

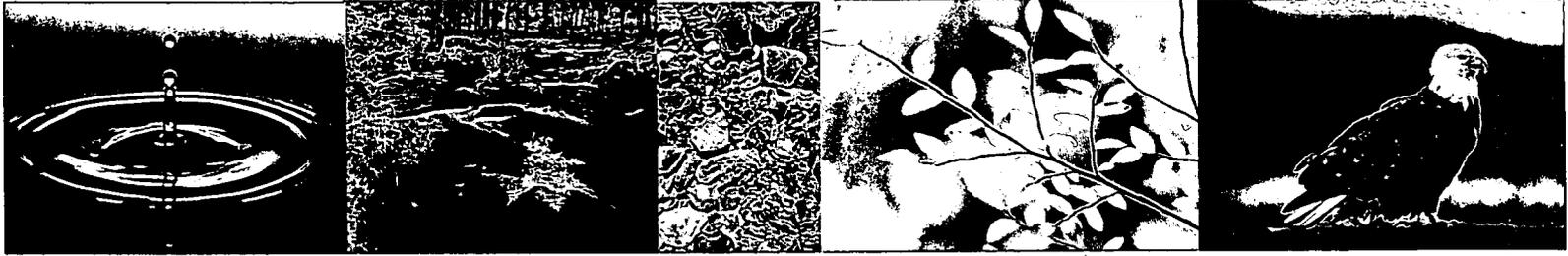
Comprehensive Long-term Environmental Action Navy

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NSWC CRANE

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CONTRACT NUMBER N62467-04-D-0055



Rev. 0
02/07

Interim Measures Work Plan for SWMU 17 - PCB Capacitor Burial/Pole Yard

Naval Surface Warfare Center Crane
Crane, Indiana

Contract Task Order 0020

February 2007



2155 Eagle Drive
North Charleston, South Carolina 29406

**INTERIM MEASURES WORK PLAN
SWMU 17 – PCB CAPACITOR BURIAL/POLE YARD**

**NAVAL SURFACE WARFARE CENTER CRANE
CRANE, INDIANA**

**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT**

**Submitted to:
Naval Facilities Engineering Command
Southeast
2155 Eagle Drive
North Charleston, South Carolina 29406**

**Submitted by:
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**CONTRACT NUMBER N62467-04-D-0055
CONTRACT TASK ORDER 0020**

FEBRUARY 2007

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LIST OF ACRONYMS

bgs	below ground surface
CFR	Code of Federal Regulations
CLEAN	Comprehensive Long-term Environmental Action Navy
CTO	Contract Task Order
DNR	Department of Natural Resources
DQO	data quality objective
DRMO	Defense Reutilization Marketing Office
EMAC	Environmental Multiple Award Contract
ESA	Endangered Species Act
HSWA	Hazardous and Solid Waste Amendments
IAS	Initial Assessment Study
IDEM	Indiana Department of Environmental Management
IDOT	Indiana Department of Transportation
IM	Interim Measure
IMWP	Interim Measures Work Plan
IR	Installation Restoration
LDPE	Low density polyethylene
mg/kg	milligram(s) per kilogram
MSDS	Material Safety Data Sheet
msl	mean sea level
NSWC	Naval Surface Warfare Center
OICC	Officer in Charge of Construction
PCB	polychlorinated biphenyl
ppm	parts per million
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
SWMU	Solid Waste Management Unit
TSCA	Toxic Substance Control Act
TtNUS	Tetra Tech NUS, Inc.
USACE	United States Army Corps of Engineers

USEPA
USFWS

United States Environmental Protection Agency
United States Fish and Wildlife Service

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

The purpose of this document is to present the Interim Measures Work Plan (IMWP) for the Polychlorinated Biphenyl (PCB) Capacitor Burial/Pole Yard, which is also known as Solid Waste Management Unit (SWMU) 17, Naval Surface Warfare Center (NSWC) Crane located in Crane, Indiana. The IMWP includes the excavation and off-site disposal of contaminated soils and sediment located within the vicinity of the PCB Capacitor Burial/Pole Yard and the drainage channels and streams that receive surface water runoff from this area. In addition, IMWP activities include stream restoration. The IMWP was prepared for the United States Navy, Naval Facilities Engineering Command, Engineering Field Division South by Tetra Tech NUS, Inc. (TiNUS) under Contract Task Order (CTO) 0020 of the Comprehensive Long-Term Environmental Action Navy (CLEAN) IV Contract Number N62467-04-D-0055.

This work is being performed under the Navy's Installation Restoration (IR) Program. The following are the four distinct phases of work conducted for IR sites:

- Phase 1 is the Preliminary Assessment [formerly known as the Initial Assessment Study (IAS)]
- Phase 2 is the Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA)
- Phase 3 is the RCRA Facility Investigation (RFI)/Corrective Measures Proposal
- Phase 4 is the Corrective Measures Implementation

This IMWP has been prepared under Phase 4 of the IR Program as part of an interim measure. The IMWP defines activities associated with corrective measures conducted to address PCB-contaminated surface soils and sediments that remain within the limits of SWMU 17. These areas include two locations within the footprint of a past interim measure (IM) conducted north and northwest of Building 357 and within several drainage channels located southwest, west, northwest, north, and northeast of the SWMU 17 area and Building 357.

1.2 FACILITY DESCRIPTION

NSWC Crane is located in the southern portion of Indiana, approximately 75 miles southwest of Indianapolis and 71 miles northwest of Louisville, Kentucky, immediately east of Crane Village and Burns City (Figure 1-1). NSWC Crane encompasses 62,463 acres (approximately 98 square miles), most of

which are located in the northern portion of Martin County. Smaller portions of NSWC Crane are located in Greene, Daviess, and Lawrence Counties. NSWC Crane is located in a rural, sparsely populated area. Most of NSWC Crane is forested, and the surrounding area is wooded or farmed land.

NSWC Crane provides material, technical, and logistical support to the Navy for equipment, shipboard weapons systems, and nonexpendable ordnance items. In addition, NSWC Crane supports the Crane Army Ammunition Activity with production, renovation, storage, shipment, demilitarization, and disposal of conventional ammunition.

1.3 REGULATORY SUMMARY

1.3.1 NSWC Crane

Following promulgation of the RCRA hazardous waste regulatory program, NSWC Crane filed notification and application to operate as a RCRA hazardous waste treatment, storage, or disposal facility in October 1980. Interim status was granted subject to operating requirements and applicable technical standards found in Title 40 of the Code of Federal Regulations (CFR), Part 265.

Corrective action programs established as part of the 1984 RCRA Hazardous and Solid Waste Amendments (HSWA) required NSWC Crane to address past releases of hazardous waste or hazardous constituents at SWMUs. Accordingly, NSWC Crane submitted a Hazardous Waste Management Report, and an RFA was conducted to characterize the potential for releases of hazardous waste or constituents from approximately 100 SWMUs identified during the RFA (TtNUS, 2006).

On December 23, 1989, United States Environmental Protection Agency (USEPA) issued the federal portion of the final RCRA Part B Permit for NSWC Crane to the Navy. USEPA renewed the permit in 1995. The Indiana Department of Environmental Management (IDEM) now has responsibility for the Federal Corrective Action Permit. IDEM renewed the Corrective Action Permit on October 18, 2001. However, certain ongoing corrective actions, including corrective actions at SWMU 17, will continue under the USEPA/IDEM Work Sharing Agreement for Corrective Action Activities at NSWC Crane (TtNUS, 2006).

1.3.2 SWMU 17 – PCB Capacitor Burial/Pole Yard

SWMU 17 is located in the north-central portion of NSWC Crane as shown on Figure 1-1. Figure 1-2 is an aerial photograph of SWMU 17. The PCB Capacitor Burial/Pole Yard has been in use since before 1966. Historically, SWMU 17 has been used for the following:

- Storage of electrical capacitors, some of which contained PCBs.
- Storage of electrical transformers, some of which contained PCBs.
- Burial of capacitors, some of which may have contained PCBs.
- Storage of creosote-impregnated utility poles, some of which may have been contaminated with PCBs as a result of leaking transformers.

It is known that capacitors were buried at SWMU 17 in the early to mid-1970s, but it is not known whether any capacitors were buried before the early 1970s or after the mid-1970s. Figure 1-3 shows areas where activities have historically occurred at SWMU 17. The soil at SWMU 17 has been investigated extensively, and a previous IM to remove contaminated soil was conducted in September 2004 (ToITest, 2004). The following is a listing of the SWMU 17 investigations and IM performed to date:

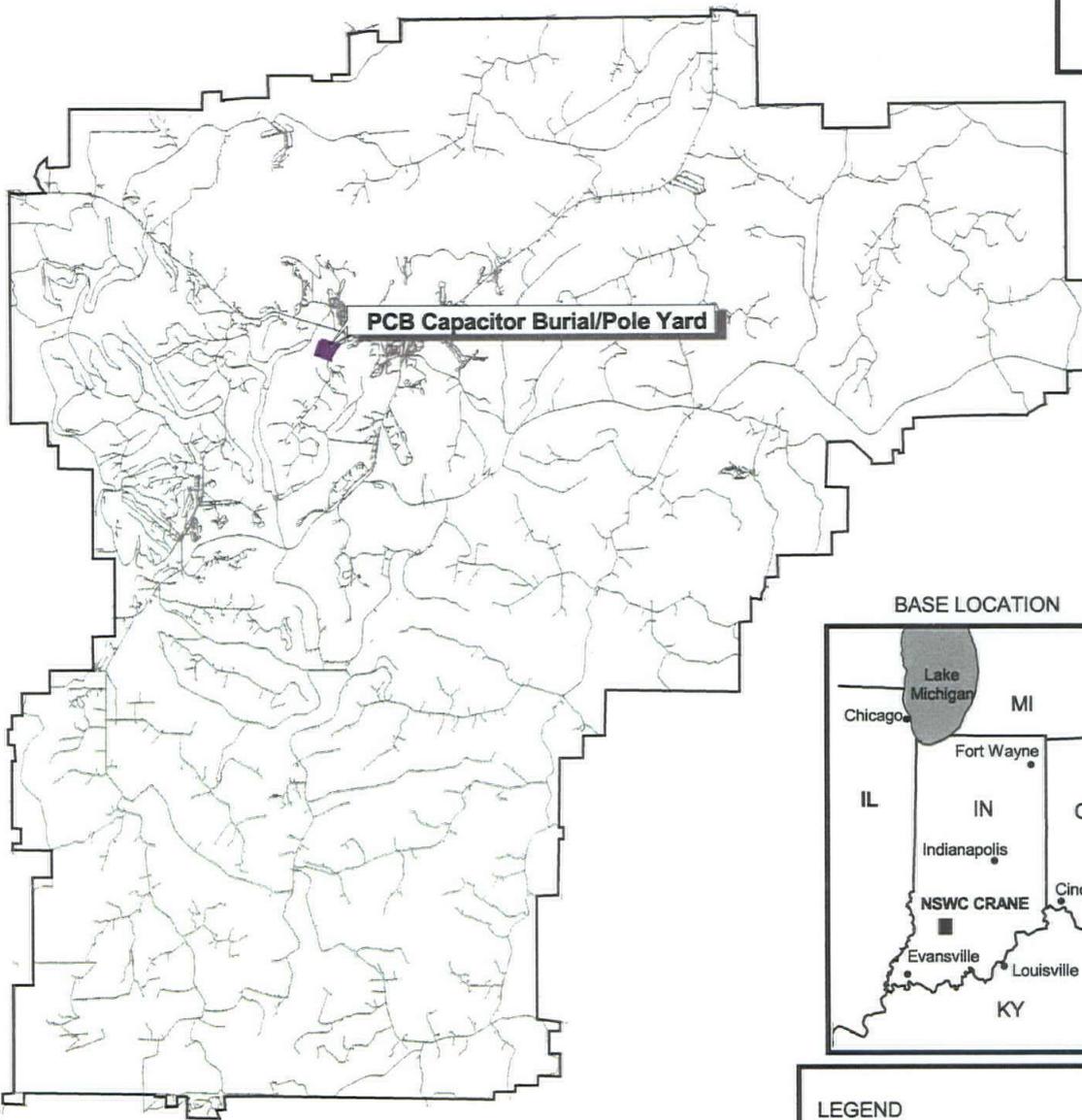
- SAIC Soil Investigation, March 2001
- TINUS RFI, March 2002
- ToITest IM, September 2004
- TINUS RFI Addendum Field Investigations, October 2005, April 2006, May 2006, and October 2006

A summary of the environmental investigations and previous IM conducted at SWMU 17 is provided in Section 2.0.

1.4 REPORT ORGANIZATION

The following highlights the information contained in the remainder of this document:

- Section 2.0 summarizes site characteristics including site description, summary of environmental investigations conducted at SWMU 17, and nature and extent of contamination.
- Section 3.0 presents the IMWP.
- Section 4.0 presents erosion and sediment control features proposed for the IMWP described in Section 3.0.
- Section 5.0 presents the sampling and analysis plan.



BASE LOCATION



LEGEND

- SWMU
- Base Boundary
- Road



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SCALE AS NOTED	



SITE LOCATION MAP
SWMU 17 - PCB CAPACITOR BURIAL/POLE YARD
INTERIM MEASURES WORK PLAN
NSWC, CRANE
CRANE, INDIANA

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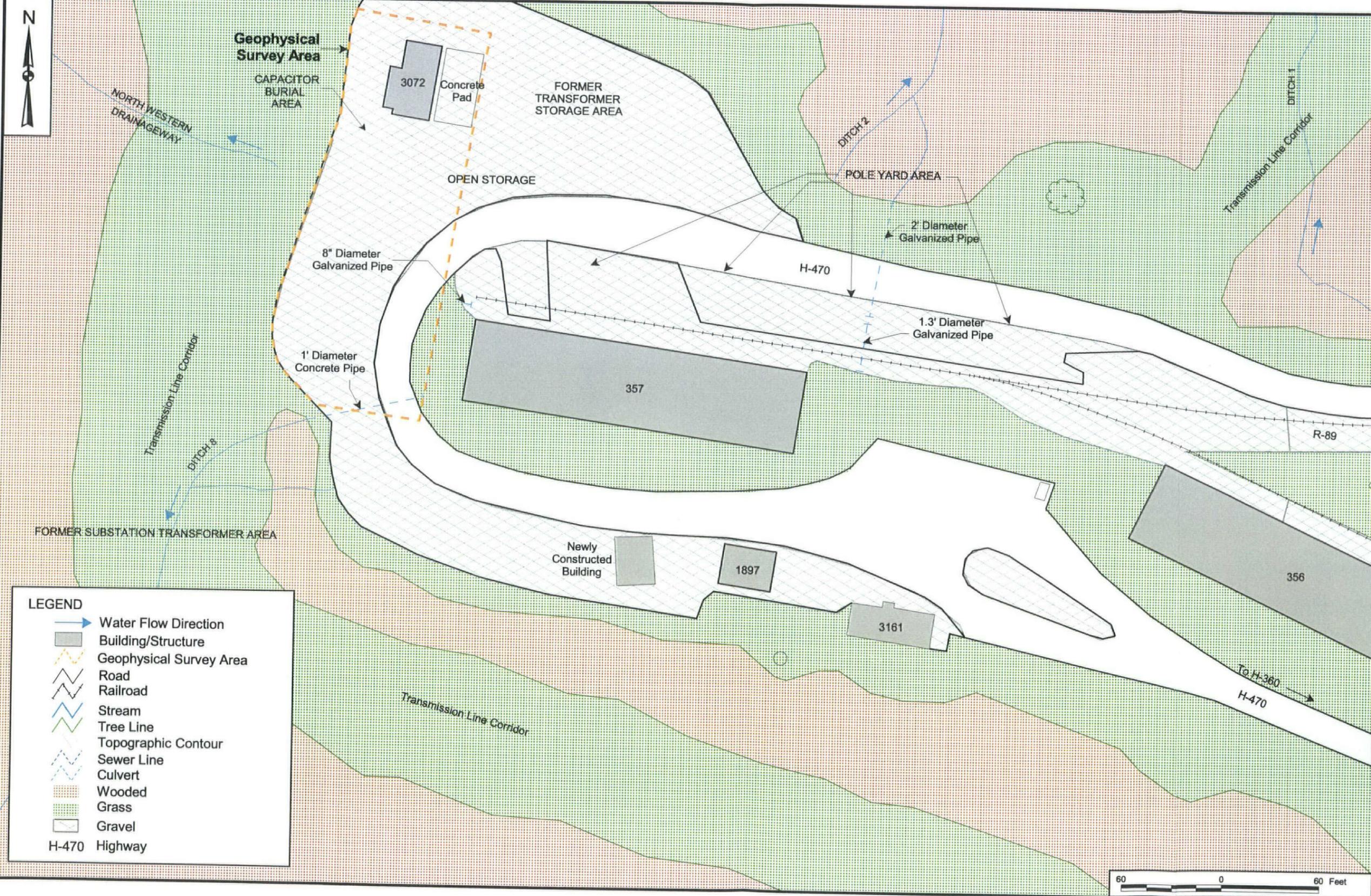


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SITE LAYOUT - 2003 AERIAL PHOTOGRAPH
 SWMU 17 - PCB CAPACITOR BURIAL/POLE YARD
 INTERIM MEASURES WORK PLAN
 NSWC, CRANE
 CRANE, INDIANA

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LAND USE MAP
 SWMU 17 - PCB CAPACITOR BURIAL/POLE YARD
 INTERIM MEASURES WORK PLAN
 NSWC, CRANE
 INDIANA



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COST/SCHED-AREA			
SCALE	AS NOTED		

2.0 SITE SUMMARY

2.1 SITE SUMMARY

A general description of SWMU 17 is provided in Section 1.0. The following sections describe the physical and geophysical conditions of areas to be addressed in the IMWP. These descriptions were excerpted from the SWMU 17 RFI Report (TINUS, 2002).

2.1.1 Physiography and Topography

SWMU 17 is located on a flattened ridge top that has moderately steep side slopes on the northern, western, and southern sides of the ridge top. The SWMU 17 area, surrounding terrain, nearby surface drainages, and local topography are presented on Figure 2-1. The topography is generally flat on the ridge top in the vicinity of the Building 357, the pole yard area, and the transformer storage area. The pole yard area is located on the northern and northeastern sides of Building 357. The transformer storage area is approximately 120 feet north of Building 357.

Ground surface elevations range from 720 and 730 feet above mean sea level (msl) on the ridge top, and decrease to the north, south, and west. The elevations along the Boggs Creek channel west of SWMU 17 are about 630 to 640 feet above msl, which equates to approximately 90 feet of total topographic relief in the immediate vicinity of SWMU 17.

Woods are located along the perimeter of the developed industrialized portion of SWMU 17, which is devoid of vegetation, and extend down the hillsides to the receiving drainage channels.

2.1.3 Surface Water Hydrology

The pole yard and the transformer storage yard are both located on the northern side of Building 357, and both areas slope gently northward as does the surface drainage channel that flows into the unnamed channel located approximately 400 feet north of Building 357. This drainage channel carries surface water west-northwest about 700 feet, where it joins the headwaters of Boggs Creek, the largest creek draining NSWC Crane. Most surface runoff from the geophysical survey area (see Section 2.2), located west of Building 357, drains to the west and northwest and empties into a small drainage channel that passes by the northeastern side of Building 2219 (Figure 2-1). The southern portion of the geophysical survey area drains southwestward into an unnamed drainage channel (informally referred to as the

Northwest Drainageway) that flows to the northwest approximately 800 feet where it discharges into Boggs Creek.

2.1.4 Geology

The Pesticide Control Area (SWMU 9), which is located approximately 1 mile south-southeast of SWMU 17, has surface elevations similar to SWMU 17 (720 to 730 feet above msl). At SWMU 9, the United States Army Corps of Engineers (USACE) installed a monitoring well (09C01) that penetrated 13 feet of overburden soil and 132 feet of Pennsylvanian-age shales, siltstones, sandstones, and thin coal seams of the Mansfield Formation before Mississippian Glen Dean Limestone was encountered. At SWMU 17, it is expected that the Mississippian formation is at about the same elevation (570 feet above msl), which would place it at least 60 feet below the Boggs Creek channel bottom. Hence, all of the geologic units from the ridge top to the Boggs Creek channel and immediately below the channel are expected to be Pennsylvanian-age sandstone, siltstone, and shale. The sandstones can be slightly to moderately transmissive to groundwater, but the shales and siltstones are relatively impermeable and act as aquitards.

Based on boring logs for 49 soil cores collected to date at SWMU 17, the thickness of the residual soil layer on the ridge top ranges from about 3.5 to 8.0 feet, and is typically 4 to 6 feet (TtNUS, 2002). The thickest residual soil layer (8.0 feet) was encountered in soil boring 17SB049 (see Figure 2-4), located on the western side of the geophysical survey area.

The residual soils are generally stiff to moderately stiff, silty clays and clayey silt with some fine sand. Fragments of weathered sandstone and/or siltstone are commonly found near the bottom of the soil profiles, indicating that sandstone and/or siltstone is the uppermost bedrock in the ridge top.

2.1.5 Hydrogeology

PCBs are relatively insoluble and tend to remain attached to soil particles close to where they were spilled. Therefore, they are not typically found in groundwater underlying PCB-contaminated sites. Even though PCBs are considered to be immobile in groundwater systems, three temporary wells were installed in the soil overburden and screened at the soil/bedrock interface to evaluate possible migration of PCBs in to shallow groundwater. Perched groundwater was encountered in only one of the temporary wells (17TW01 installed in soil boring 17SB046; see Figure 2-4). No perched groundwater was encountered in the other two temporary wells (installed in soil borings 17SB048 and 17SB049). No permanent monitoring wells were installed at SWMU 17 during this phase of the field investigation, or in

any of the previous phases of investigation. Analytical results from the groundwater sample collected from temporary well (17TW01) indicated that there was not PCB contamination found in the SWMU 17 groundwater. Groundwater sample analytical results are presented in Appendix B.

2.2 PREVIOUS INVESTIGATIONS

Previous soil investigations at the PCB Capacitor Burial/Pole Yard are summarized below.

2001 Soil Investigation – In March 2001, SAIC conducted a soil investigation in and around the SWMU 17 capacitor burial and pole storage areas. The investigation included the collection of surface soil samples only from 0- to 6-inches and 6- to 12-inches below ground surface (bgs). Six composite samples consisting of soil take from 8 grab locations were collected and analyzed for PCBs only. The results indicated elevated concentrations of PCBs within the surface soils of the investigated areas. The primary contaminant of concern was determined to be Aroclor-1260. Sample locations are presented on Figure 2-3.

2002 RFI – Based on the results of the 2001 soil investigation, TtNUS conducted an RFI for SWMU 17. Field work for the RFI began in March 2002 and consisted of collecting surface and subsurface soil samples and performing a geophysical survey. In total, 44 surface soil samples were collected from 0- to 24-inches bgs, and 44 subsurface soil samples were collected 2- to 4-feet bgs. The sampling identified five areas of concern immediately north and west of Building 357 and within the northwestern drainageway. In addition to soil sampling, a geophysical survey was conducted to identify the limits of the reported capacitor burial area. The geophysical survey identified several anomalies in the reported capacitor burial area and many locations of subsurface metal including buried utilities. Figure 2-2 identifies the locations of the surface and subsurface soil samples and geophysical survey area.

2004 Interim Measure – Based on the results of the 2002 RFI, ToITest was contracted to remove PCB-contaminated soils from the SWMU 17 area. This IM was conducted in September 2004 and resulted in the excavation of 2,140 tons of soil with PCB concentrations less than 25 milligrams per kilogram (mg/kg) and 790 tons of soil with PCB concentrations greater than 25 mg/kg. The excavation around the capacitor burial area uncovered electrical insulators, a transformer, and miscellaneous debris. Because of contractual limitations, excavation operations ceased before all contaminated soils were removed. Site delineation samples and post-excavation sampling indicated that PCBs remained in subsurface soils below two feet of clean fill at concentrations greater than 25 mg/kg, and in the surface soil within the drainageway downgradient of the disposal area and in the area between Building 357 and the asphalt paved road (eastern end of building) at concentrations greater than 1 mg/kg. However, the sampling did

not identify the extent of the remaining contamination. The surface soil within the drainageway downgradient of the disposal area was not excavated because the area was beyond the identified work area and posed no health risk to workers. The surface soil between Building 357 and the paved road at the eastern end of Building 357 was not excavated based on a regulatory decision (ToITest, 2004). It was identified in the ToITest report that these areas would be targeted for further evaluation in a future RFI. The approximate locations of the 2004 IM excavation areas are identified on Figure 2-3.

RFI Addendum Sampling – In October 2005, April 2006, and May 2006, TtNUS conducted sediment sampling within the drainage channels that receive runoff from the SWMU 17 area and surface soil sampling around Building 0357. The October 2005 sampling event included the collection of seven sediment samples from within the Northwest Drainageway, Boggs Creek, Ditch 8, and Ditch 3 and surface and subsurface soil samples around Building 0357 (see Figures 2-4 and 2-5). The results presented on Figures 2-4 and 2-5 identify PCB concentrations ranging from non-detect to 37 mg/kg. The April 2006 sampling event included the collection of 33 sediment samples from within the upstream drainageways originating at SWMU 17. The results presented in Figures 2-4 and 2-5 identify PCB concentrations ranging from non-detect to 4.6 mg/kg. PCBs were detected at 1.3 mg/kg at location 17SD14, upgradient of a contributing stream that originated from SWMU 17. This detection suggested an additional source of PCB contamination other than SWMU 17 in the tributary. Further investigation of facilities upgradient of sample location 17SD14, indicated that Building 2721 was historically used as a transformer maintenance facility and that PCB-contaminated oils were discharged through an oil-water separator to the drainage ditch. Consequently, in May 2006, 23 additional sediment samples were collected in the drainage ditch, the stream in which 17SD14 was located, and other drainage channels upgradient of SWMU 17. The analytical results presented on Figures 2-4 and 2-5 identify PCB concentrations ranging from non-detect to 3.3 mg/kg.

As a result of finding additional PCB contamination in the stream originating at Building 2721, additional soil and sediments samples were collected in the vicinity of Building 2721 in October 2006, within areas along the stream outside its banks that would likely receive flood waters, and within the drainage ditches within the vicinity of SWMU 1 not previously sampled. In total, 62 additional samples were collected from 35 soil boring and 5 sediment locations. PCB concentrations within the soil samples collected around Building 2721 and within the potential flood zone along the stream north of SWMU 17 range from non-detect to 73 mg/kg. The 73 mg/kg of PCB was found in a surface soil sample (0 to 2 foot bgs) collected from soil boring 17SB55, which is located adjacent to the southwest corner of Building 2721. PCB concentrations within the sediment samples collected from the streams and drainage channels range from non-detect to 0.96 mg/kg.

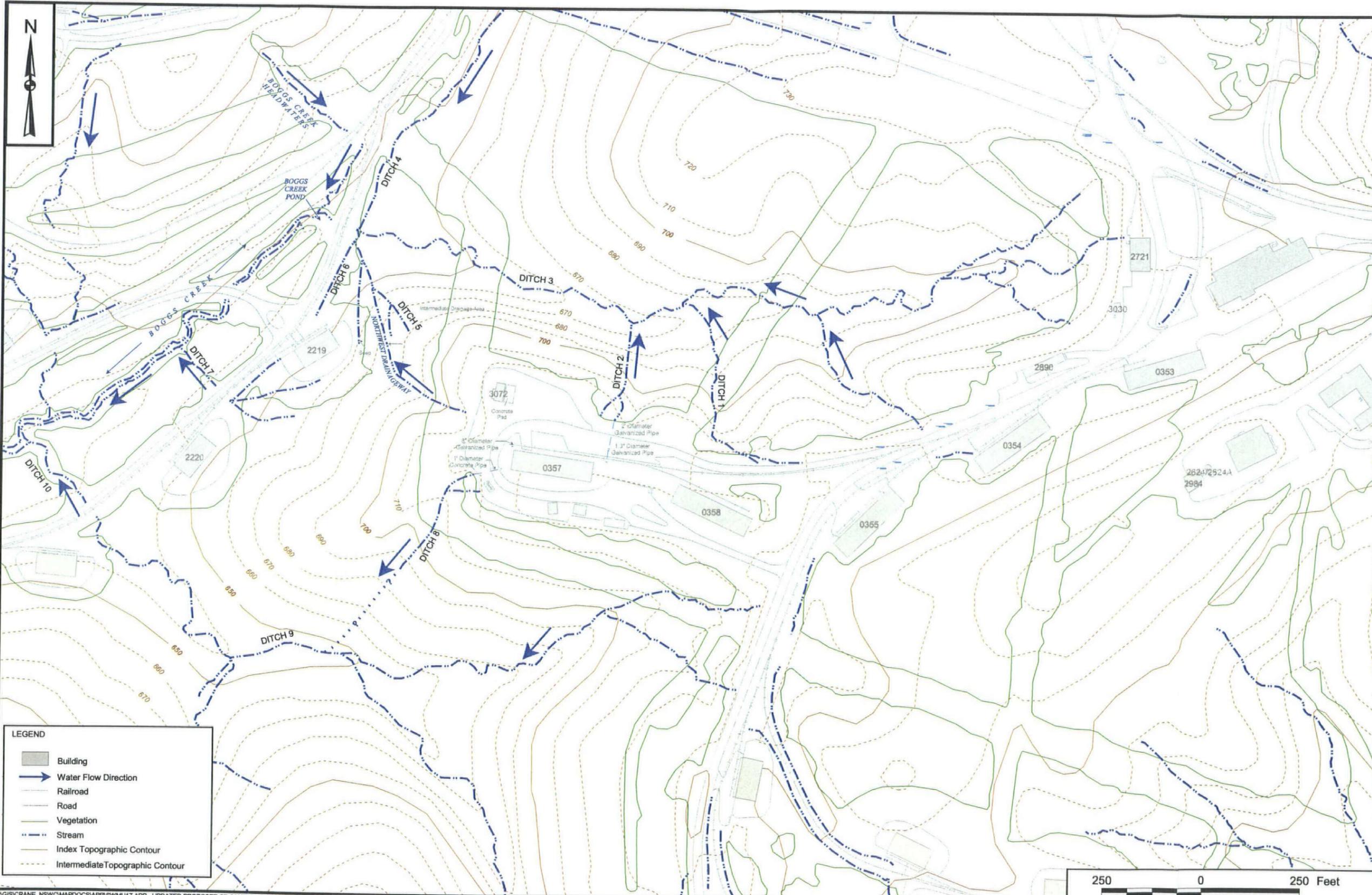
The soil and sediment sample logs from the 2005 and 2006 field investigations are provided in Appendix A. The analytical results from the 2005 and 2006 field investigations are summarized in Appendix B.

2.3 EXTENT OF CONTAMINATION

The 2004 IM removed the majority of PCB (Aroclor-1260) contamination from the SWMU 17 capacitor burial area and pole storage yard. However, verification samples collected following the IM identified isolated areas where PCB contamination remained in the subsurface soil. In addition, as indicated by the 2005 and 2006 sediment sampling events PCB contamination is present within the sediments and soils within the drainage channel network surrounding SWMU 17 and surface and subsurface soils surrounding Buildings 0357 and 2721.

For SWMU 17, a preliminary cleanup goal, 1 mg/kg (ground surface to 2-feet bgs), has been established for the surface soil and sediments. Although this proposed cleanup goal will not remove all of the SWMU 17 PCB contamination, the goal removes human health risk and reduces ecological risk such that average concentrations meet ecological requirements. This PCB cleanup goal has been used and found acceptable by IDEM for similar cleanup operations at a nearby General Motors site and at Lower Fox River (IL) and Lake Michigan's Green Bay (WI) cleanup projects. These PCB cleanup goals also represent the Toxic Substance Control Act (TSCA) High Occupancy Standard (1 mg/kg) and the TSCA Low Occupancy Standard (25 mg/kg).

Using these PCB cleanup goals (1 mg/kg for surface soils and sediment and 25 mg/kg for subsurface soil), the extent of contamination that requires removal under this IM is identified in Figure 2-6.

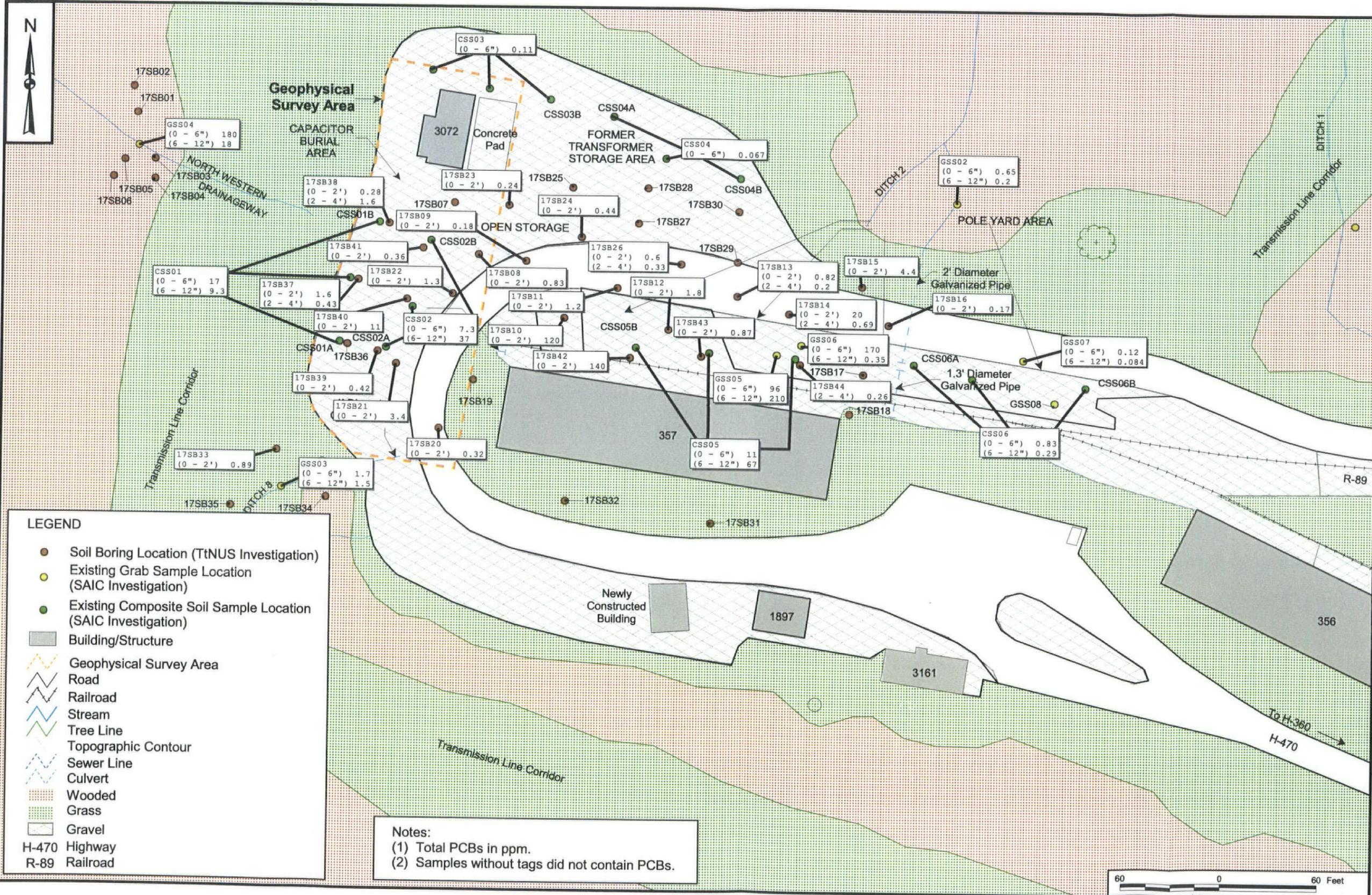


P:\GIS\CRANE_NSWC\MAPDOCS\APR\SWMU17.APR UPDATED PROPOSED SD SAMPLE LOCS LAYOUT 5/22/06 SS

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COST/SCHED-AREA			APPROVED BY	
SCALE AS NOTED			DRAWING NO. FIGURE 2-1	
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SITE LAYOUT MAP
SWMU 17 - PCB CAPACITOR BURIAL/POLE YARD
INTERIM MEASURES WORK PLAN
NSWC, CRANE
CRANE, INDIANA





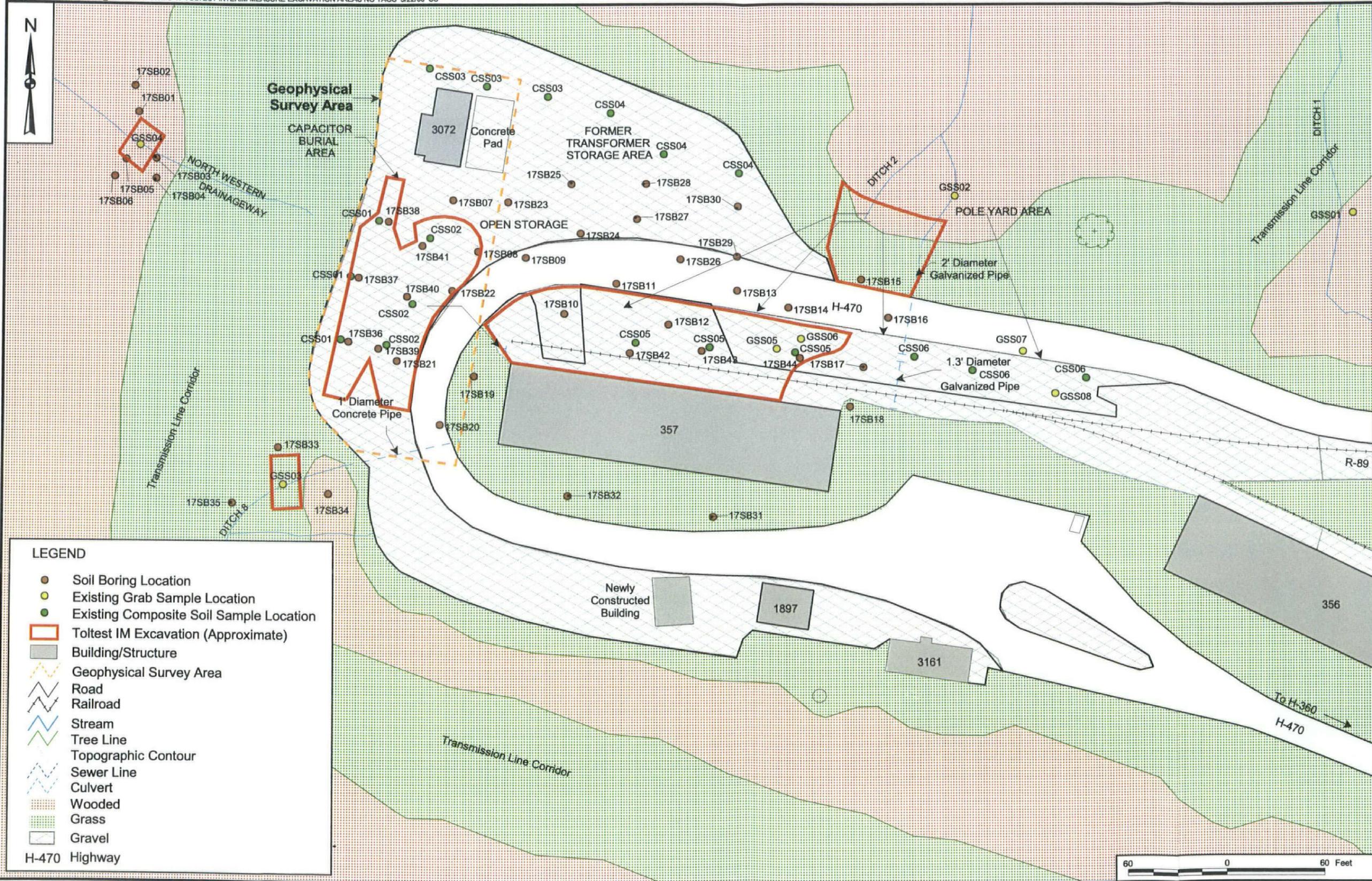
LEGEND

- Soil Boring Location (TtNUS Investigation)
- Existing Grab Sample Location (SAIC Investigation)
- Existing Composite Soil Sample Location (SAIC Investigation)
- Building/Structure
- Geophysical Survey Area
- Road
- Railroad
- Stream
- Tree Line
- Topographic Contour
- Sewer Line
- Culvert
- Wooded
- Grass
- Gravel
- H-470 Highway
- R-89 Railroad

Notes:
 (1) Total PCBs in ppm.
 (2) Samples without tags did not contain PCBs.



CONTRACT NO. 0020	APPROVED BY DATE	APPROVED BY DATE	DRAWING NO. REV FIGURE 2 - 2
PRE-2004 INTERIM MEASURES TOTAL PCB CONCENTRATIONS SWMU 17 - PCB CAPACITOR BURIAL/POLE YARD INTERIM MEASURES WORK PLAN NSWC, CRANE CRANE, INDIANA			
		SCALE AS NOTED	
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COST/SCHED-AREA		COST/SCHED-AREA	



LEGEND

- Soil Boring Location
- Existing Grab Sample Location
- Existing Composite Soil Sample Location
- Toltest IM Excavation (Approximate)
- Building/Structure
- Geophysical Survey Area
- Road
- Railroad
- Stream
- Tree Line
- Topographic Contour
- Sewer Line
- Culvert
- Wooded
- Grass
- Gravel
- H-470 Highway



CONTRACT NO. 0040	DATE	DATE
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DRAWING NO.	FIGURE 2 - 3	

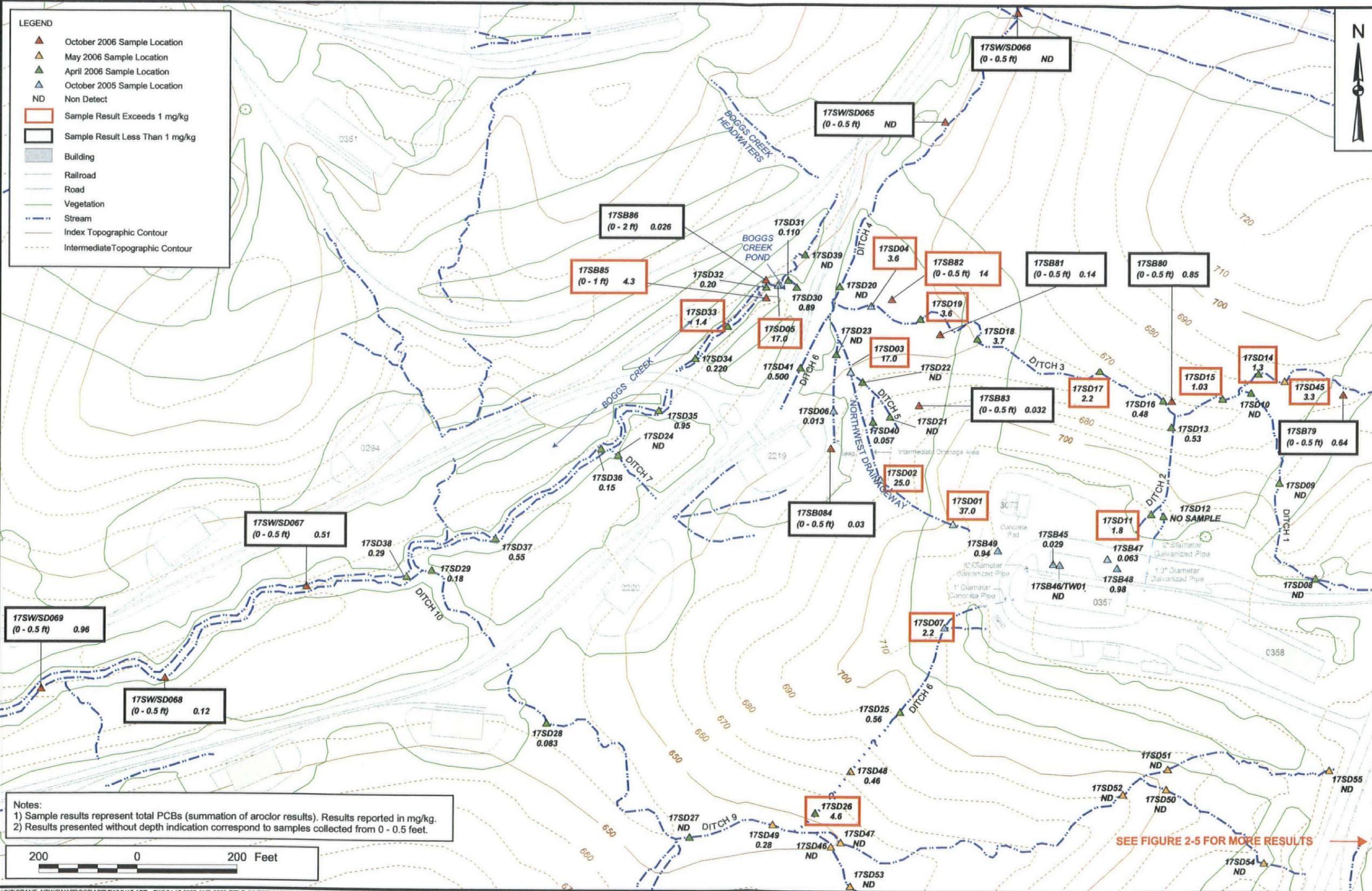
2004 INTERIM MEASURE EXCAVATION AREAS
SWMU 17 - PCB CAPACITOR BURIAL/POLE YARD
INTERIM MEASURES WORK PLAN
NSWC, CRANE
CRANE, INDIANA



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S. STROZ	5/18/06	T. SMITH	5/22/06	AS NOTED
COST/SCHED-AREA				

LEGEND

- ▲ October 2006 Sample Location
- ▲ May 2006 Sample Location
- ▲ April 2006 Sample Location
- ▲ October 2005 Sample Location
- ND Non Detect
- Sample Result Exceeds 1 mg/kg
- Sample Result Less Than 1 mg/kg
- Building
- Railroad
- Road
- Vegetation
- Stream
- Index Topographic Contour
- Intermediate Topographic Contour



Notes:
 1) Sample results represent total PCBs (summation of aroclor results). Results reported in mg/kg.
 2) Results presented without depth indication correspond to samples collected from 0 - 0.5 feet.



