TABLE 2-8 (Continued)

SAMPLING LOCATION	SAMPLE ID	PPL Org(a)	PPL VOAs (b)	PPL Metals & Al, Fe, Mn(c)	Total Sulfide(d)	Total Phosphorus(e)	TKN(e)	NO2 & NO3(e)	Ammonia(e)	TOC(e)	BOD(f)	COD(e)	Cyanide(g)
ELUTRIATES													
Swan Point	SWPEL	X		X	X	X	X	X	X	X	X	X	X
Craighill Entrance/Craighill	CRE/CREL	X		X	X	X	X	X	X	X	X	X	X
Craighill Angle	CRAEL	X		X	X	X	X	X	X	X	X	X	X
Craighill Upper Range/Cutoff Angle	CRU/CUTEL	X		X	X	X	X	X	X	X	X	X	X
Tolchester (Van Veen)	TLCEL	X		X	X	X	X	X	X	X	X	X	X
Tolchester (Gravity Core)	TLVEL	X		X	X	X	X	X	X	X	X	X	X
Brewerton, Eastern Ext. (Van Veen)	BEEL	X		X	X	X	X	X	X	X	X	X	X
Brewerton Eastern Ext. (Gravity Core)	BEVEL	X		X	X	X	X	X	X	X	X	X	X
Brewerton/Brewerton Angle	BR/BRAEL	X		X	X	X	X	X	X	X	X	X	X
Curtis Bay	CBEL	X		X	X	X	X	X	X	X	X	X	X
Ft. McHenry	FMHEL	X		X	X	X	X	X	X	X	X	X	X
Ferry Bar	FBEL	X		X	X	X	X	X	X	X	X	X	X
Northwest Branch East/NW Branch West	NBE/NBWEL	X		X	X	X	X	X	X	X	X	X	X

(a) Samples were placed in 2 (40 ml) glass VOC containers (for volatiles) and 4 (1 liter) clear glass containers (pest/pcbs, semivolatiles).
(b) Samples were placed in 2 (40 ml) glass containers.
(c) Samples were placed in a "C" bottle preserved with HNO3.
(d) Samples were placed in an "I" bottle preserved with zinc acetate.
(e) Samples were placed in a 500 ml "B" bottle preserved with H2SO4.
(f) Samples were placed in a 500 ml "A" bottle (no preservative).
(g) Samples were placed in a "G" bottle preserved with NAOH.
(h) Sample IDs and volumes used in elutriate preparation are listed in Table 2-6.

TABLE 2-5. CHEMICAL ANALYSES FOR CHESAPEAKE BAY AND BALTIMORE HARBOR SEDIMENT SAMPLES

SAMPLING LOCATION	SAMPLE ID	PPL Org(a)	PAHs(b)	PCB Congeners(b)	TBT(b)	PPL Metals & Al, Fe, Mn(b)	Total Sulfide(b)	Total Phos. (b)	TKN(b)	NO2 & NO3(b)	Ammonia(b)	TOC(b)	BOD(b)	COD(b)	Cyanide(b)	Atterberg, Moist., Grain size(b)	Elutriate Prep(d)
BRA1 Blind split	BRA1SEDBS *	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	
BRA2	BRA2SED	X	X			X	X	X	X	X	X	X	X	X	X	X	BR/BRAEL
Curtis Bay																	
CB1	CB1SED	X	X			X	X	X	X	X	X	X	X	X	X	X	CBEL
CB2	CB2SED	X	X			X	X	X	X	X	X	X	X	X	X	X	CBEL
CB3	CB3SED	X	X			X	X	X	X	X	X	X	X	X	X	X	CBEL
CB4	CB4SED	X	X			X	X	X	X	X	X	X	X	X	X	X	CBEL
Ft. McHenry																	
FMH1	FMH1SED	X	X			X	X	X	X	X	X	X	X	X	X	X	FMHEL
FMH2	FMH2SED	X	X			X	X	X	X	X	X	X	X	X	X	X	FMHEL
FMH3	FMH3SED	X	X			X	X	X	X	X	X	X	X	X	X	X	FMHEL
FMH4	FMH4SED	X	X			X	X	X	X	X	X	X	X	X	X	X	FMHEL
Ferry Bar																	
FB1	FB1SED	X	X			X	X	X	X	X	X	X	X	X	X	X	FBEL
FB2	FB2SED	X	X			X	X	X	X	X	X	X	X	X	X	X	FBEL
FB3	FB3SED	X	X			X	X	X	X	X	X	X	X	X	X	X	FBEL
Northwest Branch East																	
NBE1	NBE1SED	X	X			X	X	X	X	X	X	X	X	X	X	X	NBE/NBWEL
NBE2	NBE2SED	X	X			X	X	X	X	X	X	X	X	X	X	X	NBE/NBWEL
Northwest Branch West																	
NBW1	NBW1SED	X	X			X	X	X	X	X	X	X	X	X	X	X	NBE/NBWEL
NBW2	NBW2SED	X	X			X	X	X	X	X	X	X	X	X	X	X	NBE/NBWEL
NBW3	NBW3SED	X	X			X	X	X	X	X	X	X	X	X	X	X	NBE/NBWEL

