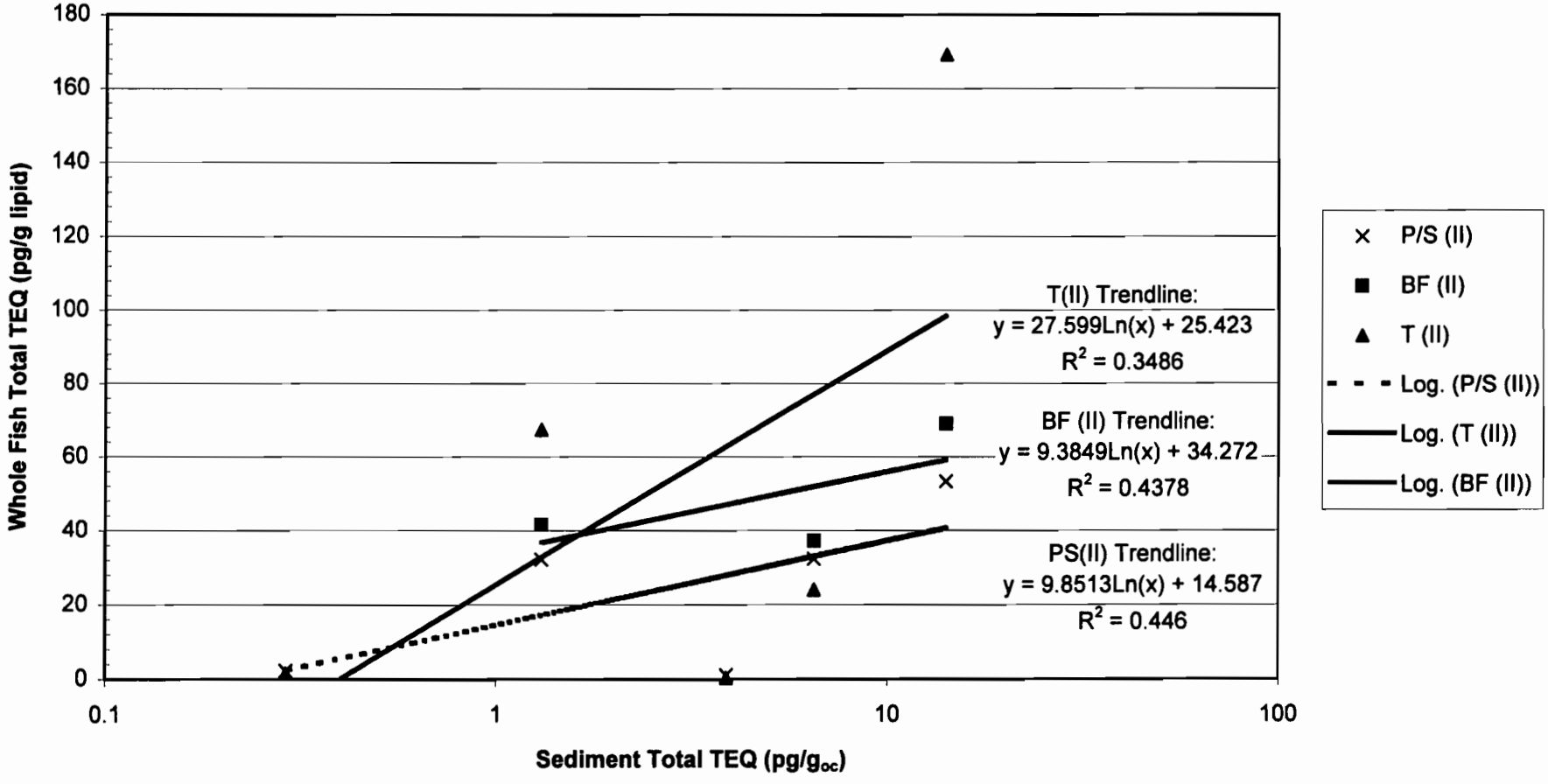
Naval Construction Battalion Center
Gulfport, Mississippi



P/S=primary/secondary consumer, BF=bottom feeder, T=tertiary consumer

Figure F-7
Relationship Between Sediment and Lipid-normalized Whole Fish Tissue TCDD TEQs by Trophic Level (Phase II)

Naval Construction Battalion Center
Gulfport, Mississippi



P/S=primary/secondary consumer, BF=bottom feeder, T=tertiary consumer

Figure F-8
Distribution of Lipid-normalized TEQs by Trophic Level

Naval Construction Battalion Center
Gulfport, Mississippi

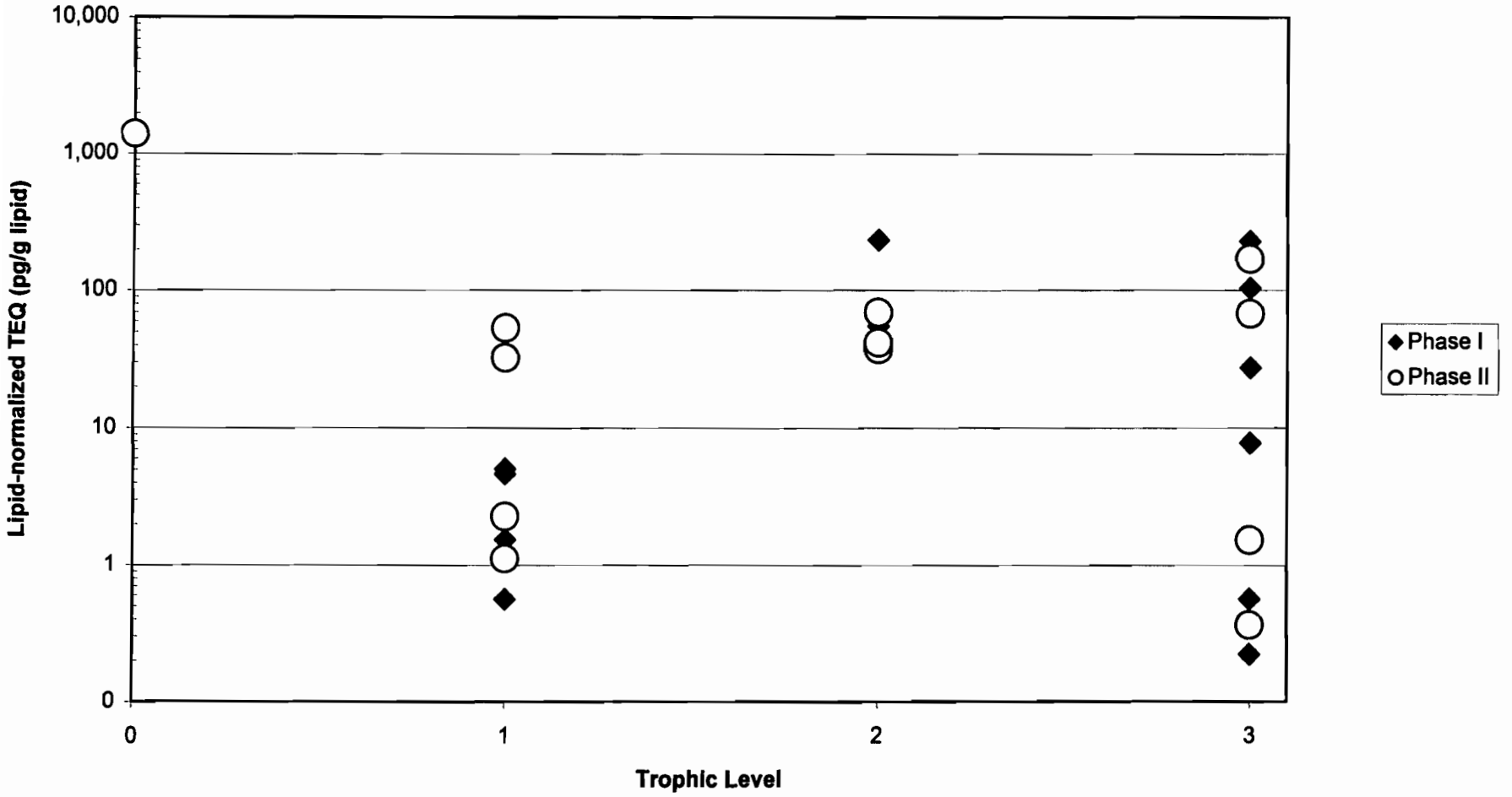
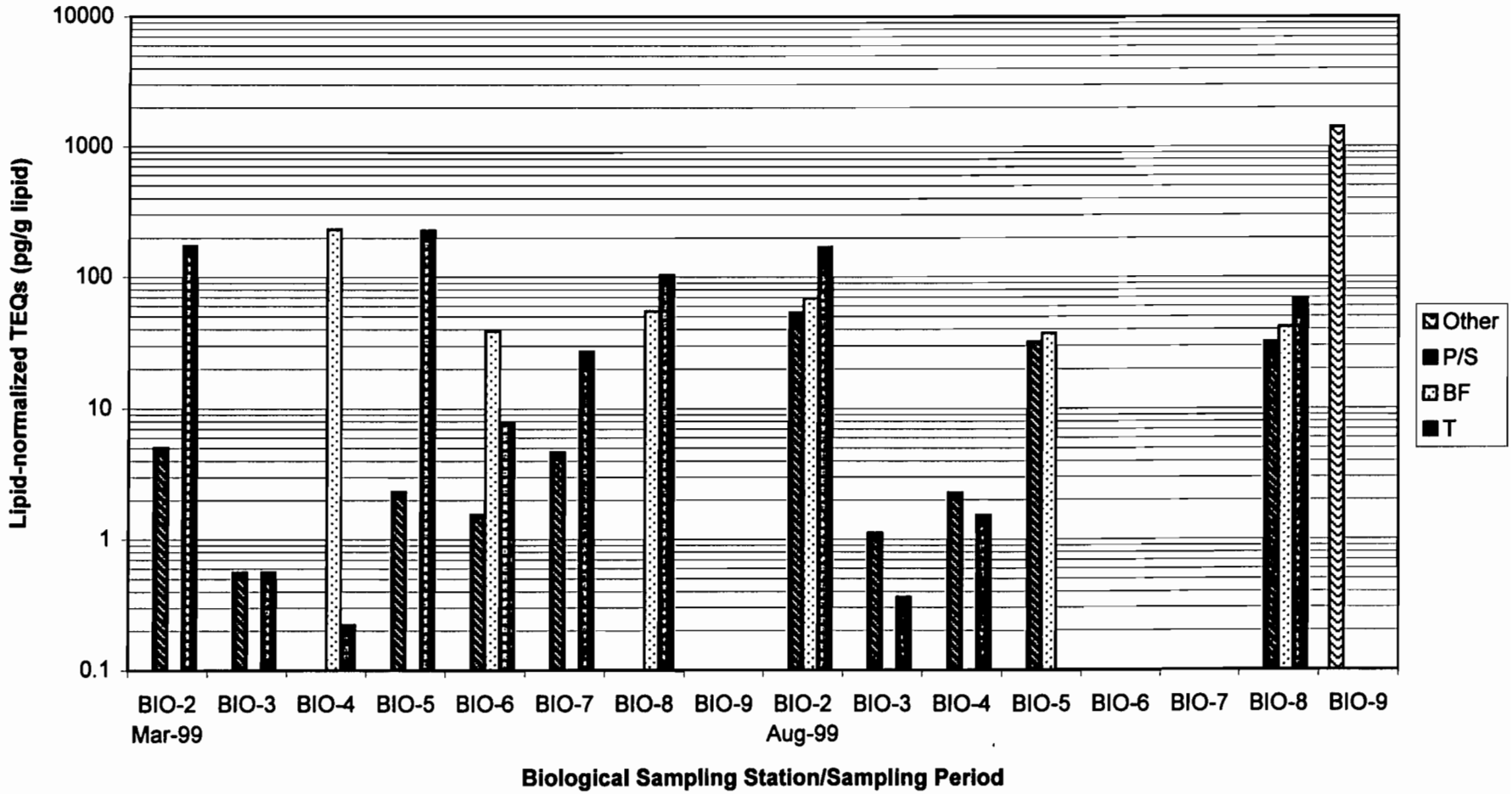