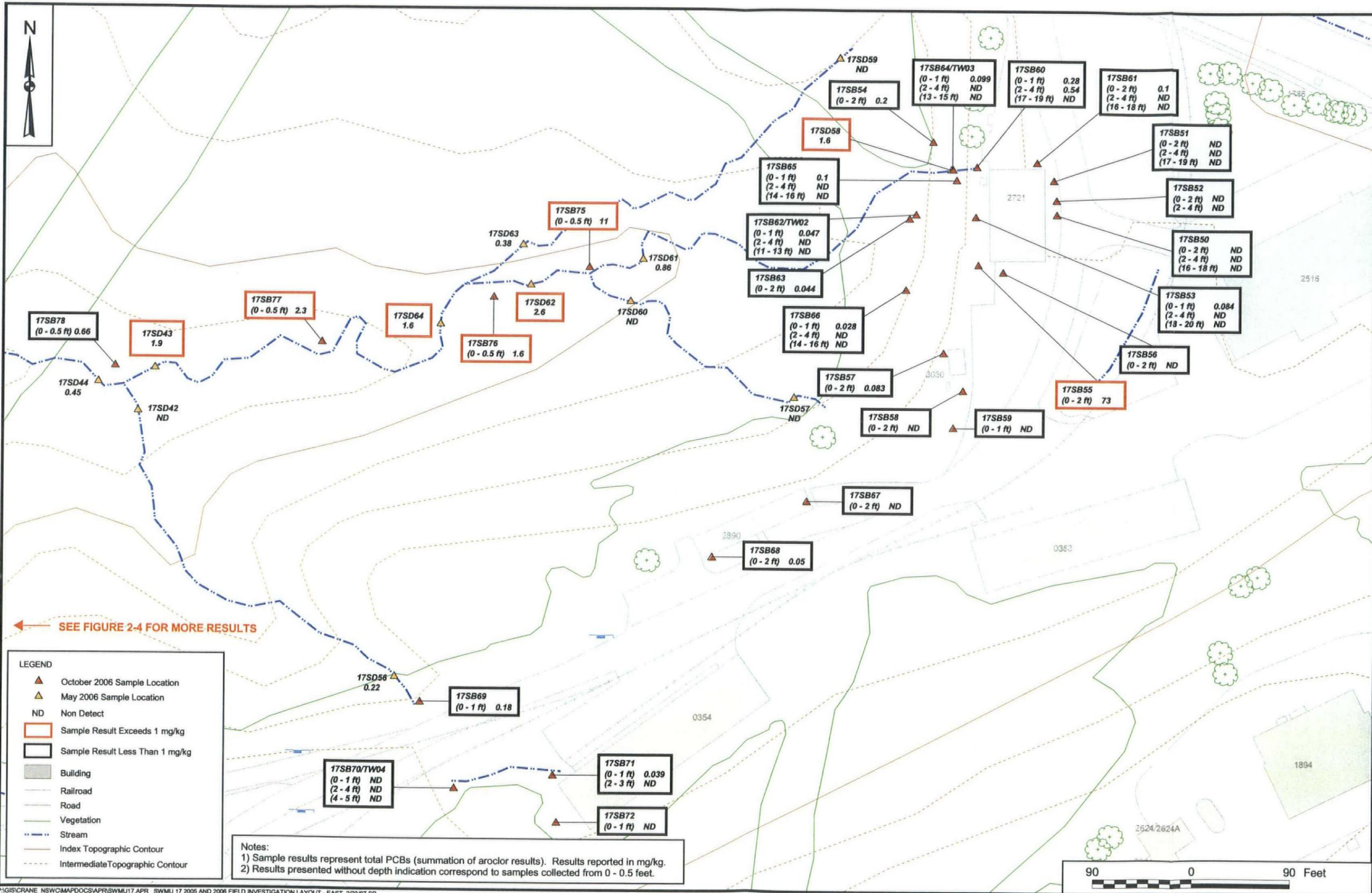
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TINUS 2005 AND 2006 FIELD INVESTIGATIONS
 SWMU 17 - PCB CAPACITOR BURIAL/POLE YARD
 INTERIM MEASURES WORK PLAN
 NSWC, CRANE
 CRANE, INDIANA



DRAWN BY	DATE	DRAWN BY	DATE
S. PAXTON	2/23/07	T. SMITH	2/23/07
CHECKED BY	COST/SCHED-AREA	SCALE	AS NOTED

SEE FIGURE 2-5 FOR MORE RESULTS

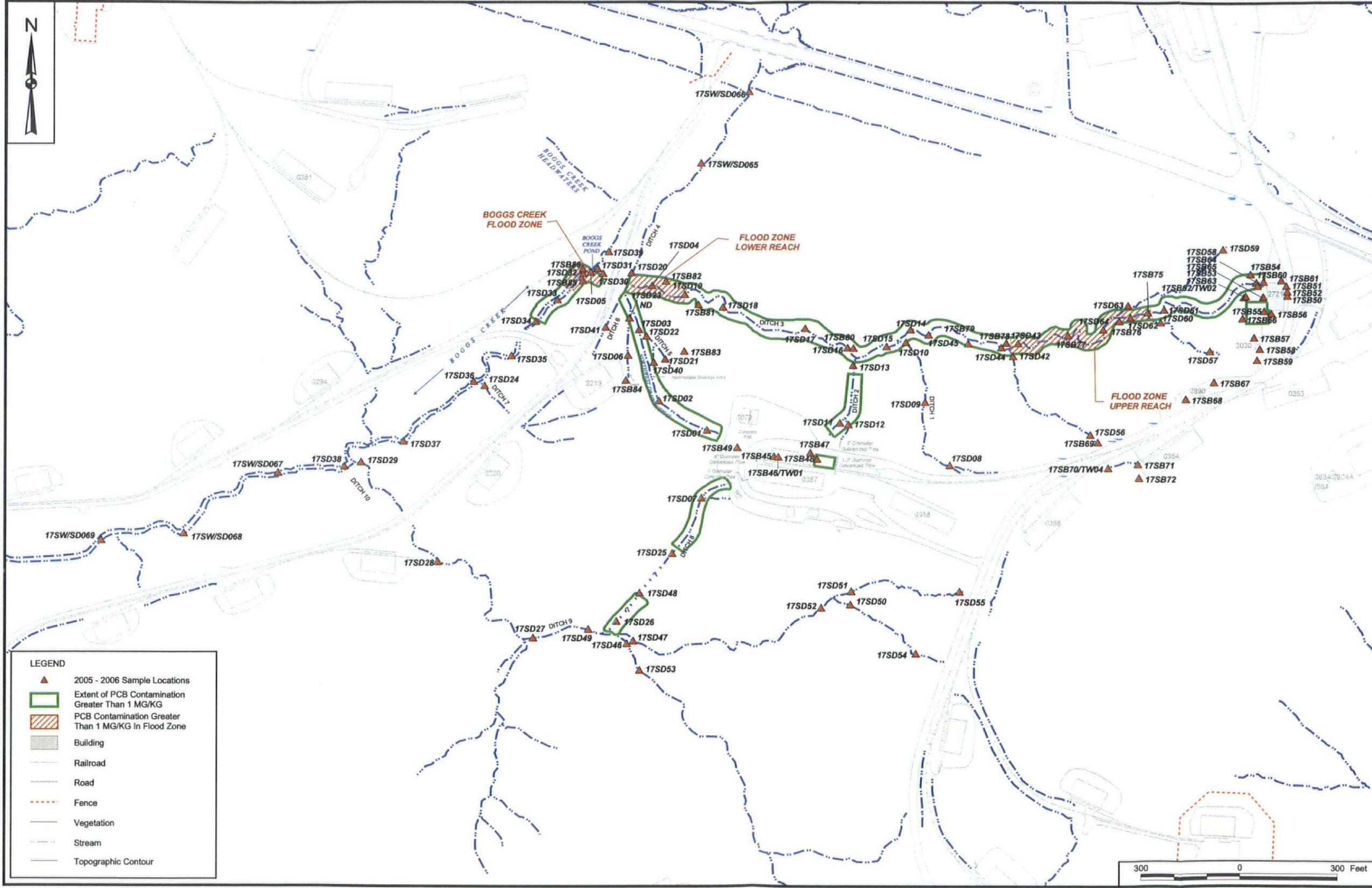


CONTRACT NO.	0020
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO.	FIGURE 2 - 5
REV	0

TINUS 2005 AND 2006 FIELD INVESTIGATIONS
 SWMU 17 - PCB CAPACITOR BURIAL/POLE YARD
 INTERIM MEASURES WORK PLAN
 NSWC, CRANE
 CRANE, INDIANA



DRAWN BY	S. PAXTON	DATE	2/23/07
CHECKED BY	T. SMITH	DATE	2/23/07
COST/SCHED-AREA			
SCALE	AS NOTED		



LEGEND

- ▲ 2005 - 2006 Sample Locations
- ▭ Extent of PCB Contamination Greater Than 1 MG/KG
- ▨ PCB Contamination Greater Than 1 MG/KG In Flood Zone
- Building
- Railroad
- Road
- - - Fence
- Vegetation
- - - Stream
- Topographic Contour

DRAWN BY S. PAXTON		DATE 2/23/07	SCALE AS NOTED	
CHECKED BY T. SMITH		DATE 2/23/07	COST/ISCHED-AREA	
EXTENT OF PCB IN SEDIMENT AND SOIL GREATER THAN 1 MG/KG SWMU 17 - PCB CAPACITOR BURIAL/POLE YARD INTERIM MEASURES WORK PLAN NSWC CRANE CRANE, INDIANA				
APPROVED BY		DATE	CONTRACT NO. 0020	
APPROVED BY		DATE	DRAWING NO. FIGURE 2 - 6	
			REV 0	



3.0 INTERIM MEASURES WORK PLAN

The intent of this IM is to remove surface soils and sediments with PCB concentrations greater than 1 mg/kg from the SWMU 17 area and the downgradient drainage channels and streams impacted by PCB contamination. The activities associated with this IMWP are intended to result in the elimination of human health risks and reduce the ecological risks to acceptable limits within the surface soils and sediments associated with SWMU 17.

3.1 DESCRIPTION OF THE INTERIM MEASURES

The IMWP specifies the removal of contaminated surface soils and sediments within and adjacent to SWMU 17. In addition, the IMWP specifies the restoration of the streams and drainageways impacted by PCB contamination and all other areas disturbed by IMWP activities. The contaminated soils and sediments to be removed have been identified as containing PCB concentrations in excess of the cleanup goal of 1 mg/kg. Specifically, Aroclor-1260 was the only PCB detected in the SWMU 17 surface soils and sediments. The volumes presented for the surface soils and sediments to be excavated are in-place, estimates. It is anticipated that these volumes will increase 5 to 10 percent after the soils and sediments are excavated and are in an unconsolidated state.

A work assignment responsibility chart (Table 3-1) identifies the responsibilities that Environmental Multiple Award Contract (EMAC) contractor, NSWC Crane, and TtNUS have in the implementation of the IMWP.

Specifically, the IMWP consists of the following major components:

- Surface Soil Excavation/Removal - An area approximately 30-feet (length) by 30-feet (width) by 2-feet (depth) near the eastern end of Building 357 contains PCB concentrations greater than 1 mg/kg. This surface soil will be excavated, characterized for disposal purposes, and transported and disposed off site. A second area approximately 50-feet (length) by 50-feet (width) by 4-feet (depth) near the southwestern corner of Building 2721 contains PCB contamination at concentrations greater than 1 mg/kg. This soil will be excavated, characterized for disposal purposes, and transported and disposed off site at an approved disposal facility. These locations of surface soil excavation are identified on Figure 3-1.

- Sediment Excavation/Removal - Sediments with PCB concentrations greater than 1 mg/kg are present within the drainage channels (1,160 linear feet of drainage channel) and streams (2,415 linear feet of stream) that collect and convey surface water runoff from SWMU 17 and the surrounding area. These sediments will be excavated/removed from the drainage channels and streams, dewatered, characterized for disposal purposes, and transported and disposed off site. The locations of the sediment excavation/removal areas are identified on Figure 3-1.
- Dewatering of Excavated/Removed Sediment - Prior to off-site disposal, sediments will be stockpiled within a dewatering pad located within the construction area. The water drained from the sediments will be containerized, filtered, characterized, and discharged to a NSWC Crane approved stabilized drainage channel. It is assumed that, following characterization, treatment will not be required and that the collected water will be discharged to a local stabilized drainage channel or the nearest NSWC Crane storm drain. It is the EMAC's responsibility to verify this assumption prior to discharging collected water. The volume of water collected through dewatering is not expected to be a large volume, unless sediment excavation/removal is performed during periods of heavy rain.
- Sampling and Analysis - Following the excavation/removal of PCB-contaminated surface soils and sediments to the specified limits, the exposed surfaces of the excavation areas will be sampled to verify contaminant removal. Where bedrock forms the excavation bottom, samples will not be collected. The Navy may require additional excavation based on the analytical results of the verification sampling. At the completion of this IM and following the removal of the support facilities (e.g., dewatering pad, decontamination pad, and material storage area), the Navy will require verification samples to confirm that the lining systems of the support facilities did not fail during the implementation of this IM. If it is determined that the lining system under any of the support facilities did fail, potentially resulting in the contamination of the soils below the support facilities, the EMAC contractor will be required to remove that contamination at their own expense. Section 5.0 presents sampling and analysis procedures.
- Off-site Disposal of Surface Soils and Sediments - Surface soils and sediments will be disposed at an off-site, NSWC Crane-approved, waste disposal facility. With the exception of the soil to be excavated from the southwestern corner of Building 2721, it is expected that the excavated sediments and soils will be disposed at a non-hazardous waste disposal facility. Verification of this assumption will be the responsibility of the EMAC contractor by conducting characterization sampling and analysis and satisfying the waste disposal facility requirements. The PCB contaminated soil within the excavation area located at the southwestern corner of Building 2721 was characterized by a

sample that has a PCB concentration of 73 mg/kg. Depending upon characterization sampling and disposal facility permitting, this material may need to be disposed of as a hazardous waste.

- **Backfilling and Restoration of Surface Soil Excavations** - After the verification of PCB-contaminated surface soil removal (removal of surface soil containing PCB concentrations greater than 1 mg/kg) near the eastern end of Building 357, the excavated areas will be backfilled and regraded to the level of surrounding grades. In addition, the backfilled area will be restored to pre-construction conditions using permanent stabilization practices by covering the backfilled area with gravel and, where appropriate, vegetation.
- **Backfilling and Restoration of Drainage Channels and Streams** - After the verification of PCB-contaminated sediment removal (removal of sediment containing PCB concentrations greater than 1 mg/kg), the drainage channels and streams will be backfilled to pre-construction conditions and restored using stabilization practices that include use of gravels and vegetation.

3.2 PERFORMANCE STANDARDS

For the purposes of defining the excavation areas and performance standards associated with each excavation area presented on Figure 3-1, the following is a summary of the excavation areas shown on Figure 3-1 and the associated performance standards for that excavation area.

Excavation Location Identification	Performance Standards for Excavation/Restoration
Surface Soil Area 1	Surface Soil Excavation/Restoration near Building 0357
Surface Soil Area 2	Surface Soil Excavation/Restoration near Building 2721
Northwest Drainageway	Drainage Channel Excavation/Restoration
Ditch 8	Drainage Channel Excavation/Restoration
Ditch 2	Drainage Channel Excavation/Restoration
Ditch 3	Stream Excavation/Restoration
Boggs Creek/Boggs Creek Pond	Stream Excavation/Restoration

Performance standards for the IMWP are presented in the following sections.

Surface Soil Excavation

Surface soils excavated from SWMU 17 near Building 0357 is identified as having PCB concentrations greater than 1 mg/kg. This soil will be removed, characterized, and disposed at an approved off-site non-hazardous waste disposal facility. Surface soil excavated from the southwestern corner of Building 2721

is identified as having PCB concentrations greater than 1 mg/kg (excavation defined by a detection of Aroclor 1260 at a concentration of 73 mg/kg). This soil will be removed, characterized, and disposed at an approved off-site non-hazardous waste disposal facility (based on assumption that disposal characterization sampling identifies PCBs and concentrations less than 50 mg/kg). Excavated surface soils will be placed in approved waste hauling containers (e.g., roll-off boxes) staged adjacent to the surface soil excavation area. Surface Soil Area 1 located at the northeastern end of Building 357 is represented by a sample collected from sample location 17SS09 (collected during the 2004 IM activities). The planned initial excavation at this location measures 30 feet by 30 feet by 2 feet bgs for an approximate excavation volume of 70 cubic yards soils. Surface Soil Area 2 located at the southwestern corner of Building 2721 is represented by sample 17SS550002 that was collected during the October 2006 TtNUS RFI sample event. The planned initial excavation at this location measures 50 feet by 50 feet by 4 feet bgs for an approximate excavation volume of 370 cubic yards. The initial surface soil excavation limits are shown on Figure 3-1, and the volume calculations are provided in Appendix C.

Surface soils that accumulate in the erosion and sediment control devices (see Section 4.0) prior to verification that all contaminated surface soils have been removed from the surface soil excavation areas, will be disposed off site along with the excavated contaminated surface soils. Following verification of contaminant removal, surface soils that accumulated in the erosion and sediment control devices will be placed in the excavation as backfill material or spread across the disturbed ground surface.

Drainage Channel Excavation

All sediments excavated from SWMU 17 drainage channel excavation areas that are identified as having PCB concentrations greater than the 1 mg/kg will be removed, characterized, and disposed at an approved off-site non-hazardous waste disposal facility. Excavated sediments will be placed in a small off-road dump truck with a sealed tail-gate to prevent the loss of sediment while the material is transported to a dewatering pad. The excavated sediments will gravity-drain within the dewatering pad prior to off-site transport and disposal. Drainage channel excavation will occur in the Northwest Drainageway, Ditch 8, and Ditch 2. The planned initial drainage channel excavation limits are located on the northern, western, and southwestern sides of Building 0357. The extent of excavation in each drainage channel is defined by sediment sample analytical results that indicate PCB concentrations greater than 1 mg/kg and PCB concentrations less than 1 mg/kg. These samples were collected from the following locations:

- Northern Drainageway – 17SD01, 17SD02, and 17SD03
- Ditch 8 – 17SD07, 17SD25, 17SD26, and 17SD48
- Ditch 2 – 17SD11 and 17SD13

The volume of sediment to be removed from each of the drainage channels is based on the average thickness of sediment overlying consolidated soils, average width of the drainage channel (base width plus height of channel banks), and length of exaction in each channel. The extent of excavation in each drainage channel is identified on Figure 3-1. The calculations for volume of excavated sediment from the drainage channels are provided in Appendix C. The initial average dimensions of excavation for each drainage channel are summarized below;

Drainage Channel	Avg. Sediment Thickness	Avg. Channel Width	Channel Length	Volume of Sediment
Northern Drainageway	6 inches	10 feet	570 feet	106 cubic yards
Ditch 8	5.5 inches	3.95 feet	390 feet	26 cubic yards
Ditch 2	6 inches	12.5 feet	200 feet	46 cubic yards
Total Volume of Sediment Excavated from Drainage Channels				178 cubic yards

Based on the depth and the confines of the excavation within the drainage channels it is assumed that these areas will be overexcavated. This overexcavation is assumed to increase the excavated volume by approximately 30 percent. Therefore, the total volume of sediment removed from the drainage channels is expected to be 230 cubic yards.

Man-made materials (concrete, lumber, etc.) will be found within the drainage channel excavation area. This material will be cleaned of adhering sediments and stockpiled for off-site disposal as construction debris. The volume of man-made material to be removed from the drainage channel excavation areas is approximated at 5 cubic yards. In addition, large rocks that have an average nominal diameter of 9-inches or more will be found throughout the length of the drainage channels. These rocks will be removed, cleaned of adhering sediments, and placed along the side of the drainage channels (out of the way of construction activities) in the general vicinity from where they were removed so that they can be placed back in the drainage channels during drainage channel restoration activities.

Sediment that accumulates in erosion and sediment control devices (see Section 4.0) prior to verification that all contaminated sediment within the associated drainage channel has been removed will be disposed off site along with the excavated contaminated sediments. Following verification of contaminant removal,

sediments that accumulate in the erosion and sediment control devices will be used to restore the drainage channel or spread across the disturbed ground surface of the drainage channel excavation.

Because the excavation of contaminated sediments from the drainage channels will occur in wooded areas, the dewatering pad (stockpile location) will be located away from the excavation area. To minimize the impact to the wooded areas in which excavation will occur, biodegradable temporary access trails (woodchip/mulch) will be used instead of temporary gravel access roads. The EMAC contractor will ensure that the temporary access trails are not contaminated with excavated sediment. In the event that the EMAC contractor spills excavated sediments on a temporary access trail, the EMAC contractor will be responsible for removing the contaminated sediments along with the impacted surface soils, verify that all contaminated materials have been removed, and dispose of that material at their own expense.

Stream Excavation

All sediments excavated from SWMU 17 stream excavation areas that are identified as having PCB concentrations greater than 1 mg/kg will be removed, characterized, and disposed at an approved off-site non-hazardous waste disposal facility. Excavated sediments will be placed in a small off-road dump truck with a sealed tail-gate to prevent the loss of sediment while the material is transported to a dewatering pad. The excavated sediments will gravity-drain within the dewatering pad prior to off-site transport and disposal. Stream excavation will occur in Boggs Creek, Boggs Creek Pond, and Ditch 3. The extent of excavation in each stream is defined by sediment sample analytical results that indicate PCB concentrations greater than 1 mg/kg and PCB concentrations less than 1 mg/kg. These samples were collected from the following locations:

- Boggs Creek / Pond - 17SD05, 17SD32, 17SD33, and 17SD34
- Ditch 3 – 17SD04, 17SD30, 17SD19, 17SD18, 17SD17, 17SD15, 17SD14, 17SD45, 17SD44, 17SD43, 17SD64, 17SD62, 17SD61, and 17SD58

In addition to these sediment samples, in October 2006 surface soil samples were collected along the streams identified as Ditch 3 and Boggs Creek, approximately 10 feet off of the stream bank in areas subject to flooding. These samples were collected in areas that receive flood waters from the associated stream to determine if PCB contamination has migrated beyond the stream channel during high water conditions. These samples identified five locations along Ditch 3 and Boggs Creek where PCB contamination at concentrations greater than 1 mg/kg were detected outside the banks of the streams within the flood zones. These samples were collected from the following locations:

- Boggs Creek/Pond - 17SB85
- Ditch 3 Upper Reach - 17SB75, 17SB76, and 17SB77
- Ditch 3 Lower Reach - 17SB82

The volume of sediment to be removed from each of the streams is based on the average thickness of sediment overlying bedrock, average width of the drainage channel (base width plus height of channel banks), and length of exaction in each channel. The volume of soil to be removed from each of the flood zones is based on the distance from the channel of the representing sample location plus 5 feet, the estimated length of the flood zone, and an excavation depth of 1 foot. The extent of excavation is identified on Figure 3-1. The calculations for volume of excavated sediment and soil from the streams and flood zones are provided in Appendix C. The initial average dimensions of excavation for each stream are summarized below;

Stream	Avg. Sediment Thickness	Avg. Stream Width	Stream Length	Volume of Sediment
Boggs Creek/Pond	5.5 inches	11.3 feet	240 feet	46 cubic yards
Ditch 3 (Upper Reach)	4.3 inches	6.3 feet	480 feet	40 cubic yards
Ditch 3 (Lower Reach)	4.4 inches	13.0 feet	1,695 feet	300 cubic yards
Flood Zones Boggs Creek/Pond	12 inches	15 feet	20 feet	11 cubic yards
Flood Zone Lower Reach	12 inches	15feet	200 feet	111 cubic yards
Flood Zone Upper Reach	12 inches	10 feet	540 feet	200 cubic yards
Total Volume of Sediment Excavated from Stream				721 cubic yards

Based on the depth and the confines of the excavation within the streams, it is expected that the areas will be overexcavated or expanded in flood zones. This overexcavation is assumed to increase the excavated volume by approximately 30 percent. Therefore, the total volume of sediment removed from the streams is expected to be 940 cubic yards.

Man-made materials (concrete, lumber, etc.) will be found within the stream excavation area. This material will be cleaned of adhering sediments and stockpiled for off-site disposal as construction debris. The volume of man-made material to be removed from the stream excavation areas is approximated at 10 cubic yards. In addition, large rocks that have an average nominal diameter of 9-inches or more should be removed, cleaned of adhering sediments, and placed along the side of the stream (out of the

way of construction activities) in the general vicinity from where they were removed so that they can be placed back in the streams during drainage channel restoration activities.

Sediment that accumulates in erosion and sediment control devices (see Section 4.0) prior to verification that all contaminated sediments have been removed from the stream will be disposed off-site along with the contaminated sediments. Following verification of contaminant removal, sediments that accumulate in the erosion and sediment control devices will be used to restore the stream or spread across the disturbed ground surface of the stream excavation.

Because the excavation of contaminated sediments from the streams will occur in wooded areas, the dewatering pad (stockpile location) will be located away from the excavation area. To minimize the impact to the wooded areas in which excavation will occur, biodegradable temporary access trails (woodchip/mulch) will be used instead of temporary gravel access roads. The EMAC contractor will ensure that the temporary access trails are not contaminated with excavated sediment. In the event that the EMAC contractor spills excavated sediments on a temporary access trail, the EMAC contractor will be responsible for removing the contaminated sediments along with the impacted surface soils, verify that all contaminated materials have been removed, and dispose of that material at their own expense.

Dewatering

Excavated sediments will be placed on the dewatering pad at a lift thickness no greater than 3 feet and allowed to drain by gravity. Following dewatering, the EMAC contractor will collect the required disposal characterization samples and mix the sediment lift to promote additional dewatering. It is estimated that following the second day of dewatering, the moisture content of the sediments will have been sufficiently reduced and the sediment will not require the addition of an absorbent agent to be suitable for transportation and disposal.

Because of the tendency of PCBs to bond with sediment and not be soluble, water removed from sediment within the dewatering pad is not expected to contain PCB contamination. Therefore, the water will not require treatment and following filtration will be discharged to an approved stabilized drainage channel or storm drain. The EMAC contractor will collect an initial characterization sample of the filtered water to verify this assumption.

Sampling and Analysis

Verification samples will be collected from the excavated areas to ensure that no PCB contamination remains at concentrations greater than the 1 mg/kg cleanup goal. In addition, verification samples will be collected from the surface soil below the decontamination pad, material storage area, dewatering pad, and temporary access trails. Additional excavation may or may not be required based on the results of this verification sampling. Verification sampling and analysis procedures are provided in Section 5.0.

Disposal

Excavated surface soils and sediments will be sampled and analyzed for waste disposal characterization using the methods required by the NSWC Crane-approved waste disposal facility. The soils and sediments will be sampled following the dewatering process. The EMAC contractor is responsible for satisfying all disposal requirements of the selected disposal facility. The following is a summary of the volumes expected to be disposed off-site.

Locations	Non-Hazardous
Surface Soils	440 cubic yards
Sediments from Drainage Channels	230 cubic yards
Sediments from Streams and Flood Zones	940 cubic yards
Total Off-site Disposal Volume	1510 cubic yards

Backfilling

Surface soil, drainage channel, and stream excavation areas will be backfilled to pre-construction conditions. The backfill soil obtained from an off-site borrow source will have properties similar to the native SWMU 17 surface soils and sediments. These soils will be subject to analytical testing to assure that the material satisfies the following requirements:

- Total petroleum hydrocarbon, diesel range organics, EPA SW-845 8015M DRO - less than 1 part per million (ppm)
- Total petroleum hydrocarbon, gasoline range organics, EPA SW-845 8015M GRO - less than 1 ppm
- Sum of benzene, toluene, ethylbenzene, and xylenes, EPA SW-846 5030 / 8021 - less than 1 ppm

- Characteristic waste determination (ignitability, corrosivity, reactivity, and toxicity), EPA SW-846 1311 - shall not fail the test for characteristic waste
- Total PCB, EPA SW-846 8082 - less than 1 ppm.

Additionally, the backfill material shall meet the following physical characteristics for each of the three excavation areas.

Surface Soil Excavation Backfill - Backfill soil for the surface soil excavation area will be placed in 1-foot thick lifts and compacted by track-walking across the backfilled area with a track-type equipment. The backfill material shall meet the following physical characteristics:

- ASTM D 2487, Classifications GW, GP, GM, SW, SP, or SM
- ASTM D 4318, Liquid limit, 35 maximum
- ASTM D 4318, Plasticity index, 12 maximum
- Maximum of 25 percent by weight passing ASTM D 1140, No. 200 sieve
- Maximum particle size of 1 inch

The existing surface in the surface soil excavation area, is gravel. Therefore, the topmost 6 inches of the backfill will be a AASHTO No. 7 stone that is compacted using a smooth drum roller or equivalent.

Drainage Channel and Stream Excavation Backfill - Backfill soil for the drainage channel and stream excavation areas will be placed and compacted by track-walking across the backfilled area with a track-type tractor or equivalent. The backfill material placed on the drainage channel and stream side slopes, shall meet the following physical characteristics:

- ASTM D 2487, Classifications GW, GP, GM, SW, SP, or SM
- ASTM D 4318, Liquid limit, 35 maximum
- ASTM D 4318, Plasticity index, 12 maximum
- Maximum of 25 percent by weight passing ASTM D 1140, No. 200 sieve
- Maximum particle size of 2 inches

The backfill material to be used to re-establish the drainage channel and stream beds will satisfy the Indiana Department of Transportation (IDOT) requirements for bank-run sands and gravel.

Large rocks that were removed from the drainage channels and streams, cleaned, and saved during excavation activities will be used to help re-establish the drainage channels and streams at the general locations from where they were removed.

Restoration

The disturbed areas that are backfilled and regraded as part of the IMWP implementation will be restored/stabilized using permanent stabilization practices. Restoration will consist of surface preparation, fertilizing, seeding, mulching, and stream restoration, where appropriate. Seeding procedures and procedures for associated activities (fertilizing and mulching) are presented in detail in Section 4.4. The following paragraphs describe the restoration activities to be performed at each of the three types of excavation areas.

Surface Soil and Flood Zone Excavation Area Restoration – The restoration associated with the surface soil and flood zone excavation area includes the preparation of gravel and vegetation surfaces. The EMAC contractor will identify the areas that require gravel and vegetation surfaces prior to excavation.

Drainage Channel Excavation Area Restoration – The restoration activities associated with the drainage channel excavation areas include seeding and placing bank-run sands and gravels and large rocks removed during excavation. The upper reaches of the drainage channels to be excavated are grass-lined and are lined with sands and gravels in the drainage channel lower reaches. The EMAC contractor will identify these transitions prior to excavation and restore the drainage channels to pre-construction conditions.

Stream Excavation Area Restoration – The restoration activities associated with the stream excavation areas include seeding and placing bank-run sands and gravels and large rocks removed during excavation. Seeding will be performed on the banks of the excavated streams, and sands, gravels, and rocks will be placed within the stream bed. The EMAC contractor will identify stream conditions and take photographs of natural pools, locations of natural aquatic features, and locations of stream bed transitions from grass lined to sand and gravel lined prior to excavation and restore the disturbed stream sections to pre-construction conditions, including pre-construction alignment and pre-construction aquatic features.

Erosion and Sediment Control

Before excavation activities begin, erosion and sediment controls will be established to prevent impacts to surface water bodies downgradient of the disturbance areas, namely Boggs Creek (see Section 4.0).

During excavation, backfilling, and restoration operations and until vegetation is established, the erosion and sediment controls will be regularly inspected and maintained. Erosion and sediment control requirements to be complied with during IMWP implementation include the Indiana Handbook for Erosion Control in Developing Areas (IDEM, 1992).

Gravel Construction Entrance

Ingress to and egress from the disturbed areas will be controlled using a gravel construction entrance, which is described in detail in Section 4.0. The EMAC contractor is required to minimize the amount of disturbance to the wooded areas where excavation activities will be performed. This requirement may result in the use of several temporary access trails. If this is the case, the EMAC contractor will be required to have a gravel construction entrance at the end of each temporary access trail that connects to NSWC Crane facility roads.

Decontamination Pad

A temporary decontamination pad will be set up to clean equipment used to excavate and transport contaminated soils and sediments. The pad will be sized to accommodate all the equipment to be used at the site and will be constructed in a manner that contains all the contaminated materials removed from equipment and the liquids used to clean the equipment. Contaminated materials removed from the equipment will be disposed off-site with the excavated sediment and soil. Wash water will be filtered and discharged to the NSWC Crane sanitary sewer system. Additional decontamination pad requirements are discussed in Section 4.5. Care will be taken to keep off-road transport equipment clean to minimize the spread of contaminated soils and sediments to areas adjacent to the excavations or the temporary access trails. Any soil or sediment removal from these areas and the associated disposal and restoration costs will be the responsibility of the EMAC contractor.

Dewatering Pad

A temporary dewatering pad will be set up to dewater sediments excavated from the drainage channels and streams. The dewatering pad will be sized to accommodate excavated sediments and loading equipment as necessary. The dewatering pad will be constructed in such a manner that will retain all materials. The dewatering pad will be constructed in a manner that will allow the water that drains by gravity from the sediment to be collected in a sump. The water will then be filtered to remove any remaining sediments. Following the filtering of the water, and if approved by the Officer in Charge of Construction (OICC), the filtered water will be discharged to a NSWC Crane approved stabilized drainage channel or storm drain. In addition, the dewatering pad will be constructed to allow for the loading of

trucks that will be used to transport the excavated sediments to the NSWC Crane-approved off-site disposal facility. Additional dewatering pad requirements are discussed in Section 4.5.

Clearing

Clearing will be performed only within the limits of disturbance shown on Figure 3-1. Clearing activities will be kept to a minimum to minimize impacts to natural habitat. Cleared vegetation will be chipped and used for the temporary access trails. Standing trees will not be removed between April 15 and September 15 to comply with Indiana bat regulations, which are further addressed Section 3.5.2.

Temporary Access Trails

Temporary access trails will be constructed with chipped vegetation obtained during clearing operations and wood chips and/or mulch material obtained from an off-site borrow source. The temporary access trails will not be constructed of gravel and will be left in place following the completion of this IM.

3.3 SEQUENCE OF IMWP IMPLEMENTATION

The time required to perform the proposed IMWP activities at the site is estimated to be approximately 10 weeks. The generalized sequence of construction activities is presented below. This sequence of construction is subject to change based on the EMAC contractor's Work Plan.

1. Hold a pre-IMWP implementation meeting with the NSWC Crane OICC, Contracting Officer, EMAC contractor, and TtNUS representative, at a minimum.
2. Inspect SWMU 17 to verify existing site conditions and overhead and underground utility locations, and obtain all required permits as detailed in Table 3-1.
3. Install perimeter controls for the gravel construction entrance(s) and construct the gravel construction entrance(s). Install the remaining perimeter controls as indicated in the Erosion and Sediment Control Plan (Section 4.0).
4. Clear areas for support features including, but not limited to, the decontamination pad, dewatering pad, and materials storage area. Construct the support features.
5. Excavate sediment material from the drainage channel excavation areas beginning at the uppermost reaches of required excavation and continuing excavation in the direction of drainage channel flow.

TtNUS will collect verification samples as identified in Section 5.0 of this IMWP. Perform additional excavation if required by the OICC. Following verification of contaminated sediment removal, restore the drainage channels as required. Allow excavated sediments placed in the dewatering pad to dewater by gravity, mixing excavated sediments daily to promote additional dewatering. Following dewatering, collect disposal characterization samples from the dewatered sediment. Following disposal characterization, load and transport sediment to the NSWC Crane-approved off-site disposal facility. During excavation, maintain erosion and sediment controls.

6. Excavate sediment and soil material from the stream and flood zone excavation areas beginning at the uppermost reaches of required excavation and continuing excavation in the direction of stream flow. TtNUS will collect verification samples as identified in Section 5.0 of this IMWP. Perform additional excavation if required by the OICC. Following verification of contaminated sediment removal, restore the disturbed streams as required. Allow excavated sediments placed in the dewatering pad to dewater by gravity mixing excavated sediments daily to promote additional dewatering. Following dewatering, collect disposal characterization samples from the dewatered sediment. Following disposal characterization, load and transport sediment to the NSWC Crane-approved off-site disposal facility. During excavation, maintain all erosion and sediment controls.
7. Excavate surface soil from the surface soil excavation areas. TtNUS will collect verification samples as identified in Section 5.0 of this IMWP. Perform additional excavation, if required by the OICC. Following verification of contaminated surface soil removal, restore the disturbed excavation area as required. Following excavation, collect disposal characterization samples from excavated soils. Following disposal characterization, load and transport surface soil to the NSWC Crane-approved off-site disposal facility.
8. Following transportation and disposal of all excavated surface soil and sediments, remove the dewatering pad, decontamination pad, and materials storage area, and collect verification samples from within the footprint of the support features and from the temporary access trails as described in Section 5.0. Following verification that the temporary access trails and the ground below the support features was not impacted by construction activities, regrade as necessary and establish permanent stabilization.
9. Following permanent stabilization of all disturbed areas, and with the approval of the OICC, remove all remaining perimeter controls and immediately stabilize all remaining disturbed areas.

3.4 STORMWATER POLLUTION PREVENTION

The SWMU 17 ground surface hydrology, grading, and cover will not be altered due to IMWP implementation activities. Pre- and post-development runoff from the limits of disturbance will be the same; therefore, additional stormwater detention capacity is not required.

The disturbed area will be approximately 8.8 acres; therefore, an IDEM Storm Water General Permit is required (stormwater permits are required for disturbances greater than 1 acre). In addition, because IM activities include working in and around a water course, the IDEM 401 Permit and Department of Natural Resources (DNR) Construction in Floodway Permit are required (refer to Table 3-1). Additionally, IMWP implementation activities require the use of best management practices for erosion and sediment control and stormwater pollution prevention as described in Section 4.0.

3.5 OTHER IMWP IMPLEMENTATION REQUIREMENTS

3.5.1 Utilities

The EMAC contractor is required to verify all utility locations and adequately protect any utilities located in the active work areas before any earth-disturbing activities begin.

Potable water for project personnel and equipment decontamination will be provided by NSWC Crane.

3.5.2 Protection of Natural Resources

Threatened and endangered species or species of special concern protected under Indiana or Federal regulations exist or may exist in SWMU 17 and will therefore be protected. Protected bird species that may use SWMU 17 as part of their home ranges include the bald eagle, osprey, sharp-shinned hawk, red-shouldered hawk, broad-winged hawk, black and white warbler, hooded warbler, and the worm-eating warbler (B&RE, 1997). Also, the Indiana bat, a federal endangered species, is known to forage at NSWC Crane. During the spring and summer, Indiana bats roost in trees and forage for insects primarily in riparian and upland forests. The most important characteristic of roost trees is thought to be structural-exfoliating bark with space for bats to roost between the bark and the bole of the tree. To a limited extent, tree cavities and crevices are also used for roosting.

In 1997, NSWC Crane received a letter from the United States Fish and Wildlife Service (USFWS) stating that, in their opinion, NSWC Crane had an abundance of Indiana bat habitat and that any activity that would result in the clearing of woody vegetation may affect the Indiana bat and would require consultation

under the Endangered Species Act (ESA). The USFWS recommended interim guidelines for protecting Indiana bats and their habitat from silvicultural activities, and these recommendations were immediately implemented by NSWC Crane under the timber management program.

Because of the Indiana bat and its potential habitat, the cutting of trees at NSWC Crane is restricted to certain times during the year, and the cutting of shagbark hickory trees (potential Indiana bat habitat) is prohibited. A summary of Indiana bat-related restrictions prepared by the NSWC Crane Natural Resources Office (i.e., "bat primer") is as follows:

- Woody vegetation that is 5 inches in diameter or greater at 4.5 feet above the ground surface may not be removed between April 15 and September 15.
- Standing dead trees may not be removed between April 15 and September 15.
- Timber harvesting may occur between September 15 and April 15 without a case-by-case consultation provided the interim guidelines for silvicultural treatment issued to the NSWC Crane Natural Resources Office by the USFWS are followed.
- During emergency situations, necessary and prudent tree removal is allowed at all times without consultation.
- Tree removal from residential settings and industrial areas for safety reasons is allowed between September 15 and April 15 without further consultation. This includes tree trimming.
- Tree removal within 25 feet of railroad tracks and within 50 feet of explosive storage and explosive operating buildings is allowed between September 15 and April 15 without further consultation.
- Brush clearing of woody vegetation less than 3 inches in diameter at 4.5 feet above the ground may occur at any time of the year without consultation.
- All other tree removal or clearing projects not covered above must be submitted to the USFWS for informal consultation on a case-by-case basis.

3.5.3 Traffic Control Plan

Access to NSWC Crane is via four gates: the Main Gate referred to as the Bloomington Gate (Gate House No. 1) in the north, Burns City Gate (Gate House No. 2) in the west, Bedford Gate (Gate House No. 3) in the east, and Crane Gate (Gate house No. 4) in the northwest. NSWC Crane will be accessed by the EMAC contractor only through the Crane Gate. All vehicles will pass through the Crane Gate via the traffic routing plan shown on Figure 3-2. The EMAC contractor is not permitted to travel within restricted areas of the facility. All waste hauling vehicles will be weighed upon arrival and at time of departure using the certified weight scale located at the Defense Reutilization and Marketing Office (DRMO) (Building 1940). The DRMO scale is operated during normal business hours, and weight tickets are available. The DRMO scale is the preferred scale for contractors' use. Alternatively, the Army scale (Building 2913) may be used. The Army scale is no longer manned and weight tickets are not available. However, a weight readout is available at the Army scale.

3.5.4 EMAC Contractor Requirements

The EMAC contractor will be required to perform all IMWP implementation activities in accordance with the EMAC Basic Contract, NSWC Crane Contractor's Operations Manual (NSWC Crane, 2002), and supplemental specifications provided in Appendix D.

The IWMP will be implemented by the EMAC contractor, NSWC Crane, and TtNUS, with work assignments summarized on Table 3-1.

3.6 IMPLEMENTATION

The EMAC contractor will coordinate all field work through the OICC.

IMWP implementation may be impacted by NSWC Crane activities and the facility's "Protective Measures". NSWC Crane will implement a corresponding set of "Protective Measures" based on the warnings provided by the Homeland Security Advisory System in the form of graduated "Threat Conditions." The EMAC contractor will be subject to any implemented "Protective Measures."

The Navy will provide a full-time oversight representative during IMWP implementation.

TABLE 3-1

**WORK ASSIGNMENT RESPONSIBILITY CHART
INTERIM MEASURES WORK PLAN SWMU 17 – PCB CAPACITOR BURIAL/POLE YARD
NSWC CRANE
CRANE, INDIANA**

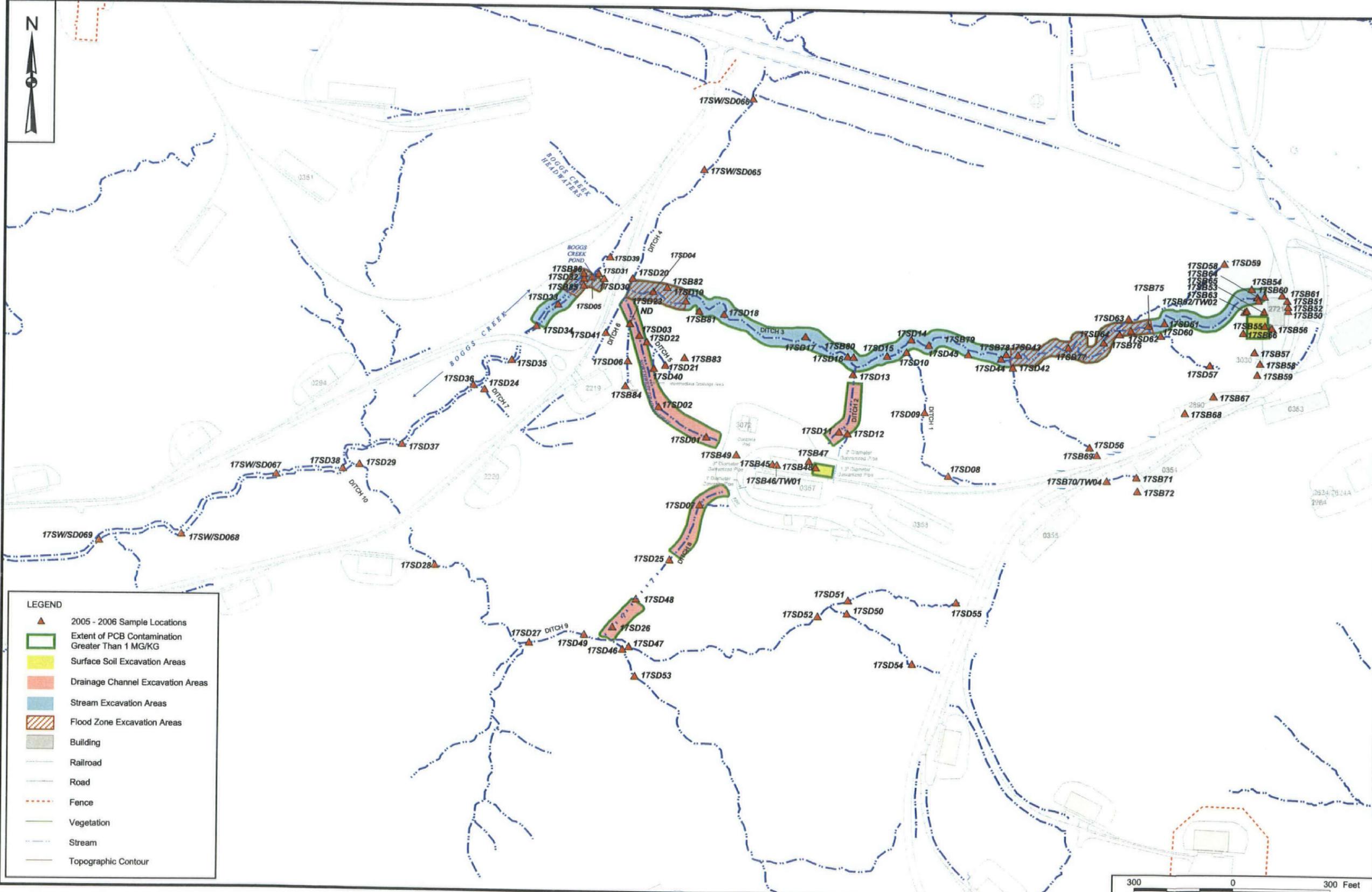
WORK ITEM	EMAC CONTRACTOR	NSWC CRANE	TtNUS
Pre-IMWP Implementation Meeting	X	X	X
Interim Measure Implementation	X		
EMAC Contractor Work Plan ⁽¹⁾	X		
Site Specific Health and Safety Plan / Activity Hazard Analysis	X		
Project Quality Control Plan	X		
Environmental Conditions Report	(2)		X
Permits			
- Safety & Building Availability Permit (ESO 8020/11)	X		
- Digging Permit (NWSCC 11000/3)	X	(3)	
- Flame Tool / Hot Work Permit (NWSCC 11320)	X		
- HERO Permit (approval for portable radios)	X		
- Tree Clearing Permit		X	
- IDEM Storm Water General Permit			X
- IDEM 401 Permit			X
- DNR Construction in the Floodway Permit			X
Field Work Reports and Submittals ⁽⁴⁾	X		
Sampling and Analysis	X ⁽⁵⁾		X ⁽⁵⁾
Wastewater Disposal (Decontamination Water)	X	(6)	
CTO Closure Report	(7)		X

NOTES:

- EMAC Contractor Work Plan includes, but is not limited to, an excavation and handling plan, waste management plan, environmental protection plan, erosion and sediment control plan, stormwater pollution prevention plan, and transportation and disposal plan.
- EMAC contractor will participate in documenting environmental conditions before, during, and after implementation of the interim measures.
- EMAC contractor completes the permit form. NSWC Crane performs the utility clearance.
- EMAC contractor will furnish items identified in the Basic Contract, NSWC Crane Contractor's Operations Manual, and the Supplemental Specifications provided in Appendix D.
- EMAC contractor will be responsible for the collection of characterization samples required for off-site disposal of excavated surface soils and sediments. TtNUS will collect verification samples from the excavation areas and from the surface soils below the support facilities following the removal of the support facilities. TtNUS will also collect verification samples from the temporary access trails. The EMAC contractor will need to coordinate and accommodate TtNUS sampling and field activities.
- EMAC Contractor will be responsible for collection, storage, characterization, and discharge of wastewater to the NSWC Crane approved stabilized drainage channel, storm drain, or wastewater treatment plant.
- EMAC Contractor will furnish items identified in the Supplemental Specifications provided in Appendix D.