(a) Sample aliquots were placed in 2 (60 ml) glass VOC containers (for volatiles) and 1 (1 gal) clear wide-mouth glass containers (pest/pcbs, semivolatiles).

(b) Sample aliquots were placed in 2 (1/2 gal) clear widemouth glass containers.

(c) Two blind splits (of 5) were selected randomly in the field and submitted to EA Labs for analysis.

(d) Samples were placed in 1 gal clear wide-mouth glass containers. Samples with the same elutriate designation (e.g., CRE/CR) were composited by the lab to provide one sediment sample that was used in elutriate preparation.

(e) Samples were analyzed only if the total PCB concentration was > 11.6 micrograms /kilogram.

TABLE 2-5. CHEMICAL ANALYSES FOR CHESAPEAKE BAY AND BALTIMORE HARBOR SEDIMENT SAMPLES

SAMPLING LOCATION	SAMPLE ID	PPL Org(a)	PAHs(b)	PCB Congeners(b)	TBT(b)	PPL Metals & Al, Fe, Mn(b)	Total Sulfide(b)	Total Phos. (b)	TKN(b)	NO2 & NO3(b)	Ammonia(b)	TOC(b)	BOD(b)	COD(b)	Cyanide(b)	Atterberg, Moist., Grain size(b)	Elutriate Prep(d)
Poplar Island																	
PI1	PI1SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	
PI2	PI2SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	
PI3	PI3SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	
PI4	PI4SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	
PI5	PI5SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	
Deep Trough																	
DT1	DT1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	
DT2	DT2SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	
DT3	DT3SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	
Kent Island Deep																	
KI1	KI1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	
KI2	KI2SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	
KI3	KI3SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	
Pooles Island																	
POL1	POL1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	
Swan Point																	
SWP1	SWP1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	SWPEL
SWP2	SWP2SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	SWPEL
SWP3	SWP3SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	SWPEL
Craighill Entrance																	
CRE1	CRE1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	CRE/CREL
CRE2	CRE2SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	CRE/CREL
CRE3	CRE3SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	CRE/CREL
Craighill																	
CR1	CR1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	CRE/CREL
CR2	CR2SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	CRE/CREL
CR2 Field Duplicate	CR2SEDFD	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	
CR3	CR3SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	CRE/CREL
Craighill Angle																	
CRA1	CRA1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	CRAEL
CRA2	CRA2SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	CRAEL
Craighill Upper Range																	
CRU1	CRU1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	CRU/CUTEL
CRU2	CRU2SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	CRU/CUTEL
CRU3	CRU3SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	CRU/CUTEL