Figure F-9
Lipid-Normalized TEQs for Aquatic Tissue Residues by Trophic Level

Naval Construction Battalion Center
Gulfport, Mississippi



P/S=primary/secondary consumer, BF=bottom feeder, T=tertiary consumer

APPENDIX G

BODY BURDEN AND TOXICITY INFORMATION

Figure G-1
Cumulative Distribution of Fish Egg Residue Effect Concentrations

Naval Construction Battalion Center
Gulfport, Mississippi

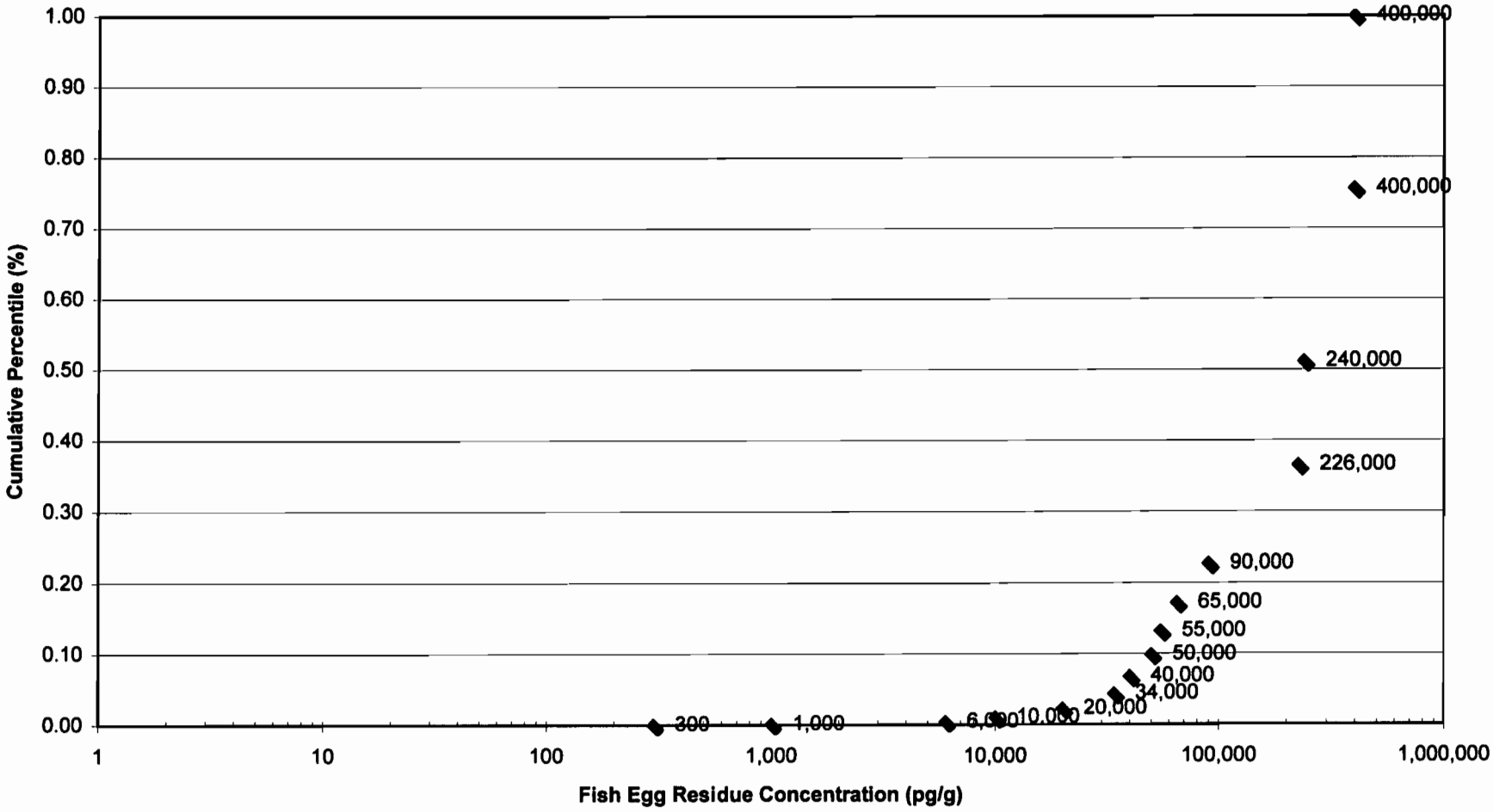


Table G-1
Derivation of Acceptable Fish Tissue TCDD Body Burdens Based on Protection of Sensitive Wildlife

Naval Construction Battalion Center
Gulfport, Mississippi

Common Name	Scientific Name	Study NOAEL (ug/kg BW-day)[a]	Adjusted NOAEL (ug/kg BW-day)[b]	EFs[c]	EFc[d]	Weight (kg)[e]	Food Ingestion Rate (kg/d)[f]	Threshold Fish Tissue Concentration (pg/g)[g]
Mink	*Mustela vison*	1.0E-03	8.5E-04	10	1	0.56	0.090	5.3E-01
Great Blue Heron	*Ardea herodias*	1.4E-02	1.1E-02	1	10	2.2	0.40	5.9E+00
Eastern Belted Kingfisher	*Ceryle alcyon*	1.4E-02	2.6E-02	1	10	0.15	0.074	5.2E+00

Notes:

a. See Table C-4 for study details; mammal value is based on three-generation rat study which evaluated various reproductive effects in F1 and F2 generations (Murray, 1979); bird value is based on a 10-week exposure to ring-necked pheasant evaluating egg production and embryo toxicity (Nosek et al., 1992a).

b. Study NOAELs were adjusted to specific endpoint receptor species selected for this ERA using a methodology provided in Opresko et al., 1994. The adjusted NOAEL was derived by multiplying the study NOAEL by the ratio of the body weights of the test species to the endpoint species raised to the one third power. The following test species body weights assumed:

Laboratory Species	Body weight (kg)	Reference	
Rat	0.35	EPA, 1985	female
Pheasant	0.95	Terres, 1987	average of female hens

c. Extrapolation factor for relative species sensitivity (EPA, 1993a)

d. Extrapolation factor for subchronic to chronic exposure (EPA, 1993a)

e. Receptor species body weights obtained from Wildlife Exposure Factors Handbook (EPA, 1993c):

Species	Notes
Belted Kingfisher	Average of three average adult (both sexes) values; animals from Pennsylvania and Ohio.
Mink	Average of four average adult female means; animals from Montana.
Great Blue Heron	Average of adult females; location not specified.

f. Food ingestion rate information provided in the Wildlife Exposure Factors guidance (EPA, 1993c) in g/g-day multiplied by the receptor body weight.

g. Assumes that the NOAEL represents an acceptable dose below which no adverse population effects would be anticipated and that receptor species diet consists solely of fish. Fish tissue concentration derived by dividing the NOAEL (ug/kg bw-d) by both extrapolation factors, multiplying by body weight (kg), dividing by the food ingestion rate (kg/d) and converting from kg to g (1000).

Table G-2
Derivation of Sediment Screening Benchmarks for 2,3,7,8 Tetrachlorodibenzo-p-dioxin

Naval Construction Battalion Center
Gulfport, Mississippi

Basis	$LogK_{ow}$[a]	sd[a]	$LogK_{oc}$[b]	sd[b]	K_{oc}	WQB[c]	CF[d]	Normalized Sediment Quality Benchmark		
								SQB_{oc}[e]	lower 95%CI[f]	upper 95%CI[f]
			L/kg_{oc}		L/kg_{oc}	ug/L	kg_{oc}/g_{oc}	ng/g_{oc}	ng/g_{oc}	ng/g_{oc}
Wildlife	6.9	0.44	6.8	0.533	5.8E+06	9.6E-09	0.001	5.6E-02	4.92E-03	6.35E-01
Aquatic life - nonfish	6.9	0.44	6.8	0.533	5.8E+06	0.2	0.001	1.2E+06	1.03E+05	1.32E+07
Aquatic life - fish	6.9	0.44	6.8	0.533	5.8E+06	4.9E-06	0.001	2.9E+01	2.51E+00	3.24E+02

Notes: a. Log K_{ow} is the octanol-water partitioning coefficient; estimated by averaging the following measured or estimated values.

Value	Reference
6.84	Mabey et al., 1982
7.14	Neely, 1983
7.28	Leo, 1979
7	Burkhard and Kuehl, 1987 (cited in USEPA, 1993).
6.15	Branson, 1983
6.9	= average
0.44	= standard deviation

b. Log K_{oc} is the organic carbon partitioning coefficient; estimated using the equation provided in USEPA, 1988: $Log_{10}(K_{oc}) = 0.00028 + 0.983 * Log_{10}(K_{ow})$.

c. Water Quality Benchmark; values presented are based on the Great Lakes Tier I Wildlife Criterion (USEPA, 1993b), LOAEL for non-fish aquatic organisms in USEPA, 1984, and NOAEL for fish species summarized in USEPA, 1993a.

d. Conversion factor

e. Sediment Quality Benchmark (SQB); equivalent to the K_{oc} * WQB * CF * 1000 (to convert from ug/g_{oc} to ng/g_{oc}).

f. Lower and upper 95% confidence interval estimates on the SQB.

Table G-3
Threshold Effect Concentration for 2,3,7,8-Tetrachlorodibenzo-p-dioxin in Fish Eggs

Naval Construction Battalion Center
Gulfport, Mississippi

Species	Toxicity Parameter	Body Burden (pg/kg egg)	Reference
Rainbow trout	E.L.S. (LOEC growth)	300	Helder, 1983
Northern pike	E.L.S. (LC_{50})	1,000	Helder, 1980
Rainbow trout	E.L.S. (25 day LC_{50})	6,000	Walker and Peterson, 1991
Northern pike	E.L.S. (LC_{99})	10,000	Helder, 1980
Rainbow trout	E.L.S. (LC_{50})	20,000	Helder and Seinen, 1985
Lake trout	NOEC (mortality)	34,000	Walker et al., 1991
Japanese medaka	E.L.S. (LC_{50})	40,000	Wisk and Cooper, 1990a
Japanese medaka	E.L.S. (LC_{50})	50,000	Wisk and Cooper, 1990a
Lake trout	LOEC (mortality)	55,000	Walker et al., 1991
Lake trout	LD_{50}	65,000	Walker et al., 1991
Japanese medaka	E.L.S. (LC_{50})	90,000	Wisk and Cooper, 1990b
Lake trout	LOEC (hatchability)	226,000	Walker et al., 1991
Rainbow trout	E.L.S. (LD_{50})	240,000	Walker and Peterson, 1991
Rainbow trout	E.L.S. (LD_{50})	400,000	Walker et al., 1992
Rainbow trout	E.L.S. (LD_{50})	400,000	Walker and Peterson, 1991

Notes: E.L.S. = Early life stage study
LD_{50} = Dose lethal to 50 percent of test population
LC_{50} = Concentration lethal to 50 percent of test population
LC_{99} = Concentration lethal to 99 percent of test population
LOEC = Lowest Observed Effect Concentration

Table G-4
Wildlife Ingestion Toxicity Information for 2,3,7,8-Tetrachlorodibenzo-p-dioxin

Naval Construction Battalion Center
Gulfport, Mississippi

Test Species		Life Stage	Test Method	Effect	Duration		Effect Concentration (ug/kgBW-day)					Reference
								Lethal	Sublethal			
					Exposure	Observation	LD_{50}	LOAEL	LOAEL	NOAEL	RTV [a]	
Mammals												
Guinea Pig	*Cavia* sp.	Adult (males)	Oral - gavage/oil	Mortality	Single dose		0.6					Schwetz et al., 1973
Guinea Pig	*Cavia* sp.		Oral - food	15-20% reduced weight gain; 37% decrease in absolute thymus weight; 24% decrease in relative thymus weight	90-d (7d/wk)				0	0.0007		DeCaprio et al., 1986
Hamster	*Cricetus* sp.		Oral - gavage/oil	Mortality	Single dose		1157					Olson et al., 1980a
Mink	*Mustela vison*	Adult (males)	Oral - gavage/oil	Mortality	Single dose	28-d	4.2					Hochstein et al., 1988
Mink	*Mustela vison*		Oral - gavage/oil	11% weight loss	Single dose	28-d			2.5	0.25		Hochstein et al., 1988
Mink	*Mustela vison*	Newborn	Ip injection	62% mortality	12 days (1x/day)	133-d		1.0	0.1	0.01		Aulerich et al., 1988
Mouse	*Mus* sp.		Oral - food	Decreased neonatal survival and growth in F1 and F2	90-d				0.01	0.001		Murray et al., 1979
Rabbit	*Lepus* sp.	Adult (females)	Oral - gavage/oil	44% decreased weight gain in dams	10 days (1x/day)				0.25	0.1		Giavini et al., 1982
Rabbit	*Lepus* sp.		Oral - gavage/oil	Mortality	Single dose		115					Schwetz et al., 1973

Table G-4
Wildlife Ingestion Toxicity Information for 2,3,7,8-Tetrachlorodibenzo-p-dioxin