CTO - Contract Task Order
EMAC - Environmental Multiple Award Contract
HERO - Hazards of Electromagnetic Radiation to Ordnance
IMWP - Interim Measures Work Plan

NSWC - Naval Surface Warfare Center
TtNUS - Tetra Tech NUS, Inc
X - Indicates responsible party



LEGEND

- ▲ 2005 - 2006 Sample Locations
- Extent of PCB Contamination Greater Than 1 MG/KG
- Surface Soil Excavation Areas
- Drainage Channel Excavation Areas
- Stream Excavation Areas
- Flood Zone Excavation Areas
- Building
- Railroad
- Road
- Fence
- Vegetation
- Stream
- Topographic Contour

<p>EXTENT OF INTERIM MEASURE EXCAVATION SWMU 17 - PCB CAPACITOR BURIAL/POLE YARD INTERIM MEASURES WORK PLAN</p>		<p>NSWC CRANE CRANE, INDIANA</p>			
<p>CONTRACT NO. 0020</p>	<p>APPROVED BY</p>	<p>DATE</p>	<p>APPROVED BY</p>	<p>DATE</p>	
<p>DRAWING NO. FIGURE 3 - 1</p>		<p>REV 0</p>			
<p>DRAWN BY S. PAXTON</p>		<p>DATE 2/23/07</p>		<p>COST/SCHED-AREA</p>	
<p>CHECKED BY T. SMITH</p>		<p>DATE 2/23/07</p>		<p>SCALE AS NOTED</p>	





Crane Gate
(Gate House No. 4)

Army Scale
(Building 2913)

Highway 5

SWMU 17

Highway 45

DRMO Scale
(Building 1940)

Highway 58

LEGEND

 SWMU 17 Boundary

 Traffic Route



DRAWN BY S. PAXTON	DATE 2/21/07
CHECKED BY T. SMITH	DATE 2/21/07
COST/SCHEDULE-AREA	
SCALE AS NOTED	



TRAFFIC ROUTING PLAN
SWMU 17 - PCB CAPACITOR BURIAL/POLE YARD
INTERIM MEASURES WORK PLAN
NSWC CRANE
CRANE, INDIANA

CONTRACT NUMBER CTO 0020	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 3 - 2	REV 0

4.0 EROSION AND SEDIMENT CONTROL PLAN

4.1 PURPOSE

The purpose of this section is to provide the steps that will be taken to minimize and/or eliminate erosion and sedimentation during the implementation of the IMWP at SWMU 17. The erosion and sediment control plan has been developed in accordance with the guidelines defined in the Indiana Handbook for Erosion Control in Developing Areas (Handbook) (IDEM, 1992). Relevant standards and specifications from the Handbook are included in this section and Appendix E. The erosion and sediment control devices described in this text can be modified based on construction equipment and techniques presented in the EMAC contractor's Work Plan. Selected erosion and sediment control devices must be identified in the Erosion and Sediment Control Plan submitted with the EMAC contractor Work Plan. After the Erosion and Sediment Control Plan is approved, no changes can be made without approval by the OICC and the IDEM.

4.2 EROSION AND SEDIMENT CONTROL REQUIREMENTS

Erosion and sediment control measures are implemented to reduce or eliminate erosion and sedimentation of soils that would be detrimental to surface water quality. With the exception of the surface soil excavation areas, all of the excavation activities associated with the IMWP are within drainage channels and streams. All of the surface water runoff from the disturbed areas finds its way to Boggs Creek. Some of the SWMU 17 drainage channels to be excavated only carry flow from stormwater runoff during rain events; the remaining drainage channels and streams have a base flow and support aquatic life. Boggs Creek, which eventually discharges to the Wabash River, is located approximately 120 feet from SWMU 17 at its closest point.

IMWP implementation activities for SWMU 17 consist of excavation and off-site disposal of PCB-contaminated surface soils and sediments, backfilling excavations, and restoration of disturbed areas. Surface soil will be excavated from one area located on the northeastern end of Building 357. Sediment will be excavated from drainage channels and streams that feed Boggs Creek and from Boggs Creek itself. Because of site conditions, temporary access trails will need to be constructed to allow access to the excavation areas.

Considering the type of IMWP activities and access issues, the proposed erosion and sediment control measures include the following:

- Silt Fence – Placed along the downslope sides of the surface soil excavation areas and the gravel construction entrances to provide a temporary sediment barrier. Silt fencing consists of synthetic filter fabric and wooden posts.
- In-stream Sediment Trap – Placed within the drainage channels and streams from which PCB-contaminated sediments will be removed to provide a temporary sediment barrier while allowing flow within the disturbed channel. Multiple in-stream sediment traps will be required based on the proposed segments of channel to be disturbed within a given time period. In-stream sediment traps are constructed of gravel, riprap, and filter fabric and will not be placed greater than 300 feet apart.
- Gravel Construction Entrances – Placed as a controlled site entrances to reduce the amount of sediment transported by construction vehicles onto facility and public roads.
- Dust Control – Utilized to prevent surface and air movement of dust from exposed soil surfaces and to reduce the amount of airborne substances that may present health hazards, traffic safety problems, or harm plant/animal life.
- Permanent Seeding – Utilized to establish perennial vegetation on disturbed areas by planting seeds of native grasses.

The construction, implementation, and maintenance of these erosion and sediment control devices will be in accordance with the Handbook. Figure 4-1 presents the proposed excavation areas along with the limits of disturbance and the locations of the proposed erosion and sediment control devices. Figure 4-2 presents typical details of the erosion and sediment control devices proposed for the IMWP implementation (i.e., silt fence, gravel construction entrance, and in-stream sediment trap). Permanent seeding is discussed in Section 4.4. Dust control will be addressed in the EMAC contractor's Work Plan. All erosion and sediment controls will remain in place until all upstream areas have been stabilized. Stabilization will be determined by the OICC.

4.3 INSPECTION AND MAINTENANCE OF EROSION AND SEDIMENT CONTROLS

In general, all erosion and sediment control measures will be checked daily and after each runoff-producing rainfall event. Any required repairs will be made immediately. The following items will be checked:

- The stone construction entrance will be maintained in a condition that will minimize tracking sediment onto facility or public roads.
- Silt fence will be checked for undermining or deterioration of the fabric. Sediment will be removed when the level of sediment causes bulging or reaches one-half of the fabric height.
- In-stream sediment traps will be checked for undermining or erosion around the edges of the trap(s). Sediment will be removed when the level of sediment reaches one-half the height of the in-stream sediment trap or when the quantity of flow through the in-stream sediment trap is significantly reduced.
- Seeded areas will be checked regularly to ensure that a good growth of vegetation is maintained and these areas will be fertilized and reseeded, as needed.
- The fuel and lubricant materials storage area will be checked to ensure that stored containers are not leaking and that the lining system is functioning properly.

All erosion and sediment control devices will be inspected and maintained until the OICC has formally accepted the permanent stabilization of the disturbed areas. The EMAC contractor will maintain a log book of all erosion and sediment control device inspections and maintenance. This log book will be available at the site at all times for inspection by duly authorized officials including NSWC Crane personnel and the IDEM.

4.4 SITE RESTORATION

All areas disturbed by the IMWP implementation activities (excavation and support facility areas) will be restored/stabilized using gravel, bank-run sands and gravels, and permanent seeding. Activities to establish permanent stabilization will be implemented as soon as possible following the establishing of final grades. The establishment of permanent vegetation includes site/seed bed preparation, seeding, and mulching of the following locations:

- Banks of the drainage channels and streams
- Drainage channel and stream beds where applicable
- Surface soils below support facilities
- Surface soil excavation areas that extend beyond existing gravel paved areas

The procedures and requirements for permanent seeding activities are presented in Section 3.12 of the Handbook. The seed mixture recommended for use at SWMU 17 is a standard Indiana seed mixture for open and disturbed areas. The seed mixture includes perennial Ryegrass and Tall fescue. Planting rates and optimum soil pH for this mixture are presented in Exhibit 3.12-C of the Handbook (this exhibit is provided in Appendix E). Following seeding, the seeded areas will be covered with temporary erosion control matting (e.g., coconut fiber matting) to provide additional stabilization until vegetation is established. In the event that disturbed areas are brought to final grade outside of the optimal growing season for the permanent seed mixture, the disturbed areas will be temporarily stabilized using a temporary seed mixture. The procedures and requirements for establishing temporary stabilization are presented in Section 3.11 of the Handbook. As indicated in the Handbook, erosion and sediment control devices will remain in place until permanent stabilization is established over the disturbed areas. Therefore, erosion and sediment control devices will not be removed by the EMAC contractor until directed by the OICC.

Sections 3.11 through 3.15 (Temporary Seeding, Permanent Seeding, Dormant and Frost Seeding, and Mulching) of the Handbook are provided in Appendix E.

4.5 RESPONSE PROCEDURES FOR SPILL MITIGATION

Potential non-stormwater discharges anticipated during IMWP implementation activities include wash water resulting from decontamination efforts associated with field equipment and vehicles, fuel and lubricant spills from vehicle fueling, lubrication, and maintenance, and spills of fertilizers and small quantities of laboratory chemicals used in sample collection, and other flammable substances.

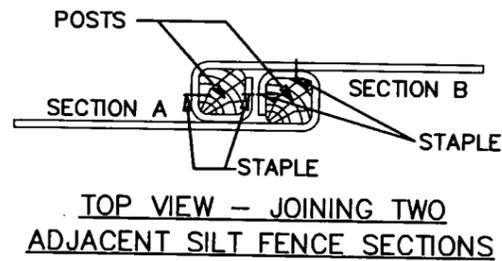
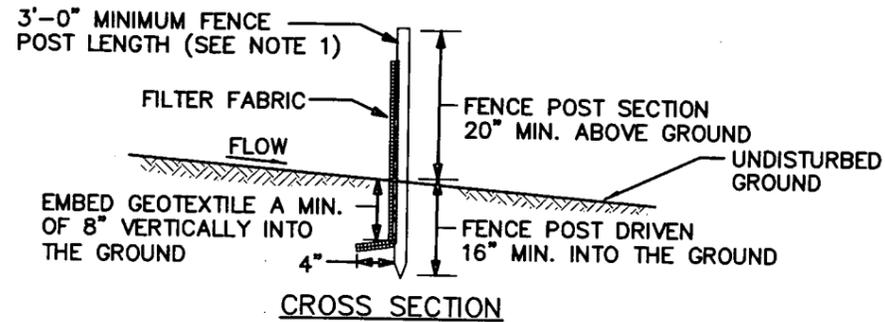
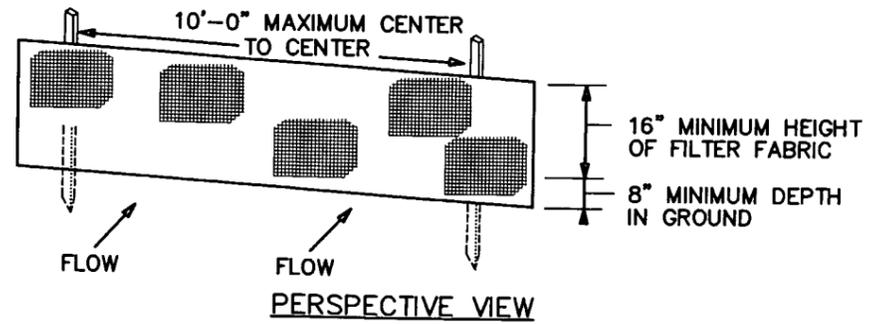
All decontamination wash water will be collected in a lined decontamination and equipment wash pad area. All waters generated from decontamination and/or other washing activities will be collected, characterized, and transported to the NSWC Crane wastewater treatment facility, if approved by NSWC Crane, or to an approved off-site treatment facility. All vehicle fueling, lubrication, and maintenance will be performed utilizing drip pans to contain any spills that may occur or within the decontamination pad to contain spills. Containers of detergents and vehicle maintenance fluids (oil, grease, antifreeze, hydraulic fluid, etc.) will be stored within an enclosed, lined, diked area along with the equipment fuel, which is stored in tanks. This area, referred to as the materials storage area, will be bermed and lined with a 60-mil low-density polyethylene (LDPE) geomembrane and will be sized to contain 110 percent of the volume stored within the area. A small sump or low point in the liner will be designed to serve as a collection and monitoring point for any leaks or spills from the containers stored within the materials

storage area. When not in use, chemicals, paints, and other flammable substances will be stored in a flammable storage cabinet located within the EMAC contractor's equipment trailer.

Good housekeeping procedures will be followed to reduce risks associated with these materials. These procedures include, but are not limited to, keeping materials in their original containers whenever possible, maintaining original labels and Material Safety Data Sheets (MSDSs), and using proper disposal methods for surplus materials. Accidental spills that may occur will be contained as appropriate for the spilled medium (liquid or solid) and collected and containerized immediately after discovery of the spill. Containerized material will be characterized for off-site transportation and disposal. The following spill mitigation equipment should be available on site during construction activities:

- Drip pans
- Oil-dry or similar compound
- Absorbent socks
- Shovels
- 55-gallon drums or storage tank (for containerization)
- Labels for contents identification

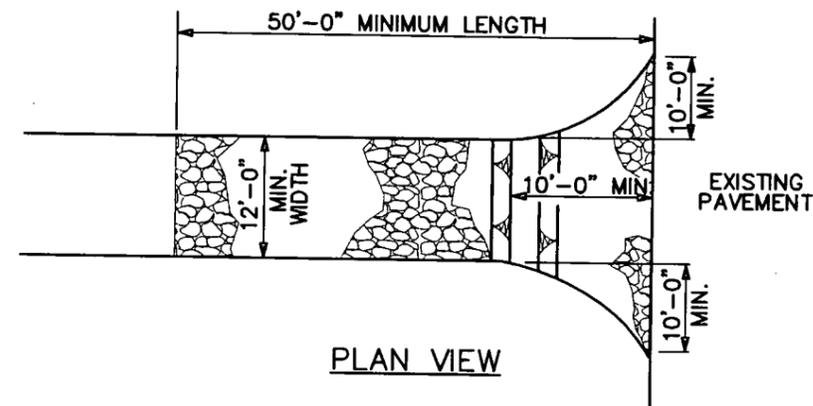
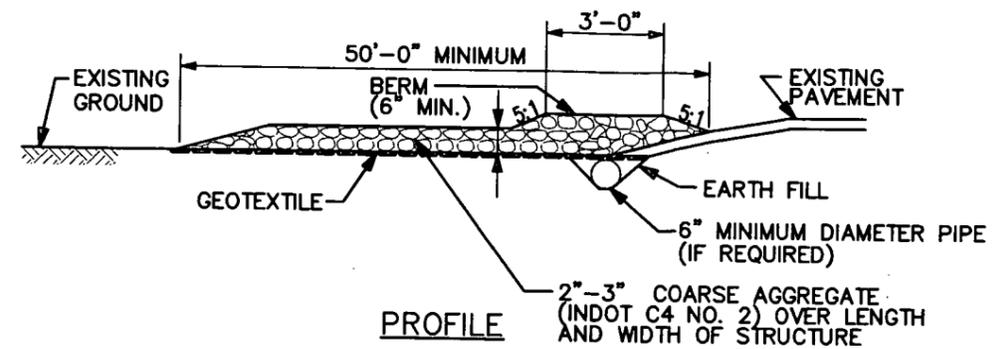
Following spill cleanup, the cause of the spill will be investigated, and material storage and handling procedures will be reviewed and revised where appropriate. All spills will be reported to the NSWC Crane Environmental Department.



NOTES:

1. WOOD POSTS SHALL BE 1.5" BY 1.5" SQUARE (MIN) CUT OR 1.75" DIAMETER (MIN) ROUND AND SHALL BE OF SOUND QUALITY HARDWOOD. STEEL POSTS WILL BE STANDARD T OR U SECTION WEIGHING NOT LESS THAN 1.00 POUND PER LINEAR FOOT.
2. FILTER FABRIC SHALL BE FASTENED SECURELY TO EACH FENCE POST WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
3. INSTALL SILT FENCE PARALLEL TO THE CONTOUR OF THE LAND.

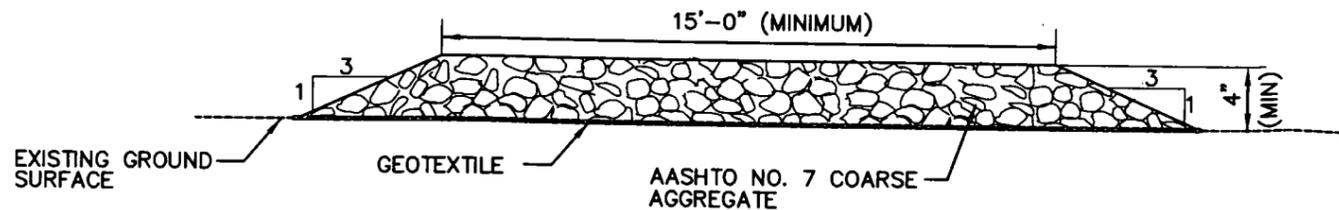
SILT FENCE



NOTES:

1. ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED THROUGH THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE.
2. IF REQUIRED PIPE SHOULD BE SIZED ACCORDING TO THE AMOUNT OF RUNOFF TO BE CONVEYED. A 6" MINIMUM DIAMETER WILL BE REQUIRED.

GRAVEL CONSTRUCTION ENTRANCE



TEMPORARY SITE ACCESS ROAD

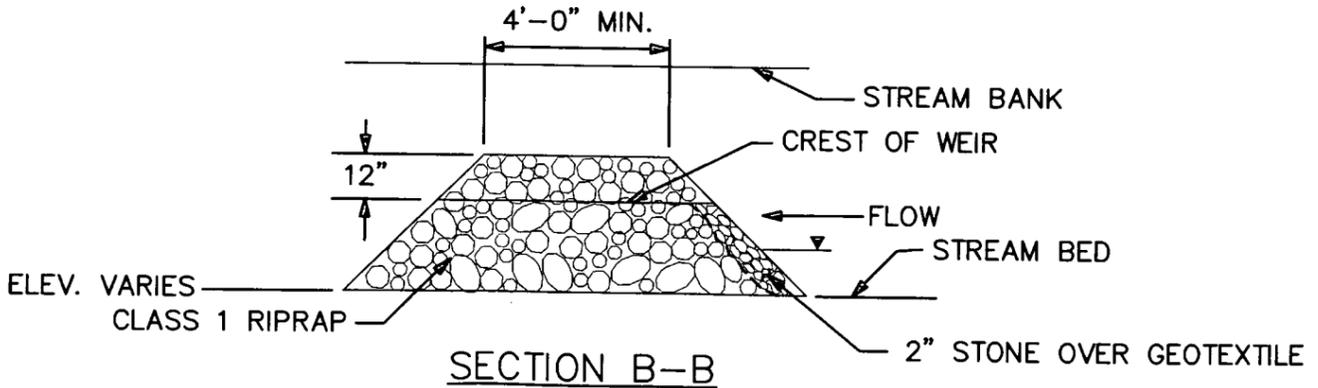
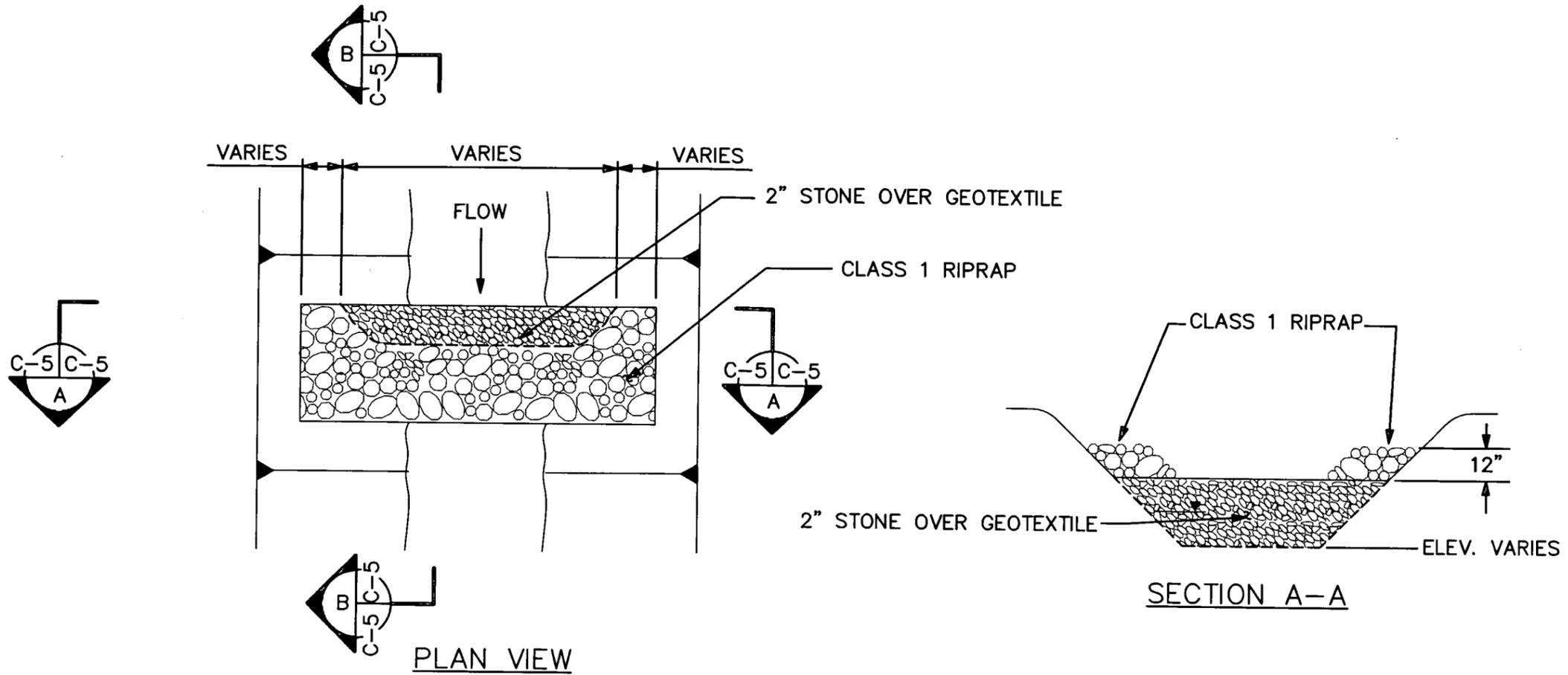
NOT TO SCALE

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SCALE AS NOTED	



EROSION AND SEDIMENT CONTROL DEVICES
 SWMU 17 - PCB
 CAPACITOR BURIAL/POLE YARD
 INTERIM MEASURES WORK PLAN
 NSWC CRANE
 CRANE, INDIANA

CONTRACT NO. 0352	
OWNER NO. 0020	
APPROVED BY	DATE
DRAWING NO. FIGURE 4-2A	REV. 0



NOTE:
 1. GABION BASKETS – GABION BASKETS WITH GEOTEXTILE CAN BE USED INSTEAD OF STONE.

IN-STREAM SEDIMENT TRAP

NOT TO SCALE

DRAWN BY MF	DATE 5/16/06		EROSION AND SEDIMENT CONTROL DEVICES (SHEET 2 OF 2) SWMU 17 - PCB CAPACITOR BURIAL/POLE YARD INTERIM MEASURES WORK PLAN NSWC CRANE CRANE, INDIANA		CONTRACT NO. 0352
CHECKED BY	DATE				OWNER NO. 0020
REVISED BY	DATE				APPROVED BY _____ DATE _____
SCALE AS NOTED					DRAWING NO. FIGURE 4-2B
				REV. 0	

5.0 VERIFICATION SAMPLING PLAN

5.1 PURPOSE

The purpose of this section is to present the two types of verification samples to be collected during and following the implementation of the IMWP. The two types of verification samples include the samples collected from within the excavation areas to verify the removal of surface soils and sediments with PCB concentrations in excess of 1 mg/kg, and the samples collected from surface soils located beneath support facilities (decontamination pad, soil dewatering pad, and material storage area) and the surfaces of the temporary access trails after IMWP implementation is complete to ensure that IMWP implementation did not contaminate support facility areas. This section also presents criteria and procedures used to evaluate verification sample data to determine the acceptability of residual soil contamination, if present. Verification samples will be collected by TtNUS. The sampling procedures, sample locations, and fixed-base laboratory analytical methods will be addressed in the Quality Assurance Project Plan (QAPP) Addendum (to be provided under separate cover).

5.2 VERIFICATION SAMPLING OF EXCAVATION AREAS

The IMWP implementation includes the excavation and off-site disposal of surface soils and sediments containing PCB concentrations greater than 1 mg/kg (or 25 mg/kg for the floor of the surface soil excavation area). These excavation areas are shown on Figure 3-1. Based on the excavation area, verification samples will be collected from the excavation floors and sidewalls to determine if all the surface soil and sediment with PCB concentrations greater than the 1 mg/kg have been removed. In general, excavation floor samples will be collected at a rate of one composite sample for every 1,000 square feet of exposed surface area and excavation side wall samples will be collected at a rate of one composite sample for every 100 linear feet of exposed side wall. The following paragraphs describe the verification sampling procedures to be performed for each of the three excavation areas.

- Surface Soil Excavation Areas - Verification samples will be collected from the excavation side walls and excavation floor in the surface soil excavation areas. Due to the planned initial size of the surface soil excavation area (30-feet by 30-feet by 2-feet and 50-feet by 50-feet by 4-feet), two excavation floor samples will be collected and eight excavation side wall samples will be collected (one from each of the excavation side walls). The results of these verification samples will be evaluated to determine if PCB contamination remains within the excavated floor and/or sidewalls at concentrations greater than 1 mg/kg. In the event that a verification sample result from an excavation side wall exceeds 1 mg/kg, the excavation will be extended a minimum of 2-feet in the appropriate

direction(s). Following additional excavation, additional verification samples will be collected by TtNUS. Excavation expansion may continue until all verification sample results indicate PCB concentrations less than 1 mg/kg. Because the initial excavation will be 2-feet in depth, the results of the verification samples collected from the excavation floor will be compared subsurface criteria (25 mg/kg), because the area will be backfilled with a minimum of 2-feet of soil and gravel material. If PCB concentrations are detected in the excavation floor verification samples at concentrations greater than 25 mg/kg, the Navy may require additional excavation to a greater depth.

- Drainage Channel Excavation Areas - Verification samples will be collected from the excavation side walls and excavation floor in the drainage channel excavation areas. As indicated above, one excavation floor sample will be collected for every 1,000 square feet of excavation area and one side wall sample will be collected for every 100 feet of exposed drainage channel banks (i.e. if 200 feet of drainage channel is excavated four verification samples will be collected from the exposed drainage channel banks, two from the left bank and two from the right bank). At a minimum, three verification samples will be collected from each length of drainage channel excavated (one from the excavation floor and one from each of the two drainage channel banks). Based on the initial length of drainage channel requiring sediment removal (1,160 linear feet), 31 verification samples (7 floor samples and 24 side wall samples) will be collected from the drainage channels. The results of these verification samples will be evaluated to determine if PCB contamination remains on the exposed surface soils at concentrations greater than 1 mg/kg. In the event a verification sample result exceeds 1 mg/kg (from floor samples or side wall samples), the excavation will be extended a minimum of 6-inches in the appropriate direction(s). Following additional excavation, additional verification samples will be collected by TtNUS. Excavation expansion may continue until verification samples indicate PCB concentrations are less than 1 mg/kg. Based on the results of the 2005 and 2006 sediment sampling events, verification sample results will not increase the length of drainage channel excavation areas.
- Stream Excavation Areas - Verification samples will be collected from the excavation floor and side walls in the stream excavation areas. However, aside from the first 600 feet or so of excavation from the upper reaches of Ditch 3 near Building 2721, the exposed excavation floor will be bedrock within the streams. Where the exposed excavation floor is bedrock, no excavation floor samples will be collected. As indicated above, within the streams, one excavation floor sample will be collected for every 1,000 square feet of excavation area and one side wall sample will be collected for every 100 feet of exposed stream bank. Based on the length of stream requiring sediment removal (2,415 linear feet), 52 verification samples (4 floor samples and 48 side wall samples), will be collected from the stream (floor samples based on only the upper 600 feet of Ditch 3 requiring verification samples). The results of these verification samples will be evaluated to determine if PCB

contamination remains on the exposed surface soils at concentrations greater than 1 mg/kg. In the event that verification sample results exceed 1 mg/kg (from floor samples or side wall samples), the excavation will be extended a minimum of 6-inches in the appropriate direction(s). Following additional excavation, additional verification samples will be collected by TtNUS. Excavation expansion may continue until verification samples indicate PCB concentrations are less than 1 mg/kg. Based on the results of the 2005 and 2006 sediment sampling events, verification sample results will not increase the length of stream excavation areas.

- Flood Zones Excavation Areas - Verification samples will be collected in the flood zone excavation areas will be collected at a rate of one floor sample for every 1,000 square feet of excavation areas and one side wall sample for every 100 feet of excavation side wall. Based on the initial information it is estimated that 10 verification samples will be collected for the flood zone excavation floors and 15 verification samples will be collected from the flood zone excavation side walls.

To minimize EMAC contractor downtime associated with waiting for analytical results from fixed-base laboratory, collected samples will be packaged and shipped to the fixed-base laboratory for analysis with a 1-day turn-around time. Therefore, verification sampling results should be available 24-hours following sample pick-up if a local fixed-base laboratory is used, or within 48-hours of sample shipment if samples need to be express shipped to a remote fixed-base laboratory. The reported results received by TtNUS will be forwarded to the Navy and EMAC contractor as they are received from the laboratory.

Sampling, sample preparation, sample shipment, and fixed-base laboratory sample analysis will be presented in the QAPP Addendum that will be available prior to implementation of the IMWP. Initial analytical results from the fixed-base laboratory will be subjected to a cursory data validation process. Sample results will not be considered final until the full validation process is complete.

5.3 VERIFICATION SAMPLING OF SUPPORT FACILITIES

The frequency of verification sampling for the soils located beneath the support facilities after IMWP implementation is the same as that for excavation samples (one verification sample for every 1,000 square feet of area disturbed) with a minimum of one verification sample being collected from each support facility. Due to the nature of the support facilities, side wall samples are not included in the support facility verification sampling program. Based on the anticipated areas of the support facilities, it is estimated that three verification samples will be collected from the support facility areas (decontamination pad, dewatering pad, and materials storage area). In addition, verification samples will be collected from the temporary access trails. These samples will be collected at a rate of one composite sample for every

200 linear feet of temporary access trail (minimum of one sample if sections of temporary access trail are less than 200 feet in length). Based on the proposed locations of temporary access trails, 18 verification samples will be collected from the temporary access trails. The results of these verification samples will be evaluated to determine if PCB contamination was introduced to the temporary access trails or the surface soils below the foot print of the support facilities at concentrations greater than 1 mg/kg. In the event that a verification sample result exceeds 1 mg/kg, 6-inches of soil will be removed from the associated temporary access road section or support facility footprint (support facility footprint equals the actual footprint plus an additional 10 feet in all directions). Following additional excavation, additional verification samples will be collected by TtNUS. Excavation expansion may continue until all verification samples indicate PCB concentrations are less than 1 mg/kg. All excavation of surface soil beneath the support facilities and the associated handling and disposal of that material will be done at EMAC contractor's expense.

5.4 SAMPLING LOCATIONS

The numbers and locations of verification samples for the excavation areas and support facilities will be identified in a QAPP Addendum that will be provided under separate cover.

REFERENCES

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APPENDIX A

**2005 - 2006 FIELD INVESTIGATION SOIL/SEDIMENT
SAMPLE LOG SHEETS**

- A.1 OCTOBER 2005 LOG SHEETS**
- A.2 APRIL 2006 LOG SHEETS**
- A.3 MAY 2006 LOG SHEETS**
- A.4 OCTOBER 2006 LOG SHEETS**

A.1 OCTOBER 2005 LOG SHEETS



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG**SWMU 9/17 Phase 3 Investigation - CRANE NSWC**

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SD010006	Created By	John Wright
TtNUS Project #	112G00042	Well ID		Created Date	10/4/05
Task/Contract #	CTO 0376	Sampled By	John Wright/DW/DH/TR	Modified By	
WBS Code #	0000	Concentration	Low Concentration	Modified Date	
Well Type				Printed By	Roger Clark
QA Sample Type	Field Duplicate 17FD10040501			Printed Date	4/19/06

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/4/05	15:20	Trowel	0.0	0-6 in	-Select-	Brown sandy silt trace clay some gravel organics (wet)

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Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG**SWMU 9/17 Phase 3 Investigation - CRANE NSWC**

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/4/05 1:00:00 AM	15:20	SW-846 8082	PCBs	4° C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G00042- 1042005-5

Page 2 of 2

General Observations and Notes

No Notes.

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG**SWMU 9/17 Phase 3 Investigation - CRANE NSWC**

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SD020006	Created By	John Wright
TtNUS Project #	112G00042	Well ID		Created Date	10/4/05
Task/Contract #	CTO 0376	Sampled By	John Wright/DW/DH/TR	Modified By	
WBS Code #	0000	Concentration	Low Concentration	Modified Date	
Well Type				Printed By	Roger Clark
QA Sample Type				Printed Date	4/19/06

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/4/05 1:00:00 AM	15:10	Trowel	0.0	0-6 in	-Select-	Brown sandy silt trace gravel organics (damp)

Page 1 of 2



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG**SWMU 9/17 Phase 3 Investigation - CRANE NSWC**

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/4/05	14:10	SW-846 8082	PCBs	4° C	2	Glass	4 oz. wide-mouth clear w/Teflon cap	Do MS/MSD	112G00042- 1042005-5

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General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG**SWMU 9/17 Phase 3 Investigation - CRANE NSWC**

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SD030006	Created By	John Wright
TtNUS Project #	112G00042	Well ID		Created Date	10/1/05
Task/Contract #	CTO 0376	Sampled By	DW/TR	Modified By	
WBS Code #	0000	Concentration	Low Concentration	Modified Date	
Well Type				Printed By	Roger Clark
QA Sample Type				Printed Date	4/19/06

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/1/05	12:25	Trowel	NA	0-6 in	-Select-	Brown silt with trace of sand - moist abundant organic material

Page 1 of 2



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG**SWMU 9/17 Phase 3 Investigation - CRANE NSWC**

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/1/05	11:25	SW-846 8082	PCBs	4° C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G00042- 1022005-3

Page 2 of 2

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG**SWMU 9/17 Phase 3 Investigation - CRANE NSWC**

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SD040006	Created By	John Wright
TtNUS Project #	112G00042	Well ID		Created Date	10/1/05
Task/Contract #	CTO 0376	Sampled By	DW/TR	Modified By	
WBS Code #	0000	Concentration	Low Concentration	Modified Date	
Well Type				Printed By	Roger Clark
QA Sample Type				Printed Date	4/19/06

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/1/05 1:00:00 AM	12:15	Trowel	NA	0-6 in	-Select-	Brown sandy silt (moist)

Page 1 of 2



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG**SWMU 9/17 Phase 3 Investigation - CRANE NSWC**

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/1/05	11:15	SW-846 8082	PCBs	4° C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G00042- 1022005-3

Page 2 of 2

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG**SWMU 9/17 Phase 3 Investigation - CRANE NSWC**

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SD050006	Created By	John Wright
TtNUS Project #	112G00042	Well ID		Created Date	10/1/05
Task/Contract #	CTO 0376	Sampled By	DW/TR	Modified By	
WBS Code #	0000	Concentration	Low Concentration	Modified Date	
Well Type				Printed By	Roger Clark
QA Sample Type				Printed Date	4/19/06

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/1/05	11:55	Trowel	NA	0-6 in	-Select-	Grey sandy silt (saturated)

Page 1 of 2



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG**SWMU 9/17 Phase 3 Investigation - CRANE NSWC**

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
<input checked="" type="checkbox"/>	10/1/05 1:00:00 AM	11:55	SW-846 8082	PCBs	4° C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G00042- 1022005-3

Page 2 of 2

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG**SWMU 9/17 Phase 3 Investigation - CRANE NSWC**

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SD060006	Created By	John Wright
TtNUS Project #	112G00042	Well ID		Created Date	10/1/05
Task/Contract #	CTO 0376	Sampled By	DW/TR	Modified By	
WBS Code #	0000	Concentration	Low Concentration	Modified Date	
Well Type				Printed By	Roger Clark
QA Sample Type				Printed Date	4/19/06

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/1/05 1:00:00 AM	11:35	Trowel	NA	0-6 in	-Select-	Light brown silty clay (moist)

Page 1 of 2



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG**SWMU 9/17 Phase 3 Investigation - CRANE NSWC**

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/1/05 1:00:00 AM	11:35	SW-846 8082	PCBs	4° C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G00042- 1022005-3

Page 2 of 2

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG**SWMU 9/17 Phase 3 Investigation - CRANE NSWC**

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SD070006	Created By	John Wright
TtNUS Project #	112G00042	Well ID		Created Date	10/4/05
Task/Contract #	CTO 0376	Sampled By	John Wright/DW/DH/TR	Modified By	
WBS Code #	0000	Concentration	Low Concentration	Modified Date	
Well Type				Printed By	Roger Clark
QA Sample Type				Printed Date	4/19/06

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/4/05	15:04	Trowel	0.0	0-6 in	-Select-	Yellow brown silty clay with some sand and organics (moist)

Page 1 of 2



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG**SWMU 9/17 Phase 3 Investigation - CRANE NSWC**

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/4/05 1:00:00 AM	15:05	SW-846 8082	PCBs	4° C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G00042- 1042005-5

Page 2 of 2

General Observations and Notes

No Notes

- End of Report -

A.2 APRIL 2006 LOG SHEETS

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD41</u>		Date: <u>4-18-06</u>	Time: <u>1200</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: <u>Upstream</u> <input type="checkbox"/> <u>Downstream</u> <input type="checkbox"/> <u>East</u> <input type="checkbox"/> <u>West</u> <input type="checkbox"/> <u>North</u> <input type="checkbox"/> <u>South</u> <input type="checkbox"/>				
Predominant Surrounding Land Use: <u>Wooded</u> <input checked="" type="checkbox"/> <u>Open Field</u> <input type="checkbox"/> <u>Other</u> <input checked="" type="checkbox"/> <u>open ditch between RR & Woods</u>				
Canopy Cover: <u>Open</u> <input checked="" type="checkbox"/> <u>Partly Open</u> <input checked="" type="checkbox"/> <u>Shaded</u> <input type="checkbox"/>				
Discharge Pipe Present: Yes <input type="checkbox"/> <u>No</u> <input checked="" type="checkbox"/>				
Aquatic Vegetation Present: Yes <input type="checkbox"/> <u>No</u> <input checked="" type="checkbox"/>			Stream channelized: Yes <input type="checkbox"/> <u>No</u> <input checked="" type="checkbox"/>	
Water flowing: Yes <input type="checkbox"/> <u>No</u> <input checked="" type="checkbox"/> <u>Not present</u> <input checked="" type="checkbox"/>				
Organisms Present: Fish (in)		Other (insects, frogs, etc.):		
Water Width (ft): <u>0.5'</u>	Water Depth (ft): <u>0.1'</u>	Estimated Flow/Velocity: <u>NA</u>		
Channel Width (ft): <u>NA</u>	Channel Depth (ft): <u>NA</u>	<u>Sed. Thickness ~ 6"</u>		
Signs of flooding (circle all that apply) Yes <input type="checkbox"/> <u>No</u> <input checked="" type="checkbox"/> Water marks on trees <input type="checkbox"/> Water-borne debris piles <input type="checkbox"/> Other: <input type="checkbox"/>				
Deep Pools Present (>2 feet): Yes <input type="checkbox"/> <u>No</u> <input checked="" type="checkbox"/> If yes (approximate size)				
Sediment Substrate: Bedrock <input type="checkbox"/> Boulder (>10 in) <input type="checkbox"/> Cobble (2.5-10 in) <input type="checkbox"/> Gravel (0.10-2.5 in) <input type="checkbox"/>				
(Circle all that apply) <u>Sand</u> <input checked="" type="checkbox"/> <u>Silt</u> <input checked="" type="checkbox"/> Clay <input type="checkbox"/> Muck <input type="checkbox"/>				
Debris <input type="checkbox"/> <u>Detritus</u> <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Iron deposits <input type="checkbox"/>				
Sediment Odors: <u>Normal</u> <input checked="" type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/>				
Sediment Oils: <u>Absent</u> <input checked="" type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/>				
Water Odors: <u>Normal</u> <input checked="" type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/>				
Water Surface Oils: <u>None</u> <input checked="" type="checkbox"/> Droplets <input type="checkbox"/> Sheen <input type="checkbox"/>				
Turbidity: <u>Clear</u> <input checked="" type="checkbox"/> Slightly Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Opaque <input type="checkbox"/>				
Other Comments/Observations: <u>17SD41-01 (NE), 02 (NE), 03 (DS), 04 (US)</u>				

1658-1664

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD40</u>		Date: <u>4-18-06</u>	Time: <u>1015</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: Yes No <u>Not present</u>				
Organisms Present: Fish (in) Other (insects, frogs, etc.):				
Water Width (ft): <u>NA</u>		Water Depth (ft): <u>NA</u>		Estimated Flow/Velocity: <u>NA</u>
Channel Width (ft): <u>2'</u>		Channel Depth (ft): <u>0.5'</u>		<u>Sed. Thickness ~6"</u>
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris <u>Detritus</u> Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: Normal Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: None Droplets Sheen				
Turbidity: Clear Slightly Turbid Turbid Opaque				
Other Comments/Observations: <u>See log for SD21. SD40 is ~24' from SD21</u>				
<u>17SD40-01 (N), 02 (N), 03 (N), 04 (S), 05 (OS),</u>				
<u>1642-1650</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD39</u>		Date: <u>4-19-06</u>	Time: <u>1105</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in)		Other (insects, frogs, etc.):		
Water Width (ft): <u>0.8'</u>	Water Depth (ft): <u><0.1'</u>	Estimated Flow/Velocity:		
Channel Width (ft): <u>2.4'</u>	Channel Depth (ft): <u>0.6'</u>	<u>Sed thickness ~4"</u>		
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: <u>Clear</u> Slightly Turbid Turbid Opaque				
Other Comments/Observations: <u>17SD39-01 (NE), 02 (US), 03 (DS)</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD38</u>		Date: <u>4-19-06</u>	Time: <u>1315</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open <u>Partly Open</u> Shaded				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) <u>2 in</u> Other (insects, frogs, etc.): <u>insects</u>				
Water Width (ft): <u>6.5'</u>		Water Depth (ft): <u>0.95'</u>		Estimated Flow/Velocity:
Channel Width (ft): <u>6.5'</u>		Channel Depth (ft): <u>0.95'</u>		<u>Sed. Thk. ~8"</u>
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size):				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: <u>17SD38-01 (W), 02 (DS), 03 (US)</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD37</u>		Date: <u>4-19-06</u>	Time: <u>1340</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: <input type="checkbox"/> Upstream <input type="checkbox"/> Downstream <input type="checkbox"/> East <input type="checkbox"/> West <input type="checkbox"/> North <input type="checkbox"/> South				
Predominant Surrounding Land Use: <input checked="" type="checkbox"/> Wooded <input type="checkbox"/> Open Field <input type="checkbox"/> Other				
Canopy Cover: <input type="checkbox"/> Open <input type="checkbox"/> Partly Open <input checked="" type="checkbox"/> Shaded				
Discharge Pipe Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Aquatic Vegetation Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			Stream channelized: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Water flowing: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not present				
Organisms Present: Fish (in) <u>3 in</u> Other (insects, frogs, etc.): <u>insects</u>				
Water Width (ft): <u>12'</u>		Water Depth (ft): <u>0.9'</u>		Estimated Flow/Velocity:
Channel Width (ft): <u>12'</u>		Channel Depth (ft): <u>3'</u>		<u>Sed. Thk ~5"</u>
Signs of flooding (circle all that apply) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Water marks on trees <input type="checkbox"/> Water-borne debris piles <input type="checkbox"/> Other:				
Deep Pools Present (>2 feet): <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> If yes (approximate size)				
Sediment Substrate: <input type="checkbox"/> Bedrock <input type="checkbox"/> Boulder (>10 in) <input type="checkbox"/> Cobble (2.5-10 in) <input type="checkbox"/> Gravel (0.10-2.5 in)				
(Circle all that apply) <input checked="" type="checkbox"/> Sand <input checked="" type="checkbox"/> Silt <input type="checkbox"/> Clay <input type="checkbox"/> Muck				
<input type="checkbox"/> Debris <input type="checkbox"/> Detritus <input type="checkbox"/> Concrete <input type="checkbox"/> Iron deposits				
Sediment Odors: <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic				
Sediment Oils: <input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse				
Water Odors: <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic				
Water Surface Oils: <input checked="" type="checkbox"/> None <input type="checkbox"/> Droplets <input type="checkbox"/> Sheen				
Turbidity: <input type="checkbox"/> Clear <input checked="" type="checkbox"/> Slightly Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Opaque				
Other Comments/Observations: <u>17SD37-01 (W), 02 (US), 03 (DS), 04 (DS)</u>				