TABLE 2-5. CHEMICAL ANALYSES FOR CHESAPEAKE BAY AND BALTIMORE HARBOR SEDIMENT SAMPLES

SAMPLING LOCATION	SAMPLE ID	PPL Org(a)	PAHs(b)	PCB Congeners(b)	TBT(b)	PPL Metals & Al, Fe, Mn(b)	Total Sulfide(b)	Total Phos. (b)	TKN(b)	NO2 & NO3(b)	Ammonia(b)	TOC(b)	BOD(b)	COD(b)	Cyanide(b)	Atterberg, Moist., Grain size(b)	Elutriate Prep(d)
Cutoff Angle																	
CUT1	CUT1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	CRU/CUTEL
CUT2	CUT2SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	CRU/CUTEL
CUT3	CUT3SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	CRU/CUTEL
Tolchester																	
TLC1	TLC1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	TLCEL
TLC2	TLC2SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	TLCEL
TLC2 Field Duplicate	TLC2SEDFD	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	TLCEL
TLC3	TLC3SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	TLCEL
TLV1	TLV1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	TLVEL
TLV2	TLV2SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	TLVEL
TLV3	TLV3SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	TLVEL
TLV4	TLV4SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	TLVEL
TLV5	TLV5SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	TLVEL
Brewerton, Eastern Ext.																	
BE1	BE1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	BEEL
BE2	BE2SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	BEEL
BE3	BE3SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	BEEL
BE4	BE4SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	BEEL
BEV1	BEV1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	BEVEL
BEV2	BEV2SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	BEVEL
BEV3	BEV3SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	BEVEL
BEV4	BEV4SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	BEVEL
BEV5	BEV5SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	BEVEL
BEV6	BEV6SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	BEVEL
Brewerton																	
BR1	BR1SED	X	X			X	X	X	X	X	X	X	X	X	X	X	BR/BRAEL
BR1 Blind split	BLIND SPLIT 1A	(c)	(c)	X (e)		(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	
BR2	BR2SED	X	X			X	X	X	X	X	X	X	X	X	X	X	BR/BRAEL
BR2 Blind split	BR2SEDBS *	(c)	(c)	X (e)		(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	
BR3	BR3SED	X	X		X	X	X	X	X	X	X	X	X	X	X	X	BR/BRAEL
BR3 Blind split	BLIND SPLIT 2A	(c)	(c)	X (e)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	
BR4	BR4SED	X	X			X	X	X	X	X	X	X	X	X	X	X	BR/BRAEL
BR4 Blind split	BR4SEDBS *	(c)	(c)	X (e)		(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	
Brewerton Angle																	
BRA1	BRA1SED	X	X			X	X	X	X	X	X	X	X	X	X	X	BR/BRAEL

TABLE 2-8. CHEMICAL ANALYSES FOR CHESAPEAKE BAY AND BALTIMORE HARBOR REFERENCE WATER AND ELUTRIATE WATER SAMPLES

SAMPLING LOCATION	SAMPLE ID	PPL Org(a)	PPL VOAs (b)	PPL Metals & Al, Fe, Mn(c)	Total Sulfide(d)	Total Phosphorus(e)	TKN(e)	NO2 & NO3(e)	Ammonia(e)	TOC(e)	BOD(f)	COD(e)	Cyanide(g)
WATER CHEMISTRY													
Poplar Island													
PI1	PI1WAT	X		X	X	X	X	X	X	X	X	X	X
PI1 Field Duplicate	PI1WATFD	X		X	X	X	X	X	X	X	X	X	X
PI5	PI5WAT	X		X	X	X	X	X	X	X	X	X	X
Deep Trough													
DT1	DT1WAT	X		X	X	X	X	X	X	X	X	X	X
Kent Island Deep													
KI3	KI3WAT	X		X	X	X	X	X	X	X	X	X	X
KI3 Field Duplicate	KI3WATFD	X		X	X	X	X	X	X	X	X	X	X
Pooles Island													
POL1	POL1WAT	X		X	X	X	X	X	X	X	X	X	X
TRIP BLANKS													
Day1	TB102695		X										
Day 2	TB102795		X										
Day 3	TB103095		X										
Day 4	TB103195		X										
Day 5	TB110695		X										
Day 6	TB111095		X										
Day 7	TB111395		X										
Day 8	TB111795		X										
Day 9	TB111895		X										
Day 10	TB112895		X										
Day 11	TB112995		X										

DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, U.S. ARMY CORPS OF ENGINEERS
P.O. BOX 1715
BALTIMORE, MD 21203-1715
March 25, 1996

REPLY TO
ATTENTION OF
Operations Division

RECEIVED
MAR 29 1996
HARBOR DEVELOPMENT

Mr. Frank Hamons
Manager, Harbor Development
Maryland Port Administration
The Maritime Center II
2310 Broening Highway
Baltimore, Maryland 21224-6621

Dear Mr. Hamons:

I am writing to follow-up on my February 21, 1996, letter regarding the proposed Fiscal Year 1996 - 1997 maintenance dredging of the Baltimore Harbor & Channels, 42 and 50-Foot Federal navigation projects.

Enclosed for your information is the *Draft Data Report - FY 1995 Sediment Sampling and Chemical Analysis for Baltimore Harbor and Chesapeake Bay, Maryland, February 1996*. Since the report is still in draft form, any comments which are received before April 10, 1996, will be addressed in the final report.

Please call me at (410) 962-5657 if you have any questions regarding this information.

Sincerely,

Jeffrey A. McKee
Project Manager
Operations Division

Enclosures

DRAFT DATA REPORT

FY 1995 SEDIMENT SAMPLING AND CHEMICAL ANALYSIS FOR BALTIMORE HARBOR AND CHESAPEAKE BAY, MARYLAND

Volume I: Data Report and Appendices A and B

Prepared for

Department of the Army
Baltimore District
U.S. Army Corps of Engineers
10 South Howard Street
10th Floor HTRW Branch
Baltimore, Maryland 21201

Prepared by

EA Engineering, Science, and Technology
11019 McCormick Road
Hunt Valley, Maryland 21031

February 1996

60787.26

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1. INTRODUCTION

1.1 BACKGROUND

Section 404 of the Federal Water Pollution Control Act of 1972 (FWPCA), Public Law 92-500, as amended by the Clean Water Act of 1977 (CWA), Public Law 95-217, requires the Environmental Protection Agency (EPA), in conjunction with the U.S. Army Corps of Engineers (USACE), to promulgate guidelines for the discharge of dredged or fill material to ensure that the proposed discharge will not result in unacceptable adverse impacts to U.S. waters. The Draft Evaluation of Dredged Material Proposed for Discharge in Inland and Near Coastal Waters - Test Manual (EPA 1994), commonly referred to as the Inland Testing Manual (ITM), establishes procedures applicable to the potential contaminant-related environmental impacts associated with the discharge of dredged material in inland waters, near coastal waters, and surrounding environs. The technical guidance in the ITM is consistent with the Guidelines [CWA Section 404 (b)(1)]. Results obtained from dredge material testing are used within the context of regulatory requirements to facilitate decision-making with regard to management of the dredged material.

1.2 SCOPE OF THIS PROJECT

The Baltimore District of the USACE required characterization of chemical concentrations in sediment proposed for dredging in FY96 and FY97 consistent with the Guidelines and technical guidance of the ITM. Approach channels considered for maintenance dredging and/or widening or realignment include the Craighill Entrance Channel, the Craighill Channel, the Craighill Angle, the Craighill Upper Range, the Cutoff Angle, the Brewerton Channel Eastern Extension, the Swan Point Channel, and the Tolchester Channel. Within Baltimore Harbor, the channels proposed for maintenance dredging include the Brewerton Channel, the Brewerton Angle, the Ft. McHenry Channel, the Curtis Bay Channel, the Ferry Bar Channel, the Northwest Branch East Channel, and the Northwest Branch West Channel. This project included analysis of sediments from the approach channels in Chesapeake Bay and the shipping channels within Baltimore Harbor. In addition, sediments from the proposed dredge material placement sites were characterized. Reference sediments and waters were collected from near Poplar Island, the Kent Island Deep Site, the proposed Deep Trough Placement Site, and the Pooles Island area.