Naval Construction Battalion Center
Gulfport, Mississippi

Test Species		Life Stage	Test Method	Effect	Duration		Effect Concentration (ug/kgBW-day)					Reference
								Lethal	Sublethal			
					Exposure	Observation	LD_{50}	LOAEL	LOAEL	NOAEL	RTV [a]	
Rat	*Rattus* sp.	Adult (females)	Oral - gavage/oil	Mortality	Single dose		60					Fan and Rozman, 1995
Rat	*Rattus* sp.	Adult (females)	Oral - gavage/oil	Decreased body weight gain in dams	10 days (1x/day)				0.5	0.125		Sparschu et al., 1971
Rat	*Rattus* sp.	Adult (females)	Oral - gavage/oil	Increased resorptions	10 days (1x/day)				0.125	0.03		Sparschu et al., 1971
Rat	*Rattus* sp.	Adult (females)	Oral - gavage/oil	16% reduction in body weight gain	16 wks (1x/wk)				0.14	0.01		Goldstein et al., 1982
Rat	*Rattus* sp.	Adult (females)	Oral - food	Hepatocellular alterations	2 yrs (7d/wk)				0.001			Kociba et al., 1978a
Rat	*Rattus* sp.	Adult (females)	Oral - food	Severe and extensive hepatic necrosis	2 yrs (7d/wk)				0.01			Kociba et al., 1978a
Rat	*Rattus* sp.	Adult (males)	Oral - gavage/oil	Mortality	Single dose		22					Schwetz et al., 1973
Rat	*Rattus* sp.	Adult (males)	Oral - gavage/oil	Demasculization and feminization of sexual behavior	15 days gestation (1x/day)				0.7			Bjerke et al., 1994a
Rat	*Rattus* sp.	Adult (males)	Oral - gavage/oil	Decreased masculine sexual behavior in male offspring	15 days gestation (1x/day)				0.064			Mably et al., 1992b,c
Rat	*Rattus* sp.		Oral - food	Myocardial degeneration; periarteritis	2 yrs (7d/wk)							
Rat	*Rattus* sp.		Oral - food	Decrease in body weight gain	2 yrs (7d/wk)				0.1			Kociba et al., 1978a

Table G-4
Wildlife Ingestion Toxicity Information for 2,3,7,8-Tetrachlorodibenzo-p-dioxin

Naval Construction Battalion Center
Gulfport, Mississippi

Test Species		Life Stage	Test Method	Effect	Duration		Effect Concentration (ug/kgBW-day)					Reference
								Lethal	Sublethal			
					Exposure	Observation	LD_{50}	LOAEL	LOAEL	NOAEL	RTV [a]	
Rat	*Rattus* sp.		Oral - food	Decreased fertility in F1 and F2	90-d				0.01	0.001	0.001	Murray et al., 1979
Rat	*Rattus* sp.		Oral - food	Increased relative kidney weight; 10% reduction in body weight gain	13 wks				0.047	0.026		Van Birgelen et al., 1995
Rhesus Monkey	*Macaca mulatta*	Adult (females)	Oral - gavage/oil	50% increased abortions	4yrs (7d/wk)			0.00064		0.00013		Bowman et al., 1989b
Rhesus Monkey	*Macaca mulatta*	Adult (females)	Oral - gavage/oil	Reduced reproduction	3.5-4 yrs; (7d/wk)			0.00064		0.00013		Bowman et al., 1989b
Birds												
Chicken	*Gallus gallus*	Chicks (3-d old)	Oral -food	Mortality	21-d (1x/day)	21-d				0.1		Schwetz et al., 1973
Chicken	*Gallus gallus*	Adult	Oral -food	Mortality	Single dose	21-d	25	5		0.5		Kociba and Schwetz, 1982
Mallard	*Anas platyrynchos*		Oral -food	Mortality	Single dose		108					Hudson et al., 1984
Northern bobwhite	*Colinus virginianus*		Oral -food	Mortality	Single dose	37-d	15					Hudson et al., 1984
Ringed turtle dove	*Stretopelia risoria*		Oral -food	Mortality	Single dose	37-d	810					Hudson et al., 1984
Ring-necked pheasant	*Phasianus colchicus*		Ip injection	Mortality (embryo)	10 weeks (1x/week)	37-d	0.06	0.0014				Nosek et al., 1992a
Ring-necked pheasant	*Phasianus colchicus*		Ip injection	Mortality (57%)	10 weeks (1x/week)	37-d	0.14					Nosek et al., 1992a
Ring-necked pheasant	*Phasianus colchicus*	Adult (female)	Ip injection	25% loss of bw; 80% mortality	Single dose	77-d		25		6.25		Nosek et al., 1992a

Table G-4
Wildlife Ingestion Toxicity Information for 2,3,7,8-Tetrachlorodibenzo-p-dioxin

Naval Construction Battalion Center
Gulfport, Mississippi

Test Species		Life Stage	Test Method	Effect	Duration		Effect Concentration (ug/kgBW-day)					Reference
								Lethal	Sublethal			
					Exposure	Observation	LD_{50}	LOAEL	LOAEL	NOAEL	RTV [a]	
Ring-necked pheasant	*Phasianus colchicus*	Adult (female)	Ip injection	Hen mortality, hen weight, egg production, embryo mortality	10 wks (1x/wk)	7-wk post dose			0.14	0.014	**0.014**	Nosek et al., 1992a
Amphibians												
Frog	*Rana catesbeiana*	Tadpole	Ip injection	Mortality	Single dose	50-d				1000		Beatty et al., 1976
Frog	*Rana catesbeiana*	Adult	Ip injection	Mortality	Single dose	35-d				500		Beatty et al., 1976

Notes:
LD_{50} = Dose resulting in 50% mortality in test population
BW = Body weight
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
[a] Selected benchmark values are boxed.

Table G-5
Egg Injection Study Toxicity Information for Dioxin Compounds

Naval Construction Battalion Center
Gulfport, Mississippi

Test Species		Life Stage	Test Method	Effect	Duration		Effect Concentration (ug/kg egg)					Reference
								Lethal	Sublethal			
					Exposure	Observation	LD_{50}	LOAEL	LOAEL	NOAEL	RTV [a]	
Birds												
Chicken	*Gallus gallus*	Egg (air cell injection)	In ovo injection	Mortality	Single dose		0.24	0.048		0.0048		Allred and Strange, 1977
Chicken	*Gallus gallus*	Egg (air cell injection)	In ovo injection	Mortality	Single dose		0.18	0.036		0.0036		Allred and Strange, 1977
Chicken	*Gallus gallus*	Egg	In ovo injection	Mortality	Single dose			0.01				Verret, 1970
Chicken	*Gallus gallus*	Egg (yolk sac)	In ovo injection	Mortality	Single dose		0.12					Henshel, 1993
Chicken	*Gallus gallus*	Egg	In ovo injection	Mortality (100%)	Single dose		1					Higginbotham et al., 1968
Ring-necked pheasant	*Phasianus colchicus*	Egg (albumin)	In ovo injection	Mortality	Single dose	28-d post hatch	2.2			1		Nosek et al., 1992c
Ring-necked pheasant	*Phasianus colchicus*	Egg (yolk)	In ovo injection	Mortality	Single dose	28-d post hatch	1.4	1.0		0.1		Nosek et al., 1992c

Notes:

LD_{50} = Dose resulting in 50% mortality in test population

BW = Body weight

LOAEL = Lowest Observed Adverse Effect Level

NOAEL = No Observed Adverse Effect Level

[a] Selected benchmark values are boxed.