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: <u>17SD36</u>		Date: <u>4-19-06</u>	Time: <u>1420</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) _____ Other (insects, frogs, etc.): <u>insects</u>				
Water Width (ft): <u>4.5'</u>		Water Depth (ft): <u>0.3'</u>		Estimated Flow/Velocity:
Channel Width (ft): <u>12'</u>		Channel-Depth (ft): <u>3'</u>		<u>Sed. THK ~ 4"</u>
Signs of flooding (circle all that apply) <u>Yes</u> No: Water marks on trees Water-borne debris piles Other: <u>Debris Piles</u>				
Deep Pools Present (>2 feet): Yes: _____ <u>No</u> If yes (approximate size) _____				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: <u>17SD36-01 (South), 02 (DS), 03 (DS), 04 (East)</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD35</u>		Date: <u>4-19-06</u>	Time: <u>1440</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) <u>2 in</u> Other (insects, frogs, etc.): <u>insects</u>				
Water Width (ft): <u>4'</u>		Water Depth (ft): <u>1.5'</u>		Estimated Flow/Velocity:
Channel Width (ft): <u>11'</u>		Channel Depth (ft): <u>3'</u>		
Signs of flooding (circle all that apply) <u>Yes</u> No Water marks on trees Water-borne debris piles Other: <u>Debris piles</u>				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: <u>17SD35-01 (NE), 02 (US), 03 (US), 04 (DS), 05 (DS)</u>				

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: <u>17SD34</u>		Date: <u>4-19-06</u>	Time: <u>1455</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open <u>Partly Open</u> Shaded				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) Other (insects, frogs, etc.):				
Water Width (ft): <u>6'</u>		Water Depth (ft): <u>0.8'</u>		Estimated Flow/Velocity:
Channel Width (ft): <u>10'</u>		Channel Depth (ft): <u>2.8'</u>		<u>Sed. Thk ~4"</u>
Signs of flooding (circle all that apply) <u>Yes</u> No Water marks on trees Water-borne debris piles Other: <u>Debris Piles</u>				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: <u>Clear</u> Slightly Turbid Turbid Opaque				
Other Comments/Observations: <u>17SD34-01 (SE), 02 (DS), 03 (US), 04 (US)</u>				
<u>DS = Downstream, US = Upstream</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD33</u>		Date: <u>4-19-06</u>	Time: <u>1505</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) Other (insects, frogs, etc.):				
Water Width (ft): <u>8'</u>		Water Depth (ft): <u>1.45'</u>		Estimated Flow/Velocity:
Channel Width (ft): <u>8'</u>		Channel Depth (ft): <u>1.5'</u>		<u>Sed. Thk. ~ 8"</u>
Signs of flooding (circle all that apply) <u>Yes</u> No Water marks on trees Water-borne debris piles Other: <u>Debris Piles</u>				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: Normal Sewage Petroleum Chemical Anaerobic				
Sediment Oils: Absent Slight Moderate Profuse				
Water Odors: Normal Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: None Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: <u>17SD33-01 (SE), 02 (SE), 03 (downstream),</u>				
<u>04 (upstream), 05 (US)</u>				
<u>US = Upstream</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD32</u>		Date: <u>4-19-06</u>	Time: <u>1120</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) Other (insects, frogs, etc.):				
Water Width (ft): ^{DH} <u>8'4.4'</u>		Water Depth (ft): <u>1.0'</u>		Estimated Flow/Velocity:
Channel Width (ft): ^{DH} <u>8'4.4'</u>		Channel Depth (ft): <u>1.4'</u>		<u>Sed. Thk ~4"</u>
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): <u>Yes</u> No If yes (approximate size) <u>~15' upstream, 30x50, see SD30/31 Log</u>				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> <u>Cloudy</u> Turbid Opaque				
Other Comments/Observations: <u>17SD32-01 (N), 02 (N), 03 (DS), 04 (US), 05 (US)</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD30/31</u>		Date: <u>4-19-06</u>	Time: <u>1045/1055</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: <u>Yes</u> No				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) <u>?</u> Other (insects, frogs, etc.): <u>insects</u>				
Water Width (ft): <u>30'</u>		Water Depth (ft): <u>?</u>		Estimated Flow/Velocity: <u>?</u>
Channel Width (ft): <u>30'</u>		Channel Depth (ft): <u>?</u>		<u>Sed. Thickness ~12"</u>
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): <u>Yes</u> No If yes (approximate size) <u>30' x 50'</u>				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear Slightly Turbid Turbid <u>Opaque</u>				
Other Comments/Observations: <u>Sed Thickness on South side of Pond (1766) is ~12", ~3" at SD30; ~3" at SD31</u>				
<u>17SD30/31-01 (N), 02 (N), 03 (NE), 04 (UP), 05 (DS), 06 (DS)</u>				

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: 17SD29		Date: 4-19-06	Time: 1325	Sampler: JG/DH
Photograph Number/Direction: <input type="checkbox"/> Upstream <input type="checkbox"/> Downstream <input type="checkbox"/> East <input type="checkbox"/> West <input type="checkbox"/> North <input type="checkbox"/> South				
Predominant Surrounding Land Use: <input checked="" type="checkbox"/> Wooded <input type="checkbox"/> Open Field <input type="checkbox"/> Other				
Canopy Cover: <input type="checkbox"/> Open <input type="checkbox"/> Partly Open <input checked="" type="checkbox"/> Shaded				
Discharge Pipe Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Aquatic Vegetation Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			Stream channelized: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Water flowing: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not present				
Organisms Present: Fish (in) _____ Other (insects, frogs, etc.): <i>insects</i>				
Water Width (ft): 5'		Water Depth (ft): 0.5'		Estimated Flow/Velocity:
Channel Width (ft): 11'		Channel Depth (ft): 1.5'		Sed THK ~ 7"
Signs of flooding (circle all that apply) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Water marks on trees <input type="checkbox"/> Water-borne debris piles <input type="checkbox"/> Other:				
Deep Pools Present (>2 feet): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes (approximate size)				
Sediment Substrate: <input type="checkbox"/> Bedrock <input type="checkbox"/> Boulder (>10 in) <input type="checkbox"/> Cobble (2.5-10 in) <input checked="" type="checkbox"/> Gravel (0.10-2.5 in)				
(Circle all that apply) <input checked="" type="checkbox"/> Sand <input checked="" type="checkbox"/> Silt <input type="checkbox"/> Clay <input type="checkbox"/> Muck				
<input type="checkbox"/> Debris <input type="checkbox"/> Detritus <input type="checkbox"/> Concrete <input type="checkbox"/> Iron deposits				
Sediment Odors: <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic				
Sediment Oils: <input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse				
Water Odors: <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic				
Water Surface Oils: <input checked="" type="checkbox"/> None <input type="checkbox"/> Droplets <input type="checkbox"/> Sheen				
Turbidity: <input type="checkbox"/> Clear <input checked="" type="checkbox"/> Slightly Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Opaque				
Other Comments/Observations: 17SD29-01 (N), 02 (DS), 03 (DS), 04 (US)				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD28</u>		Date: <u>4-19-06</u>	Time: <u>1246</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) <u>3 in</u> Other (insects, frogs, etc.): <u>insects</u>				
Water Width (ft): <u>6.0'</u>		Water Depth (ft): <u>1.2'</u>		Estimated Flow/Velocity:
Channel Width (ft): <u>6.5'</u>		Channel Depth (ft): <u>2.0'</u>		<u>Secl. TWK. ~5"</u>
Signs of flooding (circle all that apply) <u>Yes</u> No Water marks on trees Water-borne debris piles Other: <u>Debris Piles</u>				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: <u>17SD28-01 (US), 02 (US), 03 (DS), 04 (DS)</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD27</u>		Date: <u>4-19-06</u>		Time: <u>1215</u>		Sampler: <u>JG/DH</u>	
Photograph Number/Direction: _____		Upstream _____		Downstream _____		East _____ West _____ North _____ South _____	
Predominant Surrounding Land Use: <u>Wooded</u>		Open Field _____		Other _____			
Canopy Cover: Open _____		<u>Partly Open</u>		Shaded _____			
Discharge Pipe Present: Yes _____		<u>No</u>					
Aquatic Vegetation Present: Yes _____				<u>No</u>			
				Stream channelized: <u>Yes</u> No _____			
Water flowing: <u>Yes</u>		No _____		Not present _____			
Organisms Present: Fish (in) _____		Other (insects, frogs, etc.): <u>insects</u>					
Water Width (ft): <u>5'</u>		Water Depth (ft): <u>0.75</u>		Estimated Flow/Velocity: _____			
Channel Width (ft): <u>6'</u>		Channel Depth (ft): <u>0.90</u>		<u>Sed. thk ~6"</u>			
Signs of flooding (circle all that apply) <u>Yes</u>		No _____		Water marks on trees _____		Water-borne debris piles _____ Other: <u>large debris piles</u>	
Deep Pools Present (>2 feet): Yes _____		No _____		If yes (approximate size) _____			
Sediment Substrate: Bedrock _____		Boulder (>10 in) _____		Cobble (2.5-10 in) _____		<u>Gravel</u> (0.10-2.5 in) _____	
(Circle all that apply) <u>Sand</u>		<u>Silt</u>		Clay _____		Muck _____	
Debris _____		Detritus _____		Concrete _____		Iron deposits _____	
Sediment Odors: <u>Normal</u>		Sewage _____		Petroleum _____		Chemical _____ Anaerobic _____	
Sediment Oils: <u>Absent</u>		Slight _____		Moderate _____		Profuse _____	
Water Odors: <u>Normal</u>		Sewage _____		Petroleum _____		Chemical _____ Anaerobic _____	
Water Surface Oils: <u>None</u>		Droplets _____		Sheen _____			
Turbidity: Clear _____		<u>Slightly Turbid</u>		Turbid _____		Opaque _____	
Other Comments/Observations: <u>17SD27-01 (SW), 02 (US), 03 (DS)</u>							

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD26</u>		Date: <u>4-18-06</u>	Time: <u>1725</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) Other (insects, frogs, etc.):				
Water Width (ft): <u>1.0'</u>		Water Depth (ft): <u>0.1'</u>		Estimated Flow/Velocity:
Channel Width (ft): <u>2.5'</u>		Channel Depth (ft): <u>0.9'</u>		<u>Sed. Thickness ~5"</u>
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: <u>Clear</u> Slightly Turbid Turbid Opaque				
Other Comments/Observations: <u>17SD26-01 (W), 02 (NW), 03 (DS), 04 (US)</u>				
1743-1749				

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: <u>175D25</u>		Date: <u>4-18-06</u>	Time: <u>1740</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) Other (insects, frogs, etc.):				
Water Width (ft): <u>0.5'</u>		Water Depth (ft): <u><0.1'</u>		Estimated Flow/Velocity:
Channel Width (ft): <u>2.5'</u>		Channel Depth (ft): <u>1.0'</u>		<u>Sed. Thickness ~ 8"</u>
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: <u>Clear</u> Slightly Turbid Turbid Opaque				
Other Comments/Observations: <u>175D25-01 (DS), 02 (DS), 03 (DS), 04 (US)</u>				
1750-1753				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD24</u>		Date: <u>4-19-04</u>	Time: <u>1430</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: <u>Upstream</u> Downstream East West North South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) Other (insects, frogs, etc.): <u>insects</u>				
Water Width (ft): <u>1.2'</u>		Water Depth (ft): <u>0.2'</u>		Estimated Flow/Velocity:
Channel Width (ft): <u>5.6'</u>		Channel Depth (ft): <u>4'</u>		
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: <u>17SD24-01 (SE), 02 (DS), 03 (US, SE), 04 (US)</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD23</u>		Date: <u>4-18-06</u>	Time: <u>1140</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: <u>Upstream</u>		<u>Downstream</u>	<u>East</u>	<u>West</u>
Predominant Surrounding Land Use: <u>Wooded</u>		<u>Open Field</u>	<u>Other</u>	
Canopy Cover: <u>Open</u>		<u>Partly Open</u>	<u>Shaded</u>	
Discharge Pipe Present: <u>Yes</u>		<u>No</u>		
Aquatic Vegetation Present: <u>Yes</u>		<u>No</u>	Stream channelized: <u>Yes</u> <u>No</u>	
Water flowing: <u>Yes</u>		<u>No</u>	<u>Not present</u>	
Organisms Present: Fish (in)		Other (insects, frogs, etc.):		
Water Width (ft): <u>1.0'</u>	Water Depth (ft): <u><0.1'</u>	Estimated Flow/Velocity:		
Channel Width (ft): <u>1.0'</u>	Channel Depth (ft): <u>~0.3'</u>	<u>Sed. thickness ~ 8"</u>		
Signs of flooding (circle all that apply) <u>Yes</u>		<u>No</u>	<u>Water marks on trees</u>	<u>Water-borne debris piles</u> <u>Other:</u>
Deep Pools Present (>2 feet): <u>Yes</u>		<u>No</u>	If yes (approximate size)	
Sediment Substrate: <u>Bedrock</u>		<u>Boulder (>10 in)</u>	<u>Cobble (2.5-10 in)</u>	<u>Gravel (0.10-2.5 in)</u>
(Circle all that apply) <u>Sand</u>		<u>Silt</u>	<u>Clay</u>	<u>Muck</u>
<u>Debris</u>		<u>Detritus</u>	<u>Concrete</u>	<u>Iron deposits</u>
Sediment Odors: <u>Normal</u>		<u>Sewage</u>	<u>Petroleum</u>	<u>Chemical</u> <u>Anaerobic</u>
Sediment Oils: <u>Absent</u>		<u>Slight</u>	<u>Moderate</u>	<u>Profuse</u>
Water Odors: <u>Normal</u>		<u>Sewage</u>	<u>Petroleum</u>	<u>Chemical</u> <u>Anaerobic</u>
Water Surface Oils: <u>None</u>		<u>Droplets</u>	<u>Sheen</u>	
Turbidity: <u>Clear</u>		<u>Slightly Turbid</u>	<u>Turbid</u>	<u>Opaque</u>
Other Comments/Observations: <u>17SD23 (W) 17SD23-01 (W), 02 (DS), 03 (US)</u> <u>04 (W)</u>				
<u>1653-1657</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: 17SD022		Date: 4-18-06	Time: 0930	Sampler: JG/DH
Photograph Number/Direction: ¹⁶²⁷ 1628 Upstream		Downstream	East	West <input checked="" type="checkbox"/> North <input type="checkbox"/> South <input type="checkbox"/>
Predominant Surrounding Land Use: <u>Wooded</u>		Open Field	Other	
Canopy Cover: Open		Partly Open	<u>Shaded</u>	
Discharge Pipe Present: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
Aquatic Vegetation Present: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		Stream channelized: <input checked="" type="checkbox"/> <u>Slight</u> No <input type="checkbox"/>		
Water flowing: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not present				
Organisms Present: Fish (in)		Other (insects, frogs, etc.):		
Water Width (ft): ^{DH} <u>2.0'</u>	Water Depth (ft): <u>< 0.1'</u>	Estimated Flow/Velocity: <u>NA</u>		
Channel Width (ft): <u>1.0'</u>	Channel Depth (ft): <u>0.5'</u>	<u>Sed Thickness ~ 6"</u>		
Signs of flooding (circle all that apply) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		Water marks on trees	Water-borne debris piles	Other:
Deep Pools Present (>2 feet): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		If yes (approximate size)		
Sediment Substrate: <u>Bedrock</u>		Boulder (>10 in)	Cobble (2.5-10 in)	<u>Gravel (0.10-2.5 in)</u>
(Circle all that apply) <u>Sand</u>		<u>Silt</u>	Clay	Muck
Debris		<u>Detritus</u>	Concrete	Iron deposits
Sediment Odors: <u>Normal</u>		Sewage	Petroleum	Chemical
				Anaerobic
Sediment Oils: <u>Absent</u>		Slight	Moderate	Profuse
Water Odors: <u>Normal</u>		Sewage	Petroleum	Chemical
				Anaerobic
Water Surface Oils: <u>None</u>		Droplets	Sheen	
Turbidity: Clear		<u>Slightly Turbid</u>	Turbid	Opaque
Other Comments/Observations: <u>Sediment thickness ~ 0.5'</u>				
<u>1629-1633 of location & surrounding area</u>				
<u>17SD22-01 (N), 02 (DS), 03 (DS), 04 (DS), 05 (US), 06 (US)</u>				

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: <u>17SD21</u>		Date: <u>4-18-06</u>	Time: <u>1000</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> ^{V. Slight} No	
Water flowing: Yes No <u>Not present</u>				
Organisms Present: Fish (in) _____ Other (insects, frogs, etc.): _____				
Water Width (ft): <u>NA</u>		Water Depth (ft): <u>NA</u>		Estimated Flow/Velocity: <u>NA</u>
Channel Width (ft): <u>2.0'</u>		Channel Depth (ft): _____		<u>Sed Thickness ~ 6"</u>
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other: _____				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size) _____				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel (0.10-2.5 in)</u>				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris <u>Detritus</u> Concrete Iron deposits				
Sediment Odors: Normal Sewage Petroleum Chemical Anaerobic				
Sediment Oils: Absent Slight Moderate Profuse				
Water Odors: Normal Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: None Droplets Sheen				
Turbidity: Clear Slightly Turbid Turbid Opaque				
Other Comments/Observations: <u>50' upstream from 17SD22, stream forks upstream</u> <u>1634-1641 from SD22, SD21 is in left fork moving upstream</u> <u>SD21 is ~ 24' from SD40</u>				
<u>17SD21-01(N), 02(N), 03(US), 04(US), 05(DS)</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD020</u>		Date: <u>4-18-06</u>	Time: <u>1215</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: _____		Upstream _____	Downstream _____	East _____ West _____ North _____ South _____
Predominant Surrounding Land Use: <u>Wooded</u>		Open Field _____	Other _____	
Canopy Cover: Open _____		<u>Partly Open</u>	Shaded _____	
Discharge Pipe Present: Yes _____		<u>No</u>		
Aquatic Vegetation Present: Yes _____		<u>No</u>	Stream channelized: <u>Yes</u>	No _____
Water flowing: <u>Yes</u>		No _____	Not present _____	
Organisms Present: Fish (in) <u>~ 3"</u>		Other (insects, frogs, etc.): _____		
Water Width (ft): <u>~ 5'</u>	Water Depth (ft): <u>~ 0.3'</u>	Estimated Flow/Velocity: _____		
Channel Width (ft): <u>~ 8'</u>	Channel Depth (ft): <u>~ 2'</u>	<u>Sed. Thickness ~ 3"</u>		
Signs of flooding (circle all that apply) <u>Yes</u>		<u>No</u>	Water marks on trees _____	<u>Water-borne debris piles</u> Other: _____
Deep Pools Present (>2 feet): Yes _____		<u>No</u>	If yes (approximate size) _____	
Sediment Substrate: Bedrock _____		Boulder (>10 in) _____	Cobble (2.5-10 in) _____	<u>Gravel</u> (0.10-2.5 in) _____
(Circle all that apply) <u>Sand</u>		<u>Silt</u>	Clay _____	Muck _____
Debris _____		Detritus _____	Concrete _____	Iron deposits _____
Sediment Odors: <u>Normal</u>		Sewage _____	Petroleum _____	Chemical _____ Anaerobic _____
Sediment Oils: <u>Absent</u>		Slight _____	Moderate _____	Profuse _____
Water Odors: <u>Normal</u>		Sewage _____	Petroleum _____	Chemical _____ Anaerobic _____
Water Surface Oils: <u>None</u>		Droplets _____	Sheen _____	
Turbidity: <u>Clear</u>		Slightly Turbid _____	Turbid _____	Opaque _____
Other Comments/Observations: <u>17SD20-01 (US), 02 (US), 03 (US), 04 (DS)</u>				

1664-1669

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD19</u>		Date: <u>4-18-06</u>	Time: <u>1235</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open <u>Partly Open</u> Shaded				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in)		Other (insects, frogs, etc.): <u>Insects</u>		
Water Width (ft): <u>5'</u>	Water Depth (ft): <u>0.45'</u>	Estimated Flow/Velocity:		
Channel Width (ft): <u>10'</u>	Channel Depth (ft): <u>2'</u>	<u>Sed. Thickness ~5"</u>		
Signs of flooding (circle all that apply) <u>Yes</u> No Water marks on trees Water-borne debris piles Other: <u>Debris Piles</u>				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel (0.10-2.5 in)</u>				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: <u>Clear</u> Slightly Turbid Turbid Opaque				
Other Comments/Observations: <u>17SD19-01 (NE), 02 (NE), 03 (E), 04 (S), 05 (DS)</u>				
<u>1669-1670-1676</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: 17SD18		Date: 4-18-06	Time: 1255	Sampler: JG/DH
Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South				
Predominant Surrounding Land Use: Wooded Open Field <u>Other</u> <i>Edge of woods + clearing</i>				
Canopy Cover: Open <u>Partly Open</u> Shaded.				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) <i>2 inch</i> Other (insects, frogs, etc.): <i>insects</i>				
Water Width (ft): <i>10'</i>		Water Depth (ft): <i>0.8'</i>		Estimated Flow/Velocity:
Channel Width (ft): <i>10'</i>		Channel Depth (ft): <i>3'</i>		<i>Sed Thickness ~ 6"</i>
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other: <i>Debris Piles</i>				
Deep Pools Present (>2 feet): <u>Yes</u> No If yes (approximate size) <i>10' x 10'</i>				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: <u>Clear</u> Slightly Turbid Turbid Opaque				
Other Comments/Observations: <i>Dupe collected here. Small water fall</i>				
<i>17SD18-01 (NE), 02 (US), 03 (US), 04 (DS), 05 (N),</i>				
<i>1677-1688</i>				

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: <u>175D17</u>		Date: <u>4-18-06</u>		Time: <u>1330</u>		Sampler: <u>JG/DH</u>	
Photograph Number/Direction: _____		Upstream _____		Downstream _____		East _____ West _____ North _____ South _____	
Predominant Surrounding Land Use: <u>Wooded</u>		Open Field _____		Other _____			
Canopy Cover: _____		Open _____		Partly Open _____		<u>Shaded</u>	
Discharge Pipe Present: _____		Yes _____		<u>No</u>			
Aquatic Vegetation Present: _____				Stream channelized: <u>Yes</u> _____ No _____			
Water flowing: _____		<u>Yes</u> _____		No _____		Not present _____	
Organisms Present: Fish (in) <u>2 inch</u>		Other (insects, frogs, etc.): <u>insects</u>					
Water Width (ft): <u>4.5'</u>		Water Depth (ft): <u>0.45'</u>		Estimated Flow/Velocity: _____			
Channel Width (ft): <u>10'</u>		Channel Depth (ft): <u>~3'</u>		<u>Sed thickness ~6"</u>			
Signs of flooding (circle all that apply)		Yes _____		No _____		Water marks on trees _____	
Deep Pools Present (>2 feet): <u>Yes</u>		No _____		If yes (approximate size) <u>4x5'</u>		Depth <u>0.9'</u>	
Sediment Substrate: _____		Bedrock _____		Boulder (>10 in) _____		Cobble (2.5-10 in) _____	
(Circle all that apply) <u>Sand</u>		<u>Silt</u>		Clay _____		<u>Gravel</u> (0.10-2.5 in)	
Debris _____		Detritus _____		Concrete _____		Iron deposits _____	
Sediment Odors: <u>Normal</u>		Sewage _____		Petroleum _____		Chemical _____ Anaerobic _____	
Sediment Oils: <u>Absent</u>		Slight _____		Moderate _____		Profuse _____	
Water Odors: <u>Normal</u>		Sewage _____		Petroleum _____		Chemical _____ Anaerobic _____	
Water Surface Oils: <u>None</u>		Droplets _____		Sheen _____		_____	
Turbidity: <u>Clear</u>		Slightly Turbid _____		Turbid _____		Opaque _____	
Other Comments/Observations: <u>175D17-01 (US), 02 (US), 03 (US), 04 (DS), 05 (DS)</u> <u>06 (S)</u>							
<u>1688-1694</u>							

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD16</u>		Date: <u>4-18-06</u>	Time: <u>1340</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>		Stream channelized: <u>Yes</u> No		
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) <u>2-3 web</u> Other (insects, frogs, etc.): <u>insects</u>				
Water Width (ft): <u>4.5'</u>	Water Depth (ft): <u>0.55'</u>	Estimated Flow/Velocity:		
Channel Width (ft): <u>8'</u>	Channel Depth (ft): <u>2'</u>	<u>Sed Thickness ~5"</u>		
Signs of flooding (circle all that apply) <u>Yes</u> No Water marks on trees Water-borne debris piles Other: <u>Debris Piles</u>				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel (0.10-2.5 in)</u>				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: <u>Clear</u> Slightly Turbid Turbid Opaque				
Other Comments/Observations: <u>17SD16-01 (S), 02 (S), 03 (US), 04 (US), 05 (DS)</u> <u>06 (DS), 07 (S)</u>				
<u>1694-1703</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD15</u>		Date: <u>4-18-06</u>	Time: <u>1468</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open <u>Partly Open</u> Shaded				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) <u>2-3 inch</u> Other (insects, frogs, etc.): <u>insects</u>				
Water Width (ft): <u>12'</u>		Water Depth (ft): <u>0.5'</u>		Estimated Flow/Velocity:
Channel Width (ft): <u>12'</u>		Channel Depth (ft): <u>2'</u>		<u>Sed Thickness ~5"</u>
Signs of flooding (circle all that apply) <u>Yes</u> No Water marks on trees Water-borne debris piles Other: <u>Debris Piles</u>				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: <u>Clear</u> Slightly Turbid Turbid Opaque				
Other Comments/Observations: <u>17SD15-01 (US), 02 (S), 03 (S, 05 to Left), 04 (S)</u> <u>05 (DS)</u>				
1769-1714				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD14</u>		Date: <u>4-18-06</u>		Time: <u>1435</u>		Sampler: <u>JG/DH</u>	
Photograph Number/Direction: <u>Upstream</u> <u>Downstream</u> <u>East</u> <u>West</u> <u>North</u> <u>South</u>							
Predominant Surrounding Land Use: <u>Wooded</u> <u>Open Field</u> <u>Other</u>							
Canopy Cover: <u>Open</u> <u>Partly Open</u> <u>Shaded</u>							
Discharge Pipe Present: <u>Yes</u> <u>No</u>							
Aquatic Vegetation Present: <u>Yes</u> <u>No</u>				Stream channelized: <u>Yes</u> <u>No</u>			
Water flowing: <u>Yes</u> <u>No</u> <u>Not present</u>							
Organisms Present: Fish (in) <u>2"</u>				Other (insects, frogs, etc.): <u>insects</u>			
Water Width (ft): <u>3'</u>		Water Depth (ft): <u>0.4'</u>		Estimated Flow/Velocity:			
Channel Width (ft): <u>8'</u>		Channel Depth (ft): <u>3'</u>		<u>Seed Thickness "5"</u>			
Signs of flooding (circle all that apply) <u>Yes</u> <u>No</u> <u>Water marks on trees</u> <u>Water-borne debris piles</u> Other: <u>Debris Piles</u>							
Deep Pools Present (>2 feet): <u>Yes</u> <u>No</u> If yes (approximate size)							
Sediment Substrate: <u>Bedrock</u> <u>Boulder (>10 in)</u> <u>Cobble (2.5-10 in)</u> <u>Gravel (0.10-2.5 in)</u>							
(Circle all that apply) <u>Sand</u> <u>Silt</u> <u>Clay</u> <u>Muck</u>							
<u>Debris</u> <u>Detritus</u> <u>Concrete</u> <u>Iron deposits</u>							
Sediment Odors: <u>Normal</u> <u>Sewage</u> <u>Petroleum</u> <u>Chemical</u> <u>Anaerobic</u>							
Sediment Oils: <u>Absent</u> <u>Slight</u> <u>Moderate</u> <u>Profuse</u>							
Water Odors: <u>Normal</u> <u>Sewage</u> <u>Petroleum</u> <u>Chemical</u> <u>Anaerobic</u>							
Water Surface Oils: <u>None</u> <u>Droplets</u> <u>Sheen</u>							
Turbidity: <u>Clear</u> <u>Slightly Turbid</u> <u>Turbid</u> <u>Opaque</u>							
Other Comments/Observations: <u>17SD14-01 (N), 02 (N), 03 (DS), 04 (DS)</u>							

1718-1725

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: <u>17SD103</u>		Date: <u>4-18-06</u>	Time: <u>1350</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: _____		Upstream _____	Downstream _____	East _____ West _____ North _____ South _____
Predominant Surrounding Land Use: <u>Wooded</u>		Open Field _____	Other _____	
Canopy Cover: Open _____		Partly Open _____	<u>Shaded</u>	
Discharge Pipe Present: Yes _____		<u>No</u>		
Aquatic Vegetation Present: Yes _____		<u>No</u>		
		Stream channelized: <u>Yes</u> No _____		
Water flowing: <u>Yes</u>		No _____	Not present _____	
Organisms Present: Fish (in) _____		Other (insects, frogs, etc.): <u>insects</u>		
Water Width (ft): <u>1.1'</u>	Water Depth (ft): <u>0.3'</u>	Estimated Flow/Velocity: _____		
Channel Width (ft): <u>8'</u>	Channel Depth (ft): <u>4'</u>	<u>Sed Thickness ~ 6"</u>		
Signs of flooding (circle all that apply) <u>Yes</u>		No _____	Water marks on trees _____	Water-borne debris piles _____ Other: <u>Debris Piles</u>
Deep Pools Present (>2 feet): Yes _____		<u>No</u> If yes (approximate size) _____		
Sediment Substrate: Bedrock _____		Boulder (>10 in) _____	Cobble (2.5-10 in) _____	<u>Gravel</u> (0.10-2.5 in) _____
(Circle all that apply) <u>Sand</u>		<u>Silt</u>	Clay _____	Muck _____
Debris _____		Detritus _____	Concrete _____	Iron deposits _____
Sediment Odors: <u>Normal</u>		Sewage _____	Petroleum _____	Chemical _____ Anaerobic _____
Sediment Oils: <u>Absent</u>		Slight _____	Moderate _____	Profuse _____
Water Odors: <u>Normal</u>		Sewage _____	Petroleum _____	Chemical _____ Anaerobic _____
Water Surface Oils: <u>None</u>		Droplets _____	Sheen _____	
Turbidity: <u>Clear</u>		Slightly Turbid _____	Turbid _____	Opaque _____
Other Comments/Observations: <u>17SD13-01 (US), 02 (US), 03 (US), 04 (US)</u>				

1704-1708

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: 17SD11		Date: 4-18-06	Time: 1645	Sampler: JG/DH
Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South				
Predominant Surrounding Land Use: <input checked="" type="radio"/> Wooded <input type="radio"/> Open Field <input type="radio"/> Other				
Canopy Cover: <input type="radio"/> Open <input checked="" type="radio"/> Partly Open <input type="radio"/> Shaded				
Discharge Pipe Present: <input checked="" type="radio"/> Yes <input type="radio"/> No				
Aquatic Vegetation Present: <input type="radio"/> Yes <input checked="" type="radio"/> No			Stream channelized: <input type="radio"/> Yes <input type="radio"/> No	
Water flowing: <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not present				
Organisms Present: Fish (in) _____ Other (insects, frogs, etc.): _____				
Water Width (ft): NA		Water Depth (ft): NA		Estimated Flow/Velocity: NA
Channel Width (ft): 5'		Channel Depth (ft): 2'		Sed Thickness ~ 6"
Signs of flooding (circle all that apply) <input type="radio"/> Yes <input checked="" type="radio"/> No Water marks on trees Water-borne debris piles Other: _____				
Deep Pools Present (>2 feet): <input type="radio"/> Yes <input checked="" type="radio"/> No If yes (approximate size) _____				
Sediment Substrate: <input type="radio"/> Bedrock <input type="radio"/> Boulder (>10 in) <input type="radio"/> Cobble (2.5-10 in) <input checked="" type="radio"/> Gravel (0.10-2.5 in)				
(Circle all that apply) <input checked="" type="radio"/> Sand <input checked="" type="radio"/> Silt <input type="radio"/> Clay <input type="radio"/> Muck				
<input type="radio"/> Debris <input type="radio"/> Detritus <input type="radio"/> Concrete <input type="radio"/> Iron deposits				
Sediment Odors: <input checked="" type="radio"/> Normal <input type="radio"/> Sewage <input type="radio"/> Petroleum <input type="radio"/> Chemical <input type="radio"/> Anaerobic				
Sediment Oils: <input checked="" type="radio"/> Absent <input type="radio"/> Slight <input type="radio"/> Moderate <input type="radio"/> Profuse				
Water Odors: <input type="radio"/> Normal <input type="radio"/> Sewage <input type="radio"/> Petroleum <input type="radio"/> Chemical <input type="radio"/> Anaerobic				
Water Surface Oils: <input type="radio"/> None <input type="radio"/> Droplets <input type="radio"/> Sheen				
Turbidity: <input type="radio"/> Clear <input type="radio"/> Slightly Turbid <input type="radio"/> Turbid <input type="radio"/> Opaque				
Other Comments/Observations: some misc. construction debris in ditch				
17SD11-01 (DS), 02 (DS), 03 (DS), 04 (US), 05 (DS)				
1735-1742				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD10</u>		Date: <u>4-18-06</u>	Time: <u>1420</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: <input type="checkbox"/> Upstream <input type="checkbox"/> Downstream <input type="checkbox"/> East <input type="checkbox"/> West <input type="checkbox"/> North <input type="checkbox"/> South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <input type="checkbox"/> <u>No</u>				
Aquatic Vegetation Present: Yes <input type="checkbox"/> <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> <input type="checkbox"/> <u>No</u> Not present				
Organisms Present: Fish (in) Other (insects, frogs, etc.):				
Water Width (ft): <u>0.5'</u>		Water Depth (ft): <u>0.1'</u>		Estimated Flow/Velocity:
Channel Width (ft): <u>5'</u>		Channel Depth (ft): <u>4.5'</u>		<u>Sed Thickness ~4"</u>
Signs of flooding (circle all that apply) <u>Yes</u> No Water marks on trees Water-borne debris piles Other: <u>Debris Piles</u>				
Deep Pools Present (>2 feet): Yes <input type="checkbox"/> <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: <u>Clear</u> Slightly Turbid Turbid Opaque				
Other Comments/Observations: <u>17SD10-01 (S), 02 (US)</u>				

1715-1717

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD09</u>		Date: <u>4-18-06</u>	Time: <u>1450</u>	Sampler: <u>JG/DH</u>
Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in)		Other (insects, frogs, etc.):		
Water Width (ft): <u>0.6</u>	Water Depth (ft): <u>0.1'</u>	Estimated Flow/Velocity:		
Channel Width (ft): <u>3.5'</u>	Channel Depth (ft): <u>3'</u>	<u>Sed thickness 6"</u>		
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) Gravel (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: <u>Clear</u> Slightly Turbid Turbid Opaque				
Other Comments/Observations: <u>17SD09-01(W), 02(DS), 03(DS)</u>				

1726-1729

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>175D08</u>		Date: <u>4-18-06</u> Time: <u>1630</u>		Sampler: <u>JG/DH</u>	
Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South					
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other					
Canopy Cover: Open Partly Open <u>Shaded</u>					
Dicharge Pipe Present: <u>Yes</u> No					
Aquatic Vegetation Present: Yes <u>No</u>		Stream channelized: Yes No			
Water flowing: <u>Yes</u> No Not present					
Organisms Present: Fish (in) _____ Other (insects, frogs, etc.): _____					
Water Width (ft): <u>2'</u>		Water Depth (ft): <u>0.4'</u>		Estimated Flow/Velocity: _____	
Channel Width (ft): <u>2'</u>		Channel Depth (ft): <u>3'</u>		<u>Sed Thickness ~ 2"</u>	
Signs of flooding (circle all that apply) Yes <u>No</u>		Water marks on trees _____		Water-borne debris piles _____ Other: _____	
Deep Pools Present (>2 feet): Yes <u>No</u>		If yes (approximate size) _____			
Sediment Substrate: Bedrock _____ Boulder (>10 in) _____ Cobble (2.5-10 in) _____ <u>Gravel</u> (0.10-2.5 in) _____					
(Circle all that apply) <u>Sand</u> <u>Silt</u> _____ Clay _____ Muck _____					
Debris _____ Detritus _____ Concrete _____ Iron deposits _____					
Sediment Odors: <u>Normal</u> Sewage _____ Petroleum _____ Chemical _____ Anaerobic _____					
Sediment Oils: <u>Absent</u> Slight _____ Moderate _____ Profuse _____					
Water Odors: <u>Normal</u> Sewage _____ Petroleum _____ Chemical _____ Anaerobic _____					
Water Surface Oils: <u>None</u> Droplets _____ Sheen _____					
Turbidity: <u>Clear</u> Slightly Turbid _____ Turbid _____ Opaque _____					
Other Comments/Observations: <u>175D08-01(S), 02(N,DS), 03(#5), 04(US), 05(US)</u>					
1730-1734					

A.3 MAY 2006 LOG SHEETS

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD42</u>		Date: <u>5-2-06</u>	Time: <u>1450</u>	Sampler: <u>JG/DH</u>
* Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other _____				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: Yes <u>No</u>	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) _____ Other (insects, frogs, etc.): _____				
Water Width (ft): <u>1.5</u>		Water Depth (ft): <u>0.2'</u>		Estimated Flow/Velocity: _____
Channel Width (ft): <u>-</u>		Channel Depth (ft): <u>-</u>		<u>Sed THK ~ 2"</u>
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other: _____				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size) _____				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel (0.10-2.5 in)</u>				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: <u>*17SD42+43+44-01 (US), 02 (DS)</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>175043</u>		Date: <u>5-2-06</u>	Time: <u>1442</u>	Sampler: <u>JG/DH</u>
* Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: Yes <u>No</u>	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) Other (insects, frogs, etc.):				
Water Width (ft): <u>4'</u>		Water Depth (ft): <u>0.4'</u>		Estimated Flow/Velocity:
Channel Width (ft):		Channel Depth (ft):		<u>Sed. TRK ~ 2"</u>
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel (0.10-2.5 in)</u>				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: <u>* See Log for 175042</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>175D44</u>		Date: <u>5-2-06</u>	Time: <u>1435</u>	Sampler: <u>JG/DH</u>
* Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: Yes <u>No</u>	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) Other (insects, frogs, etc.):				
Water Width (ft): <u>~5.0'</u>		Water Depth (ft): <u>0.9'</u>		Estimated Flow/Velocity:
Channel Width (ft): <u>-</u>		Channel Depth (ft): <u>-</u>		<u>Sed Thk ~ 2 inches</u>
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: <u>* See Log for 175D42</u>				

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: <u>17SD45</u>		Date: <u>5-2-06</u>	Time: <u>1425</u>	Sampler: <u>JG/DH</u>
* Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: Yes <u>No</u>	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) Other (insects, frogs, etc.):				
Water Width (ft): <u>6.4'</u>		Water Depth (ft): <u>0.2'</u>		Estimated Flow/Velocity:
Channel Width (ft): <u>-</u>		Channel Depth (ft): <u>-</u>		<u>Sed Thk ~ 4 inches</u>
Signs of flooding (circle all that apply) <u>Yes</u> No Water marks on trees <u>Water-borne debris piles</u> Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: <u>* 17SD45-01 (North), 02 (DS), 03 (US)</u>				

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: 17SD46		Date: 5-2-06	Time: 0930	Sampler: JG/DH
* Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open <u>Partly Open</u> Shaded				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes No			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) Other (insects, frogs, etc.):				
Water Width (ft): 3.3'		Water Depth (ft): 0.25'		Estimated Flow/Velocity:
Channel Width (ft): ~7'		Channel Depth (ft): ~1.0'		Sed. Thk ~5 inches
Signs of flooding (circle all that apply) Yes No Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: *17SD46-01 (East), 02 (DS), 03 & 04 (US)				

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: <u>17SD47</u>		Date: <u>5-7-06</u>	Time: <u>1005</u>	Sampler: <u>JG/DH</u>
* Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open <u>Partly Open</u> Shaded				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: <u>Yes</u> No <u>Algae</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) Other (insects, frogs, etc.):				
Water Width (ft): <u>~4'</u>		Water Depth (ft): <u>0.38</u>		Estimated Flow/Velocity:
Channel Width (ft): <u>4'</u>		Channel Depth (ft): <u>0.5'</u>		<u>Sed. Thk ~3"</u>
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: <u>*17SD47-01 (South), 02 (US), 03 (DS)</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD48</u>		Date: <u>5/2/06</u>	Time: <u>0850</u>	Sampler: <u>JG/DH</u>
* Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in)		Other (insects, frogs, etc.):		
Water Width (ft): <u>~1.0'</u>	Water Depth (ft): <u>~0.1</u>	Estimated Flow/Velocity:		
Channel Width (ft): <u>~2.0'</u>	Channel Depth (ft): <u>~0.5'</u>	<u>Sed. Thk ~3 inches</u>		
Signs of flooding (circle all that apply) <u>Yes</u> No Water marks on trees Water-borne debris piles Other: <u>debris piles</u>				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: <u>Clear</u> Slightly Turbid Turbid Opaque				
Other Comments/Observations: <u>* 17SD48-01 (West), 02 (DS), 03 (DS), 04 (US)</u>				

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: <u>17SD49</u>		Date: <u>5/2/06</u>	Time: <u>0905</u>	Sampler: <u>JG/DH</u>
* Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) Other (insects, frogs, etc.):				
Water Width (ft): <u>2.5'</u>		Water Depth (ft): <u>0.2'</u>		Estimated Flow/Velocity:
Channel Width (ft): <u>2.5'</u>		Channel Depth (ft): <u>0.2</u>		<u>Sed. Thk ~ 8 inches</u>
Signs of flooding (circle all that apply) <u>Yes</u> No Water marks on trees <u>Water-borne debris piles</u> Other:				
Deep Pools Present (>2 feet): Yes No If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel (0.10-2.5 in)</u>				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: <u>* 17SD49-01 (South), 02 (US), 03 & 04 (DS)</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD50</u>		Date: <u>5-2-06</u>	Time: <u>1130</u>	Sampler: <u>JG/DH</u>
* Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: <u>Yes</u> No			Stream channelized: Yes <u>No</u>	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in)		Other (insects, frogs, etc.):		
Water Width (ft): <u>1.0'</u>		Water Depth (ft): <u>0.2'</u>		Estimated Flow/Velocity:
Channel Width (ft):		Channel Depth (ft):		<u>Sed THK ~ 2 inches</u>
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: * ^{DH} <u>17SD50-01 (17SD50#51#52-01#02 (US)</u>				

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: <u>17SD51</u>		Date: <u>5-2-06</u>	Time: <u>1122</u>	Sampler: <u>JG/DH</u>
* Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: <u>Yes</u> No			Stream channelized: Yes <u>No</u>	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in)		Other (insects, frogs, etc.):		
Water Width (ft): <u>1'-2'</u>	Water Depth (ft): <u>0.1'-0.8'</u>	Estimated Flow/Velocity:		
Channel Width (ft):	Channel Depth (ft):	<u>Sed THK ~3 inches</u>		
Signs of flooding (circle all that apply)	Yes <u>No</u>	Water marks on trees	Water-borne debris piles	Other:
Deep Pools Present (>2 feet):	Yes <u>No</u>	If yes (approximate size)		
Sediment Substrate: (Circle all that apply)	Bedrock	Boulder (>10 in)	Cobble (2.5-10 in)	<u>Gravel</u> (0.10-2.5 in)
	<u>Sand</u>	<u>Silt</u>	Clay	Muck
	Debris	Detritus	Concrete	Iron deposits
Sediment Odors: <u>Normal</u>	Sewage	Petroleum	Chemical	Anaerobic
Sediment Oils: <u>Absent</u>	Slight	Moderate	Profuse	
Water Odors: <u>Normal</u>	Sewage	Petroleum	Chemical	Anaerobic
Water Surface Oils: <u>None</u>	Droplets	Sheen		
Turbidity: Clear	<u>Slightly Turbid</u>	Turbid	Opaque	
Other Comments/Observations: <u>* See Log for 17SD50</u>				

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: <u>17SD52</u>		Date: <u>5-2-06</u>	Time: <u>1115</u>	Sampler: <u>JG/DH</u>
* Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: <u>Yes</u> No			Stream channelized: Yes <u>No</u>	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) Other (insects, frogs, etc.):				
Water Width (ft): <u>~1.0'</u>		Water Depth (ft): <u>0.1'-0.8'</u>		Estimated Flow/Velocity:
Channel Width (ft):		Channel Depth (ft):		<u>Sed THK 3 inches</u>
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel (0.10-2.5 in)</u>				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: <u>* See Log for 17SD50</u>				

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: 17SD ^{DH} 53		Date: 5-2-06	Time: 0945	Sampler: JG/DH
* Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: <u>Yes</u> No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) Other (insects, frogs, etc.):				
Water Width (ft): 3.0'		Water Depth (ft): 0.5'		Estimated Flow/Velocity:
Channel Width (ft): 3.0'		Channel Depth (ft): 0.5'		<u>Sed THK 6 inches</u>
Signs of flooding (circle all that apply) <u>Yes</u> No Water marks on trees <u>Water-borne debris piles</u> Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absen</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: * 17SD53-01 (West), 02 (US), 03 (DS)				