This data report presents summaries of sediment sampling/analysis. A description of sample collection procedures is included in Chapter 2. A complete description of the sampling protocols is included in the Final Sampling Plan (EA 1995a) (Appendix A). Chapter 3 outlines the QA/QC protocols used for this project. Comprehensive QA/QC guidelines and procedures are addressed more specifically in the Quality Assurance Project Plan (QAPP) (EA 1995b) (Appendix B). Summaries of volatile, semivolatile, PCB, pesticide, metal, general chemistry, grain size, percent moisture, and Atterberg limit analyses for sediments collected from within the shipping channels and from the proposed disposal areas in Chesapeake Bay are included in Chapter 4 (section 4.1).

Chapter 4 also includes summaries of volatile, semivolatile, PCB, pesticide, metal, and general chemistry analyses for reference site water and for elutriate water prepared from sediment and water collected within each sampling reach (section 4.2). Results of QA/QC sample analyses will be presented in a Chapter 5 addendum. Summaries of Laboratory Reports for all analyses, Chain-of-Custody forms, and Field Data Sheets are included in Appendices C, D, E, F, and G.

2. SAMPLE COLLECTION

2.1 SAMPLING LOCATIONS

A total of sixty-nine stations (in 20 sampling reaches) were sampled during the period of October 26 to November 29, 1996 : 47 stations outside of Baltimore Harbor and 22 stations inside Baltimore Harbor. Because chemical concentration gradients were expected in Chesapeake Bay sediments, sampling began with the stations anticipated to contain the lowest chemical concentrations. Samples were collected first from the most southerly stations (Mid-Chesapeake Bay) and easterly stations, and sampling proceeded sequentially to the north and west from four reference locations: (Poplar Island, Kent Island Deep, Deep Trough, and Pooles Island). The last samples were recovered in the Inner Harbor area of Baltimore City. Station locations for each sampling reach are illustrated in Figures 2-1 through 2-13. Latitude/longitude of each station, collection technique, and station depths are presented in Tables 2-1 and 2-2. Sampling locations were determined in the field using a Magellan® GPS with a differential beacon receiver. All field data sheets are included in Appendix G.

2.2 SAMPLING EQUIPMENT AND PROCEDURES

Detailed sampling procedures are included in the Final Sampling Plan (EA 1995a) (Appendix A).

2.2.1 Sediment/Elutriate Sediment

Surface sediments were collected at reference sites and channel reaches (58 stations) using a Kahlsico® stainless steel Van Veen sampler (40 liter capacity). One grab sample was collected from each station. Samples for volatiles analysis were transferred directly from the grab sampler to sample containers, and headspace was eliminated from the volatiles sample containers by completely filling the container to the rim prior to capping. After the volatiles samples were removed, approximately one gallon of sediment was homogenized with a pre-cleaned stainless steel spoon in a pre-cleaned stainless steel mixing bowl. The homogenized sample was transferred to sample containers using a stainless steel spoon.

Gravity coring took place at 11 stations within the two reaches where undisturbed sediments may be dredged (Brewerton Eastern Extension and Tolchester). A Benthos® Model 2171, 8ft. Gravity Corer with polycarbonate core liners (2 ⅞ inch diameter) was deployed to collect cores of consolidated material. Up to three cores were collected at each station in order to obtain the volume of sediment required for chemical and elutriate analyses. For each core, the unconsolidated surface layer was measured and discarded (approximately the top 2-18 inches of sediment), and the remaining consolidated material from each core was measured with a measuring tape and recorded to the nearest inch. The material from each core was then combined and homogenized in a pre-cleaned stainless steel bowl. All samples were transferred to holding containers using a pre-cleaned stainless steel spoon. The depth of bottom sediment sampled by each core is summarized in Table 2-3.

Volatiles samples were collected from the middle section of the first gravity core and transferred directly to the volatiles sample containers before homogenizing. Headspace was eliminated from volatiles sample containers by filling the container to the rim prior to capping. Sample container types, preservation techniques and holding times are presented in Table 2-4. A synopsis of analyses required at each station and the associated sample ID is presented in Table 2-5.

All sediment sampling equipment was decontaminated between samples, according to the procedures described in Section 2.3. Sampling inside of Rock Point/North Point was conducted under level D conditions. Gloves, coveralls and goggles were worn by all technicians handling samples.