APPENDIX H

ECOLOGICAL HAZARD QUOTIENTS

Figure H-1
Surface Water TCDD TEQ Hazard Quotients - Base Drainage Areas

Naval Construction Battalion Center
Gulfport, Mississippi

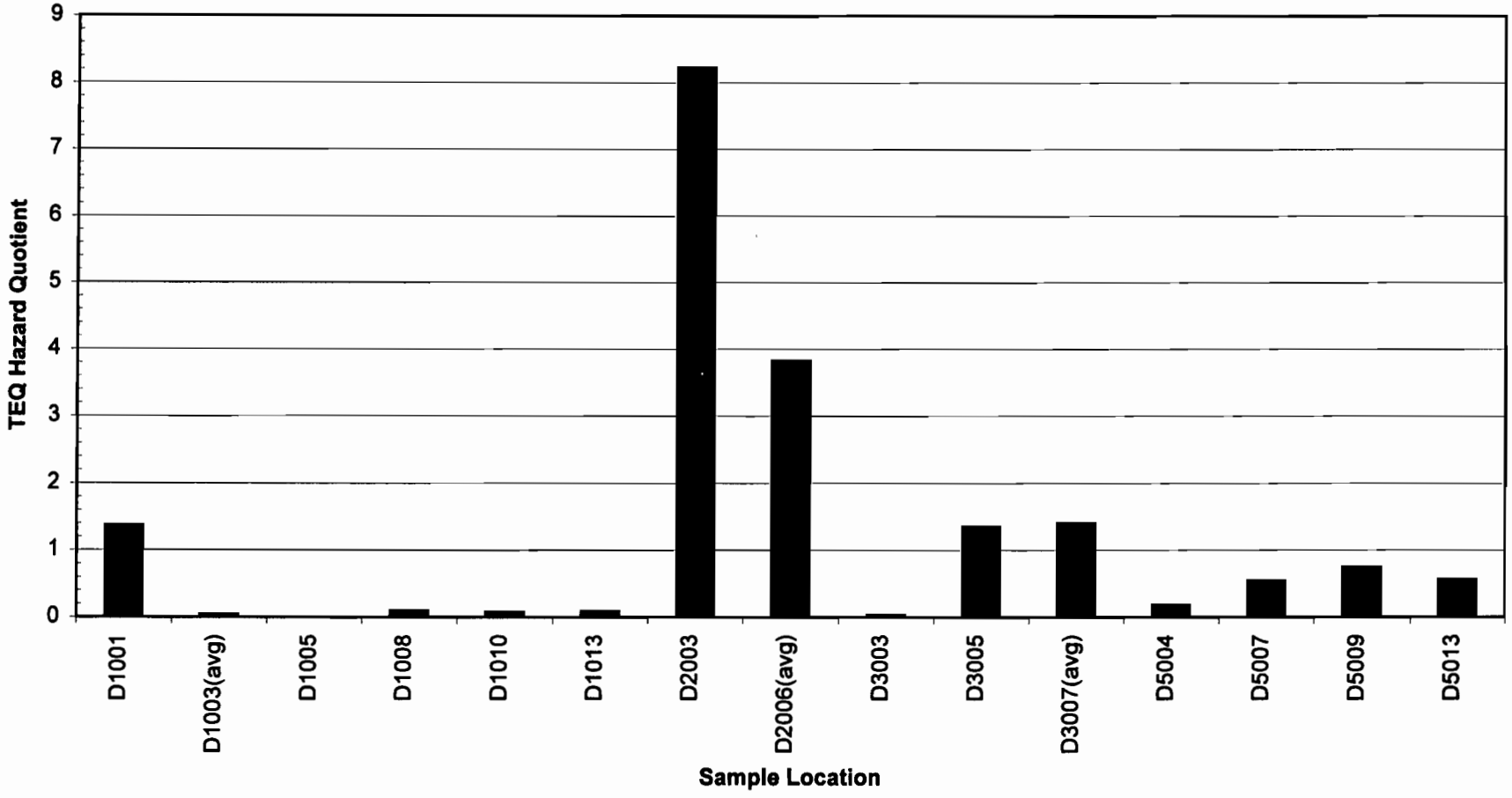


Figure H-2
Surface Water TCDD TEQ Hazard Quotients - Off Base and Canal

Naval Construction Battalion Center
Gulfport, Mississippi

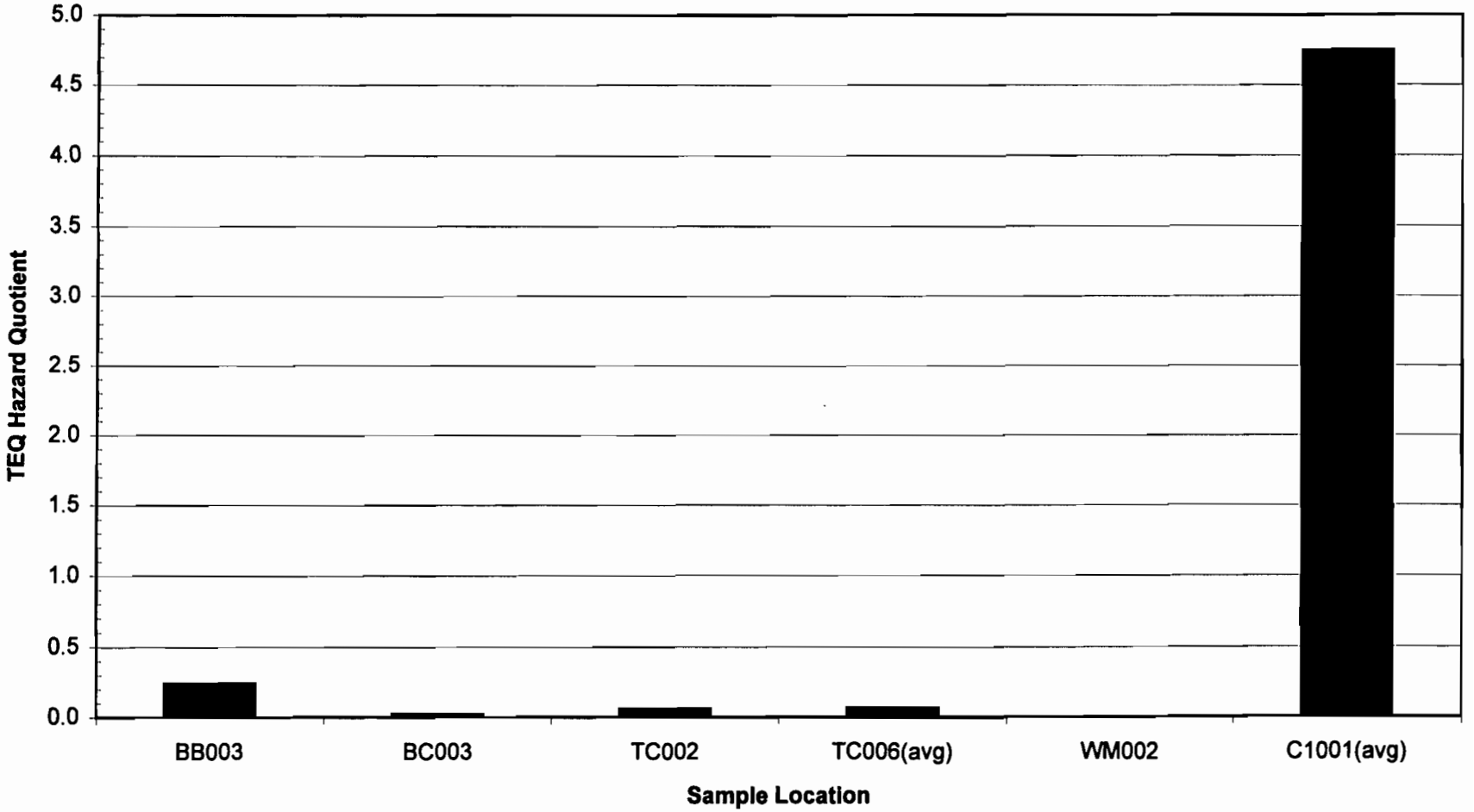


Figure H-3
Groundwater TCDD TEQ Hazard Quotients - GPT Wells

Naval Construction Battalion Center
Gulfport, Mississippi

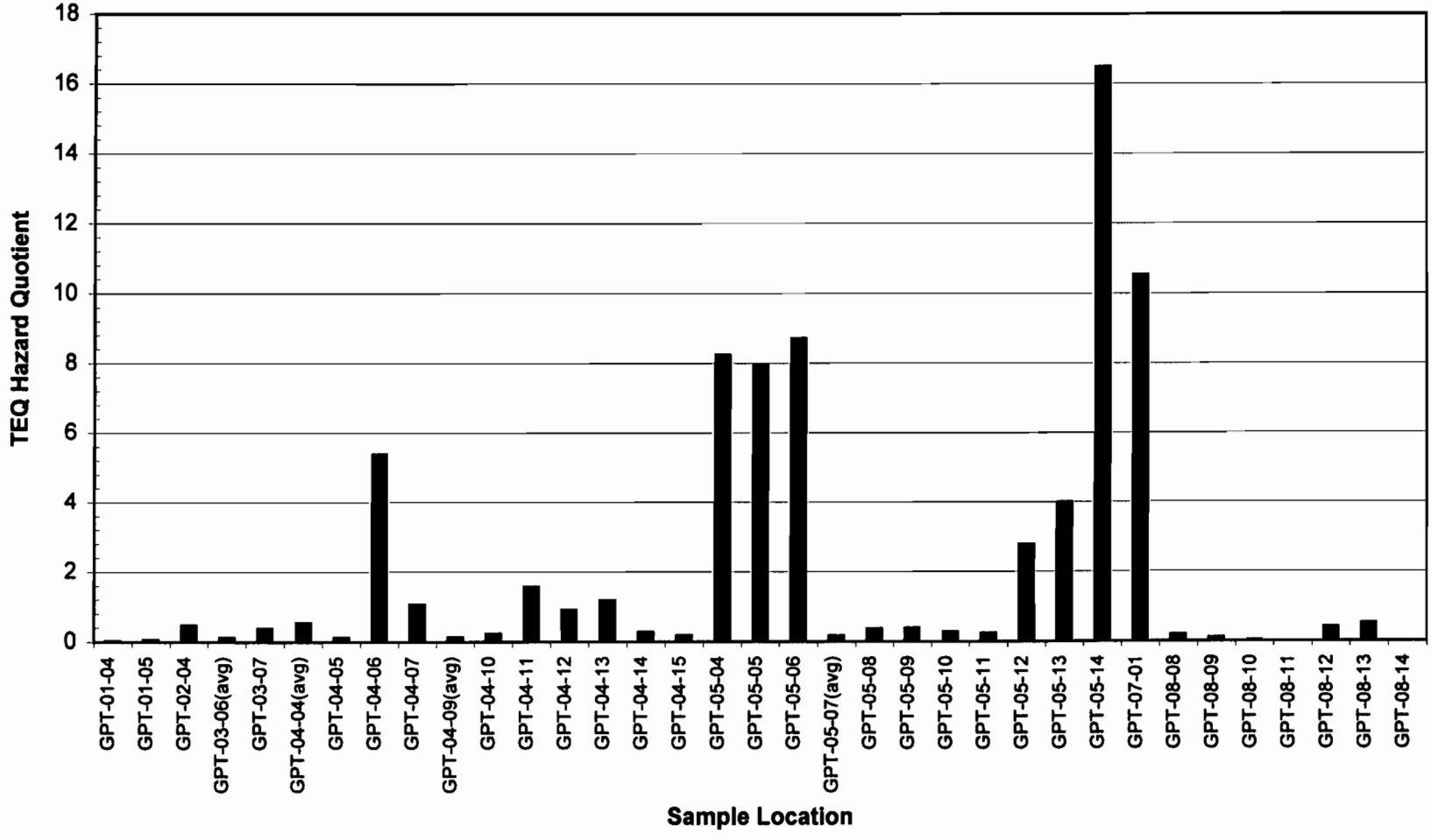


Figure H-4
Groundwater TCDD TEQ Hazard Quotients - L and R4/R5 Wells

Naval Construction Battalion Center
Gulfport, Mississippi

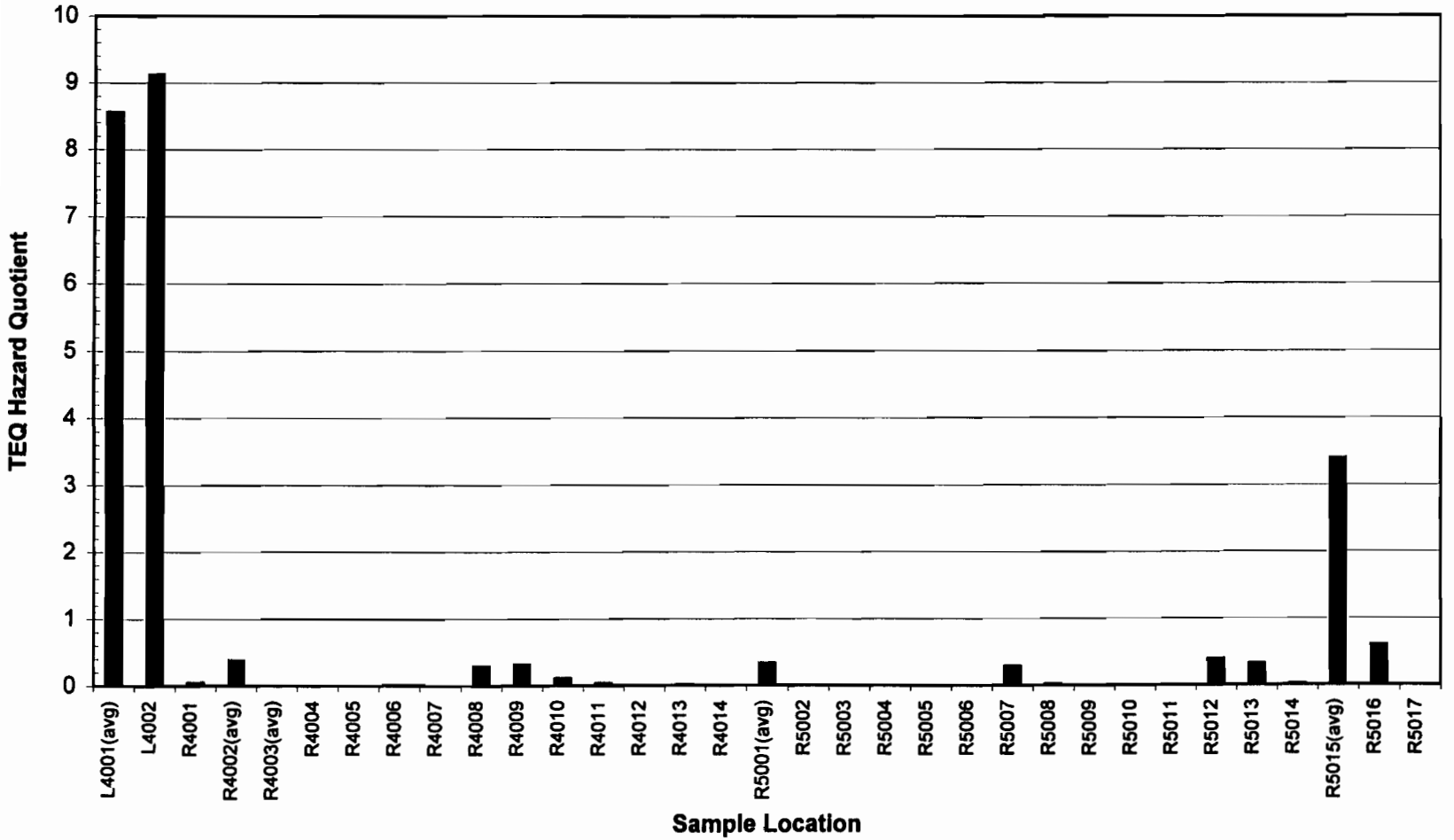


Figure H-5
Groundwater TCDD TEQs Hazard Quotients - R8 Wells