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: <u>175D54</u>		Date: <u>5-2-06</u>	Time: <u>1200</u>	Sampler: <u>JG/DH</u>
* Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other <u>Edge of woods</u>				
Canopy Cover: Open <u>Partly Open</u> Shaded				
Discharge Pipe Present: <u>Yes</u> No				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: Yes <u>No</u>	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) Other (insects, frogs, etc.):				
Water Width (ft): <u>1.3'</u>		Water Depth (ft): <u>0.15'</u>		Estimated Flow/Velocity:
Channel Width (ft):		Channel Depth (ft):		<u>Sed. THK ~ 3"</u>
Signs of flooding (circle all that apply) Yes No Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes No If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: <u>* 175D54-01 + 02 (DS)</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD55</u>		Date: <u>5-2-06</u>	Time: <u>1145</u>	Sampler: <u>JG/DH</u>
* Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>Wooded</u> <u>Open Field</u> <u>Other</u>				
Canopy Cover: <u>Open</u> <u>Partly Open</u> <u>Shaded</u>				
Discharge Pipe Present: <u>Yes</u> <u>No</u>				
Aquatic Vegetation Present: <u>Yes</u> <u>No</u>			Stream channelized: <u>Yes</u> <u>No</u>	
Water flowing: <u>Yes</u> <u>No</u> <u>Not present</u>				
Organisms Present: Fish (in) <u> </u> Other (insects, frogs, etc.): <u> </u>				
Water Width (ft): <u>1.4'</u>		Water Depth (ft): <u>0.3'</u>		Estimated Flow/Velocity: <u> </u>
Channel Width (ft): <u>1.4</u>		Channel Depth (ft): <u>1.5'</u>		<u>Sed TWK ~10"</u>
Signs of flooding (circle all that apply) <u>Yes</u> <u>No</u> Water marks on trees <u> </u> Water-borne debris piles <u> </u> Other: <u> </u>				
Deep Pools Present (>2 feet): <u>Yes</u> <u>No</u> If yes (approximate size) <u> </u>				
Sediment Substrate: <u>Bedrock</u> <u>Boulder (>10 in)</u> <u>Cobble (2.5-10 in)</u> <u>Gravel (0.10-2.5 in)</u>				
(Circle all that apply) <u>sand</u> <u>Silt</u> <u>Clay</u> <u>Muck</u>				
<u>Debris</u> <u>Detritus</u> <u>Concrete</u> <u>Iron deposits</u>				
Sediment Odors: <u>Normal</u> <u>Sewage</u> <u>Petroleum</u> <u>Chemical</u> <u>Anaerobic</u>				
Sediment Oils: <u>Absent</u> <u>Slight</u> <u>Moderate</u> <u>Profuse</u>				
Water Odors: <u>Normal</u> <u>Sewage</u> <u>Petroleum</u> <u>Chemical</u> <u>Anaerobic</u>				
Water Surface Oils: <u>None</u> <u>Droplets</u> <u>Sheen</u>				
Turbidity: <u>Clear</u> <u>Slightly Turbid</u> <u>Turbid</u> <u>Opaque</u>				
Other Comments/Observations: <u>* 17SD55-01 (North), 02 (US), 03 (DS)</u>				

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: <u>17SD56</u>		Date: <u>5-2-06</u>	Time: <u>1510</u>	Sampler: <u>JG/DH</u>
* Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South				
Predominant Surrounding Land Use: <u>Wooded</u>		Open Field	Other: <u>Edge of woods</u>	
Canopy Cover: Open		Partly Open	<u>Shaded</u>	
Discharge Pipe Present: <u>Yes</u>		No		
Aquatic Vegetation Present: Yes <u>No</u>		Stream channelized: Yes <u>No</u>		
Water flowing: <u>Yes</u>		No	Not present	
Organisms Present: Fish (in)		Other (insects, frogs, etc.):		
Water Width (ft): <u>0.5'</u>	Water Depth (ft): <u>0.2'</u>	Estimated Flow/Velocity:		
Channel Width (ft): <u>-</u>	Channel Depth (ft): <u>-</u>	<u>Sed TRK</u>		
Signs of flooding (circle all that apply)	Yes <u>No</u>	Water marks on trees	Water-borne debris piles	Other:
Deep Pools Present (>2 feet):	Yes <u>No</u>	If yes (approximate size)		
Sediment Substrate: Bedrock	Boulder (>10 in)	Cobble (2.5-10 in)	<u>Gravel</u> (0.10-2.5 in)	
(Circle all that apply) <u>Sand</u>	<u>Silt</u>	Clay	Muck	
Debris	Detritus	Concrete	Iron deposits	
Sediment Odors: <u>Normal</u>	Sewage	Petroleum	Chemical	Anaerobic
Sediment Oils: <u>Absent</u>	Slight	Moderate	Profuse	
Water Odors: <u>Normal</u>	Sewage	Petroleum	Chemical	Anaerobic
Water Surface Oils: <u>None</u>	Droplets	Sheen		
Turbidity: Clear	<u>Slightly Turbid</u>	Turbid	Opaque	
Other Comments/Observations: <u>* 17SD56-01, 02 & 03 (DS)</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD57</u>		Date: <u>5-2-06</u>	Time: <u>1525</u>	Sampler: <u>JG/DH</u>
* Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other <u>Edge of woods</u>				
Canopy Cover: Open <u>Partly Open</u> Shaded				
Dicharge Pipe Present: <u>Yes</u> No				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: Yes No	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) Other (insects, frogs, etc.):				
Water Width (ft): <u>4'</u>		Water Depth (ft): <u>0.4'</u>		Estimated Flow/Velocity:
Channel Width (ft):		Channel Depth (ft):		<u>Sed THK ~3"</u>
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: <u>Deep gully, ~15'</u>				
<u>* 17SD57-01 (South), 02 (DS), 03 (South)</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD58</u>		Date: <u>5-2-06</u>	Time: <u>1555</u>	Sampler: <u>JG/DH</u>
* Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: Wooded <u> </u> <u>Open Field</u> <u> </u> Other <u>Power line cut</u>				
Canopy Cover: <u>Open</u> <u> </u> Partly Open <u> </u> Shaded <u>overhead powerlines</u>				
Discharge Pipe Present: Yes <u> </u> <u>No</u>				
Aquatic Vegetation Present: Yes <u> </u> <u>No</u>			Stream channelized: Yes <u> </u> <u>No</u>	
Water flowing: <u>Yes</u> <u> </u> No <u> </u> Not present				
Organisms Present: Fish (in) <u> </u> Other (insects, frogs, etc.): <u> </u>				
Water Width (ft): <u>0.7'</u>		Water Depth (ft): <u>0.15</u>		Estimated Flow/Velocity: <u> </u>
Channel Width (ft): <u>-</u>		Channel Depth (ft): <u>-</u>		<u>Sed Thk ~ 7"</u>
Signs of flooding (circle all that apply) Yes <u> </u> <u>No</u> Water marks on trees <u> </u> Water-borne debris piles <u> </u> Other: <u> </u>				
Deep Pools Present (>2 feet): Yes <u> </u> <u>No</u> If yes (approximate size) <u> </u>				
Sediment Substrate: Bedrock <u> </u> Boulder (>10 in) <u> </u> Cobble (2.5-10 in) <u> </u> <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay <u> </u> Muck <u> </u>				
Debris <u> </u> Detritus <u> </u> Concrete <u> </u> Iron deposits <u> </u>				
Sediment Odors: <u>Normal</u> Sewage <u> </u> Petroleum <u> </u> Chemical <u> </u> Anaerobic <u> </u>				
Sediment Oils: <u>Absent</u> Slight <u> </u> Moderate <u> </u> Profuse <u> </u>				
Water Odors: <u>Normal</u> Sewage <u> </u> Petroleum <u> </u> Chemical <u> </u> Anaerobic <u> </u>				
Water Surface Oils: <u>None</u> Droplets <u> </u> Sheen <u> </u>				
Turbidity: Clear <u> </u> <u>Slightly Turbid</u> Turbid <u> </u> Opaque <u> </u>				
Other Comments/Observations: <u>*17SD58-01 (US), 02 (US), 03 (US)</u>				

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: 17SD59		Date: 5-2-06	Time: 1600	Sampler: JG/DH
* Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South				
Predominant Surrounding Land Use: Wooded Open Field <u>Other</u> Power line cut				
Canopy Cover: Open <u>Partly Open</u> Shaded				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: Yes <u>No</u>	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) Other (insects, frogs, etc.):				
Water Width (ft): 2'		Water Depth (ft): 0.4'		Estimated Flow/Velocity:
Channel Width (ft): -		Channel Depth (ft): -		Seal THK ~6"
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: *17SD59-01 (Upstream), 02 (upstream)				

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: <u>17SD60</u>		Date: <u>5-2-06</u>	Time: <u>1645</u>	Sampler: <u>JG/DH</u>
* Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: Yes <u>No</u>	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in)		Other (insects, frogs, etc.):		
Water Width (ft): <u>~4'</u>		Water Depth (ft): <u>0.35'</u>		Estimated Flow/Velocity:
Channel Width (ft):		Channel Depth (ft):		<u>Sed TRK ~4"</u>
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: <u>*17SD60-01 (west), 02 (upstream)</u>				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD61</u>		Date: <u>5-2-06</u>	Time: <u>1650</u>	Sampler: <u>JG/DH</u>
* Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: Yes <u>No</u>	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) _____ Other (insects, frogs, etc.): _____				
Water Width (ft): <u>~1.5'</u>		Water Depth (ft): <u>0.2'</u>		Estimated Flow/Velocity:
Channel Width (ft): <u>1</u>		Channel Depth (ft): <u>1</u>		<u>Sed thk ~ 2"</u>
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: <u>* 17SD61-01 (Upstream), -02 (Upstream)</u>				

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: 17SD62		Date: 5-2-06	Time: 1635	Sampler: JG/DH
* Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: Yes <u>No</u>	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) Other (insects, frogs, etc.):				
Water Width (ft): 1.5		Water Depth (ft): 0.3		Estimated Flow/Velocity:
Channel Width (ft):		Channel Depth (ft):		Sed THK ~ 4"
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel</u> (0.10-2.5 in)				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: Clear <u>Slightly Turbid</u> Turbid Opaque				
Other Comments/Observations: *17SD62-01 (upst), 02 (downstream)				

**SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA**

Sample Number: <u>17SD63</u>		Date: <u>5-2-06</u>	Time: <u>1630</u>	Sampler: <u>JG/DH</u>
* Photograph Number/Direction: <u> </u> Upstream <u> </u> Downstream <u> </u> East <u> </u> West <u> </u> North <u> </u> South				
Predominant Surrounding Land Use: <u>(Wooded)</u> Open Field Other				
Canopy Cover: Open Partly Open <u>(Shaded)</u>				
Discharge Pipe Present: Yes <u>(No)</u>				
Aquatic Vegetation Present: Yes <u>(No)</u>			Stream channelized: Yes <u>(No)</u>	
Water flowing: <u>(Yes)</u> No Not present				
Organisms Present: Fish (in) Other (insects, frogs, etc.):				
Water Width (ft): <u>1.0'</u>		Water Depth (ft): <u>0.1'</u>		Estimated Flow/Velocity:
Channel Width (ft): <u> </u>		Channel Depth (ft): <u> </u>		<u>Sed thk ~ 8"</u>
Signs of flooding (circle all that apply) Yes <u>(No)</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes <u>(No)</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>(Gravel)</u> (0.10-2.5 in)				
(Circle all that apply) <u>(Sand)</u> <u>(Silt)</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>(Normal)</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>(Absent)</u> Slight Moderate Profuse				
Water Odors: <u>(Normal)</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>(None)</u> Droplets Sheen				
Turbidity: Clear <u>(Slightly Turbid)</u> Turbid Opaque				
Other Comments/Observations: <u>*17SD63-01 (South), 02 (downstream)</u>				

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: 175D64		Date: 5-2-06	Time: 1625	Sampler: JG/DH
* Photograph Number/Direction: _____ Upstream _____ Downstream _____ East _____ West _____ North _____ South				
Predominant Surrounding Land Use: <u>Wooded</u> Open Field Other				
Canopy Cover: Open Partly Open <u>Shaded</u>				
Discharge Pipe Present: Yes <u>No</u>				
Aquatic Vegetation Present: Yes <u>No</u>			Stream channelized: Yes <u>No</u>	
Water flowing: <u>Yes</u> No Not present				
Organisms Present: Fish (in) Other (<u>Insects</u> , frogs, etc.):				
Water Width (ft): 2'		Water Depth (ft): 0.1'		Estimated Flow/Velocity:
Channel Width (ft): /		Channel Depth (ft): /		Sed THK ~ 2"
Signs of flooding (circle all that apply) Yes <u>No</u> Water marks on trees Water-borne debris piles Other:				
Deep Pools Present (>2 feet): Yes <u>No</u> If yes (approximate size)				
Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) <u>Gravel (0.10-2.5 in)</u>				
(Circle all that apply) <u>Sand</u> <u>Silt</u> Clay Muck				
Debris Detritus Concrete Iron deposits				
Sediment Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Sediment Oils: <u>Absent</u> Slight Moderate Profuse				
Water Odors: <u>Normal</u> Sewage Petroleum Chemical Anaerobic				
Water Surface Oils: <u>None</u> Droplets Sheen				
Turbidity: <u>Clear</u> Slightly Turbid Turbid Opaque				
Other Comments/Observations: *175D64-01 (south), 02 (downstream)				

A.4 OCTOBER 2006 LOG SHEETS



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS500002	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB50	Created Date	10/20/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/20/06	09:40	DPT	0	0-2'	Other	See boring log

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/20/06	09:40	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10202006-5
✓	10/20/06	09:40	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	09:40	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5

General Observations and Notes

Sample ID = 0-2' but first 12 inches were asphalt and gravel.

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB500204	Created By	David Hickey
TtNUS Project #	112G0042	Sample Location ID	17SB50	Created Date	10/20/06
Task/Contract #	CTO 0376	Sampled By	David Hickey	Modified By	James GoerdT
WBS Code #		Concentration	Low concentration	Modified Date	11/15/06
QA Sample Type				Printed By	James GoerdT
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/20/06	09:45	DPT	NA	2-4	brown	

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/20/06	09:45	SW-846-8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	09:45	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	09:45	SW-846-8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10202006-5

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB501618	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB50	Created Date	10/20/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/20/06	09:55	DPT	0	16-18'	Other	See boring log

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/20/06	09:55	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	09:55	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10202006-5
✓	10/20/06	09:55	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS510002	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB51	Created Date	10/20/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/20/06	11:00	DPT	0	0-2'	Other	See boring log

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/20/06	11:00	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10202006-5
✓	10/20/06	11:00	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	11:00	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5

General Observations and Notes

Sample ID = 0-2' but first 8 inches were asphalt and gravel.

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB510204	Created By	David Hickey
TtNUS Project #	112G0042	Sample Location ID	17SB51	Created Date	10/20/06
Task/Contract #	CTO 0376	Sampled By	David Hickey	Modified By	James GoerdT
WBS Code #		Concentration	Low concentration	Modified Date	11/15/06
QA Sample Type				Printed By	James GoerdT
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/20/06	11:05	DPT	0	2-4	brown	

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/20/06	11:05	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	11:05	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C/HCL	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10202006-5
✓	10/20/06	11:05	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB511719	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB51	Created Date	10/20/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/20/06	11:21	DPT	0	17-19	Other	See boring log

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/20/06	11:21	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	11:21	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10202006-5
✓	10/20/06	11:21	SW-846- 8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB520204	Created By	David Hickey
TtNUS Project #	112G0042	Sample Location ID	17SB52	Created Date	10/20/06
Task/Contract #	CTO 0376	Sampled By	David Hickey	Modified By	James Goerd
WBS Code #		Concentration	Low concentration	Modified Date	11/15/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/20/06	10:20	DPT	0	2-4	brown	

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/20/06	10:20	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	10:20	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10202006-5
✓	10/20/06	10:20	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB521618	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB52	Created Date	10/20/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/20/06	10:24	DPT	0	16-18'	Other	See boring log

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/20/06	10:24	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10202006-5
✓	10/20/06	10:24	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	10:24	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0530001	Created By	James Goerd
TtNUS Project #	112G0042	Sample Location ID	17SB053	Created Date	10/9/06
Task/Contract #	CTO 0376	Sampled By	James Goerd	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	10/19/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/9/06	12:50	Hand auger	NA	0-1'	brown	

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/9/06	12:50	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1092006-2
✓	10/9/06	12:50	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1092006-2
✓	10/9/06	12:50	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1092006-2

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB530204	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB53	Created Date	10/19/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/19/06	13:45	DPT	0	2-4'	Other	See boring log

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/19/06	13:45	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10192006-4
✓	10/19/06	13:45	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10192006-4
✓	10/19/06	13:45	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10192006-4

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB531820	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB53	Created Date	10/19/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/19/06	14:15	DPT	0	18-20	Other	See boring log

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/19/06	14:15	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	8 oz. wide-mouth clear w/Teflon cap	DO MS/MSD	112G0042-10192006-4
✓	10/19/06	14:15	SW-846 8260B	VOCs	4°C	6	EnCore	EnCore Sampler - 5 gram	DO MS/MSD	112G0042-10192006-4
✓	10/19/06	14:15	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	6	EnCore	EnCore Sampler - 5 gram	DO MS/MSD	112G0042-10192006-4

General Observations and Notes

DO MS/MSD

- - End of Report - -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0540002	Created By	James Goerd
TtNUS Project #	112G0042	Sample Location ID	17SB054	Created Date	10/6/06
Task/Contract #	CTO 0376	Sampled By	James Goerd	Modified By	James Goerd
WBS Code #		Concentration	Low concentration	Modified Date	10/11/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/6/06	12:05	Hand auger	NA	0-2'	brown	Samples collected adjacent to concrete pipe which lies about 18" bgs. Approximately 2'x 2' hole around pipe and soil has washed away and/or settled around and below the pipe. Original PCB glass jar received broken at lab. Resampled on 10/10/06.

Analysis Records

Chain#	Comments	Requirements	Type	Count	Preservative	Description of Analysis	Analysis / Method	Time	Date	Collected
112G0042-1062006-1	Received broken and unsalvagable by lab.	4 oz. wide-mouth clear	Glass	1	4°C	PCBs / SVOCs /	SW-846 8082 / 8270C /	12:05	10/6/06	<input checked="" type="checkbox"/>

			8015B	DRO				w/Teflon cap	Sample re-collected on 10/10/06.	
✓	10/6/06	12:05	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1062006-1
✓	10/6/06	12:05	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1062006-1
✓	10/10/06	11:00	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap	Collected to replace original sample (10/06) which was received broken and unsalvagable at lab.	112G0042-10112006-3

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0550002	Created By	James Goerdts
TtNUS Project #	112G0042	Sample Location ID	17SB055	Created Date	10/6/06
Task/Contract #	CTO 0376	Sampled By	James Goerdts	Modified By	James Goerdts
WBS Code #		Concentration	Low concentration	Modified Date	10/11/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/6/06	12:40	Hand auger	NA	0-2'	brown	

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/6/06	12:40	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1062006-1
✓	10/6/06	12:40	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1062006-1
✓	10/6/06	12:40	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1062006-1

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS560002	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB56	Created Date	10/20/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/20/06	09:15	DPT	0	0-2'	Other	See boring log

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/20/06	09:15	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	09:15	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10202006-5
✓	10/20/06	09:15	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5

General Observations and Notes

Sample ID = 0-2' but first 12 inches were asphalt and gravel.

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0570002	Created By	James Goerdts
TtNUS Project #	112G0042	Sample Location ID	17SB057	Created Date	10/6/06
Task/Contract #	CTO 0376	Sampled By	James Goerdts	Modified By	James Goerdts
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/6/06	14:00	Hand auger	NA	0-2	brown	
10/6/06		-Select-			-Select-	

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/6/06	14:00	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1062006-1
✓	10/6/06	14:00	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1062006-1
✓	10/6/06	14:00	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1062006-1

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0580002	Created By	James Goerd
TtNUS Project #	112G0042	Sample Location ID	17SB058	Created Date	9/27/06
Task/Contract #	CTO 0376	Sampled By	James Goerd	Modified By	James Goerd
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/6/06	14:10	Hand auger	NA	0-2'	light brown	

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
X	10/6/06	14:10	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1062006-1
X	10/6/06	14:10	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1062006-1
X	10/6/06	14:10	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1062006-1

General Observations and Notes

No Notes



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0590001	Created By	James Goerdt
TtNUS Project #	112G0042	Sample Location ID	17SB059	Created Date	10/6/06
Task/Contract #	CTO 0376	Sampled By	James Goerdt	Modified By	James Goerdt
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerdt
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/6/06	15:25	Hand auger	NA	0-1'	light brown	Refusal at 1.0 feet. Sample collected over asphalt area.

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/6/06	15:25	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1062006-1
✓	10/6/06	14:25	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1062006-1
✓	10/6/06	14:25	SW-846- 8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1062006-1

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0600001	Created By	James Goerd
TtNUS Project #	112G0042	Sample Location ID	17SB060	Created Date	10/9/06
Task/Contract #	CTO 0376	Sampled By	James Goerd	Modified By	James Goerd
WBS Code #		Concentration	Low concentration	Modified Date	10/11/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/9/06	10:15	Hand auger	NA	0-1'	dark brown	sandy soil

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/9/06	10:15	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1092006-2
✓	10/9/06	10:15	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1092006-2
✓	10/9/06	10:15	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1092006-2

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB600204	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB60	Created Date	10/20/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/20/06	14:05	DPT	0	2-4'	Other	

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/20/06	14:05	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	14:05	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	14:05	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10202006-5

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB601719	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB60	Created Date	10/20/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/20/06	15:18	DPT	0	17-19'	Other	

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/20/06	15:18	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	15:18	SW-846-8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	15:18	SW-846-8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10202006-5

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS610002	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB61	Created Date	10/20/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James GoerdT
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/20/06	12:55	DPT	0	0-2'	Other	See boring log

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/20/06	12:55	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	12:55	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	12:55	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10202006-5

General Observations and Notes

Sample ID = 0-2' but first 12 inches were asphalt and gravel.

- End of Report. -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB610204	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB61	Created Date	10/20/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/20/06	13:05	DPT	0	2-4'	Other	

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/20/06	13:05	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10202006-5
✓	10/20/06	13:05	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	13:05	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB611618	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB61	Created Date	10/20/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/20/06	13:20	DPT	0	16-18'	Other	

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/20/06	13:20	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	6	EnCore	EnCore Sampler - 5 gram	DO MS/MSD	112G0042-10202006-5
✓	10/20/06	13:20	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	8 oz. wide-mouth clear w/Teflon cap	DO MS/MSD	112G0042-10202006-5
✓	10/20/06	13:20	SW-846 8260B	VOCs	4°C	6	EnCore	EnCore Sampler - 5 gram	DO MS/MSD	112G0042-10202006-5

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0620001	Created By	James Goerdts
TtNUS Project #	112G0042	Sample Location ID	17SB062	Created Date	10/9/06
Task/Contract #	CTO 0376	Sampled By	James Goerdts	Modified By	James Goerdts
WBS Code #		Concentration	Low concentration	Modified Date	10/11/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/9/06	11:00	Hand auger	NA	0-1'	brown	

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/9/06	11:00	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1092006-2
✓	10/9/06	11:00	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1092006-2
✓	10/9/06	11:00	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1092006-2

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB620204	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB62	Created Date	10/19/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/19/06	11:20	DPT	0	2-4'	Other	See boring log

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/19/06	11:20	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10192006-4
✓	10/19/06	11:20	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10192006-4
✓	10/19/06	11:20	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10192006-4

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB621113	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB62	Created Date	10/19/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/19/06	11:30	DPT	0	11-13'	Other	See boring log

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/19/06	11:30	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10192006-4
✓	10/19/06	11:30	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10192006-4
✓	10/19/06	11:30	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10192006-4

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0630002	Created By	James Goerd
TtNUS Project #	112G0042	Sample Location ID	17SB063	Created Date	10/6/06
Task/Contract #	CTO 0376	Sampled By	James Goerd	Modified By	James Goerd
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/6/06	12:40	Other - Define	NA	0-2'	light brown	Collected sample within utility junction box via threaded pipe with stainless steel bucket.

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/6/06	12:40	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	9	EnCore	EnCore Sampler - 5 gram	Do MS/MSD	112G0042-1062006-1
✓	10/6/06	12:40	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	3	Glass	4 oz. wide-mouth clear w/Teflon cap	Do MS/MSD	112G0042-1062006-1
✓	10/6/06	12:40	SW-846 8260B	VOCs	4°C	9	EnCore	EnCore Sampler - 5 gram	Do MS/MSD	112G0042-1062006-1

General Observations and Notes

MS/MSD

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0640001	Created By	James Goerd
TtNUS Project #	112G0042	Sample Location ID	17SB064	Created Date	10/9/06
Task/Contract #	CTO 0376	Sampled By	James Goerd	Modified By	James Goerd
WBS Code #		Concentration	Low concentration	Modified Date	10/11/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/9/06	10:55	Hand auger	NA	0-1"	dark brown	

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/9/06	10:55	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1092006-2
✓	10/9/06	10:55	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1092006-2
✓	10/9/06	10:55	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1092006-2

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB640204	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB64	Created Date	10/20/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James GoerdT
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/20/06	15:40	DPT	0	2-4'	Other	

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/20/06	15:40	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	15:40	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	15:40	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10202006-5

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB641315	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB64	Created Date	10/20/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/20/06	16:05	DPT	0	13-15'	Other	

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/20/06	16:05	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	16:05	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10202006-5
✓	10/20/06	16:05	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10202006-5

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0650001	Created By	James Goerd
TtNUS Project #	112G0042	Sample Location ID	17SB065	Created Date	10/9/06
Task/Contract #	CTO 0376	Sampled By	James Goerd	Modified By	James Goerd
WBS Code #		Concentration	Low concentration	Modified Date	10/11/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/9/06	10:45	Hand auger	NA	0-1"	dark brown	

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/9/06	10:45	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1092006-2
✓	10/9/06	10:45	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1092006-2
✓	10/9/06	10:45	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1092006-2

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB650204	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB65	Created Date	10/19/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/19/06	14:45	DPT	0	2-4"	Other	See boring log

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/19/06	14:45	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10192006-4
✓	10/19/06	14:45	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10192006-4
✓	10/19/06	14:45	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10192006-4

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB651416	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB65	Created Date	10/19/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/19/06	15:00	DPT	0	14-16'	Other	See boring log

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/19/06	15:00	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042- 10192006-4
✓	10/19/06	15:00	SW-846- 8260B	OVGRO- specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042- 10192006-4
✓	10/19/06	15:00	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide- mouth clear w/Teflon cap		112G0042- 10192006-4

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0660001	Created By	James Goerdts
TtNUS Project #	112G0042	Sample Location ID	17SB066	Created Date	10/9/06
Task/Contract #	CTO 0376	Sampled By	James Goerdts	Modified By	James Goerdts
WBS Code #		Concentration	Low concentration	Modified Date	10/11/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/9/06	13:05	Hand auger	NA	0-1'	dark brown	

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/9/06	13:05	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1092006-2
✓	10/9/06	13:05	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1092006-2
✓	10/9/06	13:05	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1092006-2

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB660204	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB66	Created Date	10/19/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James GoerdT
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/19/06	09:58	DPT	0	2-4	Other	See boring log

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/19/06	09:58	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10192006-4
✓	10/19/06	09:58	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10192006-4
✓	10/19/06	09:58	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10192006-4

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB661416	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	12SB66	Created Date	10/19/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/19/06	10:23	DPT	0	14-16'	Other	See boring log

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/19/06	10:23	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10192006-4
✓	10/19/06	10:23	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10192006-4
✓	10/19/06	10:23	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10192006-4

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0670002	Created By	James Goerdts
TtNUS Project #	112G0042	Sample Location ID	17SB067	Created Date	10/6/06
Task/Contract #	CTO 0376	Sampled By	James Goerdts	Modified By	James Goerdts
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/6/06	14:25	Hand auger	NA	0-2'	brown	

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/6/06	14:20	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1062006-1
✓	10/6/06	14:20	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1062006-1
✓	10/6/06	14:20	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1062006-1

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0680002	Created By	James Goerd
TtNUS Project #	112G0042	Sample Location ID	17SB068	Created Date	10/6/06
Task/Contract #	CTO 0376	Sampled By	James Goerd	Modified By	Dave Chapman
WBS Code #		Concentration	Low concentration	Modified Date	1/18/07
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/6/06	14:45	Hand auger	NA	0-2'	brown	

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/6/06	14:45	SW-846-8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		
✓	10/6/06	14:45	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		
✓	10/6/06	14:45	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0690001	Created By	James Goerdts
TtNUS Project #	112G0042	Sample Location ID	17SB069	Created Date	10/6/06
Task/Contract #	CTO 0376	Sampled By	James Goerdts	Modified By	James Goerdts
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/6/06	15:05	Hand auger	NA	0-1'	brown	Refusal at 1.0 feet

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/6/06	15:05	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1062006-1
✓	10/6/06	15:05	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1062006-1
✓	10/6/06	15:05	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1062006-1

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0700001	Created By	James Goerdts
TtNUS Project #	112G0042	Sample Location ID	17SB070	Created Date	10/9/06
Task/Contract #	CTO 0376	Sampled By	James Goerdts	Modified By	James Goerdts
WBS Code #		Concentration	Low concentration	Modified Date	10/11/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/9/06	13:40	Hand auger	NA	0-1"	dark brown	Sample location in drainage ditch near culvert by RR tracks. Wet sample location.

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/9/06	13:40	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1092006-2
✓	10/9/06	13:40	SW-846-8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1092006-2
✓	10/9/06	13:40	SW-846-8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1092006-2

General Observations and Notes



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB700204	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB70	Created Date	10/24/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James GoerdT
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/24/06	14:25	DPT	0	2-4'	Other	See Boring Log

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/24/06	14:25	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10242006-6
✓	10/24/06	14:25	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10242006-6
✓	10/24/06	14:25	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10242006-6

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB700405	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB70	Created Date	10/24/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/24/06	14:35	DPT	0	4-5'	Other	See Boring Log

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/24/06	14:35	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10242006-6
✓	10/24/06	14:35	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-10242006-6
✓	10/24/06	14:35	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-10242006-6

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0710001	Created By	James Goerdts
TtNUS Project #	112G0042	Sample Location ID	17SB071	Created Date	10/9/06
Task/Contract #	CTO 0376	Sampled By	James Goerdts	Modified By	James Goerdts
WBS Code #		Concentration	Low concentration	Modified Date	10/11/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/9/06	13:30	Hand auger	NA	0-1'	brown	Sample collected in shallow drainage channel at end of RR tracks next to bunker 354. Slightly moist.

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/9/06	13:30	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1092006-2
✓	10/9/06	13:30	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1092006-2
✓	10/9/06	13:30	SW-846-8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1092006-2



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SB710203	Created By	Terry Rojahn
TtNUS Project #	112G0042	Sample Location ID	17SB71	Created Date	10/24/06
Task/Contract #	CTO 0376	Sampled By	Terry Rojahn	Modified By	Terry Rojahn
WBS Code #		Concentration	Low concentration	Modified Date	11/3/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/24/06	14:05	DPT	0	2-3'	Other	See Boring Log

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/24/06	14:05	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042- 10242006-6
✓	10/24/06	14:05	SW-846- 8260B	OVGRO- specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042- 10242006-6
✓	10/24/06	14:05	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide- mouth clear w/Teflon cap		112G0042- 10242006-6

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0720001	Created By	James Goerdts
TtNUS Project #	112G0042	Sample Location ID	17SB072	Created Date	10/9/06
Task/Contract #	CTO 0376	Sampled By	James Goerdts	Modified By	James Goerdts
WBS Code #		Concentration	Low concentration	Modified Date	10/11/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/9/06	14:00	Hand auger	NA	0-1'	orange	Sample collected at end of bunker 354. Refusal at 8"

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/9/06	14:00	SW-846 8082 / 8270C / 8015B	PCBs / SVOCs / DRO	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1092006-2
✓	10/9/06	14:00	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1092006-2
✓	10/9/06	14:00	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler - 5 gram		112G0042-1092006-2

General Observations and Notes

No Notes



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0750006	Created By	James Goerd
TtNUS Project #	112G0042	Sample Location ID	17SB075	Created Date	10/8/06
Task/Contract #	CTO 0376	Sampled By	James Goerd	Modified By	James Goerd
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/7/06	10:00	Trowel	NA	0-6"	brown	Sample collected approx 10' on north side of streambed. Silt with fine sand.

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/7/06	10:00	SW-846 8082	PCBs	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1092006-2
✗	10/7/06	10:00	SW-846 8082	PCBs	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0760006	Created By	James Goerdts
TtNUS Project #	112G0042	Sample Location ID	17SB076	Created Date	10/8/06
Task/Contract #	CTO 0376	Sampled By	James Goerdts	Modified By	James Goerdts
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/7/06	10:12	Trowel	NA	0-6"	brown	Sample collected approximately 10' south of streambed. Silt with fine sand.

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
X	10/7/06	10:12	SW-846 8082	PCBs	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		
✓	10/7/06	10:12	SW-846 8082	PCBs	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1092006-2

General Observations and Notes

No Notes



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0770006	Created By	James Goerdts
TtNUS Project #	112G0042	Sample Location ID	17SB077	Created Date	10/8/06
Task/Contract #	CTO 0376	Sampled By	James Goerdts	Modified By	James Goerdts
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/7/06	10:34	Trowel	NA	0-6"	brown	Steel trowel. Sample collected approximately 10' north of streambed. Silt with fine sand

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/7/06	10:34	SW-846 8082	PCBs	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1092006-2

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0780006	Created By	James Goerd
TtNUS Project #	112G0042	Sample Location ID	17SB078	Created Date	10/8/06
Task/Contract #	CTO 0376	Sampled By	James Goerd	Modified By	James Goerd
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/7/06	10:45	Trowel	0	0-6"	brown	Steel trowel. Sample collected approximately 15' north of streambed. Silt with fine sand. Some small rocks.

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/7/06	10:45	SW-846 8082	PCBs	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1092006-2

General Observations and Notes

No Notes

-- End of Report --



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0790006	Created By	James Goerd
TtNUS Project #	112G0042	Sample Location ID	17SB079	Created Date	10/8/06
Task/Contract #	CTO 0376	Sampled By	James Goerd	Modified By	James Goerd
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/7/06	10:52	Trowel	NA	0-6"	brown	Steel trowel. Sample collected approximately 8' south of streambed. Silt with fine sand.

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/7/06	10:52	SW-846 8082	PCBs	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1092006-2

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0800006	Created By	James Goerd
TtNUS Project #	112G0042	Sample Location ID	17SB080	Created Date	10/8/06
Task/Contract #	CTO 0376	Sampled By	James Goerd	Modified By	James Goerd
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/7/06	15:50	Trowel	NA	0-6"	brown	Steel trowel. Sample collected approximately 10' south of streambed. Silt. Steep bank on SW side ~30'

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/7/06	15:50	SW-846 8082	PCBs	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1092006-2

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0810006	Created By	James Goerd
TtNUS Project #	112G0042	Sample Location ID	17SB081	Created Date	10/8/06
Task/Contract #	CTO 0376	Sampled By	James Goerd	Modified By	James Goerd
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/7/06	13:35	Trowel	NA	0-6"	brown	Steel trowel. Sample collected approximately 18' from streambed. Approximately 35' from utility corridor.

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/7/06	13:35	SW-846 8082	PCBs	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1092006-2

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0820006	Created By	James Goerd
TtNUS Project #	112G0042	Sample Location ID	17SB082	Created Date	10/8/06
Task/Contract #	CTO 0376	Sampled By	James Goerd	Modified By	James Goerd
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/7/06	13:25	Trowel	NA	0-6"	brown	Sample collected approximately 20' from streambed. Located in small valley. Silt with fine sand.

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/7/06	13:25	SW-846 8082	PCBs	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1092006-2

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0830006	Created By	James Goerdts
TtNUS Project #	112G0042	Sample Location ID	17SB083	Created Date	10/8/06
Task/Contract #	CTO 0376	Sampled By	James Goerdts	Modified By	James Goerdts
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/7/06	16:15	Trowel	NA	0-6"	brown	Steel trowel. Sample collected approximately 40' north of location 17SWSD21

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/7/06	16:15	SW-846 8082	PCBs	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1092006-2

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0840006	Created By	James Goerd
TtNUS Project #	112G0042	Sample Location ID	17SB084	Created Date	10/8/06
Task/Contract #	CTO 0376	Sampled By	James Goerd	Modified By	James Goerd
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/7/06	13:15	Trowel	NA	0-6"	brown	Steel trowel. Sample collected in seep line (back side of bunker 2219). Brown damp silty soil.

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/7/06	13:15	SW-846 8082	PCBs	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1092006-2

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0850001	Created By	David Hickey
TtNUS Project #	112G0042	Sample Location ID	17SB085	Created Date	10/6/06
Task/Contract #	CTO 0376	Sampled By	David Hickey	Modified By	James Goerdts
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/5/06	12:00	Hand auger	NA	0-1	brown	SANDY

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/5/06	12:00	SW-846 8082	PCBs	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1062006-1

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SS0860002	Created By	David Hickey
TtNUS Project #	112G0042	Sample Location ID	17SB086	Created Date	10/6/06
Task/Contract #	CTO 0376	Sampled By	David Hickey	Modified By	James Goerd
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/5/06	12:10	Hand auger	NA	0-2	light brown	SANDY CLAY

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/5/06	12:10	SW-846 8082	PCBs	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1062006-1

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SD0650006	Created By	James Goerd
TtNUS Project #	112G0042	Sample Location ID	17SWSD065	Created Date	10/5/06
Task/Contract #	CTO 0376	Sampled By	James Goerd	Modified By	John Wright
WBS Code #		Concentration	Low concentration	Modified Date	10/6/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/5/06	12:20	Trowel	NA	0-6"	brown	Sandy/silt. Low flow approx 5" deep. Channel width = 6' and depth is 3'.

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/5/06	12:20	SW-846 8082	PCBs	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1062006-1

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SD0660006	Created By	James Goerdts
TtNUS Project #	112G0042	Sample Location ID	17SWSD066	Created Date	10/5/06
Task/Contract #	CTO 0376	Sampled By	James Goerdts	Modified By	James Goerdts
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	10/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/5/06	12:35	Trowel	NA	0-6"	brown	Silt with fine sand. Low flow at approximately 8" deep. Channel is ~5' wide and ~2' deep.

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
<input checked="" type="checkbox"/>	10/5/06	12:35	SW-846 8082	PCBs	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap	Do MS/MSD	112G0042-1062006-1

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SD0670006	Created By	James Goerdts
TtNUS Project #	112G0042	Sample Location ID	17SWSD067	Created Date	10/5/06
Task/Contract #	CTO 0376	Sampled By	James Goerdts	Modified By	James Goerdts
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerdts
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/5/06	11:30	Trowel	NA	0-6"	brown	Silt with small pebbles and fine sand. Low flow with small pooled area ~12" deep. Channel is ~25' wide and ~6" deep on the side closest to bunker 2222.

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/5/06	11:30	SW-846 8082	PCBs	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1062006-1

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SD0680006	Created By	James Goerd
TtNUS Project #	112G0042	Sample Location ID	17SWSD068	Created Date	10/5/06
Task/Contract #	CTO 0376	Sampled By	James Goerd	Modified By	James Goerd
WBS Code #		Concentration	Low concentration	Modified Date	10/8/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/5/06	11:15	Trowel	NA	0-6"	brown	Silt with small pebbles. Low flow ~5" deep. Channel is ~20' wide and ~4' deep on the side closest to bunker 2222. Saw a flying squirrel at this location.

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/5/06	11:15	SW-846 8082	PCBs	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1062006-1

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

SOIL SEDIMENT SAMPLING LOG

SWMU 17 Investigation - October 2006 - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	Sample ID #	17SD0690001	Created By	James Goerd
TtNUS Project #	112G0042	Sample Location ID	17SWSD069	Created Date	10/5/06
Task/Contract #	CTO 0376	Sampled By	James Goerd	Modified By	James Goerd
WBS Code #		Concentration	Low concentration	Modified Date	10/11/06
QA Sample Type				Printed By	James Goerd
Status	Complete			Printed Date	2/21/07

Sample Collection Records

Date	Time	Method	Monitor (ppm)	Depth (ft)	Color	Description
10/5/06	11:00	Trowel	NA	0-6"	brown	Silt with small pebbles. Low flow with ~6" deep. Pooled (18" deep) near sample location. Channel is ~25' wide and ~5' deep on road side. Slow flow in and out of pool and fairly stagnant within pool.

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/5/06	11:00	SW-846 8082	PCBs	4°C	1	Glass	4 oz. wide-mouth clear w/Teflon cap		112G0042-1062006-1
✗	10/6/06	15:20	SW-846 8260B	VOCs	4°C	3	EnCore	EnCore Sampler -		

								5 gram		
X	10/6/06	15:20	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C	3	EnCore	EnCore Sampler - 5 gram		

General Observations and Notes

No Notes

- End of Report -



Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By James Goerdts Modified By James Goerdts Printed By James Goerdts
 Created Date 10/24/06 Modified Date 11/15/06 Printed Date 2/21/07

Project Information

SWMU 17 Investigation - October 2006 - CRANE NSWC

Facility Name	CRANE NSWC	Sample ID #	17GWTW02
TtNUS Project #	112G0042	Well ID	17TW02
Task/Contract #	CTO 0376	Well Type	Temporary Well
WBS Code #		Sampled By	James Goerdts
Status	Complete	Concentration	Low concentration

Well and Sample Data

Date	10/24/06	Static Water Level (ft.)	10.61	Water Quality Meter	4143008
Purge Method	Low flow - peristaltic	Total Well Depth (ft.)		Pump Control Box	No Data
Sampling Method	Low flow - peristaltic	Well Riser Diameter (in.)	1	Turbidity Meter	3596-3502
MS/MSD Collected?	N	Well Volumes Req.	1		
Duplicate Sample Collected?	N	Monitor Reading (ppm)	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
10/24/06	10:00	10.61		Highly Turbid	6.24	0.488	10.26	244		20			0

Final Purge / Sample Data

**One Casing
Volume**

**Total Vo. Purge
(L)**

Start Purge (hrs.)

End Purge (hrs.)

**Total Purge Time
(min.)**

Method

Waterlevel (ft.)

Flowrate (mL/min)

Color

pH (S.U.)

**Conductivity
(mS/cm)**

Low flow -
peristaltic

**Dissolved Oxygen
(mg/L)**

Turbidity (NTUs)

Temp (C)

ORP (mV)

Salinity

Other



Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/24/06	10:00	SW-846 8270C	SVOCs	4°C	2	Glass	1L Amber		112G0042-10252006-7
✓	10/24/06	10:00	SW-846 8082	PCBs	4°C	2	Glass	1L Amber		112G0042-10252006-7
✓	10/24/06	10:00	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C/HCL	3	Glass	40ml vials		112G0042-10252006-7
✓	10/24/06	10:00	SW-846-8270C	OSDRO-specific COCs per IDEM	4°C	2	Glass	1L Amber		112G0042-10252006-7
✓	10/24/06	12:15	SW-846 8260B	VOCs	4°C/HCL	3	Glass	40ml vials		112G0042-10252006-7

Page 2 of 2

General Observations and Notes

Total well depth was 16.4' including a 3.4' stick up. Began initial purge at 9:15 at which time (6) 40 ml vials and 1.5 Liters were collected for sample. The well dried out at 9:32. Water color was highly turbid (light brown). The well was allowed to recharge for 30 minutes. At 10:05 an additional 1.5 liters was collected before the well dried out again at 10:11. The water was much clearer at this time. Since the water is so much clearer

- End of Report -



GROUNDWATER SAMPLE LOG

Created By James Goerd **Modified By** James Goerd **Printed By** James Goerd
Created Date 10/24/06 **Modified Date** 11/15/06 **Printed Date** 2/21/07

Project Information

SWMU 17 Investigation - October 2006 - CRANE NSWC

Facility Name	CRANE NSWC	Sample ID #	17GWTW03
TtNUS Project #	112G0042	Well ID	17TW03
Task/Contract #	CTO 0376	Well Type	Temporary Well
WBS Code #		Sampled By	James Goerd
Status	Complete	Concentration	Low concentration

Well and Sample Data

Date	10/24/06	Static Water Level (ft.)	13.82	Water Quality Meter	4143008
Purge Method	Low flow - peristaltic	Total Well Depth (ft.)		Pump Control Box	No Data
Sampling Method	Low flow - peristaltic	Well Riser Diameter (in.)		Turbidity Meter	3596-3502
MS/MSD Collected?	N	Well Volumes Req.	1		
Duplicate Sample Collected?	N	Monitor Reading (ppm)	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (ms/cm)	DO (mg/L)	Turbidity (NTUS)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
10/24/06	12:40	13.82		Highly Turbid	NA	NA	NA	NA	NA	NA	NA	NA	0

Final Purge / Sample Data

One Casing Volume	Method	Low flow - peristaltic	Dissolved Oxygen (mg/L)
Total Vo. Purge (L)	Waterlevel (ft.)		Turbidity (NTUs)
Start Purge (hrs.)	Flowrate (mL/min)		Temp (C)
End Purge (hrs.)	Color		ORP (mV)
Total Purge Time (min.)	pH (S.U.)		Salinity
	Conductivity (mS/cm)		Other



SWMU 17 Investigation - October 2006 - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain #
✓	10/25/06	12:55	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C/HCL	3	Glass	40ml vials		112G0042-10252006-7
✓	10/25/06	12:55	SW-846-8260B	VOCs	4°C/HCL	3	Glass	40ml vials		112G0042-10252006-7

Page 2 of 2

General Observations and Notes

Total depth of well was 14.73 including a 6" stick up. The purge began at 12:40 and the well dried at 12:43. Approximately 300 ml was collected and retained for possible sample analyses. The well was allowed to recharge for approximately 30 minutes and another 50 ml was collected.