Pre-selected sediment samples were used by the analytical laboratory to prepare elutriate samples that consisted of composites of sediments collected from one or two reaches. Instructions for elutriate composites and resulting sample IDs are presented in Table 2-6. Elutriate sediments were composited in the laboratory in pre-cleaned stainless steel bowls and approximately 3 L of the homogenized sample was removed and placed in the appropriate test container using a pre-cleaned stainless steel spoon.

2.2.2 Site Water/Elutriate Water

Reference water samples were collected from the proposed placement sites in the Bay: Poplar Island, Deep Trough, Kent Island, and Pooles Island (Table 2-2). These samples were analyzed for chemical constituents and were collected using dedicated (1.5 inch diameter) Teflon® bailers. Because water depth at the Deep Trough site exceeded 100 ft., a 1 liter, Teflon®-coated General Oceanics® niskin bottle was deployed by a hydraulic winch to collect water within this reach. The niskin bottle was deployed approximately 6-8 times to obtain the required sample volume. All water samples were poured directly into holding containers supplied by EA Laboratories which contained appropriate preservatives. To avoid loss of volatile chemicals, volatiles sample containers were filled first.

Elutriate water samples were collected from each reach using a peristaltic pump with polyethylene tubing (Table 2-2). Within each reach, four gallons of site water were collected from approximately 5 ft. above the bottom. If water depth was less than 5 ft, a mid-depth sample was collected. At each station, the tubing was flushed with the equivalent of 10 times the collection tubing volume prior to sample collection. Water samples were dispensed directly into appropriate holding containers. Sample container types, preservation techniques and holding times for water samples are presented in Table 2-7. A synopsis of analyses required for each station and the associated sample ID number are presented in Table 2-8.

2.3 EQUIPMENT DECONTAMINATION

To minimize cross-contamination, all non-dedicated sediment sampling equipment (stainless steel Van Veen, mixing bowls, and spoons) was rinsed with site water, scrubbed with a bristle brush, rinsed a second time with site water, and rinsed with deionized water between samples. For gravity coring, a dedicated polycarbonate liner was used at each station, and the exterior of the corer was scrubbed with a bristle brush and rinsed with site water to remove excess sediment. All dedicated sampling equipment was protected from contamination with covering (e.g. plastic wrapped, boxed) until employed for sampling.

2.4 FIELD QC SAMPLES

2.4.1 Trip Blanks

Trip blanks are samples that originate as analyte-free water placed in volatile organic vials (preserved with HCl) in the laboratory and analyzed for volatile organic compounds. Trip blanks (also called transport blanks) were analyzed to evaluate the effect of ambient site conditions and sample shipment on sample integrity and to ensure proper sample container preparation and handling techniques. For this program, trip blanks were analyzed for volatile organic compounds only. A total of eleven trip blanks were analyzed; one trip blank was analyzed per group of samples per day. All volatile samples (both water and sediment) collected on each sampling day were stored in the same cooler as the trip blank. Results of trip blanks will be presented in Chapter 5 and Appendix E.

2.4.2 Field Duplicates

Field duplicates are samples collected simultaneously from the same sampling location and are used as measures of matrix homogeneity and sampling precision. Two field duplicate samples were collected for each matrix (sediment and water). Duplicate samples were collected as individual, co-located samples. These samples were homogenized separately, or placed directly into sample containers in the case of volatiles samples. Stations where field duplicates were collected are listed in Table 2-5 (sediment) and Table 2-8 (water). Results are presented in Chapter 4 summary tables with the associated reach and sample ID.

2.4.3 Field Blind Duplicate Samples

A blind duplicate sample is a sample collected simultaneously from the same sampling location and is re-labeled as a unique sample to obscure its identity/origin. At five locations, EA collected a duplicate set of samples. Two of the five samples were blind selected, relabeled to obscure their identity, and delivered to EA Laboratories. These results were tracked as separate, unique samples. The remaining three duplicate samples were delivered to EA Laboratories and retained in storage. Stations where sediment blind duplicate samples were collected are listed in Table 2.5. (Note: Laboratory results label these samples as blind splits and these samples are referenced as blind splits in Chapter 4 summary tables).