Naval Construction Battalion Center
Gulfport, Mississippi

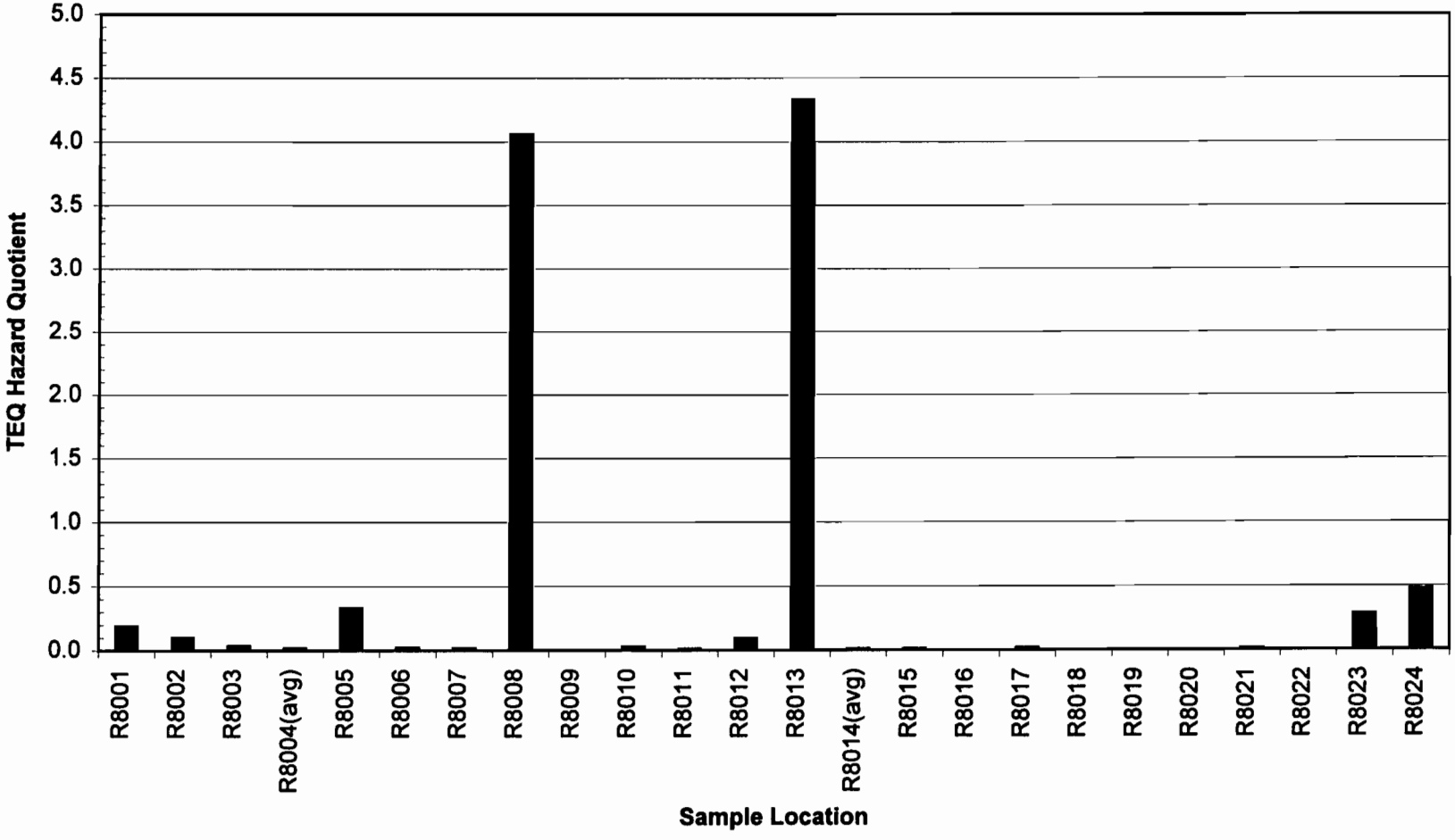
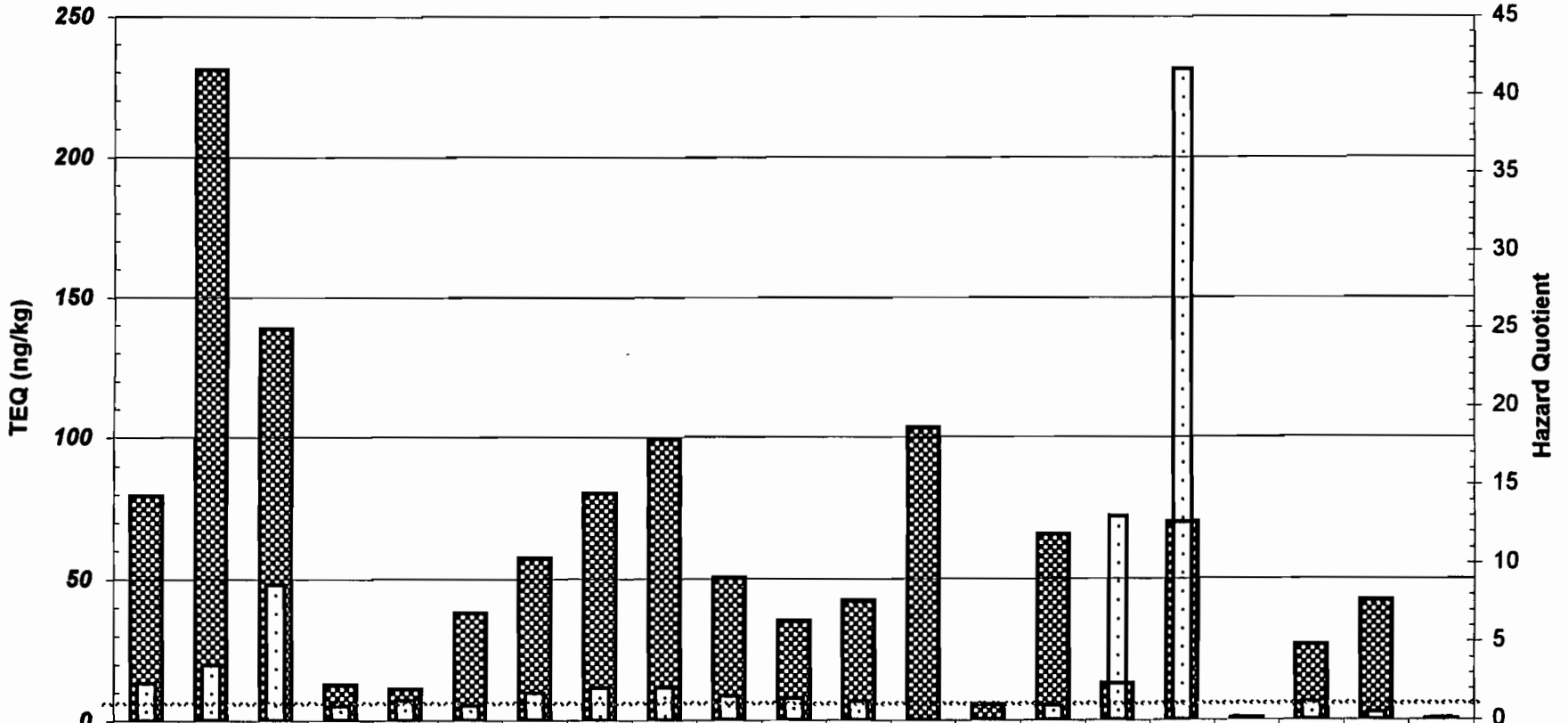


Figure H-6
Sediment TCDD TEQs and Hazard Quotients - Area D1

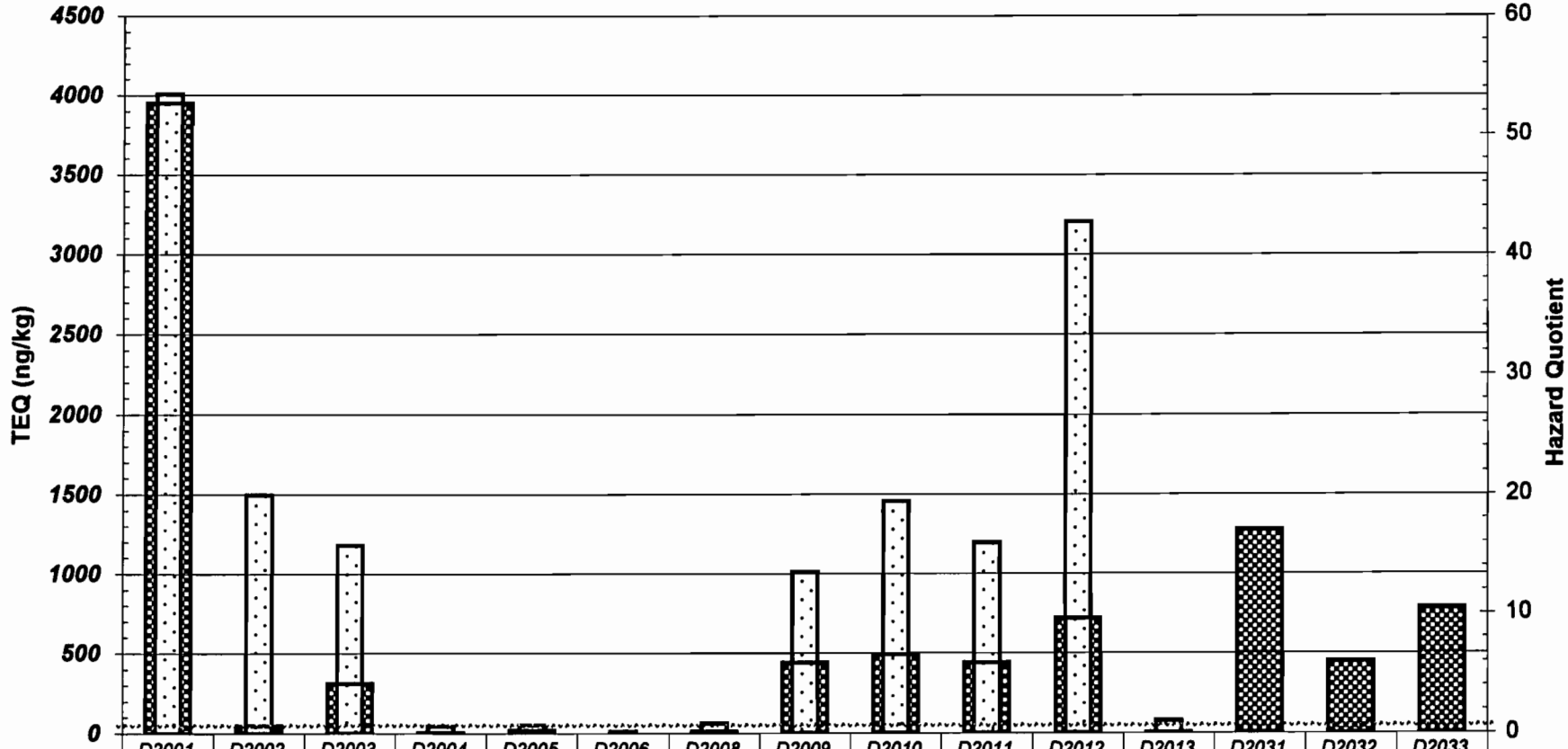
Naval Construction Battalion Center
Gulfport, Mississippi



	D1001	D1002	D1003	D1006	D1007	D1008	D1009	D1010	D1011	D1012	D1013	D1014	D1015	D1016	D1017	D1018	D1019	D1020	D1021	D1022	D1023
TEQ	79.5	231	139	12.5	11.1	38.1	57.4	80.4	100	50.3	35.3	42.3	103	5.5	65.7	13.0	70.0	0.5	26.6	42.5	0
HQ	2.4	3.5	8.6	0.9	1.3	0.9	1.8	2.1	2.1	1.5	1.4	1.2	0.0	0.0	0.9	12.9	41.6	0.2	1.1	0.5	0.1

Figure H-7
Sediment TCDD TEQs and Hazard Quotients - Area D2

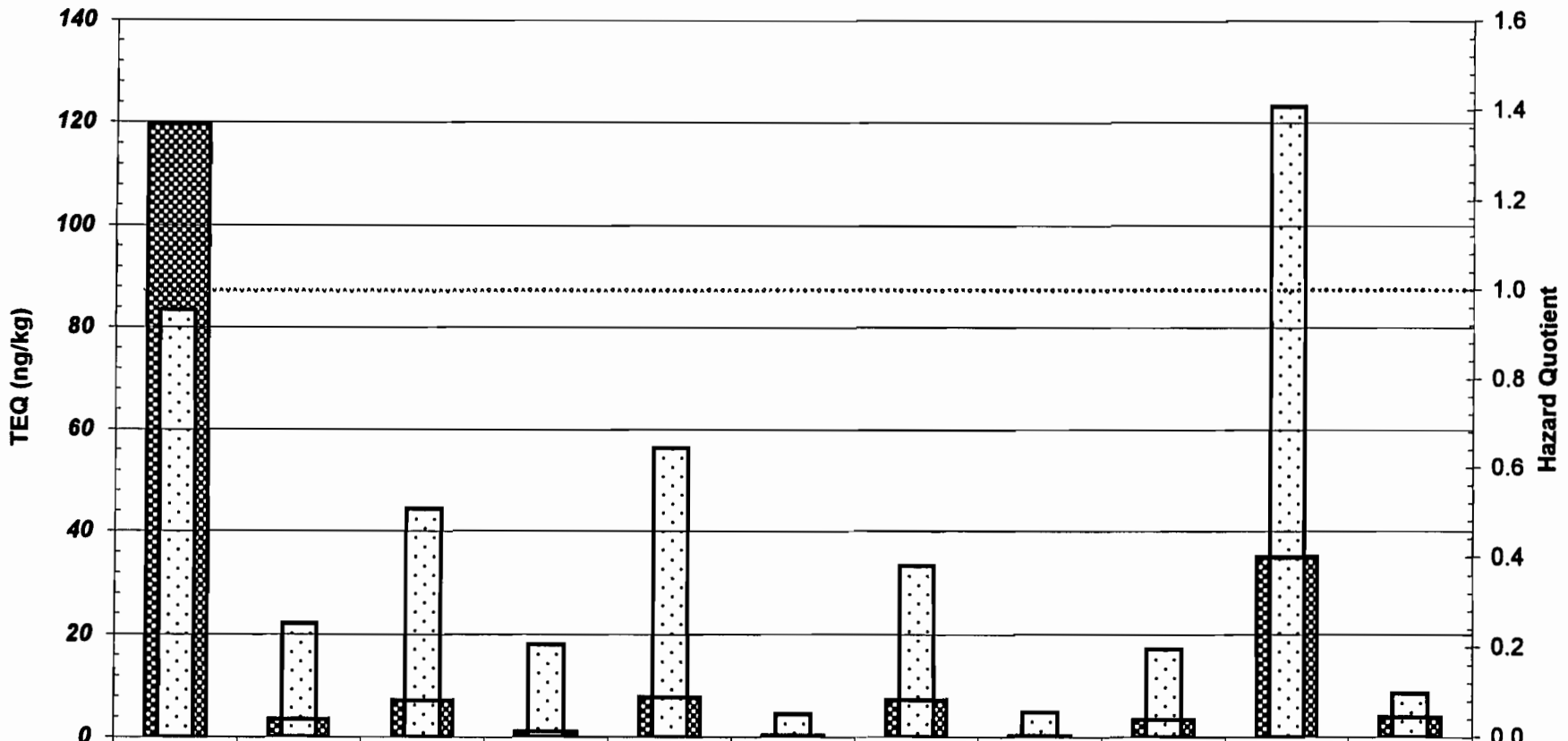
Naval Construction Battalion Center
Gulfport, Mississippi