- End of Report -



Created By James Goerdts Modified By James Goerdts Printed By James Goerdts
 Created Date 10/25/06 Modified Date 11/15/06 Printed Date 2/21/07

Project Information

SWMU 17 Investigation - October 2006 - CRANE NSWC

Facility Name	CRANE NSWC	Sample ID #	17GWTW04
TtNUS Project #	112G0042	Well ID	17TW04
Task/Contract #	CTO 0376	Well Type	Temporary Well
WBS Code #		Sampled By	James Goerdts
Status	Complete	Concentration	Low concentration

Well and Sample Data

Date	10/25/06	Static Water Level (ft.)	5.31	Water Quality Meter	4143008
Purge Method	Low flow - peristaltic	Total Well Depth (ft.)		Pump Control Box	103
Sampling Method	Low flow - peristaltic	Well Riser Diameter (in.)		Turbidity Meter	3596-3502
MS/MSD Collected?	N	Well Volumes Req.	1		
Duplicate Sample Collected?	N	Monitor Reading (ppm)	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
10/25/06	11:15	5.31	300	Clear	6.19	.139	8.87	57.1	NA	208	NA	NA	0

Final Purge / Sample Data

One Casing Volume	Method	Low flow - peristaltic	Dissolved Oxygen (mg/L)
Total Vo. Purge (L)	Waterlevel (ft.)		Turbidity (NTUs)
Start Purge (hrs.)	Flowrate (mL/min)		Temp (C)
End Purge (hrs.)	Color		ORP (mV)
Total Purge Time (min.)	pH (S.U.)		Salinity
	Conductivity (mS/cm)		Other



Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	10/25/06	11:15	SW-846-8270C	OSDRO-specific COCs per IDEM	4°C	2	Glass	1L Amber		112G0042-10252006-7
✓	10/25/06	11:15	SW-846-8270C	SVOCs	4°C	2	Glass	1L Amber		112G0042-10252006-7
✓	10/25/06	11:15	SW-846-8082	PCBs	4°C	2	Glass	1L Amber		112G0042-10252006-7
✓	10/25/06	11:15	SW-846-8260B	VOCs	4°C/HCL	3	Glass	40ml vials		112G0042-10252006-7
✓	10/25/06	11:15	SW-846-8260B	OVGRO-specific COCs per IDEM	4°C/HCL	3	Glass	40ml vials		112G0042-10252006-7

Page 2 of 2

General Observations and Notes

Well is associated with soil boring 17SB70. Total depth is 9.80' with a stick up of 4.7'. Well is located in drainage channel near culvert. Initial water was med brown in color and then went to just cloudy after 10 minutes of purging. Purged approximately 6 liters before collecting samples. Wayer level only dropped to 5.41 after collecting all samples.

- End of Report -

APPENDIX B

2005 - 2006 FIELD INVESTIGATION SAMPLE RESULTS

- B.1 OCTOBER 2005 ANALYTICAL RESULTS**
- B.2 APRIL 2006 ANALYTICAL RESULTS**
- B.3 MAY 2006 ANALYTICAL RESULTS**
- B.4 OCTOBER 2006 ANALYTICAL RESULTS**

B.1 OCTOBER 2005 ANALYTICAL RESULTS

October 2005 - Sediment Analytical Data

SWMU	17/04	17/04	17/04	17/04	17/04	17/04	17/04	17/04
LOCATION	17SW/SD001	17SW/SD001	17SW/SD002	17SW/SD003	17SW/SD004	17SW/SD005	17SW/SD006	17SW/SD007
NSAMPLE	17SD010006	17SD010006-D	17SD020006	17SD030006	17SD040006	17SD050006	17SD060006	17SD070006
SAMPLE	17SD010006	17FD10040501	17SD020006	17SD030006	17SD040006	17SD050006	17SD060006	17SD070006
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
SAMPLE DATE	10/4/2005	10/4/2005	10/4/2005	10/1/2005	10/1/2005	10/1/2005	10/1/2005	10/4/2005

Pesticides/PCBs (ug/kg)

AROCLOR-1016	131 U	131 U	109 U	135 U	255 U	12 U	11.2 U	12.1 U
AROCLOR-1221	131 U	131 U	109 U	135 U	255 U	12 U	11.2 U	12.1 U
AROCLOR-1232	131 U	131 U	109 U	135 U	255 U	12 U	11.2 U	12.1 U
AROCLOR-1242	131 U	131 U	109 U	135 U	255 U	12 U	11.2 U	12.1 U
AROCLOR-1248	131 U	131 U	109 U	135 U	255 U	12 U	11.2 U	12.1 U
AROCLOR-1254	131 U	131 U	109 U	135 U	255 U	12 U	11.2 U	12.1 U
AROCLOR-1260	37000 J	42000 J	25000	17000	3600 J	1700	13 J	2200 J

October 2005 - Groundwater Analytical Data

SWMU	17/04
LOCATION	17MWT01
NSAMPLE	17GWTW01
SAMPLE	17GWTW01
MATRIX	GW
SAMPLE DATE	10/3/2005

Pesticides/PCBs (ug/L)

AROCLOR-1016	0.024 U
AROCLOR-1221	0.024 U
AROCLOR-1232	0.024 U
AROCLOR-1242	0.024 U
AROCLOR-1248	0.024 U
AROCLOR-1254	0.024 U
AROCLOR-1260	0.024 U

B.2 APRIL 2006 ANALYTICAL RESULTS

nsample 17FD04180601
 samp_date 4/18/2006
 lab_id 37621-001
 qc_type NM
 units UG/KG
 Pct_Solids 77.0
 DUP_OF: 17SD0180006

nsample 17SD0080006
 samp_date 4/18/2006
 lab_id 37621-002
 qc_type NM
 units UG/KG
 Pct_Solids 74.0
 DUP_OF:

nsample 17SD0090006
 samp_date 4/18/2006
 lab_id 37621-003
 qc_type NM
 units UG/KG
 Pct_Solids 72.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	220	U	
AROCLOR-1221	220	U	
AROCLOR-1232	220	U	
AROCLOR-1242	220	U	
AROCLOR-1248	220	U	
AROCLOR-1254	220	U	
AROCLOR-1260	1200	J	G
AROCLOR-1262	220	U	
AROCLOR-1268	220	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	23	U	
AROCLOR-1221	23	U	
AROCLOR-1232	23	U	
AROCLOR-1242	23	U	
AROCLOR-1248	23	U	
AROCLOR-1254	23	U	
AROCLOR-1260	23	U	
AROCLOR-1262	23	U	
AROCLOR-1268	23	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	24	U	
AROCLOR-1221	24	U	
AROCLOR-1232	24	U	
AROCLOR-1242	24	U	
AROCLOR-1248	24	U	
AROCLOR-1254	24	U	
AROCLOR-1260	24	U	
AROCLOR-1262	24	U	
AROCLOR-1268	24	U	

PROJ_NO: 00042

SDG: 37621 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample 17SD0100006
samp_date 4/18/2006
lab_id 37621-004
qc_type NM
units UG/KG
Pct_Solids 79.0
DUP_OF:

nsample 17SD0110006
samp_date 4/18/2006
lab_id 37621-005
qc_type NM
units UG/KG
Pct_Solids 87.0
DUP_OF:

nsample 17SD0130006
samp_date 4/18/2006
lab_id 37621-006
qc_type NM
units UG/KG
Pct_Solids 72.0
DUP_OF:

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	22	U	
AROCLOR-1221	22	U	
AROCLOR-1232	22	U	
AROCLOR-1242	22	U	
AROCLOR-1248	22	U	
AROCLOR-1254	22	U	
AROCLOR-1260	22	U	
AROCLOR-1262	22	U	
AROCLOR-1268	22	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	200	U	
AROCLOR-1221	200	U	
AROCLOR-1232	200	U	
AROCLOR-1242	200	U	
AROCLOR-1248	200	U	
AROCLOR-1254	200	U	
AROCLOR-1260	1800		
AROCLOR-1262	200	U	
AROCLOR-1268	200	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	240	U	
AROCLOR-1221	240	U	
AROCLOR-1232	240	U	
AROCLOR-1242	240	U	
AROCLOR-1248	240	U	
AROCLOR-1254	240	U	
AROCLOR-1260	530		
AROCLOR-1262	240	U	
AROCLOR-1268	240	U	

nsample 17SD0140006
 samp_date 4/18/2006
 lab_id 37621-007
 qc_type NM
 units UG/KG
 Pct_Solids 71.0
 DUP_OF:

nsample 17SD0150006
 samp_date 4/18/2006
 lab_id 37621-008
 qc_type NM
 units UG/KG
 Pct_Solids 74.0
 DUP_OF:

nsample 17SD0160006
 samp_date 4/18/2006
 lab_id 37621-009
 qc_type NM
 units UG/KG
 Pct_Solids 79.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	240	U	
AROCLOR-1221	240	U	
AROCLOR-1232	240	U	
AROCLOR-1242	240	U	
AROCLOR-1248	240	U	
AROCLOR-1254	240	U	
AROCLOR-1260	1300		
AROCLOR-1262	240	U	
AROCLOR-1268	240	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	230	U	
AROCLOR-1221	230	U	
AROCLOR-1232	230	U	
AROCLOR-1242	230	U	
AROCLOR-1248	230	U	
AROCLOR-1254	230	U	
AROCLOR-1260	1000		
AROCLOR-1262	230	U	
AROCLOR-1268	230	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	220	U	
AROCLOR-1221	220	U	
AROCLOR-1232	220	U	
AROCLOR-1242	220	U	
AROCLOR-1248	220	U	
AROCLOR-1254	220	U	
AROCLOR-1260	480		
AROCLOR-1262	220	U	
AROCLOR-1268	220	U	

PROJ_NO: 00042

SDG: 37621 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample 17SD0170006
samp_date 4/18/2006
lab_id 37621-010
qc_type NM
units UG/KG
Pct_Solids 75.0
DUP_OF:

nsample 17SD0180006
samp_date 4/18/2006
lab_id 37621-011
qc_type NM
units UG/KG
Pct_Solids 75.0
DUP_OF:

nsample 17SD0190006
samp_date 4/18/2006
lab_id 37621-012
qc_type NM
units UG/KG
Pct_Solids 77.0
DUP_OF:

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	230	U	
AROCLOR-1221	230	U	
AROCLOR-1232	230	U	
AROCLOR-1242	230	U	
AROCLOR-1248	230	U	
AROCLOR-1254	230	U	
AROCLOR-1260	2200		
AROCLOR-1262	230	U	
AROCLOR-1268	230	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	230	U	
AROCLOR-1221	230	U	
AROCLOR-1232	230	U	
AROCLOR-1242	230	U	
AROCLOR-1248	230	U	
AROCLOR-1254	230	U	
AROCLOR-1260	3700	J	G
AROCLOR-1262	230	U	
AROCLOR-1268	230	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	220	U	
AROCLOR-1221	220	U	
AROCLOR-1232	220	U	
AROCLOR-1242	220	U	
AROCLOR-1248	220	U	
AROCLOR-1254	220	U	
AROCLOR-1260	3700		
AROCLOR-1262	220	U	
AROCLOR-1268	220	U	

nsample 17SD0200006
 samp_date 4/18/2006
 lab_id 37621-013
 qc_type NM
 units UG/KG
 Pct_Solids 82.0
 DUP_OF:

nsample 17SD0210006
 samp_date 4/18/2006
 lab_id 37621-014
 qc_type NM
 units UG/KG
 Pct_Solids 60.0
 DUP_OF:

nsample 17SD0220006
 samp_date 4/18/2006
 lab_id 37621-015
 qc_type NM
 units UG/KG
 Pct_Solids 61.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	21	U	
AROCLOR-1221	21	U	
AROCLOR-1232	21	U	
AROCLOR-1242	21	U	
AROCLOR-1248	21	U	
AROCLOR-1254	21	U	
AROCLOR-1260	21	U	
AROCLOR-1262	21	U	
AROCLOR-1268	21	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	28	U	
AROCLOR-1221	28	U	
AROCLOR-1232	28	U	
AROCLOR-1242	28	U	
AROCLOR-1248	28	U	
AROCLOR-1254	28	U	
AROCLOR-1260	21	J	P
AROCLOR-1262	28	U	
AROCLOR-1268	28	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	28	U	
AROCLOR-1221	28	U	
AROCLOR-1232	28	U	
AROCLOR-1242	28	U	
AROCLOR-1248	28	U	
AROCLOR-1254	28	U	
AROCLOR-1260	30		
AROCLOR-1262	28	U	
AROCLOR-1268	28	U	

PROJ_NO: 00042

SDG: 37621 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample 17SD0230006
 samp_date 4/18/2006
 lab_id 37621-016
 qc_type NM
 units UG/KG
 Pct_Solids 74.0
 DUP_OF:

nsample 17SD0250006
 samp_date 4/18/2006
 lab_id 37621-017
 qc_type NM
 units UG/KG
 Pct_Solids 81.0
 DUP_OF:

nsample 17SD0260006
 samp_date 4/18/2006
 lab_id 37621-018
 qc_type NM
 units UG/KG
 Pct_Solids 69.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	23	UJ	R
AROCLOR-1221	23	UJ	R
AROCLOR-1232	23	UJ	R
AROCLOR-1242	23	UJ	R
AROCLOR-1248	23	UJ	R
AROCLOR-1254	23	UJ	R
AROCLOR-1260	25	J	R
AROCLOR-1262	23	UJ	R
AROCLOR-1268	23	UJ	R

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	210	U	
AROCLOR-1221	210	U	
AROCLOR-1232	210	U	
AROCLOR-1242	210	U	
AROCLOR-1248	210	U	
AROCLOR-1254	210	U	
AROCLOR-1260	580		
AROCLOR-1262	210	U	
AROCLOR-1268	210	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	250	U	
AROCLOR-1221	250	U	
AROCLOR-1232	250	U	
AROCLOR-1242	250	U	
AROCLOR-1248	250	U	
AROCLOR-1254	250	U	
AROCLOR-1260	5300		
AROCLOR-1262	250	U	
AROCLOR-1268	250	U	

nsample 17SD0400006
 samp_date 4/18/2006
 lab_id 37621-019
 qc_type NM
 units UG/KG
 Pct_Solids 56.0
 DUP_OF:

nsample 17SD0410006
 samp_date 4/18/2006
 lab_id 37621-020
 qc_type NM
 units UG/KG
 Pct_Solids 60.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	30	U	
AROCLOR-1221	30	U	
AROCLOR-1232	30	U	
AROCLOR-1242	30	U	
AROCLOR-1248	30	U	
AROCLOR-1254	30	U	
AROCLOR-1260	63		
AROCLOR-1262	30	U	
AROCLOR-1268	30	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	280	U	
AROCLOR-1221	280	U	
AROCLOR-1232	280	U	
AROCLOR-1242	280	U	
AROCLOR-1248	280	U	
AROCLOR-1254	280	U	
AROCLOR-1260	500		
AROCLOR-1262	280	U	
AROCLOR-1268	280	U	

PROJ_NO: 00042

SDG: 37622 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample 17FD04190601
samp_date 4/19/2006
lab_id 37622-006
qc_type NM
units UG/KG
Pct_Solids 80.0
DUP_OF: 17SD0380006

nsample 17SD0240006
samp_date 4/19/2006
lab_id 37622-007
qc_type NM
units UG/KG
Pct_Solids 78.0
DUP_OF:

nsample 17SD0270006
samp_date 4/19/2006
lab_id 37622-014
qc_type NM
units UG/KG
Pct_Solids 78.0
DUP_OF:

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	21	UJ	R
AROCLOR-1221	21	UJ	R
AROCLOR-1232	21	UJ	R
AROCLOR-1242	21	UJ	R
AROCLOR-1248	21	UJ	R
AROCLOR-1254	21	UJ	R
AROCLOR-1260	230	J	R
AROCLOR-1262	21	UJ	R
AROCLOR-1268	21	UJ	R

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	22	U	
AROCLOR-1221	22	U	
AROCLOR-1232	22	U	
AROCLOR-1242	22	U	
AROCLOR-1248	22	U	
AROCLOR-1254	22	U	
AROCLOR-1260	22	U	
AROCLOR-1262	22	U	
AROCLOR-1268	22	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	22	UJ	R
AROCLOR-1221	22	UJ	R
AROCLOR-1232	22	UJ	R
AROCLOR-1242	22	UJ	R
AROCLOR-1248	22	UJ	R
AROCLOR-1254	22	UJ	R
AROCLOR-1260	22	UJ	R
AROCLOR-1262	22	UJ	R
AROCLOR-1268	22	UJ	R

nsample 17SD0280006
 samp_date 4/19/2006
 lab_id 37622-001
 qc_type NM
 units UG/KG
 Pct_Solids 67.0
 DUP_OF:

nsample 17SD0290006
 samp_date 4/19/2006
 lab_id 37622-008
 qc_type NM
 units UG/KG
 Pct_Solids 67.0
 DUP_OF:

nsample 17SD0300006
 samp_date 4/19/2006
 lab_id 37622-002
 qc_type NM
 units UG/KG
 Pct_Solids 70.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	25	UJ	R
AROCLOR-1221	25	UJ	R
AROCLOR-1232	25	UJ	R
AROCLOR-1242	25	UJ	R
AROCLOR-1248	25	UJ	R
AROCLOR-1254	25	UJ	R
AROCLOR-1260	83	J	R
AROCLOR-1262	25	UJ	R
AROCLOR-1268	25	UJ	R

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	25	U	
AROCLOR-1221	25	U	
AROCLOR-1232	25	U	
AROCLOR-1242	25	U	
AROCLOR-1248	25	U	
AROCLOR-1254	25	U	
AROCLOR-1260	180		
AROCLOR-1262	25	U	
AROCLOR-1268	25	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	24	U	
AROCLOR-1221	24	U	
AROCLOR-1232	24	U	
AROCLOR-1242	24	U	
AROCLOR-1248	24	U	
AROCLOR-1254	24	U	
AROCLOR-1260	89		
AROCLOR-1262	24	U	
AROCLOR-1268	24	U	

PROJ_NO: 00042

SDG: 37622 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample 17SD0310006
samp_date 4/19/2006
lab_id 37622-003
qc_type NM
units UG/KG
Pct_Solids 75.0
DUP_OF:

nsample 17SD0320006
samp_date 4/19/2006
lab_id 37622-004
qc_type NM
units UG/KG
Pct_Solids 78.0
DUP_OF:

nsample 17SD0330006
samp_date 4/19/2006
lab_id 37622-009
qc_type NM
units UG/KG
Pct_Solids 73.0
DUP_OF:

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	23	U	
AROCLOR-1221	23	U	
AROCLOR-1232	23	U	
AROCLOR-1242	23	U	
AROCLOR-1248	23	U	
AROCLOR-1254	23	U	
AROCLOR-1260	110		
AROCLOR-1262	23	U	
AROCLOR-1268	23	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	22	U	
AROCLOR-1221	22	U	
AROCLOR-1232	22	U	
AROCLOR-1242	22	U	
AROCLOR-1248	22	U	
AROCLOR-1254	22	U	
AROCLOR-1260	200		
AROCLOR-1262	22	U	
AROCLOR-1268	22	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	23	UJ	R
AROCLOR-1221	23	UJ	R
AROCLOR-1232	23	UJ	R
AROCLOR-1242	23	UJ	R
AROCLOR-1248	23	UJ	R
AROCLOR-1254	23	UJ	R
AROCLOR-1260	1300		
AROCLOR-1262	23	UJ	R
AROCLOR-1268	23	UJ	R

nsample 17SD0340006
 samp_date 4/19/2006
 lab_id 37622-010
 qc_type NM
 units UG/KG
 Pct_Solids 78.0
 DUP_OF:

nsample 17SD0350006
 samp_date 4/19/2006
 lab_id 37622-015
 qc_type NM
 units UG/KG
 Pct_Solids 74.0
 DUP_OF:

nsample 17SD0360006
 samp_date 4/19/2006
 lab_id 37622-011
 qc_type NM
 units UG/KG
 Pct_Solids 75.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	22	UJ	R
AROCLOR-1221	22	UJ	R
AROCLOR-1232	22	UJ	R
AROCLOR-1242	22	UJ	R
AROCLOR-1248	22	UJ	R
AROCLOR-1254	22	UJ	R
AROCLOR-1260	220	R	U
AROCLOR-1262	22	UJ	R
AROCLOR-1268	22	UJ	R

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	23	UJ	R
AROCLOR-1221	23	UJ	R
AROCLOR-1232	23	UJ	R
AROCLOR-1242	23	UJ	R
AROCLOR-1248	23	UJ	R
AROCLOR-1254	23	UJ	R
AROCLOR-1260	950		
AROCLOR-1262	23	UJ	R
AROCLOR-1268	23	UJ	R

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	23	UJ	R
AROCLOR-1221	23	UJ	R
AROCLOR-1232	23	UJ	R
AROCLOR-1242	23	UJ	R
AROCLOR-1248	23	UJ	R
AROCLOR-1254	23	UJ	R
AROCLOR-1260	150	R	U
AROCLOR-1262	23	UJ	R
AROCLOR-1268	23	UJ	R

PROJ_NO: 00042

SDG: 37622 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample 17SD0370006
samp_date 4/19/2006
lab_id 37622-012
qc_type NM
units UG/KG
Pct_Solids 75.0
DUP_OF:

nsample 17SD0380006
samp_date 4/19/2006
lab_id 37622-013
qc_type NM
units UG/KG
Pct_Solids 78.0
DUP_OF:

nsample 17SD0390006
samp_date 4/19/2006
lab_id 37622-005
qc_type NM
units UG/KG
Pct_Solids 67.0
DUP_OF:

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	23	U	
AROCLOR-1221	23	U	
AROCLOR-1232	23	U	
AROCLOR-1242	23	U	
AROCLOR-1248	23	U	
AROCLOR-1254	23	U	
AROCLOR-1260	550		
AROCLOR-1262	23	U	
AROCLOR-1268	23	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	22	UJ	R
AROCLOR-1221	22	UJ	R
AROCLOR-1232	22	UJ	R
AROCLOR-1242	22	UJ	R
AROCLOR-1248	22	UJ	R
AROCLOR-1254	22	UJ	R
AROCLOR-1260	290	J	R
AROCLOR-1262	22	UJ	R
AROCLOR-1268	22	UJ	R

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	25	UJ	R
AROCLOR-1221	25	UJ	R
AROCLOR-1232	25	UJ	R
AROCLOR-1242	25	UJ	R
AROCLOR-1248	25	UJ	R
AROCLOR-1254	25	UJ	R
AROCLOR-1260	25	UJ	R
AROCLOR-1262	25	UJ	R
AROCLOR-1268	25	UJ	R

B.3 MAY 2006 ANALYTICAL RESULTS

Laucks

Testing Laboratories, Inc.

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Seattle, WA 98108

(206) 767-5060 FAX (206) 767-5063

FAX Cover Sheet

To: Ed Sedlmeyer
Company: Tetra Tech NUS
From: Ernie Walker

FAX Number: Sedlmeyer@tnus.com

Date: 5/9/06

No. of Pages
(including cover
page): 13

Preliminary Results for:

Workorders(s): _____

SDG (s): 37624

Analysis: 8082

Verified by: GR

Do these samples need to be re-analyzed? Yes No

If yes, which samples?: All

Reason: CCVs did not pass and some sample had PCB hit

exceed the linear calibration range.

The preliminary results for the re-analysis will be faxed on (date): _____

Laucks does not certify that these results meet NELAC Standards because all NELAC required elements are not included in the facsimile. Please refer to the full report to review all NELAC required elements.

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client::	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06
Sample ID:	17SD0550006	Lab sample ID:	37624-001
Date/time collected:	05/02/2006 11:45	Date/time received:	05/04/2006 08:45
Date/time prepared:	05/04/2006 14:00	SDG Number:	37624
		Run Sequence ID:	R006719

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	17 U	ug/kg	05/05/2006 23:00
Aroclor-1221	1	17 U		
Aroclor-1232	1	17 U		
Aroclor-1242	1	17 U		
Aroclor-1248	1	17 U		
Aroclor-1254	1	17 U		
Aroclor-1260	1	17 U		
Aroclor-1262	1	17 U		
Aroclor-1268	1	17 U		
Decachlorobiphenyl	1	59	%	
Tetrachloro-m-xylene	1	72		
2,2',4,4',5,5'-hexabromobiphenyl	1			

Laucks does not certify that these results meet NELAC Standards because all NELAC required elements are not included in the facsimile. Please refer to the full report to review all NELAC required elements.

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client:	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06	
Sample ID:	17SD0560006	Lab sample ID:	37624-002	
Date/time collected:	05/02/2006 15:10	Date/time received:	05/04/2006 08:45	
Date/time prepared:	05/04/2006 14:00	SDG Number:	37624	Run Sequence ID: R006719

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	22 U	ug/kg	05/05/2006 23:28
Aroclor-1221	1	22 U		
Aroclor-1232	1	22 U		
Aroclor-1242	1	22 U		
Aroclor-1248	1	22 U		
Aroclor-1254	1	22 U		
Aroclor-1260	1	220		
Aroclor-1262	1	22 U		
Aroclor-1268	1	22 U		
Decachlorobiphenyl	1	69	%	
Tetrachloro-m-xylene	1	80		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client:	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06	
Sample ID:	17SD0570006	Lab sample ID:	37624-003	
Date/time collected:	05/02/2006 15:25	Date/time received:	05/04/2006 08:45	
Date/time prepared:	05/04/2006 14:00	SDG Number:	37624	Run Sequence ID: R006719

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	17 U	ug/kg	05/05/2006 23:56
Aroclor-1221	1	17 U		
Aroclor-1232	1	17 U		
Aroclor-1242	1	17 U		
Aroclor-1248	1	17 U		
Aroclor-1254	1	17 U		
Aroclor-1260	1	17 U		
Aroclor-1262	1	17 U		
Aroclor-1268	1	17 U		
Decachlorobiphenyl	1	70	%	
Tetrachloro-m-xylene	1	85		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client:	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06
Sample ID:	17SD0580006	Lab sample ID:	37624-004
Date/time collected:	05/02/2006 15:55	Date/time received:	05/04/2006 08:45
Date/time prepared:	05/04/2006 14:00	SDG Number:	37624
		Run Sequence ID:	R006719

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	17 U	ug/kg	05/06/2006 00:24
Aroclor-1221	1	17 U		
Aroclor-1232	1	17 U		
Aroclor-1242	1	17 U		
Aroclor-1248	1	17 U		
Aroclor-1254	1	17 U		
Aroclor-1260	1	1600		
Aroclor-1262	1	17 U		
Aroclor-1268	1	17 U		
Decachlorobiphenyl	1	64	%	
Tetrachloro-m-xylene	1	87		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client::	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06	
Sample ID:	17SD0590006	Lab sample ID:	37624-005	
Date/time collected:	05/02/2006 16:00	Date/time received:	05/04/2006 08:45	
Date/time prepared:	05/04/2006 14:00	SDG Number:	37624	Run Sequence ID: R006719

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	24 U	ug/kg	05/06/2006 00:52
Aroclor-1221	1	24 U		
Aroclor-1232	1	24 U		
Aroclor-1242	1	24 U		
Aroclor-1248	1	24 U		
Aroclor-1254	1	24 U		
Aroclor-1260	1	24 U		
Aroclor-1262	1	24 U		
Aroclor-1268	1	24 U		
Decachlorobiphenyl	1	65	%	
Tetrachloro-m-xylene	1	81		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client::	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06	
Sample ID:	17SD0600006	Lab sample ID:	37624-006	
Date/time collected:	05/02/2006 16:45	Date/time received:	05/04/2006 08:45	
Date/time prepared:	05/04/2006 14:00	SDG Number:	37624	Run Sequence ID: R006719

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	17 U	ug/kg	05/06/2006 01:19
Aroclor-1221	1	17 U		
Aroclor-1232	1	17 U		
Aroclor-1242	1	17 U		
Aroclor-1248	1	17 U		
Aroclor-1254	1	17 U		
Aroclor-1260	1	17 U		
Aroclor-1262	1	17 U		
Aroclor-1268	1	17 U		
Decachlorobiphenyl	1	66	%	
Tetrachloro-m-xylene	1	80		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client:	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06	
Sample ID:	17SD0610006	Lab sample ID:	37624-007	
Date/time collected:	05/02/2006 16:50	Date/time received:	05/04/2006 08:45	
Date/time prepared:	05/04/2006 14:00	SDG Number:	37624	Run Sequence ID: R006719

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	17 U	ug/kg	05/06/2006 01:47
Aroclor-1221	1	17 U		
Aroclor-1232	1	17 U		
Aroclor-1242	1	17 U		
Aroclor-1248	1	17 U		
Aroclor-1254	1	17 U		
Aroclor-1260	1	860		
Aroclor-1262	1	17 U		
Aroclor-1268	1	17 U		
Decachlorobiphenyl	1	9	%	
Tetrachloro-m-xylene	1	8		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client:	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06	
Sample ID:	17SD0620006	Lab sample ID:	37624-008	
Date/time collected:	05/02/2006 16:35	Date/time received:	05/04/2006 08:45	
Date/time prepared:	05/04/2006 14:00	SDG Number:	37624	Run Sequence ID: R006719

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	17 U	ug/kg	05/06/2006 02:15
Aroclor-1221	1	17 U		
Aroclor-1232	1	17 U		
Aroclor-1242	1	17 U		
Aroclor-1248	1	17 U		
Aroclor-1254	1	17 U		
Aroclor-1260	1	2600		
Aroclor-1262	1	17 U		
Aroclor-1268	1	17 U		
Decachlorobiphenyl	1	62	%	
Tetrachloro-m-xylene	1	77		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client:	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06
Sample ID:	17SD0630006	Lab sample ID:	37624-009
Date/time collected:	05/02/2006 16:30	Date/time received:	05/04/2006 08:45
Date/time prepared:	05/04/2006 14:00	SDG Number:	37624 Run Sequence ID: R006719

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	17 U	ug/kg	05/06/2006 03:11
Aroclor-1221	1	17 U		
Aroclor-1232	1	17 U		
Aroclor-1242	1	17 U		
Aroclor-1248	1	17 U		
Aroclor-1254	1	17 U		
Aroclor-1260	1	380		
Aroclor-1262	1	17 U		
Aroclor-1268	1	17 U		
Decachlorobiphenyl	1	70	%	
Tetrachloro-m-xylene	1	84		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client:	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06	
Sample ID:	17SD0640006	Lab sample ID:	37624-010	
Date/time collected:	05/02/2006 16:25	Date/time received:	05/04/2006 08:45	
Date/time prepared:	05/04/2006 14:00	SDG Number:	37624	Run Sequence ID: R006719

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	17 U	ug/kg.	05/06/2006 03:39
Aroclor-1221	1	17 U		
Aroclor-1232	1	17 U		
Aroclor-1242	1	17 U		
Aroclor-1248	1	17 U		
Aroclor-1254	1	17 U		
Aroclor-1260	1	1600		
Aroclor-1262	1	17 U		
Aroclor-1268	1	17 U		
Decachlorobiphenyl	1	59	%	
Tetrachloro-m-xylene	1	76		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client:	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06	
Sample ID:	17FD05020601	Lab sample ID:	37624-011	
Date/time collected:	05/02/2006 00:00	Date/time received:	05/04/2006 08:45	
Date/time prepared:	05/04/2006 14:00	SDG Number:	37624	Run Sequence ID: R006719

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	17 U	ug/kg	05/06/2006 04:06
Aroclor-1221	1	17 U		
Aroclor-1232	1	17 U		
Aroclor-1242	1	17 U		
Aroclor-1248	1	17 U		
Aroclor-1254	1	17 U		
Aroclor-1260	1	410		
Aroclor-1262	1	17 U		
Aroclor-1268	1	17 U		
Decachlorobiphenyl	1	64	%	
Tetrachloro-m-xylene	1	76		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client::	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06	
Sample ID:	17FD05020602	Lab sample ID:	37624-012	
Date/time collected:	05/02/2006 00:00	Date/time received:	05/04/2006 08:45	
Date/time prepared:	05/04/2006 14:00	SDG Number:	37624	Run Sequence ID: R006719

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	17 U	ug/kg	05/06/2006 04:34
Aroclor-1221	1	17 U		
Aroclor-1232	1	17 U		
Aroclor-1242	1	17 U		
Aroclor-1248	1	17 U		
Aroclor-1254	1	17 U		
Aroclor-1260	1	17 U		
Aroclor-1262	1	17 U		
Aroclor-1268	1	17 U		
Decachlorobiphenyl	1	72	%	
Tetrachloro-m-xylene	1	87		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks

Testing Laboratories, Inc.

940 South Harney St.
Seattle, WA 98108

(206) 767-5060 FAX (206) 767-5063

FAX Cover Sheet

To: Ed Sedlmyer FAX Number: Sedlmyer@t4rus.com
Company: Tetra Tech WWS Date: 5/8/06
From: Elaine Walker No. of Pages
(including cover page): 14

Preliminary Results for:

Workorders(s): _____

SDG (s): 37623

Analysis: 8082

Verified by: GR

Do these samples need to be re-analyzed? Yes No

If yes, which samples?: ALL

Reason: CCV did not pass and some samples had PCB hit exceeded

the linear calibration range.

The preliminary results for the re-analysis will be faxed on (date): _____

Laucks does not certify that these results meet NELAC Standards because all NELAC required elements are not included in the facsimile. Please refer to the full report to review all NELAC required elements.

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client:	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06
Sample ID:	17SD0420006	Lab sample ID:	37623-001
Date/time collected:	05/02/2006 14:50	Date/time received:	05/04/2006 08:45
Date/time prepared:	05/04/2006 13:15	SDG Number:	37623
		Run Sequence ID:	R006718

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	23 U	ug/kg	05/05/2006 14:12
Aroclor-1221	1	23 U		
Aroclor-1232	1	23 U		
Aroclor-1242	1	23 U		
Aroclor-1248	1	23 U		
Aroclor-1254	1	23 U		
Aroclor-1260	1	23 U		
Aroclor-1262	1	23 U		
Aroclor-1268	1	23 U		
Decachlorobiphenyl	1	70	%	
Tetrachloro-m-xylene	1	76		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client:	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06	
Sample ID:	17SD0430006	Lab sample ID:	37623-002	
Date/time collected:	05/02/2006 14:42	Date/time received:	05/04/2006 08:45	
Date/time prepared:	05/04/2006 13:15	SDG Number:	37623	Run Sequence ID: R006718

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	22 U	ug/kg	05/05/2006 14:40
Aroclor-1221	1	22 U		
Aroclor-1232	1	22 U		
Aroclor-1242	1	22 U		
Aroclor-1248	1	22 U		
Aroclor-1254	1	22 U		
Aroclor-1260	1	1900		
Aroclor-1262	1	22 U		
Aroclor-1268	1	22 U		
Decachlorobiphenyl	1	70	%	
Tetrachloro-m-xylene	1	77		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client:	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06	
Sample ID:	17SD0440006	Lab sample ID:	37623-003	
Date/time collected:	05/02/2006 14:35	Date/time received:	05/04/2006 08:45	
Date/time prepared:	05/04/2006 13:15	SDG Number:	37623	Run Sequence ID: R006718

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	25 U	ug/kg	05/05/2006 15:08
Aroclor-1221	1	25 U		
Aroclor-1232	1	25 U		
Aroclor-1242	1	25 U		
Aroclor-1248	1	25 U		
Aroclor-1254	1	25 U		
Aroclor-1260	1	450		
Aroclor-1262	1	25 U		
Aroclor-1268	1	25 U		
Decachlorobiphenyl	1	70	%	
Tetrachloro-m-xylene	1	78		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client:	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06	
Sample ID:	17SD0450006	Lab sample ID:	37623-004	
Date/time collected:	05/02/2006 14:25	Date/time received:	05/04/2006 08:45	
Date/time prepared:	05/04/2006 13:15	SDG Number:	37623	Run Sequence ID: R006718

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	27 U	ug/kg	05/05/2006 15:36
Aroclor-1221	1	27 U		
Aroclor-1232	1	27 U		
Aroclor-1242	1	27 U		
Aroclor-1248	1	27 U		
Aroclor-1254	1	27 U		
Aroclor-1260	1	3300		
Aroclor-1262	1	27 U		
Aroclor-1268	1	27 U		
Decachlorobiphenyl	1	70	%	
Tetrachloro-m-xylene	1	78		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client::	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06	
Sample ID:	17SD0460006	Lab sample ID:	37623-005	
Date/time collected:	05/02/2006 09:30	Date/time received:	05/04/2006 08:45	
Date/time prepared:	05/04/2006 13:15	SDG Number:	37623	Run Sequence ID: R006718

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	24 U	ug/kg	05/05/2006 16:03
Aroclor-1221	1	24 U		
Aroclor-1232	1	24 U		
Aroclor-1242	1	24 U		
Aroclor-1248	1	24 U		
Aroclor-1254	1	24 U		
Aroclor-1260	1	24 U		
Aroclor-1262	1	24 U		
Aroclor-1268	1	24 U		
Decachlorobiphenyl	1	67	%	
Tetrachloro-m-xylene	1	85		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client:	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06
Sample ID:	17SD0470006	Lab sample ID:	37623-006
Date/time collected:	05/02/2006 10:05	Date/time received:	05/04/2006 08:45
Date/time prepared:	05/04/2006 13:15	SDG Number:	37623
		Run Sequence ID:	R006718

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	23 U	ug/kg	05/05/2006 16:31
Aroclor-1221	1	23 U		
Aroclor-1232	1	23 U		
Aroclor-1242	1	23 U		
Aroclor-1248	1	23 U		
Aroclor-1254	1	23 U		
Aroclor-1260	1	23 U		
Aroclor-1262	1	23 U		
Aroclor-1268	1	23 U		
Decachlorobiphenyl	1	71	%	
Tetrachloro-m-xylene	1	78		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client::	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06	
Sample ID:	17SD0480006	Lab sample ID:	37623-007	
Date/time collected:	05/02/2006 08:50	Date/time received:	05/04/2006 08:45	
Date/time prepared:	05/04/2006 13:15	SDG Number:	37623	Run Sequence ID: R006718

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	22 U	ug/kg	05/05/2006 16:59
Aroclor-1221	1	22 U		
Aroclor-1232	1	22 U		
Aroclor-1242	1	22 U		
Aroclor-1248	1	22 U		
Aroclor-1254	1	22 U		
Aroclor-1260	1	460		
Aroclor-1262	1	22 U		
Aroclor-1268	1	22 U		
Decachlorobiphenyl	1	71	%	
Tetrachloro-m-xylene	1	79		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories

Preliminary Results

Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client:	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06	
Sample ID:	17SD0490006	Lab sample ID:	37623-008	
Date/time collected:	05/02/2006 09:05	Date/time received:	05/04/2006 08:45	
Date/time prepared:	05/04/2006 13:15	SDG Number:	37623	Run Sequence ID: R006718

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	23 U	ug/kg	05/05/2006 17:27
Aroclor-1221	1	23 U		
Aroclor-1232	1	23 U		
Aroclor-1242	1	23 U		
Aroclor-1248	1	23 U		
Aroclor-1254	1	23 U		
Aroclor-1260	1	280		
Aroclor-1262	1	23 U		
Aroclor-1268	1	23 U		
Decachlorobiphenyl	1	68	%	
Tetrachloro-m-xylene	1	75		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client::	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06	
Sample ID:	17SD0500006	Lab sample ID:	37623-009	
Date/time collected:	05/02/2006 11:30	Date/time received:	05/04/2006 08:45	
Date/time prepared:	05/04/2006 13:15	SDG Number:	37623	Run Sequence ID: R006718

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	23 U	ug/kg	05/05/2006 18:22
Aroclor-1221	1	23 U		
Aroclor-1232	1	23 U		
Aroclor-1242	1	23 U		
Aroclor-1248	1	23 U		
Aroclor-1254	1	23 U		
Aroclor-1260	1	23 U		
Aroclor-1262	1	23 U		
Aroclor-1268	1	23.U		
Decachlorobiphenyl	1	67	%	
Tetrachloro-m-xylene	1	71		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client:	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06	
Sample ID:	17SD0510006	Lab sample ID:	37623-010	
Date/time collected:	05/02/2006 11:22	Date/time received:	05/04/2006 08:45	
Date/time prepared:	05/04/2006 13:15	SDG Number:	37623	Run Sequence ID: R006718

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	23 U	ug/kg	05/05/2006 18:50
Aroclor-1221	1	23 U		
Aroclor-1232	1	23 U		
Aroclor-1242	1	23 U		
Aroclor-1248	1	23 U		
Aroclor-1254	1	23 U		
Aroclor-1260	1	23 U		
Aroclor-1262	1	23 U		
Aroclor-1268	1	23 U		
Decachlorobiphenyl	1	73	%	
Tetrachloro-m-xylene	1	80		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client:	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06	
Sample ID:	17SD0520006	Lab sample ID:	37623-011	
Date/time collected:	05/02/2006 11:15	Date/time received:	05/04/2006 08:45	
Date/time prepared:	05/04/2006 13:15	SDG Number:	37623	Run Sequence ID: R006718

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	36 U	ug/kg	05/05/2006 19:18
Aroclor-1221	1	36 U		
Aroclor-1232	1	36 U		
Aroclor-1242	1	36 U		
Aroclor-1248	1	36 U		
Aroclor-1254	1	36 U		
Aroclor-1260	1	36 U		
Aroclor-1262	1	36 U		
Aroclor-1268	1	36 U		
Decachlorobiphenyl	1	71	%	
Tetrachloro-m-xylene	1	80		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client:	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06	
Sample ID:	17SD0530006	Lab sample ID:	37623-012	
Date/time collected:	05/02/2006 09:45	Date/time received:	05/04/2006 08:45	
Date/time prepared:	05/04/2006 13:15	SDG Number:	37623	Run Sequence ID: R006718

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	22 U	ug/kg	05/05/2006 19:46
Aroclor-1221	1	22 U		
Aroclor-1232	1	22 U		
Aroclor-1242	1	22 U		
Aroclor-1248	1	22 U		
Aroclor-1254	1	22 U		
Aroclor-1260	1	22 U		
Aroclor-1262	1	22 U		
Aroclor-1268	1	22 U		
Decachlorobiphenyl	1	67	%	
Tetrachloro-m-xylene	1	73		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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Laucks Testing Laboratories
Preliminary Results
Printed on: 5/6/2006

Method: Polychlorinated Biphenyls by Gas Chromatography (8082A)

Client:	Tetra Tech NUS, Inc.	Project:	CTO 376 4/18/06	
Sample ID:	17SD0540006	Lab sample ID:	37623-013	
Date/time collected:	05/02/2006 12:00	Date/time received:	05/04/2006 08:45	
Date/time prepared:	05/04/2006 13:15	SDG Number:	37623	Run Sequence ID: R006718

Preliminary Results

Analyte	DF	Result	Units	Date/time analyzed
Aroclor-1016	1	23 U	ug/kg	05/05/2006 20:14
Aroclor-1221	1	23 U		
Aroclor-1232	1	23 U		
Aroclor-1242	1	23 U		
Aroclor-1248	1	23 U		
Aroclor-1254	1	23 U		
Aroclor-1260	1	23 U		
Aroclor-1262	1	23 U		
Aroclor-1268	1	23 U		
Decachlorobiphenyl	1	71	%	
Tetrachloro-m-xylene	1	83		
2,2',4,4',5,5'-hexabromobiphenyl	1			

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B.4 OCTOBER 2006 ANALYTICAL RESULTS

OCTOBER 2007 SAMPLING RESULTS

PAGE 1

Location ID	Sample ID	Sample Date	Matrix	Parameter	mg/kg	Val Qual	Top Depth	Bottom Depth
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SOILS

17SB50	17SS500002	20061020	SOIL	AROCLOR-1016	0.01	U	0	2
				AROCLOR-1221	0.01	U		
				AROCLOR-1232	0.01	U		
				AROCLOR-1242	0.01	U		
				AROCLOR-1248	0.01	U		
				AROCLOR-1254	0.01	U		
				AROCLOR-1260	0.01	U		
				TOTAL PCBs	ND			
17SB50	17SS500204	20061020	SOIL	AROCLOR-1016	0.01	U	2	4
				AROCLOR-1221	0.01	U		
				AROCLOR-1232	0.01	U		
				AROCLOR-1242	0.01	U		
				AROCLOR-1248	0.01	U		
				AROCLOR-1254	0.01	U		
				AROCLOR-1260	0.01	U		
				TOTAL PCBs	ND			
17SB50	17SS501618	20061020	SOIL	AROCLOR-1016	0.011	U	16	18
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.011	U		
				TOTAL PCBs	ND			
17SB51	17SS510002	20061020	SOIL	AROCLOR-1016	0.011	U	0	2
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.011	U		
				TOTAL PCBs	ND			

OCTOBER 2007 SAMPLING RESULTS

PAGE 2

Location ID	Sample ID	Sample Date	Matrix	Parameter	mg/kg	Val Qual	Top Depth	Bottom Depth
17SB51	17SS510204	20061020	SOIL	AROCLOR-1016	0.011	U	2	4
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.011	U		
				TOTAL PCBs	ND			
17SB51	17SS511719	20061020	SOIL	AROCLOR-1016	0.011	U	17	19
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.011	U		
				TOTAL PCBs	ND			
17SB52	17SB520002	20061020	SOIL	AROCLOR-1016	0.011	U	0	2
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.011	U		
				TOTAL PCBs	ND			
17SB52	17SB520204	20061020	SOIL	AROCLOR-1016	0.0095	U	2	4
				AROCLOR-1221	0.0095	U		
				AROCLOR-1232	0.0095	U		
				AROCLOR-1242	0.0095	U		
				AROCLOR-1248	0.0095	U		
				AROCLOR-1254	0.0095	U		
				AROCLOR-1260	0.0095	U		
				TOTAL PCBs	ND			

OCTOBER 2007 SAMPLING RESULTS

Location ID	Sample ID	Sample Date	Matrix	Parameter	mg/kg	Val Qual	Top Depth	Bottom Depth
17SB53	17SS530001	20061009	SOIL	AROCLOR-1016	0.011	U	0	1
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.084			
				TOTAL PCBs	0.084			
17SB53	17SS530204	20061009	SOIL	AROCLOR-1016	0.011	U	2	4
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.011	U		
				TOTAL PCBs	ND			
17SB53	17SS531820	20061009	SOIL	AROCLOR-1016	0.011	U	18	20
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.011	U		
				TOTAL PCBs	ND			
17SB54	17SS540002	20061006	SOIL	AROCLOR-1016	0.011	U	0	2
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.2			
				TOTAL PCBs	0.2			

OCTOBER 2007 SAMPLING RESULTS

PAGE 4

Location ID	Sample ID	Sample Date	Matrix	Parameter	mg/kg	Val Qual	Top Depth	Bottom Depth
17SB55	17SS550002	20061006	SOIL	AROCLOR-1016	5.1	U	0	2
				AROCLOR-1221	5.1	U		
				AROCLOR-1232	5.1	U		
				AROCLOR-1242	5.1	U		
				AROCLOR-1248	5.1	U		
				AROCLOR-1254	5.1	U		
				AROCLOR-1260	73			
				TOTAL PCBs	73			
17SB56	17SS560002	20061020	SOIL	AROCLOR-1016	0.01	U	0	2
				AROCLOR-1221	0.01	U		
				AROCLOR-1232	0.01	U		
				AROCLOR-1242	0.01	U		
				AROCLOR-1248	0.01	U		
				AROCLOR-1254	0.01	U		
				AROCLOR-1260	0.01	U		
				TOTAL PCBs	ND			
17SB57	17SS570002	20061006	SOIL	AROCLOR-1016	0.01	U	0	2
				AROCLOR-1221	0.01	U		
				AROCLOR-1232	0.01	U		
				AROCLOR-1242	0.01	U		
				AROCLOR-1248	0.01	U		
				AROCLOR-1254	0.01	U		
				AROCLOR-1260	0.083			
				TOTAL PCBs	0.083			
17SB58	17SS580002	20061006	SOIL	AROCLOR-1016	0.011	U	0	2
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.011	U		
				TOTAL PCBs	ND			

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Location ID	Sample ID	Sample Date	Matrix	Parameter	mg/kg	Val Qual	Top Depth	Bottom Depth
17SB59	17SS590001	20061006	SOIL	AROCLOR-1016	0.0094	U	0	1
				AROCLOR-1221	0.0094	U		
				AROCLOR-1232	0.0094	U		
				AROCLOR-1242	0.0094	U		
				AROCLOR-1248	0.0094	U		
				AROCLOR-1254	0.0094	U		
				AROCLOR-1260	0.0094	U		
				TOTAL PCBs	ND			
17SB60	17SS600001	20061009	SOIL	AROCLOR-1016	0.011	U	0	1
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.28			
				TOTAL PCBs	0.28			
17SB60	17SB600204	20061020	SOIL	AROCLOR-1016	0.011	U	2	4
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.54			
				TOTAL PCBs	0.54			
17SB60	17SB601719	20061020	SOIL	AROCLOR-1016	0.011	U	17	19
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.011	U		
				TOTAL PCBs	ND			

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Location ID	Sample ID	Sample Date	Matrix	Parameter	mg/kg	Val Qual	Top Depth	Bottom Depth
17SB61	17SS610002	20061020	SOIL	AROCLOR-1016	0.01	U	0	2
				AROCLOR-1221	0.01	U		
				AROCLOR-1232	0.01	U		
				AROCLOR-1242	0.01	U		
				AROCLOR-1248	0.01	U		
				AROCLOR-1254	0.01	U		
				AROCLOR-1260	0.1			
				TOTAL PCBs	0.1			
17SB61	17SB610204	20061020	SOIL	AROCLOR-1016	0.01	U	2	4
				AROCLOR-1221	0.01	U		
				AROCLOR-1232	0.01	U		
				AROCLOR-1242	0.01	U		
				AROCLOR-1248	0.01	U		
				AROCLOR-1254	0.01	U		
				AROCLOR-1260	0.01	U		
				TOTAL PCBs	ND			
17SB61	17SB611618	20061020	SOIL	AROCLOR-1016	0.011	U	16	18
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.011	U		
				TOTAL PCBs	ND			
17SB63	17SS630002	20061006	SOIL	AROCLOR-1016	0.012	U	0	2
				AROCLOR-1221	0.012	U		
				AROCLOR-1232	0.012	U		
				AROCLOR-1242	0.012	U		
				AROCLOR-1248	0.012	U		
				AROCLOR-1254	0.012	U		
				AROCLOR-1260	0.044			
				TOTAL PCBs	0.044			

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Location ID	Sample ID	Sample Date	Matrix	Parameter	mg/kg	Val Qual	Top Depth	Bottom Depth
17SB64	17SS640001	20061009	SOIL	AROCLOR-1016	0.01	U	0	1
				AROCLOR-1221	0.01	U		
				AROCLOR-1232	0.01	U		
				AROCLOR-1242	0.01	U		
				AROCLOR-1248	0.01	U		
				AROCLOR-1254	0.01	U		
				AROCLOR-1260	0.099			
				TOTAL PCBs	0.099			
17SB64	17SB640204	20061020	SOIL	AROCLOR-1016	0.012	U	2	4
				AROCLOR-1221	0.012	U		
				AROCLOR-1232	0.012	U		
				AROCLOR-1242	0.012	U		
				AROCLOR-1248	0.012	U		
				AROCLOR-1254	0.012	U		
				AROCLOR-1260	0.012	U		
				TOTAL PCBs	ND			
17SB64	17SB641315	20061020	SOIL	AROCLOR-1016	0.012	U	13	15
				AROCLOR-1221	0.012	U		
				AROCLOR-1232	0.012	U		
				AROCLOR-1242	0.012	U		
				AROCLOR-1248	0.012	U		
				AROCLOR-1254	0.012	U		
				AROCLOR-1260	0.012	U		
				TOTAL PCBs	ND			
17SB65	17SS650001	20061009	SOIL	AROCLOR-1016	0.01	U	0	1
				AROCLOR-1221	0.01	U		
				AROCLOR-1232	0.01	U		
				AROCLOR-1242	0.01	U		
				AROCLOR-1248	0.01	U		
				AROCLOR-1254	0.01	U		
				AROCLOR-1260	0.1	J		
				TOTAL PCBs	0.1			

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Location ID	Sample ID	Sample Date	Matrix	Parameter	mg/kg	Val Qual	Top Depth	Bottom Depth
17SB65	17SB650204	20061019	SOIL	AROCLOR-1016	0.011	U	2	4
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.011	U		
				TOTAL PCBs	ND			
17SB65	17SB651416	20061019	SOIL	AROCLOR-1016	0.011	U	14	16
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.011	U		
				TOTAL PCBs	ND			
17SB66	17SS660001	20061009	SOIL	AROCLOR-1016	0.011	U	0	1
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.028			
TOTAL PCBs	0.028							
17SB66	17SB660204	20061019	SOIL	AROCLOR-1016	0.012	U	2	4
				AROCLOR-1221	0.012	U		
				AROCLOR-1232	0.012	U		
				AROCLOR-1242	0.012	U		
				AROCLOR-1248	0.012	U		
				AROCLOR-1254	0.012	U		
				AROCLOR-1260	0.012	U		
				TOTAL PCBs	ND			

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Location ID	Sample ID	Sample Date	Matrix	Parameter	mg/kg	Val Qual	Top Depth	Bottom Depth
17SB66	17SB661416	20061019	SOIL	AROCLOR-1016	0.011	U	14	16
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.011	U		
				TOTAL PCBs	ND			
17SB67	17SS670002	20061006	SOIL	AROCLOR-1016	0.011	U	0	2
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.011	U		
				TOTAL PCBs	ND			
17SB68	17SS680002	20061006	SOIL	AROCLOR-1016	0.011	U	0	2
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.017	U		
				AROCLOR-1260	0.05	J		
				TOTAL PCBs	0.05			
17SB69	17SS690001	20061006	SOIL	AROCLOR-1016	0.0096	U	0	1
				AROCLOR-1221	0.0096	U		
				AROCLOR-1232	0.0096	U		
				AROCLOR-1242	0.0096	U		
				AROCLOR-1248	0.0096	U		
				AROCLOR-1254	0.0096	U		
				AROCLOR-1260	0.18	J		
				TOTAL PCBs	0.18			

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Location ID	Sample ID	Sample Date	Matrix	Parameter	mg/kg	Val Qual	Top Depth	Bottom Depth
17SB71	17SS710001	20061009	SOIL	AROCLOR-1016	0.011	U	0	1
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.039	J		
				TOTAL PCBs	0.039			
17SB71	17SB710203	20061024	SOIL	AROCLOR-1016	0.0095	U	2	3
				AROCLOR-1221	0.0095	U		
				AROCLOR-1232	0.0095	U		
				AROCLOR-1242	0.0095	U		
				AROCLOR-1248	0.0095	U		
				AROCLOR-1254	0.0095	U		
				AROCLOR-1260	0.0095	U		
				TOTAL PCBs	ND			
17SB72	17SS720001	20061009	SOIL	AROCLOR-1016	0.011	U	0	1
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.011	U		
				TOTAL PCBs	ND			
17SB75	17SS750006	20061007	SOIL	AROCLOR-1016	0.012	U	0	0.5
				AROCLOR-1221	0.012	U		
				AROCLOR-1232	0.012	U		
				AROCLOR-1242	0.012	U		
				AROCLOR-1248	0.012	U		
				AROCLOR-1254	0.012	U		
				AROCLOR-1260	11			
				TOTAL PCBs	11			

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Location ID	Sample ID	Sample Date	Matrix	Parameter	mg/kg	Val Qual	Top Depth	Bottom Depth
17SB76	17SS760006	20061007	SOIL	AROCLOR-1016	0.014	U	0	0.5
				AROCLOR-1221	0.014	U		
				AROCLOR-1232	0.014	U		
				AROCLOR-1242	0.014	U		
				AROCLOR-1248	0.014	U		
				AROCLOR-1254	0.014	U		
				AROCLOR-1260	1.6			
				TOTAL PCBs	1.6			
17SB77	17SS770006	20061007	SOIL	AROCLOR-1016	0.011	U	0	0.5
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	2.3			
				TOTAL PCBs	2.3			
17SB78	17SS780006	20061007	SOIL	AROCLOR-1016	0.011	U	0	0.5
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.66			
				TOTAL PCBs	0.66			
17SB79	17SS790006	20061007	SOIL	AROCLOR-1016	0.012	U	0	0.5
				AROCLOR-1221	0.012	U		
				AROCLOR-1232	0.012	U		
				AROCLOR-1242	0.012	U		
				AROCLOR-1248	0.012	U		
				AROCLOR-1254	0.012	U		
				AROCLOR-1260	0.64			
				TOTAL PCBs	0.64			

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Location ID	Sample ID	Sample Date	Matrix	Parameter	mg/kg	Val Qual	Top Depth	Bottom Depth
17SB80	17SS800006	20061007	SOIL	AROCLOR-1016	0.012	U	0	0.5
				AROCLOR-1221	0.012	U		
				AROCLOR-1232	0.012	U		
				AROCLOR-1242	0.012	U		
				AROCLOR-1248	0.012	U		
				AROCLOR-1254	0.012	U		
				AROCLOR-1260	0.85			
				TOTAL PCBs	0.85			
17SB81	17SS810006	20061007	SOIL	AROCLOR-1016	0.011	U	0	0.5
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.14			
				TOTAL PCBs	0.14			
17SB82	17SS820006	20061007	SOIL	AROCLOR-1016	0.013	U	0	0.5
				AROCLOR-1221	0.013	U		
				AROCLOR-1232	0.013	U		
				AROCLOR-1242	0.013	U		
				AROCLOR-1248	0.013	U		
				AROCLOR-1254	0.013	U		
				AROCLOR-1260	14			
				TOTAL PCBs	14			
17SB83	17SS830006	20061007	SOIL	AROCLOR-1016	0.011	U	0	0.5
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.032			
				TOTAL PCBs	0.032			

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Location ID	Sample ID	Sample Date	Matrix	Parameter	mg/kg	Val Qual	Top Depth	Bottom Depth
17SB84	17SS840006	20061007	SOIL	AROCLOR-1016	0.013	U	0	0.5
				AROCLOR-1221	0.013	U		
				AROCLOR-1232	0.013	U		
				AROCLOR-1242	0.013	U		
				AROCLOR-1248	0.013	U		
				AROCLOR-1254	0.013	U		
				AROCLOR-1260	0.03			
				TOTAL PCBs	0.03			
17SB85	17SS850001	20061005	SOIL	AROCLOR-1016	0.011	U	0	1
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	4.3			
				TOTAL PCBs	4.3			
17SB86	17SS860002	20061005	SOIL	AROCLOR-1016	0.011	U	0	2
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.026			
				TOTAL PCBs	0.026			
17SB62/TW02	17SB620204	20061019	SOIL	AROCLOR-1016	0.01	U	2	4
				AROCLOR-1221	0.01	U		
				AROCLOR-1232	0.01	U		
				AROCLOR-1242	0.01	U		
				AROCLOR-1248	0.01	U		
				AROCLOR-1254	0.01	U		
				AROCLOR-1260	0.01	U		
				TOTAL PCBs	ND			

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Location ID	Sample ID	Sample Date	Matrix	Parameter	mg/kg	Val Qual	Top Depth	Bottom Depth
17SB62/TW02	17SB621113	20061019	SOIL	AROCLOR-1016	0.012	U	11	13
				AROCLOR-1221	0.012	U		
				AROCLOR-1232	0.012	U		
				AROCLOR-1242	0.012	U		
				AROCLOR-1248	0.012	U		
				AROCLOR-1254	0.012	U		
				AROCLOR-1260	0.012	U		
				TOTAL PCBs	ND			
17SB62/TW02	17SS620001	20061009	SOIL	AROCLOR-1016	0.011	U	0	1
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.047			
				TOTAL PCBs	0.047			
17SB70/TW04	17SB700204	20061024	SOIL	AROCLOR-1016	0.011	U	2	4
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.011	U		
				TOTAL PCBs	ND			
17SB70/TW04	17SB700405	20061024	SOIL	AROCLOR-1016	0.011	U	4	5
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.011	U		
				TOTAL PCBs	ND			

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Location ID	Sample ID	Sample Date	Matrix	Parameter	mg/kg	Val Qual	Top Depth	Bottom Depth
17SB70/TW04	17SS700001	20061009	SOIL	AROCLOR-1016	0.012	U	0	1
				AROCLOR-1221	0.012	U		
				AROCLOR-1232	0.012	U		
				AROCLOR-1242	0.012	U		
				AROCLOR-1248	0.012	U		
				AROCLOR-1254	0.012	U		
				AROCLOR-1260	0.012	U		
				TOTAL PCBs	ND			
SEDIMENT								
17SW/SD065	17SD0650006	20061005	SEDIMENT	AROCLOR-1016	0.011	U	0	0.5
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.011	U		
				TOTAL PCBs	ND			
17SW/SD066	17SD0660006	20061005	SEDIMENT	AROCLOR-1016	0.011	U	0	0.5
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.011	U		
				TOTAL PCBs	ND			
17SW/SD067	17SD0670006	20061005	SEDIMENT	AROCLOR-1016	0.011	U	0	0.5
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.51			
				TOTAL PCBs	0.51			

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Location ID	Sample ID	Sample Date	Matrix	Parameter	mg/kg	Val Qual	Top Depth	Bottom Depth
17SW/SD068	17SD0680006	20061005	SEDIMENT	AROCLOR-1016	0.011	U	0	0.5
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.12			
				TOTAL PCBs	0.12			
17SW/SD069	17SD0690006	20061005	SEDIMENT	AROCLOR-1016	0.011	U	0	0.5
				AROCLOR-1221	0.011	U		
				AROCLOR-1232	0.011	U		
				AROCLOR-1242	0.011	U		
				AROCLOR-1248	0.011	U		
				AROCLOR-1254	0.011	U		
				AROCLOR-1260	0.96	J		
				TOTAL PCBs	0.96			
GROUNDWATER*								
17SB70/TW04	17GWTW04	20061025	GROUNDWATER	AROCLOR-1016	0.00028	U	NA	NA
				AROCLOR-1221	0.00028	U		
				AROCLOR-1232	0.00028	U		
				AROCLOR-1242	0.00028	U		
				AROCLOR-1248	0.00028	U		
				AROCLOR-1254	0.00028	U		
				AROCLOR-1260	0.00028	U		
				TOTAL PCBs	ND			
17SB46/TW01	17GWTW01	20061025	GROUNDWATER	AROCLOR-1016	0.024	U	NA	NA
				AROCLOR-1221	0.024	U		
				AROCLOR-1232	0.024	U		
				AROCLOR-1242	0.024	U		
				AROCLOR-1248	0.024	U		
				AROCLOR-1254	0.024	U		
				AROCLOR-1260	0.024	U		
				TOTAL PCBs	ND			

* Units are mg/L

APPENDIX C

EXCAVATION VOLUME CALCULATIONS

CLIENT: NAVAL SURFACE WARFARE CENTER, CRANE		JOB NUMBER: 112G00352 - 14.300	
SUBJECT: SWMU 17 - PCB CAPACITOR BURIAL/POLE YARD			
BASED ON: Soil / Sediment Field Sample Logs		DRAWING NUMBER: Figure 3-1	
BY: TWS	CHECKED BY: VJP	APPROVED BY:	DATE:
Date: 2-22-07	Date: 2-26-07		

OBJECTIVE:

The purpose of this calculation is to estimate the volume of surface soil and sediment within the various excavation areas identified in the SWMU 17 Interim Measures Work Plan.

APPROACH:

1. Using the historic surface soil sample information from the 2004 Interim Measure at SWMU 17 the size of the surface soil excavation area near Building 0357 will be estimated. Using the estimated surface area and required excavation depth, the volume of PCB contaminated surface soil, near Building 0357, with total PCB concentration greater than 1 mg/kg will be calculated.
2. Using the TtNUS 2006 investigation sample information at SWMU 17 the size of the surface soil excavation area near Building 2721 will be estimated. Using the estimated surface area and required excavation depth, the volume of PCB contaminated surface soil, near Building 2721, with total PCB concentration greater than 1 mg/kg will be calculated.
3. Based on the TtNUS 2005 and 2006 field investigations, the depth of sediment measurements, field photographs, and channel width, the required areas to remove all PCB contaminated sediments with total PCB concentration greater than 1 mg/kg will be calculated. Using these average measurements, the length of excavation will be used to calculate the volume of sediment to be excavated from the SWMU 17 drainage channels and streams.

REFERENCES:

ToITest (ToITest Inc.), 2004. Interim Measures Report, PCB Capacitor Burial Pole Yard Remediation, NSWC Crane, Crane, Indiana, November.

TtNUS (Tetra Tech NUS, Inc.), 2006. Interim Measures Work Plan SWMU 17 - PCB Capacitor Burial/Pole Yard, NSWC Crane, Crane, Indiana, Appendix A.

CALCULATIONS**1. Surface Soil Excavation Volume (Building 0357)**

Following the excavation of PCB contaminated soils, during the 2004 Interim Measure, verification samples within the limits of their excavation and several surface soil samples beyond the limits of their excavation were collected. The purpose of the surface soil sampling was to determine if the limits of excavation removed all surface soils containing PCB contamination at concentrations greater than 1 mg/kg. As a result of the surface soil sampling, one area near the northeastern corner of Building 357 was identified as having surface soil containing PCB contamination at a concentration greater than 1 mg/kg.

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Based on the 2004 surface soil sampling and the limits of the 2004 Interim Measure excavation, the proposed area of excavation was developed (see Page 8 of 9). Based on the depth of the 2004 Interim Measure excavation, the surface soil excavation depth needs to be 2-feet in depth to achieve the same risk goals.

Excavation Area	Excavation Width =	30 ft	
	Excavation Length =	30 ft	
	Excavation Depth =	2 ft	
	Volume of Surface Soil Excavation =	1,800 cf	(30 x 30 x 2)
	=	67 cy	(1,800 / 27)
	Use	70 cy	

2. Surface Soil Excavation Volume (Building 2721)

Based on the results of the surface soil samples collected during the TtNUS 2006 Field Investigation (samples 17SB50 through 17SB86) surface soil excavation will be required in the vicinity of Building 2721 (soil boring sample location SB55). The sampling interval for this location is 0 to 2 feet bgs. However, because there were no samples collected at depth below this sampling interval, a contingency excavation depth of an additional 2 feet will be added to the excavation quantity. Therefore the excavation depth will be set at 4 feet. This volume is to be disposed of as hazardous material.

Excavation Area	Excavation Width =	50 ft	
	Excavation Length =	50 ft	
	Excavation Depth =	4 ft	
	Volume of Surface Soil Excavation =	10,000 cf	(50 x 50 x 4)
	=	370 cy	(10,000 / 27)

3. Sediment Excavation Volume in Drainage Channels

There are 3 drainage channels from which PCB-contaminated sediment needs to be excavated to achieve a cleanup goal of 1 mg/kg. These channels include the Northwestern Drainageway, Ditch 8, and Ditch 2. The depth of sediment within these drainage channels was estimated based on the soil / sediment sample log sheets and the site photographs. The information from all of the sample locations within the length of drainage channel were used to calculate the average stream dimensions and sediment depths.

Northwest Drainageway:

Based on the results of the surface soil samples collected during the 2004 Interim Measure (samples 17SS01 through 17SS05), TtNUS collected 3 sediment samples within the Northwestern Drainageway during the SWMU 17 RFI Addendum sampling event performed in October 2005. The reported sediment depth at each location are as follows (Soil / Sediment Field Sample Logs are provided in Appendix A of the IMWP report).

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Sample Number	Sediment Depth	Notes
17SD01	6 in	Sample depth interval
17SD02	6 in	Sample depth interval
17SD03	6 in	Sample depth interval
Average Sediment Depth =		6 in

The width of the Northwest Drainageway was determined by reviewing historic photographs from the 2004 Interim Measure and based upon TtNUS field personnel recollection. The reported average channel width equals the channel bottom plus the channel banks.

Average Channel Width =	10 ft	Based on field observations and historic photos.
Length of Channel Excavation =	570 ft	(See Excavation Map on page 9 of 9)
Sediment Volume =	2,850 cf	(570 x 10 x 6/12)
Sediment Volume =	106 cy	(2,850 / 27)

Ditch No. 2:

During the April 2006 RFI Addendum sampling event, 2 sediment samples were collected from within Drainage Channel Ditch No. 2. The reported sediment depth at each location are as follows (Soil / Sediment Field Sample Logs are provided in Appendix A of the IMWP report).

Sample Number	Sediment Depth	Notes
17SD11	6 in	Thickness of sediment reported on log sheet
17SD13	6 in	Thickness of sediment reported on log sheet
Average Sediment Depth =		6 in

The base width and channel depth of Ditch No. 2 was recorded on the soil and sediment field sampling logs during the April 2006 investigation (Soil / Sediment Field Sample Logs are provided in Appendix A of the IMWP report).

Sample Number	Channel Width	Notes
17SD11	9 ft	5-foot base width and 2-foot channel depths
17SD13	16 ft	8-foot base width and 4-foot channel depths
Average Channel Width =		12.5 ft
Length of Channel Excavation =	200 ft	(See Excavation Map on page 9 of 9)

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Sediment Volume = 1,250 cf (200 x 12.5 x 6/12)
 Sediment Volume = 46 cy (1,250 / 27)

Ditch No. 8

During the October 2005, April 2006, and May 2006 RFI Addendum sampling event 4 sediment samples were collected from within Ditch No. 8. The reported sediment depths at each location are as follows (Soil / Sediment Field Sample Logs are provided in Appendix A of the IMWP report).

Sample Number	Sediment Depth	Notes
17SD07	6 in	Sample depth interval
17SD25	8 in	Depth of sediment reported on log sheet
17SD26	5 in	Depth of sediment reported on log sheet
17SD48	3 in	Depth of sediment reported on log sheet

Average Sediment Depth = 5.5 in

The width of Drainage Channel Ditch No. 8 was recorded on the soil and sediment field sampling logs during the April 2006 and May 2006 investigations. The width of Drainage Channel Ditch No. 8 at the October 2005 sample locations was estimated based on photographs (Soil / Sediment Field Sample Logs are provided in Appendix A of the IMWP report).

Sample Number	Channel Width	Notes
17SD07	4 ft	Estimated based on site photos
17SD25	4.5 ft	2.5-foot base width and 1-foot channel depth
17SD26	4.3 ft	2.5-foot base width and 0.9-foot channel depth
17SD48	3 ft	2-foot base width and 0.5-foot channel depth

Average Channel Width = 3.95 ft

Length of Channel Excavation = 390 ft (See Excavation Map on page 9 of 9)

Sediment Volume = 706 cf (390 x 3.95 x 5.5/12)
 Sediment Volume = 26 cy 706 / 27

Total Excavation from Drainage Channels = 178 cy (26 + 46 + 106)
30% Increase for Over Excavation = 231 cy (178 + 30%)
Use 230 cy (round)

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BASED ON: Soil / Sediment Field Sample Logs		DRAWING NUMBER: Figure 3-1	
BY: TWS	CHECKED BY: VJP	APPROVED BY:	DATE:
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3. Sediment And Flood Zone Excavation Volume

3a. Sediment Excavation Volume in Streams

There are 2 streams from which PCB-contaminated sediment needs to be excavated to achieve a cleanup goal of 1 mg/kg. These streams include Ditch 3 and Boggs Creek. The depth of sediment within these drainage channels was estimated based on the soil / sediment sample log sheets and the site photographs. The information from all of the sample locations within the length of drainage channel were used to calculate the average stream dimensions and sediment depths.

Boggs Creek

During the October 2005 and April 2006 RFI Addendum sampling events 10 sediment samples were collected from within Boggs Creek. Because the size of Boggs Creek changes rapidly the average dimension are based on the four sample locations collected within the top reach of Boggs Creek (Soil / Sediment Field Sample Logs are provided in Appendix A of the IMWP report).

Sample Number	Sediment Depth	Notes
17SD32	4 in	Thickness of sediment reported on log sheet
17SD33	8 in	Thickness of sediment reported on log sheet
17SD34	4 in	Thickness of sediment reported on log sheet
17SD05	6 in	Sample Depth Interval
17SB85	12 in	Sample Depth Interval
Average Sediment Depth =		7 in

The width of Boggs Creek was recorded on the soil and sediment field sampling logs during the April 2006 investigations. (Soil / Sediment Field Sample Logs are provided in Appendix A of the IMWP report).

Sample Number	Channel Width	Notes
17SD32	7.2 ft	4.4-foot base width and 1.4-foot channel depth
17SD33	11 ft	8-foot base width and 1.5-foot channel depth
17SD34	15.6 ft	10-foot base width and 2.8-foot channel depth
Average Channel Width =		11.3 ft
Length of Channel Excavation =		240 ft (See Excavation Map on page 9 of 9)
Sediment Volume =		1,582 cf (240 x 11.3 x 7/12)
Sediment Volume =		59 cy (1,582 / 27)

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BY:	TWS	CHECKED BY:	VJP	APPROVED BY:	DATE:	
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Ditch 3

During the October 2005, April 2006, and May 2006 RFI Addendum sampling events 14 sediment samples were collected from within Ditch No. 3. The reported sediment depth at each location are as follows (Soil / Sediment Field Sample Logs are provided in Appendix A of the IMWP report). For the purposes of generating a more accurate volume estimate the upper reach of Ditch No. 3 was segregated from the lower reaches of Ditch No. 3 (see page 9 of 9 for channel reach designation).

Lower Reach of Ditch No. 3

Sample Number	Sediment Depth	Notes
17SD04	6 in	Sample Depth Interval
17SD19	5 in	Thickness of sediment reported on log sheet
17SD18	6 in	Thickness of sediment reported on log sheet
17SD17	6 in	Thickness of sediment reported on log sheet
17SD16	5 in	Thickness of sediment reported on log sheet
17SD15	5 in	Thickness of sediment reported on log sheet
17SD14	5 in	Thickness of sediment reported on log sheet
17SD45	4 in	Thickness of sediment reported on log sheet
17SD44	2 in	Thickness of sediment reported on log sheet
17SD43	2 in	Thickness of sediment reported on log sheet
17SD64	2 in	Thickness of sediment reported on log sheet
Average Sediment Depth =	4.4 in	(Lower Reach)

Upper Reach of Ditch No. 3

Sample Number	Sediment Depth	Notes
17SD62	4 in	Thickness of sediment reported on log sheet
17SD61	2 in	Thickness of sediment reported on log sheet
17SD58	7 in	Thickness of sediment reported on log sheet
Average Sediment Depth =	4.3 in	(Upper Reach)

The width of Ditch No. 3 at each sample location was recorded on the soil and sediment field sampling logs during the April 2006 and May 2006 investigations. (Soil / Sediment Field Sample Logs are provided in Appendix A of the IMWP report). For the purposes of generating a more accurate volume estimate the upper reach of Ditch No. 3 was segregated from the lower reaches of Ditch No. 3 (see page 9 of 9 for channel reach designation).

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Lower Reach of Ditch No. 3

Sample Number	Channel Width	Notes
17SD04	14 ft	Estimate based on Photos
17SD19	14 ft	10-foot base width and 2-foot channel depth
17SD18	16 ft	10-foot base width and 3-foot channel depth
17SD17	16 ft	10-foot base width and 3-foot channel depth
17SD16	12 ft	8-foot base width and 2-foot channel depth
17SD15	16 ft	12-foot base width and 2-foot channel depth
17SD14	14 ft	8-foot base width and 3-foot channel depth
17SD45	9 ft	Estimate based on Photos
17SD44	11 ft	Estimate based on Photos
17SD43	11 ft	Estimate based on Photos
17SD64	10 ft	Estimate based on Photos
Average Channel Width = 13.0 ft		(Lower Reach)

Upper Reach of Ditch No. 3

Sample Number	Channel Width	Notes
17SD62	10 ft	Estimate based on Photos
17SD61	6 ft	Estimate based on Photos
17SD58	3 ft	Estimate based on Photos
Average Channel Width = 6.3 ft		(Upper Reach)
Channel Length (lower reach) =	1695 ft	(See Excavation Map on page 9 of 9)
Channel Length (upper reach) =	480 ft	(See Excavation Map on page 9 of 9)

Sediment Volume (Ditch No. 3 Lower Reach) =	8,080 cf	(1,695 x 13 x 4.4/12)
Sediment Volume (Ditch No. 3 Upper Reach) =	1,084 cf	(480 x 6.3 x 4.3/12)
Total Volume of Sediment in Ditch No. 3 =	9,164 cf	(8,080 + 1,084)
Total Volume of Sediment in Ditch No. 3 =	339 cy	(9,164 / 27)
Total Sediment Excavated from Streams =	398 cy	(339 + 59)
30% Increase for Over Excavation =	517 cy	(398 + 30%)
Use	520 cy	(round)

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3b. Flood Zone Excavation

During the October 2006 investigations surface soil samples were collected from the flood zones associated with the 2 streams from which PCB-contaminated sediment needs to be excavated. These samples were to determine if PCB contaminated sediments migrated beyond the banks of the streams during flood conditions. In 5 of the samples collected from the flood zones PCB contamination was detected at concentrations greater than 1 mg/kg. because the extent of PCB contamination was not bound, assumptions were used to determine the amount of PCB contamination located within the stream flood zones that requires excavation.

The linear extent of each flood zone (distance along the stream) was based on the review of site photos and other sampling.

The width of each flood zone (distance away from the stream) was based on the distance from the stream that the sample was collected plus 5 feet.

The Depth of excavation in each flood zone is estimated to be 1 foot.

Boggs Creek

In Boggs Creek one sample collected from the flood zone contained PCB contamination at concentrations greater than 1 mg/kg. This Sample was located 10 feet from the bank of the stream.

Excavation area dimensions	Length =	20 feet	(from photos)
	Width =	15 feet	(10 feet plus 5 feet)
	Depth =	1 foot	(assumption)
Boggs Creek Flood Zone Excavation Volume =		300 cf	(20 x 15 x 1)
Boggs Creek Flood Zone Excavation Volume =		11 cy	(300 / 27)

Ditch 3 - Upper Reach

In the upper reaches of Ditch 3 three sample collected from the flood zone contained PCB contamination at concentrations greater than 1 mg/kg. These Sample was located an average of 5 feet from the bank of the stream.

Excavation area dimensions	Length =	540 feet	(from photos)
	Width =	10 feet	(5 feet plus 5 feet)
	Depth =	1 foot	(assumption)
Boggs Creek Flood Zone Excavation Volume =		5,400 cf	(540 x 10 x 1)
Boggs Creek Flood Zone Excavation Volume =		200 cy	(5,400 / 27)

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Ditch 3 - Lower Reach

In the lower reaches of Ditch 3 one sample collected from the flood zone contained PCB contamination at concentratioos greater than 1 mg/kg. This Sample was located 10 feet from the bank of the stream.

Excavation area dimensions	Length =	200 feet	(from photos)
	Width =	15 feet	(5 feet plus 5 feet)
	Depth =	1 foot	(assumption)
Boggs Creek Flood Zone Excavation Volume =		3,000 cf	(200 x 10 x 1)
Boggs Creek Flood Zone Excavation Volume =		111 cy	(3,000 / 27)
Total Flood Zones Excavation =		322 cy	(111 + 200 + 11)
30% Increase for Over Excavation =		419 cy	(322 + 30%)
Use		420 cy	(round)

VOLUME SUMMARY

Total Volume of Sediment Excavation	750 cy
Total Volume of Flood Zone Excavation	420 cy
Total Volume of Surface Soil Excavation	440 cy
Total Volume of Excavated Surface Soils and Sediments	1,610 cy

APPENDIX D

SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SPECIFICATIONS
INTERIM MEASURES WORK PLAN
SWMU 17 – PCB CAPACITOR BURIAL/POLE YARD
NSWC CRANE
CRANE, INDIANA

EMAC Contractor Requirements

The Environmental Multiple Award Contract (EMAC) contractor will be responsible for performing the following work:

1. Attend pre-IMWP implementation conference.
2. Submit documentation in accordance with the EMAC 'Basic Contract' 30 days prior to beginning work to allow the Navy sufficient time to review and comment. The EMAC contractor will then incorporate Navy comments into the documents. These documents include the following:
 - Work Plan
 - Excavation and Handling Plan
 - Hazardous/Waste Management Plan
 - Environmental Protection Plan
 - Erosion and Sediment Control Plan
 - Stormwater Pollution Prevention Plan
 - Transportation and Disposal Plan
 - Site Specific Health and Safety Plan (SSHSP) and Activity Hazard Analysis
 - Project Quality Control Plan (QCP)
3. Acquire Facility-specific permits, including but not limited to the following:
 - Safety & Building Availability Permit (ESO 8020/11)
 - Digging Permit (NWSCC 11000/3)
 - Flame Tool/Hot Work Permit (NWSCC 11320)
 - Hazards of Electromagnetic Radiation to Ordnance (HERO) (approval for portable radios)
4. Mobilize required equipment and personnel to excavate the indicated contaminated surface soil and sediments.
5. Construct and maintain the required erosion and sediment control devices for the duration of the project.
6. Construct required support facilities including, but not limited to, temporary gravel construction entrance, temporary access trails, dewatering pad, decontamination pad(s), and material storage areas.
7. Excavate, transport, and dispose PCB-contaminated surface soils and sediments.
8. Restore surface soil excavation area to meet surrounding grades.
9. Restore drainage channels and streams to pre-construction conditions and alignment.
10. Remove all temporary support facilities, leaving perimeter erosion and sediment controls in place until revegetation is complete and as instructed by the Navy.
11. Restore areas used for temporary support facilities (regrading and revegetation).
12. Demobilize equipment and personnel.

In addition to the QC submittals and Safety and Health submittals required by the NSWC Crane Contractor's Operations Manual and the Basic Contract, the EMAC contractor shall submit the following to the Navy:

- Field work reports in accordance with Part 6.4 Section C of the Basic Contract.
- Contractor 40 CFR 1910.120 Employee Training Certificates for all Contractor employees scheduled to be on-site.
- Erosion and Sediment Control installation and inspection logs.
- Copies of NSWC Crane specific permits.
- Certification and sampling results for backfill material and topsoil. A minimum of one sample per borrow source is required.
- Waste transportation subcontractor name, address, contact name, telephone number, and USDOT number.

- Hazardous waste disposal facility name, address, contact name, telephone number, and USEPA and State identification numbers, if required.
- Solid waste disposal facility name, address, contact name, telephone number, USEPA and State identification numbers.
- Copies of Treatment/Disposal Facility Permits.
- Waste profiles, complete waste characterization results, and any waste disposal facility pre-approval or approval documentation.
- Work Site Decontamination Certificates (verification that all vehicles equipment and containers were properly decontaminated prior to leaving the work site).
- Disposal Site Decontamination Certificates (verification that vehicles and containers were decontaminated prior to leaving the disposal facility).
- Shipment Manifests (manifests and other documents required to ship waste).
- Delivery Certificates (verification that waste was received at identified waste disposal facility).
- Treatment and Disposal Certificates (verification that waste was successfully received and disposed).
- Decontamination Log.

The EMAC contractor-provided information will be compiled in the project CTO Closure Report to be prepared by the Navy.

Supplemental Specifications

In addition to the performance specifications presented in the NSW Crane Contractor's Operation Manual and in the Basic Contract, the EMAC contractor shall perform the activities in accordance with the supplemental specifications provided below.

General Requirements

The EMAC contractor is advised that this project is subject to Federal, State, and local regulatory agency inspections and review for compliance with environmental laws and regulations. The EMAC contractor shall fully cooperate with any representative from any Federal, State, or local regulatory agency who may visit the job site and shall provide immediate notification to the Officer in Charge of Construction (OICC), who shall accompany them on any subsequent site inspections. The EMAC contractor shall complete, maintain, and make available to the OICC, Facility, or regulatory agency personnel all documentation relating to environmental compliance under applicable Federal, State, and local laws and regulations. The EMAC contractor shall immediately notify the OICC if a Notice of Violation, Notice of Deficiency, or similar regulatory notice is issued to the EMAC contractor.

The EMAC contractor shall be responsible for all damages to persons or property resulting from EMAC contractor fault or negligence as well as for the payment of any civil fines or penalties which may be assessed by any Federal, State, or local regulatory agency as a result of the EMAC contractor's or any subcontractor's violation of an applicable Federal, State, or local environmental law or regulation. Should a Notice of Violation, Notice of Noncompliance, Notice of Deficiency, or similar regulatory agency notice be issued to the Government or Facility owner/operator on account of the actions or inactions of the EMAC contractor or one of its subcontractors in the performance of work under this contract, the EMAC contractor shall fully cooperate with the Government in defending against regulatory assessment of any civil fines or penalties arising out of such actions or inactions.

After approval of the EMAC contractor's Work Plan and before commencement of work the EMAC contractor shall submit to the OICC the required certifications. As requested by the OICC, the Navy Representative for this project may review and provide surveillance for the OICC to determine if EMAC contractor's submittals comply with the contract requirements.

The EMAC contractor shall be required to commence work on the approved EMAC contractor's Work Plan within 5 calendar days after receiving the notice to proceed and to prosecute the work diligently after receiving the notice to proceed.

NSWC Crane will remain in operation during the entire construction period. The EMAC contractor shall schedule the work as to cause the least amount of interference with the Facility. Work schedules shall be subject to the approval of the OICC. Permission to interrupt Facility road services shall be requested in writing a minimum of 15 calendar days prior to the desired date of interruption. The OICC shall be notified 48 hours prior to starting excavation activities.

Regular work hours shall consist of an 8-1/2 hour daily period established by the OICC, Monday through Friday, excluding Government holidays. The EMAC contractor should assume an 8-1/2 hour daily period. Working outside of the 8-1/2 hour daily period will require approval by the OICC. Work hours shall be established during the pre-IMWP implementation conference.

On-site storage, laydown, material handling, and decontamination activities shall be limited to areas approved by the OICC.

During the progress of construction activities, the work area and adjacent areas shall be kept clean and free of rubbish, surplus materials, and unneeded construction equipment. No material or debris shall be allowed to flow or wash into watercourses, ditches, gutters, drains, or pipes. Upon completion of the work, the EMAC contractor shall sweep paved areas and rake clean landscaped areas, and remove waste and surplus materials, rubbish, and construction facilities from the site.

Work Restrictions

EMAC contractor personnel employed at the Facility shall become familiar with and obey Facility regulations and keep within the limits of the work and avenues of ingress and egress as directed. Personnel shall not enter any restricted areas unless required to do so and until cleared for such entry. The EMAC contractor's equipment shall be clearly marked for identification.

The EMAC contractor shall indicate on the construction schedule any activity that could potentially interrupt Facility operations. The EMAC contractor shall notify the OICC in writing 15 calendar days prior to the required interruption.

Facilities and Services

Provide utility permits in accordance with Part 4.13 Section C of the Basic Contract.

NSWC Crane shall make all reasonably required amounts of utilities available to the EMAC Contractor from existing outlets and supplies, as indicated. The amount of each utility service consumed shall be charged to or paid for by the EMAC Contractor at the prevailing rates charged to NSWC Crane or shall be furnished at no charge as indicated. The EMAC Contractor shall carefully conserve any utilities furnished without charge.

The point at which NSWC Crane will deliver such utilities or services and the quantity available will be identified by NSWC Crane.

The EMAC Contractor, at its expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for the purpose of determining charges. Before final acceptance of the work by the Government, the EMAC Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

Electric – Electrical power available, primary voltage is [2400 volt 3 phase, 3 wire, 60 cycle AC. Secondary voltages may be 120/208 or 120/240 volts.] Final taps and tie-ins to the NSWC Crane utility grid will be made by NSWC Crane electric shop.

Potable Water – Potable water is not available. EMAC Contractor shall provide potable water for use by all personnel.

Water – A reasonable quantity of water is available at [Building [] fire station] at no charge. Provide backflow preventor devices on connections to potable water supplies. Under no circumstances will taps to NSWC Crane fire hydrants be allowed for obtaining water.

Telephone – Telephone service is not available.

Sanitary Facilities - Provide temporary sanitary facilities for use by all personnel in accordance with Part 3.10 Section C of the Basic Contract.

Municipal Waste – Municipal waste storage and disposal is not available.

Sewer – Water resulting from personnel and equipment decontamination, excavation dewatering, and water from materials handling pad may be discharged to the NSWC Crane sanitary sewer system, subject to approval of the NSWC Crane based on characterization samples of water to be discharged.

Site Personnel Qualifications

Site Superintendent - The EMAC contractor shall designate a Site Superintendent who shall have responsibility and authority to direct work performed. The Site Superintendent shall be responsible for the management and execution of all site activities in accordance with the IMWP, approved EMAC contractor's Work Plan, and all Federal, State, and local laws and regulations. The Site Superintendent may not act in the dual role as the Project Quality Control Manager or Site Health and Safety Specialist (SHSS). The Site Superintendent shall have, as a minimum, the following qualifications:

- A minimum of six years site superintendent experience.
- A minimum of three years experience on hazardous, toxic and radioactive waste (HTRW) projects.
- Familiar with the requirements of the U.S. Army Corps of Engineers Safety - Safety and Health Requirements (EM 385-1-1).
- Experience in the areas of hazard identification and safety compliance.

Project Quality Control Manager - The EMAC contractor shall designate a Project Quality Control (QC) Manager who shall assist and represent the QC Program Manager in continued implementation and enforcement of the approved Project QC Plan. The QC Program Manager or Project QC Manager shall be physically present at the project site whenever work is in progress. The Project QC Manager may be dual hatted with the SHSS if qualified. The Project QC Manager shall have, as a minimum, the following qualifications:

- A minimum two years experience as a Project QC Manager.
- A minimum of ten years combined experience in the following positions: project superintendent, QC manager, project manager, project engineer or construction manager on similar size and type of construction contracts which included the major trades that are part of this IM.
- Alternatively, the above ten year combined experience requirement may be satisfied by providing a professional engineer registered in the State of Indiana having at least two years experience as a Project QC Manager.
- Familiar with the requirements of the U.S. Army Corps of Engineers Safety - Safety and Health Requirements (EM 385-1-1).
- Experience in the areas of hazard identification and safety compliance.

Site Health and Safety Specialist - The EMAC contractor shall designate a Site Health and Safety Specialist (SHSS) who shall assist and represent the EMAC contractor's Health and Safety (H/S) Manager in continued implementation and enforcement of the approved Site Health and Safety Plan (SSHSP). The SHSS shall have the on-site responsibility and authority to modify and stop work, or remove personnel from the site if working conditions change which may effect on-site and off-site health and safety. The SHSS shall be physically present at the project site at all times. The SHSS may be dual hatted with the Project QC Manager. The SHSS shall have, as a minimum, the following qualifications:

- A minimum of five years safety work on similar projects.
- 30-hour OSHA construction safety class or equivalent within the last five years.
- An average of at least 24 hours of formal safety training each year for the last five years.
- Competent person status for at least the following:

- excavation,
- health hazard recognition, evaluation and control of chemical, physical and biological agents, and
- personal protective equipment and clothing to include selection, use and maintenance.
- First aid and cardiopulmonary resuscitation (CPR) qualified.

Quality Control

Approval of the QC Plan is required prior to the start of construction. The OICC reserves the right to require changes in the QC Plan and operations as necessary to ensure the specified quality of work. The Contracting Officer reserves the right to interview the QC Manager at any time in order to verify his/her submitted qualifications.

The OICC shall be notified, in writing, of any proposed changes to the QC Plan, at a minimum of seven calendar days prior to the implementation of the proposed change. Proposed changes must be approved by the OICC.

Combined Contractor Production Report/Contractor Quality Control Report (CPR/CQCR) is required for each day that work is performed. CPR/CQCRs are to be prepared, signed, and dated by the Project QC Manager.

Safety and Occupational Health Requirements

The SHSS and EMAC contractor representatives who have a responsibility or significant role in accident prevention shall attend the pre-IMWP implementation conference. The purpose of the conference is for the EMAC contractor and the OICC to become acquainted and explain the functions and operating procedures of their respective organizations and to reach mutual understanding relative to the administration of the overall project before the initiation of work. The EMAC contractor shall discuss the details of the work identified in the approved EMAC contractor's Work Plan and discuss which construction phases will require significant or additional activity hazard analysis. In addition, a schedule for the preparation, submittal, review, and acceptance of additional hazard analysis shall be established to preclude project delays. Lastly, deficiencies in the submitted accident prevention report will be brought to the attention of the EMAC contractor at the conference. The EMAC contractor shall revise the plan to correct deficiencies and resubmit the plan for acceptance.

New employees (prime or subcontractor) will be informed of specific site hazards before they begin work. Documentation of this orientation shall be kept on file at the project site.

If unforeseen materials hazardous to human health are encountered during operations, that portion of the work shall be stopped and the OICC shall be notified immediately. Within 14 days, the Navy will determine if the material is hazardous. If the material is not hazardous or poses no danger, the OICC will direct the EMAC contractor to proceed without change. If the material is determined to be hazardous or to pose danger, and handling of the material is necessary to accomplish the work, the Contracting Officer will issue modifications to the proposed work.