	D2001	D2002	D2003	D2004	D2005	D2006	D2008	D2009	D2010	D2011	D2012	D2013	D2031	D2032	D2033
TEQ	3949	48.6	311	4.4	16.5	0.63	11.6	440	488	439	719	3.3	1276	445	782
HQ	53.4	20.0	15.7	0.56	0.66	0.13	0.83	13.5	19.4	15.9	42.7	1.0	0	0	0

Figure H-8
Sediment TCDD TEQs and Hazard Quotients - Areas D3/D4

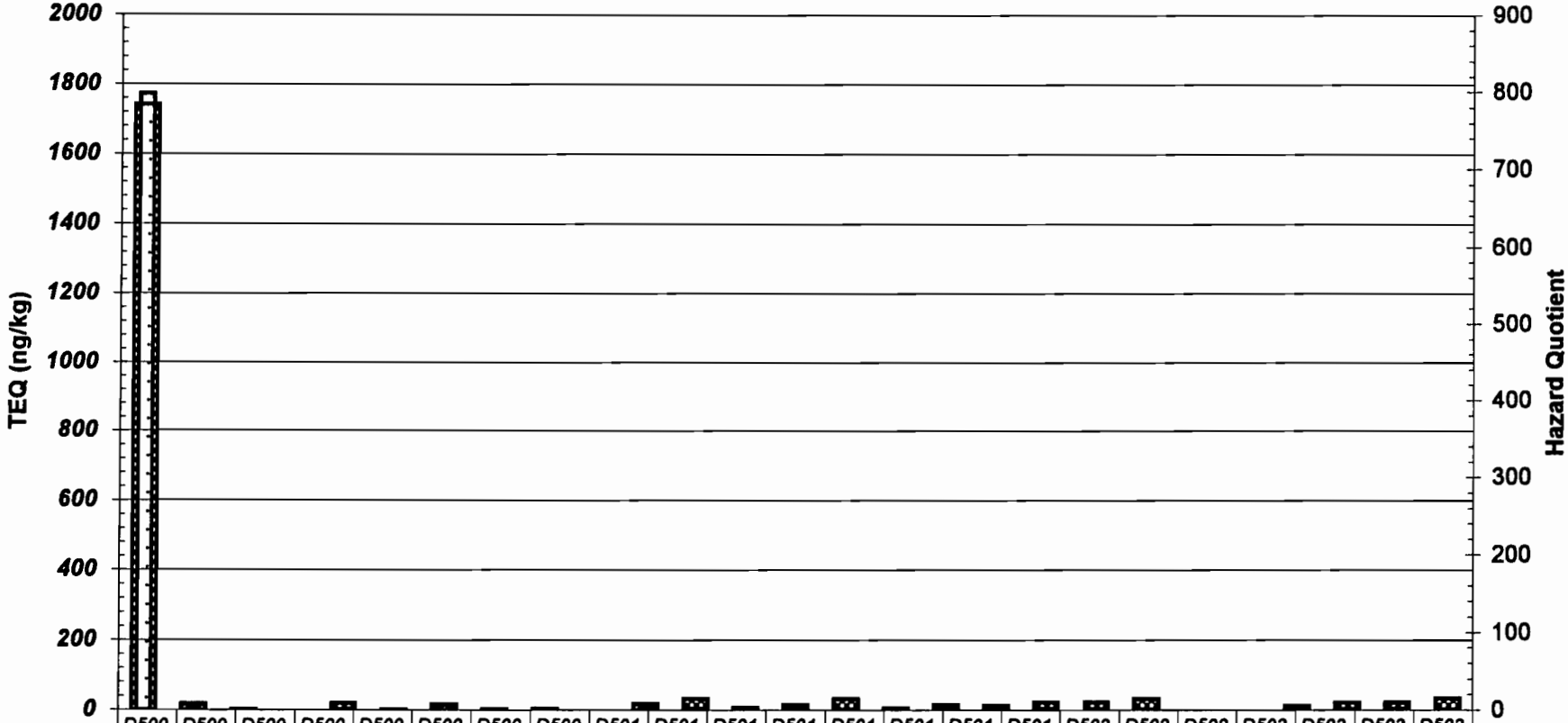
Naval Construction Battalion Center
Gulfport, Mississippi



	D3001	D3002	D3003	D3004	D3005	D3006	D3007	D3008	D4001	D4002	D4003
TEQ	120	3.4	7.1	1.0	7.8	0.23	7.2	0.20	3.3	35.0	3.9
HQ	0.95	0.25	0.51	0.20	0.64	0.051	0.38	0.056	0.20	1.41	0.10

Figure H-9
Sediment TCDD TEQs and Hazard Quotients - Area D5

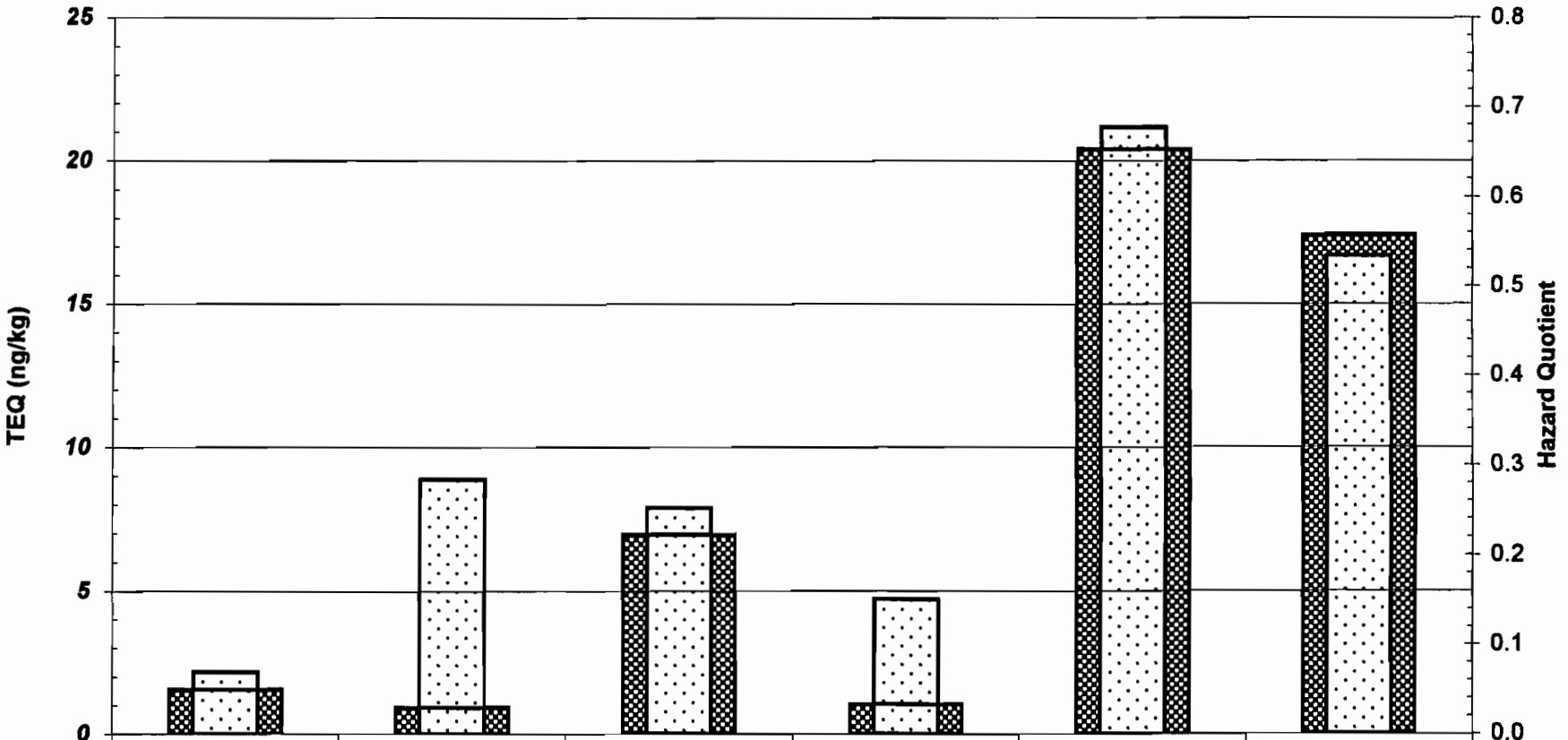
Naval Construction Battalion Center
Gulfport, Mississippi



	D5001	D5002	D5003	D5005	D5006	D5007	D5008	D5009	D5010	D5012	D5013	D5014	D5015	D5016	D5017	D5019	D5020	D5021	D5027	D5030	D5032	D5034	D5035
TEQ	1740	16.8	1.1	18.3	2.4	15.2	0.94	3.0	0.4	31.0	6.4	15.0	31.1	4.5	14.2	22.1	21.7	31.6			11.7	21.7	32.92
HQ	797	0.76	0.18	0.52	0.24	0.35	0.20	0.40	0.24	1.24	0.27	0.54	0.50	0.33	0.83	0.74	1.05	0.70			0.74	1.1	0.73

Figure H-10
Sediment TCDD TEQs and Hazard Quotients - Area D6

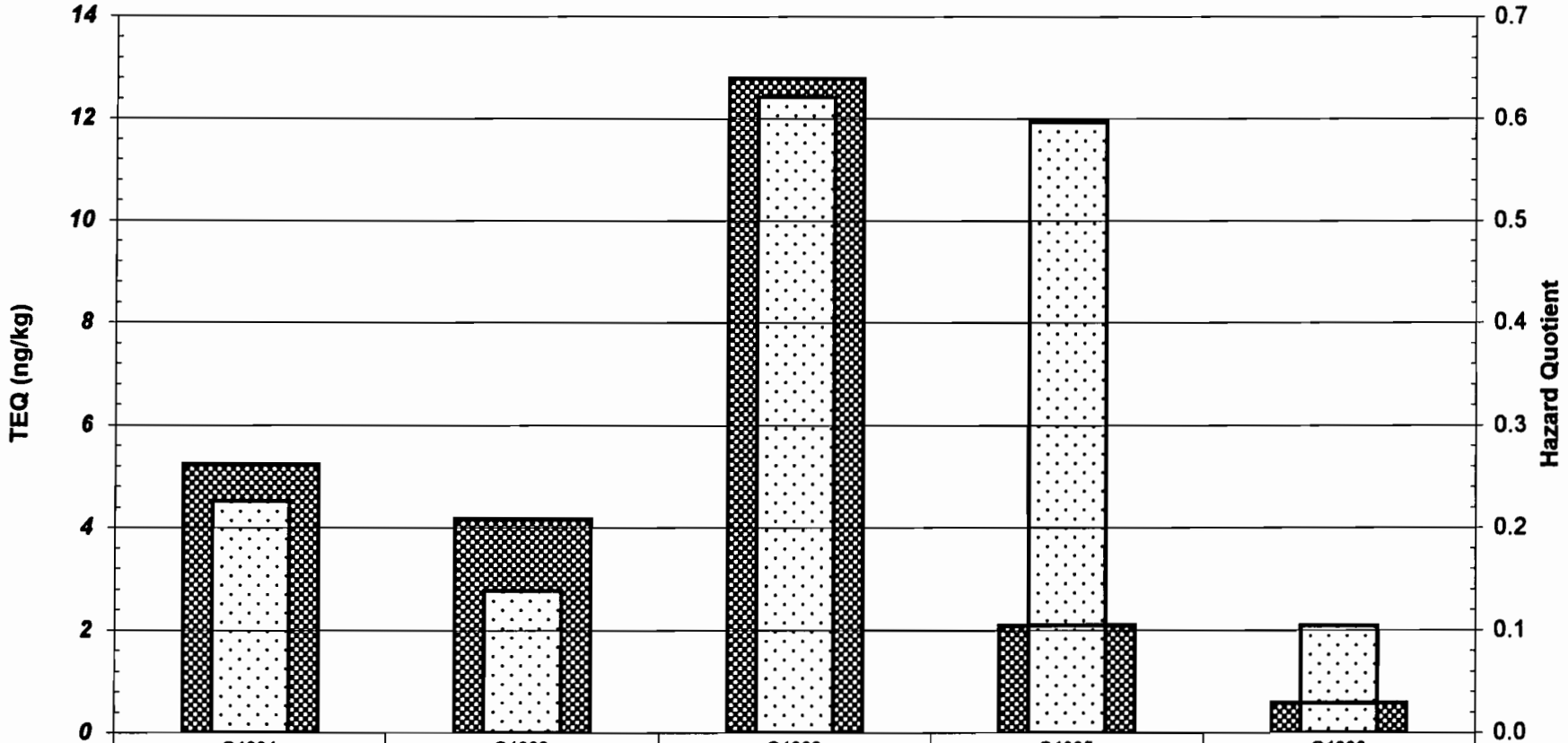
Naval Construction Battalion Center
Gulfport, Mississippi