Equipment shall be operated by designated qualified operators. Proof of qualifications shall be kept on the project site for review. Manufacturer's specifications or owner's manual for the equipment shall be on site and reviewed for additional safety precautions or requirements. Such additional safety precautions or requirements shall be incorporated into the activity hazard analysis. Mechanized equipment shall be inspected in accordance with manufacturer's recommendations for safe operations by a competent person prior to being placed into use. Daily checks or tests shall be conducted and documented on mechanized equipment by designated competent persons.

The competent person for excavations performed as a result of contract work shall be on-site when excavation work is being performed, and shall inspect and document the excavations daily prior to entry by workers. The competent person must evaluate all hazards, including atmospheric, that may be associated with the work, and shall have the resources necessary to correct hazards promptly.

Environmental Controls

An Erosion and Sediment Control Plan is included in the IMWP. The Erosion and Sediment Control Plan describes the location and description of all erosion and sediment control measures, a sequence of construction to be followed, graphic details of all erosion and sediment control measures to be used, and an approval sign-off block containing the names of the Facility and EMAC contractor contacts, whose signatures indicate plan acceptance/approval.

The EMAC contractor shall strictly follow the Erosion and Sediment Control Plan and maintain all measures used during construction. Modifications to the Erosion and Sediment Control Plan shall be submitted to the OICC and the Indiana Department of Environmental Management (IDEM) for approval. No modifications to the Erosion and Sediment Control Plan will be allowed until these changes have been approved by the OICC and IDEM and three copies of the approved modifications have been submitted to the OICC and one copy of the approved modifications have been submitted to IDEM.

Transportation and Disposal of Contaminated Material

The EMAC contractor shall be solely responsible for complying with all Federal, State, and local requirements for decontamination of vehicles, equipment, and containers and shall bear all responsibility and cost for any noncompliance. In addition to these requirements, the EMAC contractor shall perform the following:

- Visually inspect all vehicles, equipment, and containers leaving the work site for proper decontamination.
- Prepare and maintain a written decontamination log.

The EMAC contractor shall be solely responsible for complying with all Federal, State, and local requirements for transporting contaminated materials through the applicable jurisdictions and shall bear all responsibility and cost for any noncompliance. In addition to these requirements, the EMAC contractor shall perform the following:

- Inspect and document all vehicles and containers for proper operation and covering.
- Inspect all vehicles and containers for proper markings, manifest documents, and other requirements for waste shipment.

All contaminated materials removed from the site shall be disposed in a treatment/disposal facility permitted to accept such material.

The EMAC contractor shall properly dispose of investigation derived waste, personnel protective equipment, and miscellaneous wastes associated with implementation of the IMWP, including sampling and analysis that are generated by the Navy representatives.

APPENDIX E

IDEM STABILIZATION SPECIFICATIONS

Practice 3.11 Temporary Seeding

Purpose

(Exhibit 3.11-A)

- * To reduce erosion and sedimentation damage by stabilizing disturbed areas where additional work (e.g., grading) is not scheduled for a period of 2 mo. to 1 yr.
- * To reduce problems associated with mud or dust from bare soil surfaces during construction.
- * To reduce sediment runoff to downstream areas.
- * To improve visual aesthetics of the construction areas.

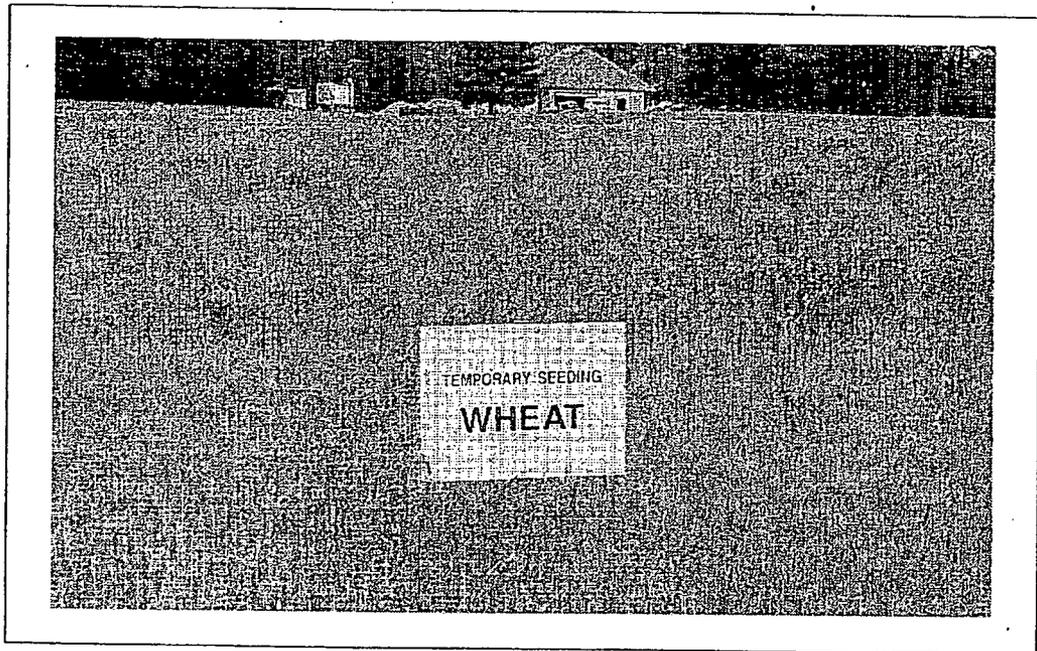


Exhibit 3.11-A. A temporary seeding of wheat to reduce erosion on a future home lot.

Requirements

Site and seedbed preparation: Graded and fertilizer applied.

Plant species: Selected on the basis of quick germination, growth, and time of year to be seeded (see Exhibit 3.11-B).

Mulch: Clean grain straw, hay, wood fibre, etc., to protect seedbed and encourage plant growth.

Seeding frequency: As often as possible following construction activity. Daily seeding of rough graded areas when the soil is loose and moist is usually most effective.

Application

(Exhibit 3.11-B)

SITE PREPARATION:

1. Install practices needed to control erosion, sedimentation, and water runoff, such as temporary and permanent diversions, sediment traps or basins, silt fences, and straw bale dams (Practices 3.21, 3.22, 3.72, 3.73, 3.74, and 3.75).
2. Grade the site as specified in the construction plan.

SEEDBED PREPARATION:

1. Test soil to determine its nutrient levels. (Contact your county SWCD or Cooperative Extension office for assistance and soils information, including available soil testing services.)
2. Fertilize as recommended by the soil test. If testing is not done, consider applying 400-600 lbs./acre of 12-12-12 analysis, or equivalent, fertilizer.
3. Work the fertilizer into the soil 2-4 in. deep with a disk or rake operated across the slope.

SEEDING:

1. Select a seeding mixture and rate from Exhibit 3.11-B, and plant at depth and on dates shown.
2. Apply seed uniformly with a drill or cultipacker-seeder or by broadcasting, and cover to the depth shown in Exhibit 3.11-B.

3. If drilling or broadcasting, firm the seedbed with a roller or cultipacker.
4. Mulch seeded areas to increase seeding success. Anchor all mulch by crimping or tackifying. Use of netting or erosion control blankets is possible, but may not be cost-effective for temporary seedings.

Exhibit 3.11-B. Temporary Seeding Recommendations.

Seed species*	Rate/acre	Planting depth	Optimum dates**
Wheat or rye	150 lbs.	1 to 1½ in.	9/15 to 10/30
Spring oats	100 lbs.	1 in.	3/1 to 4/15
Annual ryegrass	40 lbs.	1/4 in.	3/1 to 5/1
			8/1 to 9/1
German millet	40 lbs.	1 to 2 in.	5/1 to 6/1
Sudangrass	35 lbs.	1 to 2 in.	5/1 to 7/30

* Perennial species may be used as a temporary cover, especially if the area to be seeded will remain idle for more than a year (Practice 3.12).

** Seeding done outside the optimum dates increases the chances of seeding failure.

Maintenance

- * Inspect periodically after planting to see that vegetative stands are adequately established; re-seed if necessary.
- * Check for erosion damage after storm events and repair; reseed and mulch if necessary.
- * Topdress fall seeded wheat or rye seedings with 50 lbs./acre of nitrogen in February or March if nitrogen deficiency is apparent. (*Exhibit 3.11-B* shows only wheat/rye fall seeded.)

Common concern

- Fertilizer not incorporated at least 2 in. deep**—may be lost in runoff or remain concentrated near the surface to inhibit germination.
- Mulch rate inadequate**—results in poor germination and failure.
- Seeding uneven or rate too low**—results in patchy growth and erosion.

Practice 3.12 Permanent Seeding

Purposes

(Exhibit 3.12-A)

- * To reduce erosion and sedimentation damage by stabilizing exposed areas where additional work (e.g., grading) is not scheduled for a period of more than a year or areas where final grading has been completed.
- * To reduce problems associated with mud or dust from bare soil surfaces during construction.
- * To reduce sediment runoff to downstream areas.
- * To improve the visual aesthetics of the construction area.

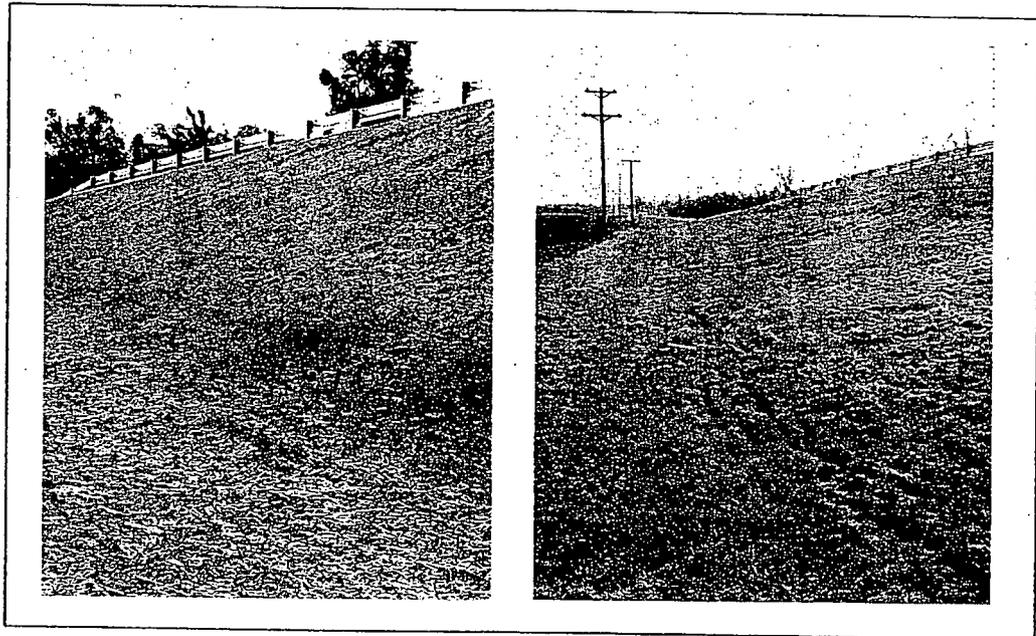


Exhibit 3.12-A. A road right-of-way (left) newly permanent seeded and mulched and (right) 6 mo. later.

Requirements

Site and seedbed preparation: Graded, and lime and fertilizer applied.

Plant species: Selected on the basis of soil type, soil pH, region of the state, time of year, and planned use of the area to be seeded (see Exhibit 3.12-C).

Mulch: Clean grain straw, hay, wood fibre, etc., to protect seedbed and encourage plant growth. The mulch may need to be anchored to reduce removal by wind or water, or erosion control blankets may be considered.

Application

(Exhibits 3.12-B, C, and D)

Permanently seed all final grade areas (e.g., landscape berms, drainage swales, erosion control structures, etc.) as each is completed and all areas where additional work is not scheduled for a period of more than a year.

SITE PREPARATION:

1. Install practices needed to control erosion, sedimentation, and runoff prior to seeding. These include temporary and permanent diversions, sediment traps and basins, silt fences, and straw bale dams (Practices 3.21, 3.22, 3.72, 3.73, 3.74, and 3.75).
2. Grade the site and fill in depressions that can collect water.
3. Add topsoil to achieve needed depth for establishment of vegetation (Practice 3.02).

SEEDBED PREPARATION:

1. Test soil to determine pH and nutrient levels. (Contact your county SWCD or Cooperative Extension office for assistance and soils information, including available testing services.)
2. If soil pH is unsuitable for the species to be seeded, apply lime according to test recommendations.

3. Fertilize as recommended by the soil test. If testing was not done, consider applying 400-600 lbs./acre of 12-12-12 analysis, or equivalent, fertilizer.
4. Till the soil to obtain a uniform seedbed, working the fertilizer and lime into the soil 2-4 in. deep with a disk or rake operated across the slope (*Exhibit 3.12-B*).

SEEDING:

Optimum seeding dates are Mar. 1-May 10 and Aug. 10-Sept. 30. Permanent seeding done between May 10 and Aug. 10 may need to be irrigated. As an alternative, use temporary seeding (Practice 3.11) until the preferred date for permanent seeding.

1. Select a seeding mixture and rate from *Exhibit 3.12-C*, based on site conditions, soil pH, intended land use, and expected level of maintenance.
2. Apply seed uniformly with a drill or cultipacker-seeder (*Exhibit 3.12-D*) or by broadcasting, and cover to a depth of 1/4-1/2 in.
3. If drilling or broadcasting, firm the seedbed with a roller or cultipacker.
4. Mulch all seeded areas (Practice 3.15). Consider using erosion control blankets on sloping areas (Practice 3.17). (NOTE: If seeding is done with a hydroseeder, fertilizer and mulch can be applied with the seed in a slurry mixture.)

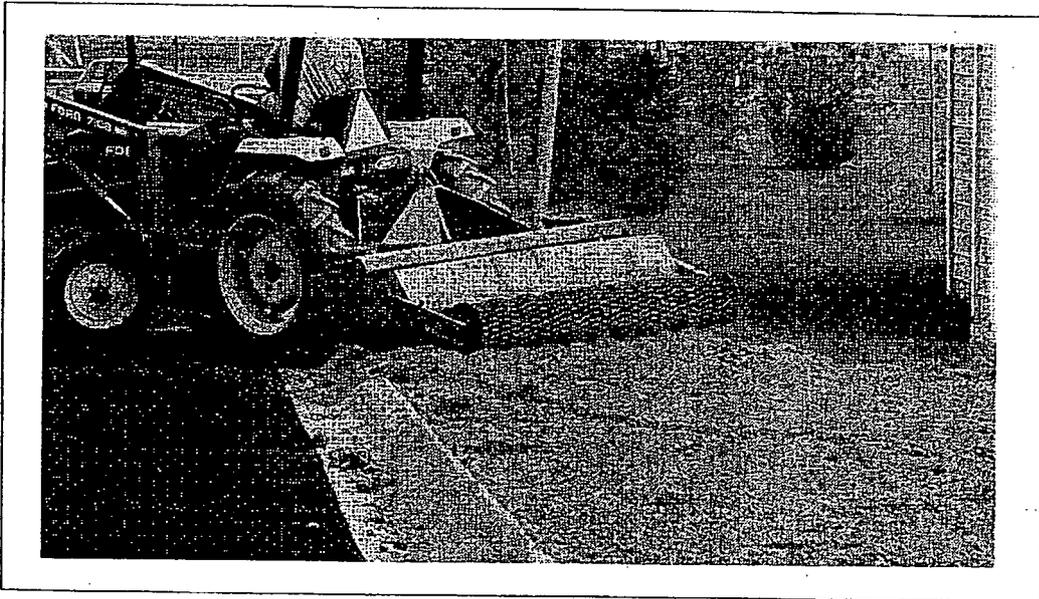


Exhibit 3.12-B. Preparing the seedbed with a combination roto-tiller and cultipacker.

Exhibit 3.12-C. Permanent Seeding Recommendations.

This table provides several seeding options. Additional seed species and mixtures are available commercially. When selecting a mixture, consider site conditions, including soil properties (e.g., soil pH and drainage), slope aspect and the tolerance of each species to shade and droughtiness.

Seed species and mixtures	Rate per acre	Optimum soil pH
OPEN AND DISTURBED AREAS (REMAINING IDLE MORE THAN 1 YR.)		
1. Perennial ryegrass	35 to 50 lbs.	5.6 to 7.0
+ white or ladino clover*	1 to 2 lbs.	
2. Kentucky bluegrass	20 lbs.	5.5 to 7.5
+ smooth bromegrass	10 lbs.	
+ switchgrass	3 lbs.	
+ timothy	4 lbs.	
+ perennial ryegrass	10 lbs.	
+ white or ladino clover*	1 to 2 lbs.	

Exhibit 3.12-C. Continued.

Seed species and mixtures	Rate per acre	Optimum soil pH
3. Perennial ryegrass	15 to 30 lbs.	5.6 to 7.0
+ tall fescue**	15 to 30 lbs.	
4. Tall fescue**	35 to 50 lbs.	5.5 to 7.5
+ ladino or white clover*	1 to 2 lbs.	
STEEP BANKS AND CUTS, LOW MAINTENANCE AREAS (NOT MOWED)		
1. Smooth brome-grass	25 to 35 lbs.	5.5 to 7.5
+ red clover*	10 to 20 lbs.	
2. Tall fescue**	35 to 50 lbs.	5.5 to 7.5
+ white or ladino clover*	1 to 2 lbs.	
3. Tall fescue**	35 to 50 lbs.	5.5 to 7.5
+ red clover*	10 to 20 lbs.	
(Recommended north of US 40)		
4. Orchardgrass	20 to 30 lbs.	5.6 to 7.0
+ red clover*	10 to 20 lbs.	
+ ladino clover*	1 to 2 lbs.	
5. Crownvetch*	10 to 12 lbs.	5.6 to 7.0
+ tall fescue**	20 to 30 lbs.	
(Recommended south of US 40)		
LAWNS AND HIGH MAINTENANCE AREAS		
1. Bluegrass	105 to 140 lbs.	5.5 to 7.0
2. Perennial ryegrass (turf-type)	45 to 60 lbs.	5.6 to 7.0
+ bluegrass	70 to 90 lbs.	
3. Tall fescue (turf-type)**	130 to 170 lbs.	5.6 to 7.5
+ bluegrass	20 to 30 lbs.	
CHANNELS AND AREAS OF CONCENTRATED FLOW		
1. Perennial ryegrass	100 to 150 lbs.	5.6 to 7.0
+ white or ladino clover*	1 to 2 lbs.	
2. Kentucky bluegrass	20 lbs.	5.5 to 7.5
+ smooth brome-grass	10 lbs.	
+ switchgrass	3 lbs.	
+ timothy	4 lbs.	
+ perennial ryegrass	10 lbs.	
+ white or ladino clover*	1 to 2 lbs.	
3. Tall fescue**	100 to 150 lbs.	5.5 to 7.5
+ ladino or white clover*	1 to 2 lbs.	
4. Tall fescue**	100 to 150 lbs.	5.5 to 7.5
+ Perennial ryegrass	15 to 20 lbs.	
+ Kentucky bluegrass	15 to 20 lbs.	

* For best results: (a) legume seed should be inoculated; (b) seeding mixtures containing legumes should preferably be spring-seeded, although the grass may be fall-seeded and the legume frost-seeded (Practice 3.13); and (c) if legumes are fall-seeded, do so in early fall.

** Tall fescue provides little cover for, and may be toxic to, some species of wildlife. The IDNR recognizes the need for additional research on alternatives to tall fescue, such as buffalograss, orchard-grass, smooth brome-grass, and switch-grass. This research, in conjunction with demonstration areas, should focus on erosion control characteristics, wildlife toxicity, turf durability, and drought resistance.

NOTE: An oat or wheat companion or nurse crop may be used with any of the above permanent seeding mixtures. If so, it is best to seed during the fall seeding period, especially after Sept. 15, and at the following rates: spring oats--1/4 to 3/4 bu./acre; wheat--no more than 1/2 bu./acre.

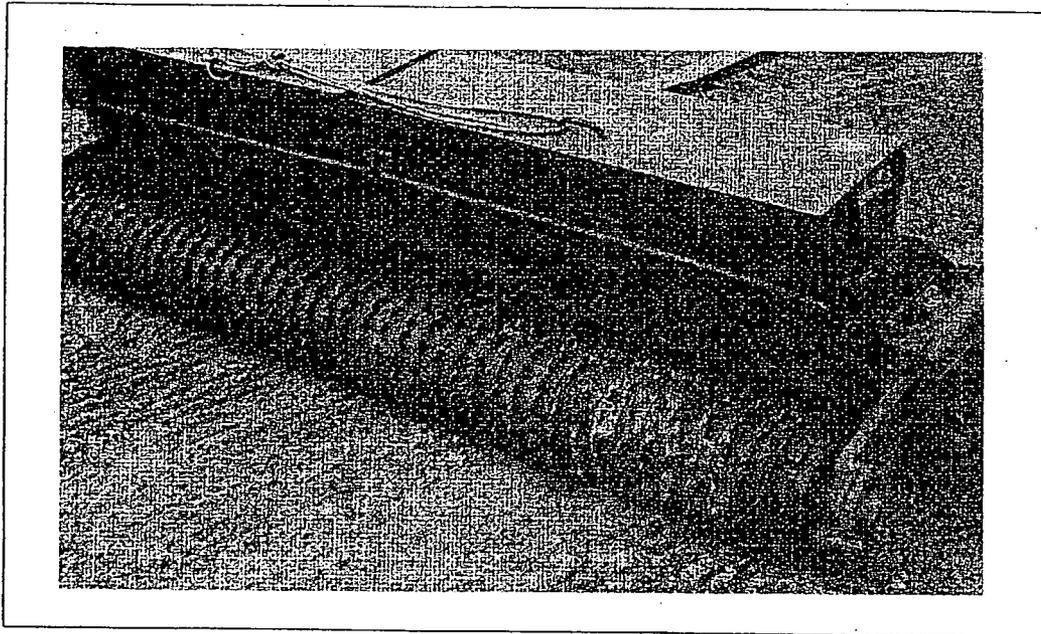


Exhibit 3.12-D. A cultipacker-seeder.

Maintenance

- * Inspect periodically, especially after storm events, until the stand is successfully established. (Characteristics of a successful stand include: vigorous dark green or bluish-green seedlings; uniform density with nurse plants, legumes, and grasses well inter-mixed; green leaves; and the perennials remaining green throughout the summer, at least at the plant base.)
- * Plan to add fertilizer the following growing season according to soil test recommendations.
- * Repair damaged, bare, or sparse areas by filling any gullies, re-fertilizing, over- or re-seeding, and mulching.
- * If plant cover is sparse or patchy, review the plant materials chosen, soil fertility, moisture condition, and mulching; then repair the affected area either by over-seeding or by re-seeding and mulching after re-preparing the seedbed.
- * If vegetation fails to grow, consider soil testing to determine acidity or nutrient deficiency problems. (Contact your SWCD or Cooperative Extension office for assistance.)
- * If additional fertilization is needed to get a satisfactory stand, do so according to soil test recommendations.

Common concerns

- Insufficient topsoil or inadequately tilled, limed, and/or fertilized seedbed**—results in poor establishment of vegetation.
 - Unsuitable species or seeding mixture**—results in poor establishment of vegetation.
 - Nurse crop rate too high in the mixture**—results in competition with the perennials.
 - Seeding done at the wrong time of year**—results in poor establishment of vegetation, also plant hardiness is significantly decreased.
 - Mulch rate inadequate**—results in poor germination and failure.
-

Practice 3.13 Dormant and Frost Seeding

Dormant seeding is a temporary or permanent seeding application at a time when soil temperatures are too low for germination to occur (less than 50°F). *Frost seeding* is a temporary or permanent seeding application in early spring when soils are in the freeze-thaw stage. (This practice can be used to repair or enhance areas having thin or declining cover or to re-vegetate an area.)

Purposes

(Exhibit 3.13-A)

- * To provide early germination and soil stabilization in the spring.
- * To reduce sediment runoff to downstream areas.
- * To improve the visual aesthetics of the construction area.
- * To repair previous seedings.

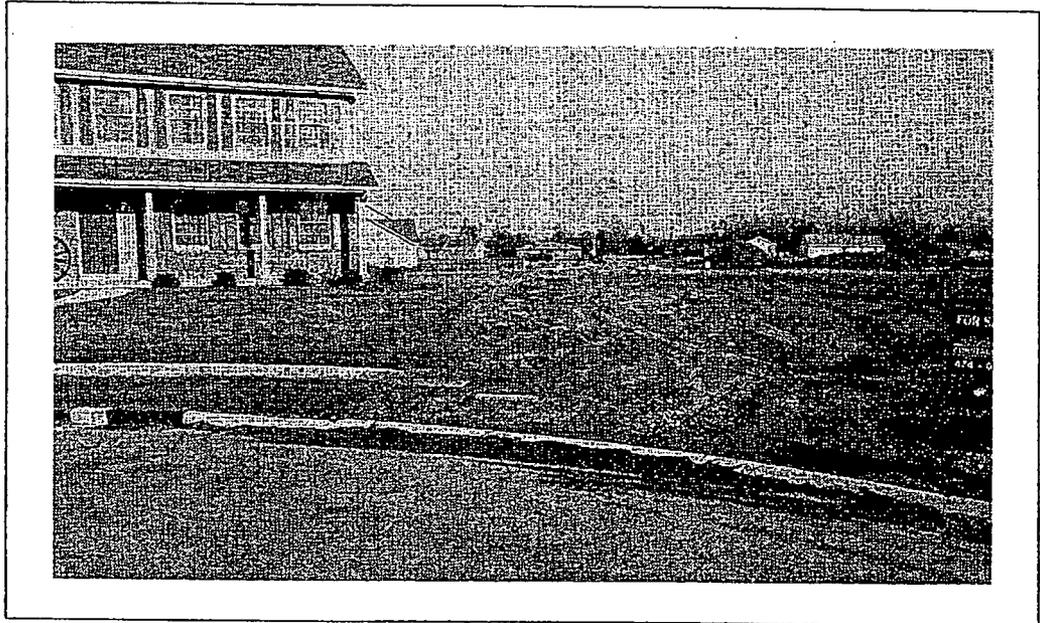


Exhibit 3.13-A. Use of dormant seeding could have reduced excessive early spring erosion on this site.

Requirements

Site and seedbed preparation: Graded as needed, and lime and fertilizer applied.

Plant species: Selected on the basis of soil type, adaptability to the region, and planned use of the area (see Exhibits 3.13-B and 3.13-C).

Application

(Exhibits 3.13-B and C)

SITE PREPARATION:

1. Grade the area to be seeded.
2. Install needed erosion/water runoff control practices, such as temporary or permanent diversions, sediment basins, silt fences, or straw bale dams (Practices 3.21, 3.22, 3.72, 3.74, or 3.75).

FOR DORMANT SEEDING:

Site and seedbed preparation and mulching can be done months ahead of actual seeding; or if the existing ground cover is adequate, seeding can be done directly into it.

Seeding dates: Dec. 1-Feb. 28 (north of U.S. 40), Dec. 10-Jan. 15 (south of U.S. 40).

1. Broadcast fertilizer as recommended by a soil test; or if testing was not done, consider applying 400-600 lbs./acre of 12-12-12 analysis, or equivalent, fertilizer.
2. Apply mulch upon completion of grading (Practice 3.15).
3. Select an appropriate seed species or mixture from Exhibit 3.13-B for temporary seeding or Exhibit 3.13-C for permanent seeding, and broadcast on top of the mulch and/or into existing ground cover at the rate shown. (If site preparation occurs within the recommended dates, fertilize and lime, seed, and mulch at that time.)

FOR FROST SEEDING:

Seed is broadcast over the prepared seedbed and incorporated into the soil by natural freeze-thaw action.

Seeding dates: Feb. 28-Mar. 28 (north of U.S. 40), Feb. 15-Mar. 15 (south of U.S. 40).

1. Broadcast fertilizer as recommended by a soil test; or if testing was not done, consider applying 400-600 lbs./acre of 12-12-12 analysis, or equivalent, fertilizer.
2. Select an appropriate seed species or mixture from *Exhibit 3.13-B* for temporary seeding or *Exhibit 3.13-C* for permanent seeding, and broadcast on to the seedbed or into the existing ground cover at the rate shown. (Do not work the seed into the soil.)

Exhibit 3.13-B. Temporary Dormant or Frost Seeding Recommendations.

Seed species*	Rate per acre
Wheat or rye	150 lbs.
Spring oats	150 lbs.
Annual ryegrass	60 lbs.

* Perennial species may be used as a temporary cover, especially if the area to be seeded will remain idle for more than a year (Practice 3.12).

Exhibit 3.13-C. Permanent Dormant or Frost Seeding Recommendations.

This table provides several seeding options. Additional seed species and mixtures are available commercially. When selecting a mixture, consider site conditions, including soil properties (e.g., soil pH and drainage), slope aspect and the tolerance of each species to shade and droughtiness.

Seed species and mixtures	Rate per acre	Optimum soil pH
OPEN AND DISTURBED AREAS (REMAINING IDLE MORE THAN 1 YR.)		
1. Perennial ryegrass	50 to 75 lbs.	5.6 to 7.0
+ white or ladino clover*	1½ to 3 lbs.	
2. Kentucky bluegrass	30 lbs.	5.5 to 7.5
+ smooth bromegrass	15 lbs.	
+ switchgrass	5 lbs.	
+ timothy	6 lbs.	
+ perennial ryegrass	15 lbs.	
+ white or ladino clover*	1½ to 3 lbs.	
3. Perennial ryegrass	22 to 45 lbs.	5.6 to 7.0
+ tall fescue**	22 to 45 lbs.	
4. Tall fescue**	50 to 75 lbs.	5.5 to 7.5
+ ladino or white clover*	1½ to 3 lbs.	
STEEP BANKS AND CUTS, LOW MAINTENANCE AREAS (NOT MOWED)		
1. Smooth bromegrass	35 to 50 lbs.	5.5 to 7.5
+ red clover*	15 to 30 lbs.	
2. Tall fescue**	50 to 75 lbs.	5.5 to 7.5
+ white or ladino clover*	1½ to 3 lbs.	
3. Tall fescue**	50 to 75 lbs.	5.5 to 7.5
+ red clover*	15 to 30 lbs.	
(Recommended north of US 40)		
4. Orchardgrass	30 to 45 lbs.	5.6 to 7.0
+ red clover*	15 to 30 lbs.	
+ ladino clover*	1½ to 3 lbs.	
5. Crownvetch*	15 to 18 lbs.	5.6 to 7.0
+ tall fescue**	30 to 45 lbs.	
(Recommended south of US 40)		

Exhibit 3.13-C. Continued.

Seed species and mixtures	Rate per acre	Optimum soil pH
LAWNS AND HIGH MAINTENANCE AREAS		
1. Bluegrass	160 to 210 lbs.	5.5 to 7.0
2. Perennial ryegrass (turf-type) + bluegrass	70 to 90 lbs. 105 to 135 lbs.	5.6 to 7.0
3. Tall fescue (turf-type)** + bluegrass	195 to 250 lbs. 30 to 45 lbs.	5.6 to 7.5
CHANNELS AND AREAS OF CONCENTRATED FLOW		
1. Perennial ryegrass + white or ladino clover*	150 to 225 lbs. 1½ to 3 lbs.	5.6 to 7.0
2. Kentucky bluegrass + smooth bromegrass + switchgrass + timothy + perennial ryegrass + white or ladino clover*	30 lbs. 15 lbs. 5 lbs. 6 lbs. 15 lbs. 1½ to 3 lbs.	5.5 to 7.5
3. Tall fescue** + ladino or white clover*	150 to 225 lbs. 1½ to 3 lbs.	5.5 to 7.5
4. Tall fescue** + Perennial bluegrass + Kentucky bluegrass	150 to 225 lbs. 22 to 30 lbs. 22 to 30 lbs.	5.5 to 7.5

* For best results: (a) legume seed should be inoculated; (b) seeding mixtures containing legumes should preferably be spring-seeded, although the grass may be fall-seeded and the legume frost-seeded; and (c) if legumes are fall-seeded, do so in early fall.

** Tall fescue provides little cover for, and may be toxic to, some species of wildlife. The IDNR recognizes the need for additional research on alternatives to tall fescue, such as buffalograss, orchardgrass, smooth bromegrass, and switchgrass. This research, in conjunction with demonstration areas, should focus on erosion control characteristics, wildlife toxicity, turf durability, and drought resistance.

NOTE: If using mixtures other than those listed here, increase the seeding rate by 50% over the conventional rate.

Maintenance

- * Apply 200-300 lbs./acre of 12-12-12 or equivalent fertilizer between Apr. 15 and May 10 or during periods of vigorous growth.
- * Re-seed and mulch any areas that have inadequate cover by mid- to late-April. For best results, re-seed within the recommended dates shown in Practices 3.11 for temporary seeding or 3.12 for permanent seeding.

Common concerns

- Seeding done at wrong time of year--results in poor seed germination and vegetative stands.
- Seeding on too steep a slope--results in seed loss and poor stands.
- Seeding failure due to late freeze, killing germinated seedlings.
- Mulch rate inadequate--results in poor germination and failure of dormant seeding.
- Unsuitable choice of seed species or seeding mixture--results in poor vegetative stands or vegetation that does not serve the intended purpose.
- Poor soil and seed contact--results in poor seed germination and vegetative stands.
- Dormant seeding over mulch or frost seeding in concentrated flow areas--can result in seed being washed away before seed-soil contact and germination can occur.

Exhibit 3.13-C. Continued.

Seed species and mixtures	Rate per acre	Optimum soil pH
LAWNS AND HIGH MAINTENANCE AREAS		
1. Bluegrass	160 to 210 lbs.	5.5 to 7.0
2. Perennial ryegrass (turf-type) + bluegrass	70 to 90 lbs. 105 to 135 lbs.	5.6 to 7.0
3. Tall fescue (turf-type)** + bluegrass	195 to 250 lbs. 30 to 45 lbs.	5.6 to 7.5
CHANNELS AND AREAS OF CONCENTRATED FLOW		
1. Perennial ryegrass + white or ladino clover*	150 to 225 lbs. 1½ to 3 lbs.	5.6 to 7.0
2. Kentucky bluegrass + smooth brome grass + switchgrass + timothy + perennial ryegrass + white or ladino clover*	30 lbs. 15 lbs. 5 lbs. 6 lbs. 15 lbs. 1½ to 3 lbs.	5.5 to 7.5
3. Tall fescue** + ladino or white clover*	150 to 225 lbs. 1½ to 3 lbs.	5.5 to 7.5
4. Tall fescue** + Perennial bluegrass + Kentucky bluegrass	150 to 225 lbs. 22 to 30 lbs. 22 to 30 lbs.	5.5 to 7.5

* For best results: (a) legume seed should be inoculated; (b) seeding mixtures containing legumes should preferably be spring-seeded, although the grass may be fall-seeded and the legume frost-seeded; and (c) if legumes are fall-seeded, do so in early fall.

** Tall fescue provides little cover for, and may be toxic to, some species of wildlife. The IDNR recognizes the need for additional research on alternatives to tall fescue, such as buffalograss, orchardgrass, smooth brome grass, and switch-grass. This research, in conjunction with demonstration areas, should focus on erosion control characteristics, wildlife toxicity, turf durability, and drought resistance.

NOTE: If using mixtures other than those listed here, increase the seeding rate by 50% over the conventional rate.

Maintenance

- * Apply 200-300 lbs./acre of 12-12-12 or equivalent fertilizer between Apr. 15 and May 10 or during periods of vigorous growth.
- * Re-seed and mulch any areas that have inadequate cover by mid- to late-April. For best results, re-seed within the recommended dates shown in Practices 3.11 for temporary seeding or 3.12 for permanent seeding.

Common concerns

- Seeding done at wrong time of year--results in poor seed germination and vegetative stands.
- Seeding on too steep a slope--results in seed loss and poor stands.
- Seeding failure due to late freeze, killing germinated seedlings.
- Mulch rate inadequate--results in poor germination and failure of dormant seeding.
- Unsuitable choice of seed species or seeding mixture--results in poor vegetative stands or vegetation that does not serve the intended purpose.
- Poor soil and seed contact--results in poor seed germination and vegetative stands.
- Dormant seeding over mulch or frost seeding in concentrated flow areas--can result in seed being washed away before seed-soil contact and germination can occur.

Practice 3.15 Mulching

Purposes

(Exhibit 3.15-A)

- * To prevent erosion by protecting the soil from wind and water impact.
- * To provide temporary surface stabilization.
- * To prevent soil from crusting.
- * To conserve moisture thereby promoting seed germination and seedling growth.



Exhibit 3.15-A. Applying straw mulch with a chopper-blower on freshly seeded soil adjacent to a road.

Requirements

(Exhibits 3.15-B and C)

Material: Straw, hay, wood fiber, cellulose, or excelsior (see Exhibit 3.15-B), or erosion control blankets or turf reinforcement mats (Practices 3.17 and 3.18), as specified in the erosion and sediment control plan.

Coverage: At least 75% of the soil surface.

Anchoring: Required for straw or hay mulch and sometimes excelsior to prevent displacement by wind and/or water (see Exhibit 3.15-C).

Exhibit 3.15-B. Mulch Materials, Rates, and Comments.

Material	Rate	Comments
Straw or hay	1½-2 tons/acre	Should be dry, unchopped, free of undesirable seeds. Spread by hand or machine. Must be crimped or anchored (see Exhibit 3.15-D).
Wood fiber or cellulose	1 ton /acre	Apply with a hydromulcher and use with tacking agent.
Long fiber wood (excelsior)	1/2-3/4 ton/acre	Anchor in areas subject to wind.

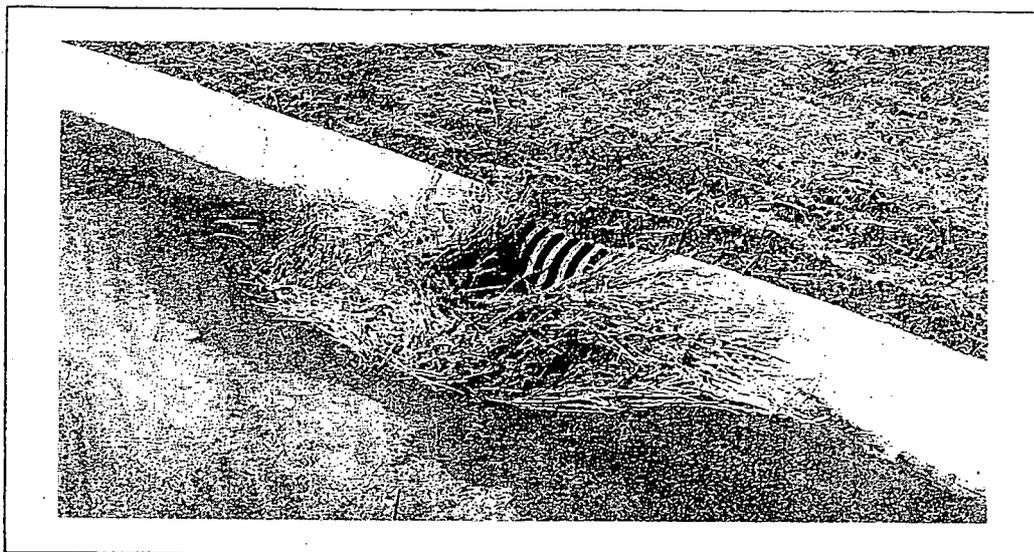


Exhibit 3.15-C. This unanchored straw mulch flowed with runoff to the storm drain. While acting somewhat as an inlet protection filter, it would have been more effective keeping soil from eroding off the site.

Application and anchoring

(Exhibits 3.15-D, E, and F)

1. Apply mulch at the recommended rate.
2. Spread uniformly by hand, hay fork, mulch blower, or hydromulcher. After spreading, no more than 25% of the ground surface should be visible.
3. If straw or hay is used, anchor it immediately one of the following ways (see Exhibit 3.15-D):
 - Crimp with a mulch anchoring tool; a weighted farm disk with dull serrated blades set straight (see Exhibit 3.15-E), or track cleats of a bulldozer; OR
 - Hydromulch with short cellulose fibers (see Exhibit 3.15-F); OR
 - Apply a liquid tackifier; OR
 - Cover with netting secured by metal staples.

Exhibit 3.15-D. Mulch Anchoring Methods.

Anchoring method	How to apply
Mulch anchoring tool <u>OR</u> Farm disk (dull, serrated, and set straight)	Crimp or punch the straw or hay into the soil 2-4 in. Operate machinery on the contour of the slope.
Cleating with dozer tracks	Operate dozer up and down slope, not across, or else the tracks will form rills.
Wood hydromulch fibers	Apply 1-2 tons/acre using a hydromulcher at a rate of 750 lbs./acre with a tacking agent (or according to contractor specifications). Do not use in areas of concentrated flow.
Asphalt emulsion	Emulsified asphalt should conform to the requirements of ASTM Spec. #977. Apply with suitable equipment at a rate of 0.05 gal./sq. yd. Do not use in areas of concentrated flow.
Synthetic tackifier, binder or soil stabilizer	Apply according to manufacturer's recommendation.
Biodegradable netting (polypropylene or similar material)*	Apply over mulch and staple with 6-8 in. wire staples. Follow manufacturer's recommendations for installation. Best suited to slope application.

* Install the netting immediately after applying the mulch. In areas of concentrated water flow, lay it parallel to the direction of flow; on other slopes, lay it either parallel or perpendicular to direction of flow. Edges of adjacent netting strips should overlap 4-6 in., with the strip on the upgrade side of any lateral water flow on top. Installation details are site specific, so follow manufacturer's directions.

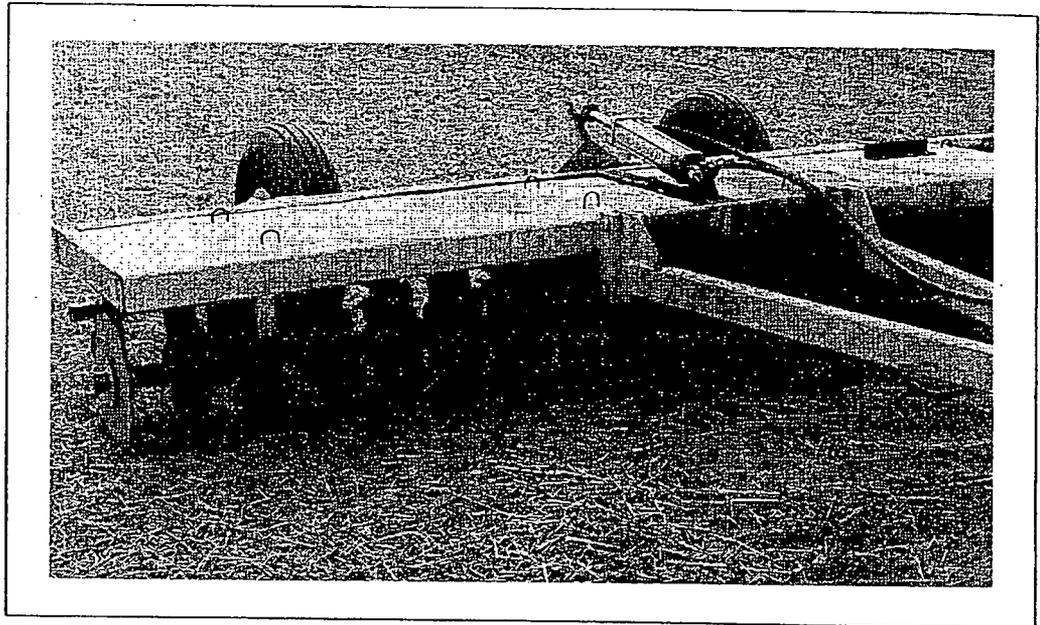


Exhibit 3.15-E. A crimper can be used to anchor mulch into the soil more securely.

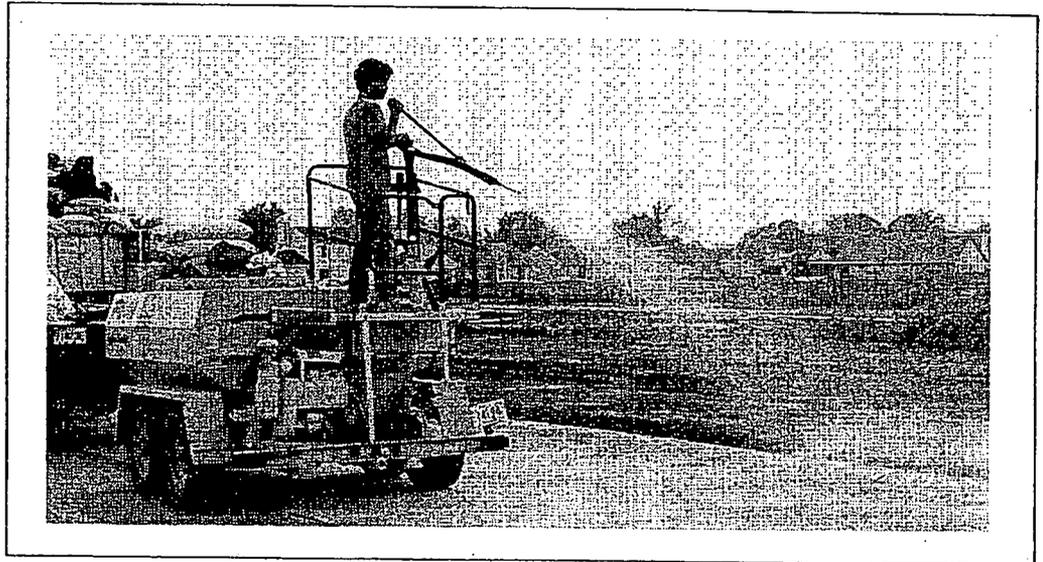


Exhibit 3.15-F. Hydroseeding the roadside in a new subdivision.

Maintenance

- * Inspect after storm events to check for movement of mulch or for erosion.
- * If washout, breakage, or erosion is present, repair the surface, then re-seed, re-mulch and, if applicable, install new netting.
- * Continue inspections until vegetation is firmly established.

Common concerns

- Inadequate coverage**—results in erosion, washout, and poor plant establishment.
- Appropriate tacking agent not applied or applied in insufficient amount**—results in mulch being lost to wind and runoff.
- Flow too concentrated to use straw mulch**—results in erosion in channel; consider use of erosion control blankets and/or a diversion until vegetation is established.
- Hydromulch applied in winter**—results in deterioration of mulch before plants can become established.
- Netting washed away**—because insufficient number of staples used.