	D6001	D6002	D6003	D6004	D6005	D6006
TEQ	1.5	0.9	7.0	1.0	20.4	17.40
HQ	0.069	0.28	0.25	0.15	0.68	0.53

Figure H-11
Sediment TCDD TEQs and Hazard Quotients - Canal

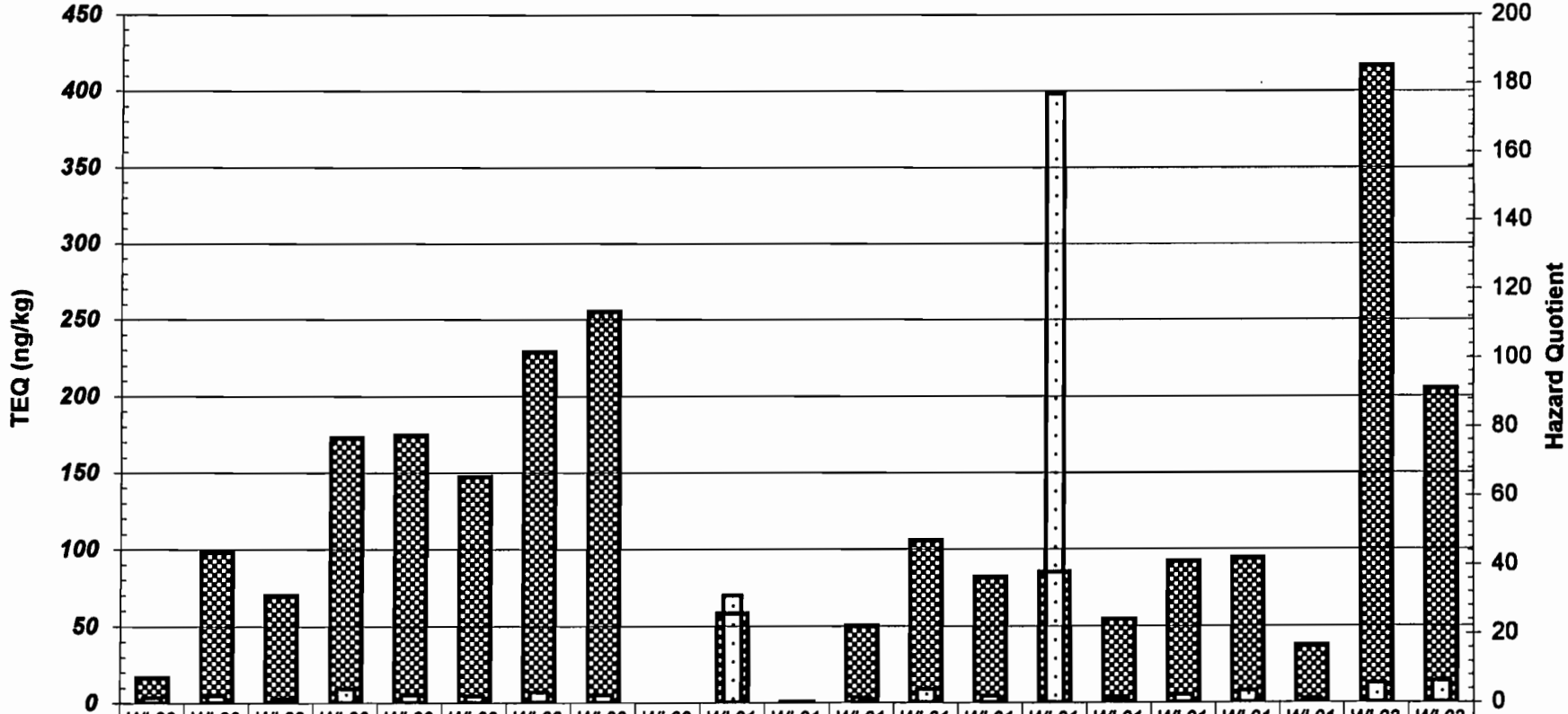
Naval Construction Battalion Center
Gulfport, Mississippi



	C1001	C1002	C1003	C1005	C1006
TEQ	5.2	4.2	12.8	2.1	0.6
HQ	0.23	0.14	0.62	0.60	0.10

Figure H-12
Sediment TCDD TEQs and Hazard Quotients - Area Downgradient of North Outfall #3 (in part)

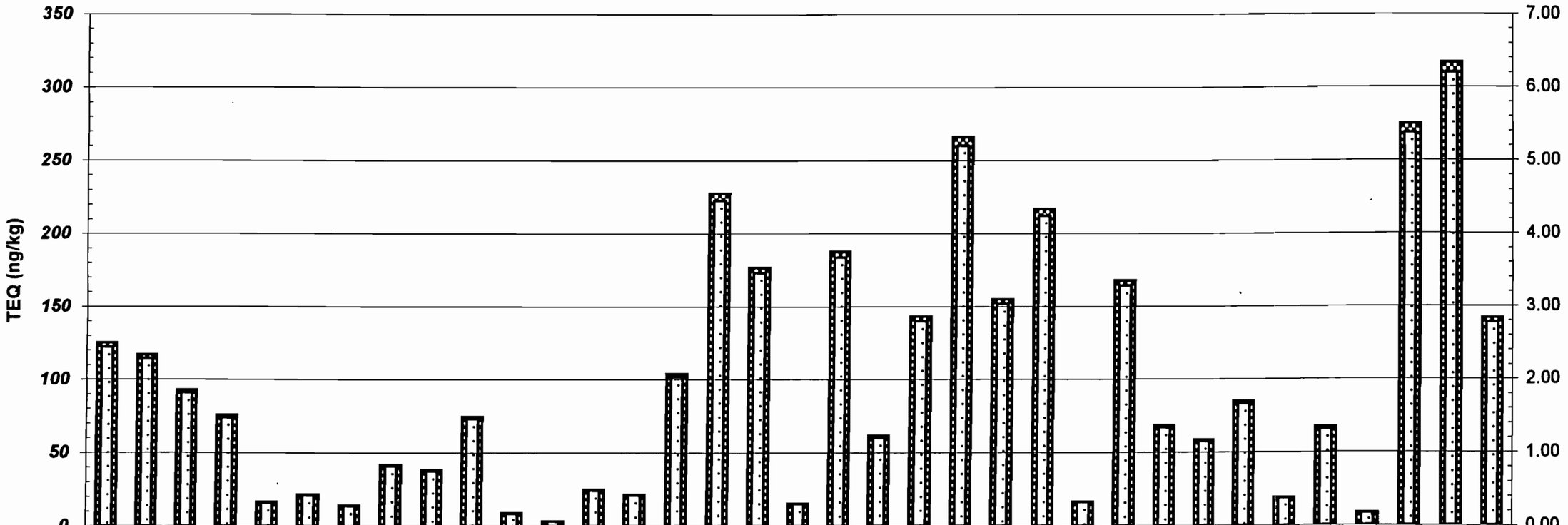
Naval Construction Battalion Center
Gulfport, Mississippi



	WL001	WL002	WL003	WL004	WL005	WL006	WL007	WL008	WL009	WL010	WL011	WL012	WL013	WL014	WL015	WL016	WL017	WL018	WL019	WL020	WL021
TEQ	16.3	98.2	69.5	173	174	147	229	255	0	58.0	0.40	50	106	81.8	84.9	53.9	92.1	94.1	37.2	416	205
HQ	1.4	2.0	1.1	4.0	2.2	2.0	3.0	2.3	0	30.8	0.010	1.4	3.8	1.8	177	1.3	2.2	3.4	1.1	5.5	6.3

Figure H-13
Sediment TCDD TEQs and Hazard Quotients - Area Downgradient of North Outfall #3 (in part)

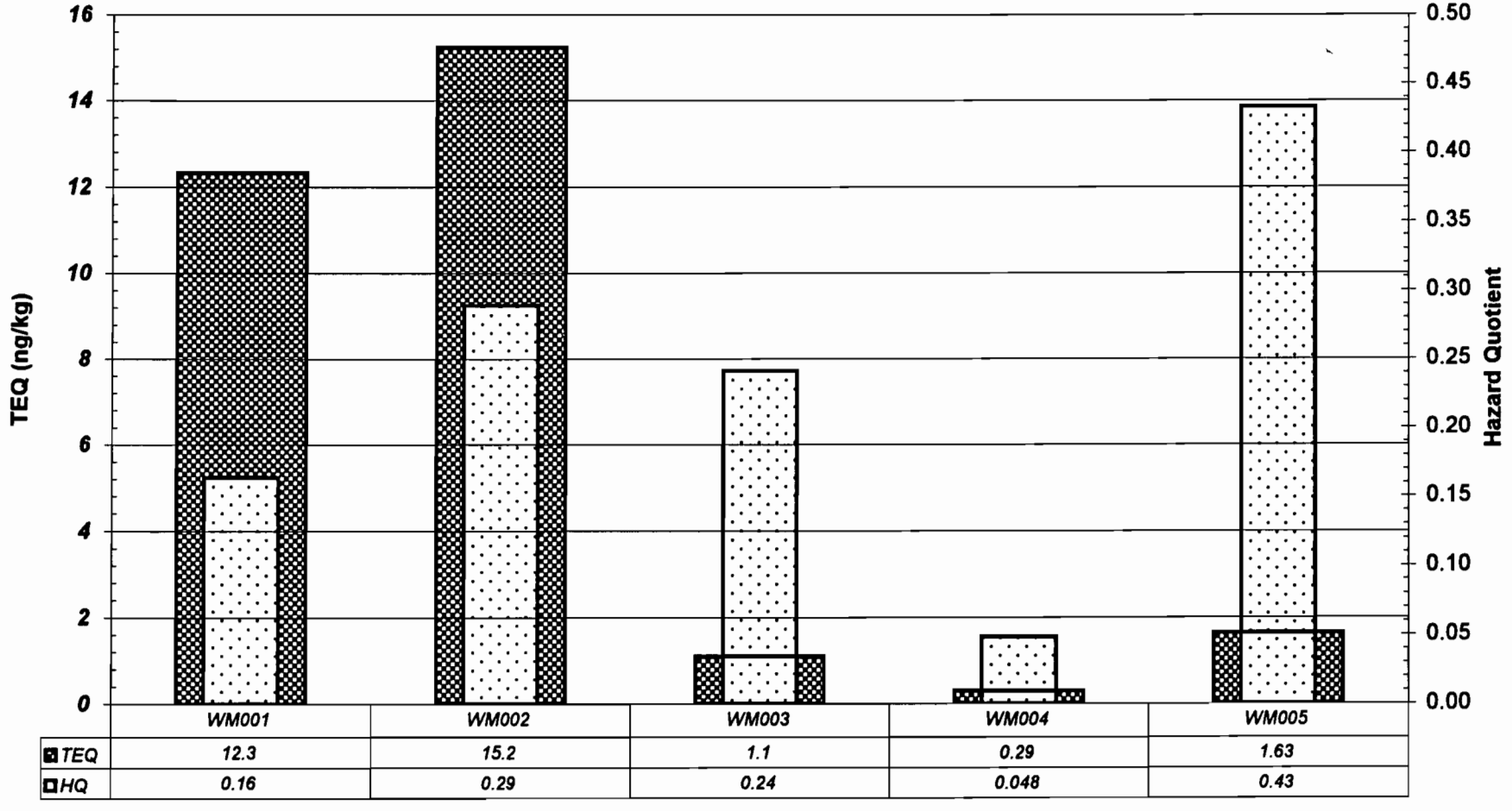
Naval Construction Battalion Center
Gulfport, Mississippi



	WL032	WL033	WL034	WL035	WL036	WL037	WL039	WL040	WL041	WL042	WL043	WL044	WL045	WL046	WL047	WL048	WL050	WL051	WL052	WL053	WL054	WL055	WL056	WL057	WL058	WL059	WL060	WL062	WL063	WL064	WL065	WL066
TEQ	125	117	92.8	75.5	16.3	21.4	41.7	38.1	74.6	9.0	3.3	24.8	21.5	104	228	177	188	61.4	143	266	155	217	16.4	168	68.4	58.6	84.8	67.3	8.5	275	317	142
HQ	2.44	2.29	1.81	1.48	0.32	0.42	0.82	0.74	1.46	0.17	0.07	0.48	0.42	2.03	4.46	3.46	3.67	1.20	2.80	5.20	3.03	4.24	0.32	3.28	1.34	1.14	1.66	1.32	0.17	5.38	6.20	2.78

Figure H-14
Sediment TCDD TEQs and Hazard Quotients - Area Downgradient of North Outfall #4

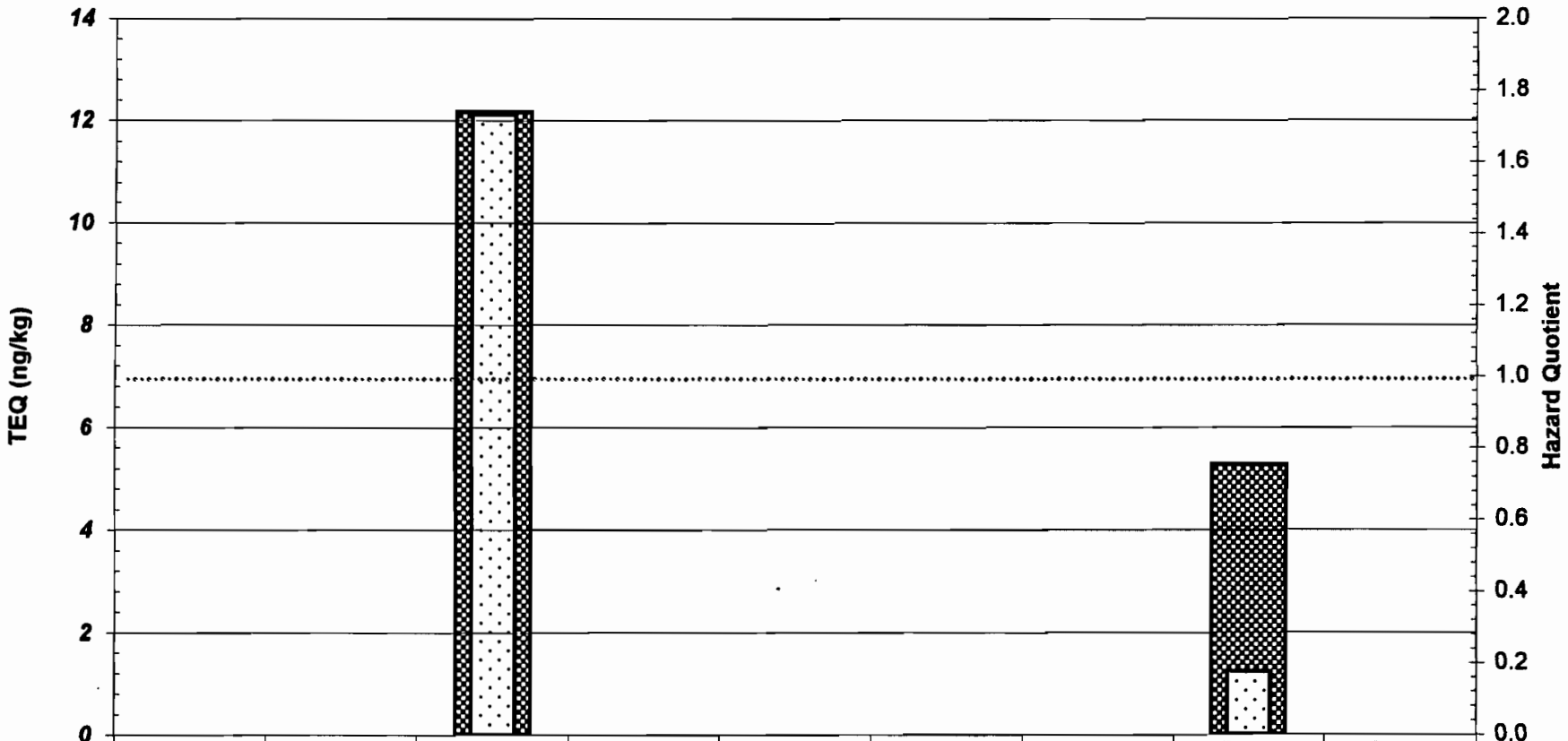
Naval Construction Battalion Center
Gulfport, Mississippi



	WM001	WM002	WM003	WM004	WM005
TEQ	12.3	15.2	1.1	0.29	1.63
HQ	0.16	0.29	0.24	0.048	0.43

Figure H-15
Sediment TCDD TEQs and Hazard Quotients - Turkey Creek

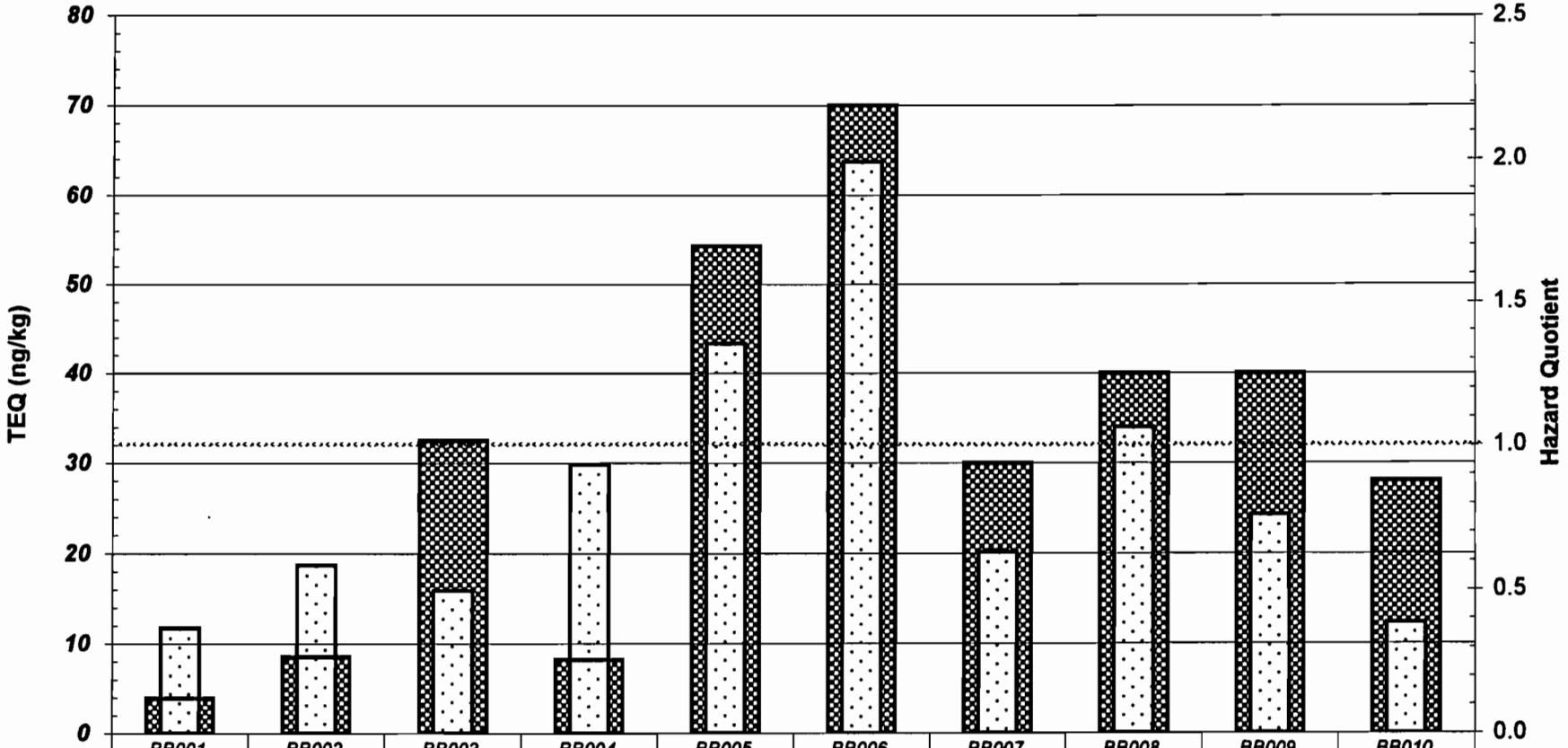
Naval Construction Battalion Center
Gulfport, Mississippi



	TC001	TC002	TC004	TC005	TC006	TC007	TC008	TC009	TC010
TEQ	0	0	12.2	0	0	0	0	5.3	0
HQ	0	0	1.7	0	0	0	0	0.17	0

Figure H-16
Sediment TCDD TEQs and Hazard Quotients - Bernard Bayou

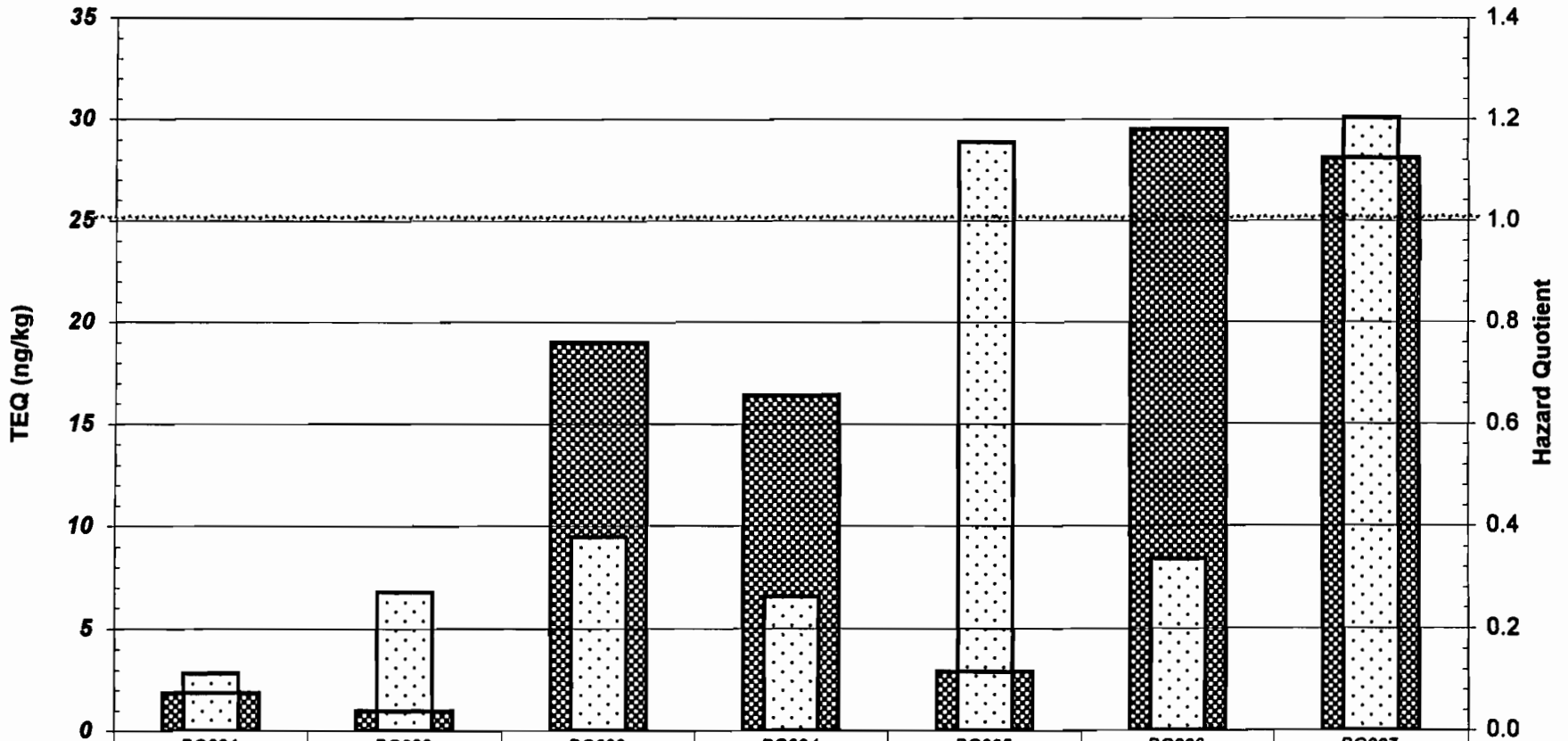
Naval Construction Battalion Center
Gulfport, Mississippi



	BB001	BB002	BB003	BB004	BB005	BB006	BB007	BB008	BB009	BB010
TEQ	4.0	8.5	32.5	8.18	54.3	70.0	30.0	40.0	40.0	28.0
HQ	0.37	0.58	0.50	0.93	1.35	1.99	0.63	1.06	0.76	0.38

Figure H-17
Sediment TCDD TEQs and Hazard Quotients - Brickyard Creek

Naval Construction Battalion Center
Gulfport, Mississippi



	BC001	BC002	BC003	BC004	BC005	BC006	BC007
TEQ	1.9	0.95	19.0	16.4	2.9	29.5	28.1
HQ	0.11	0.27	0.38	0.26	1.2	0.34	1.20