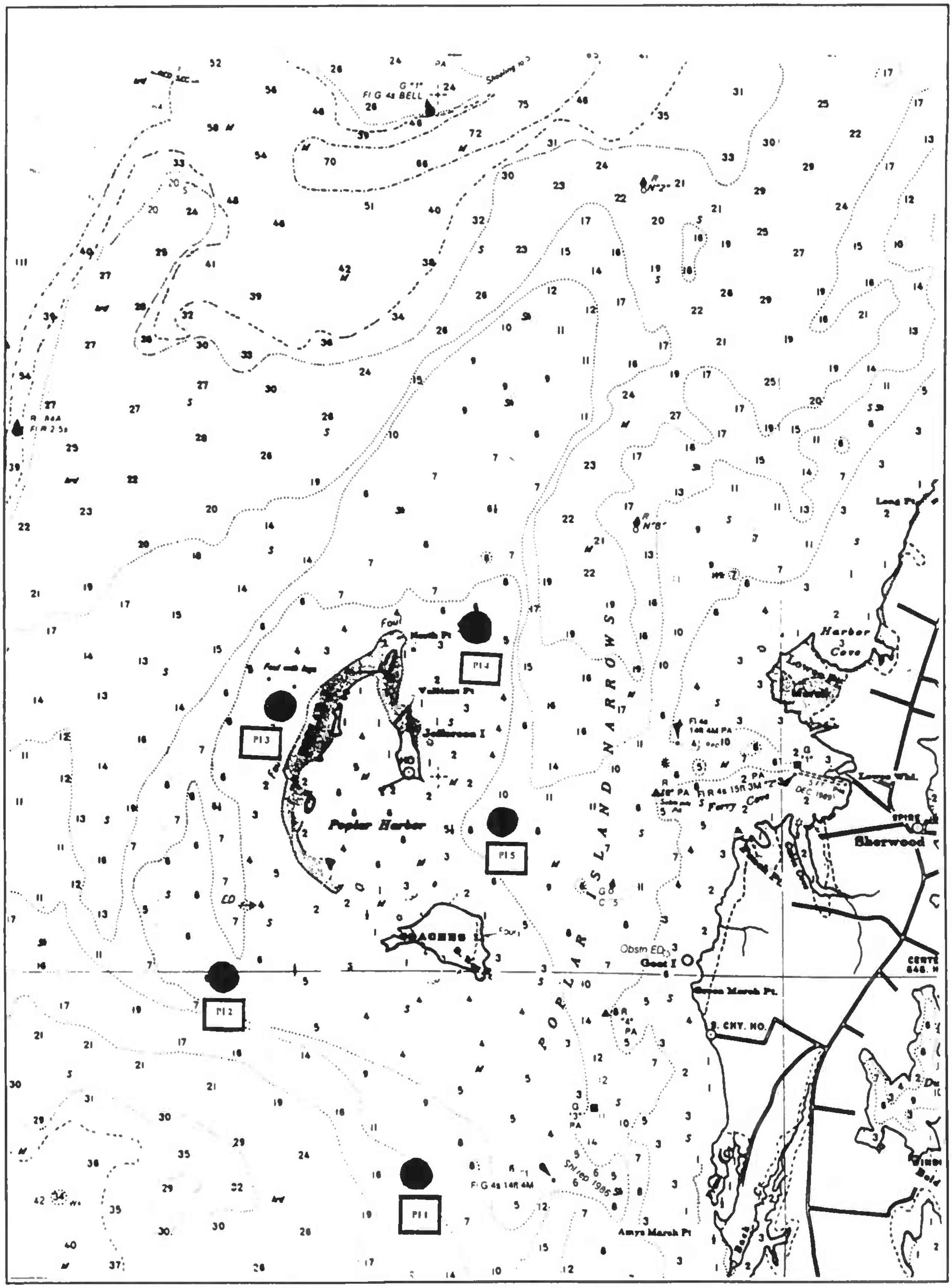

Figure 2-1. Sampling stations in the Poplar Island reach.

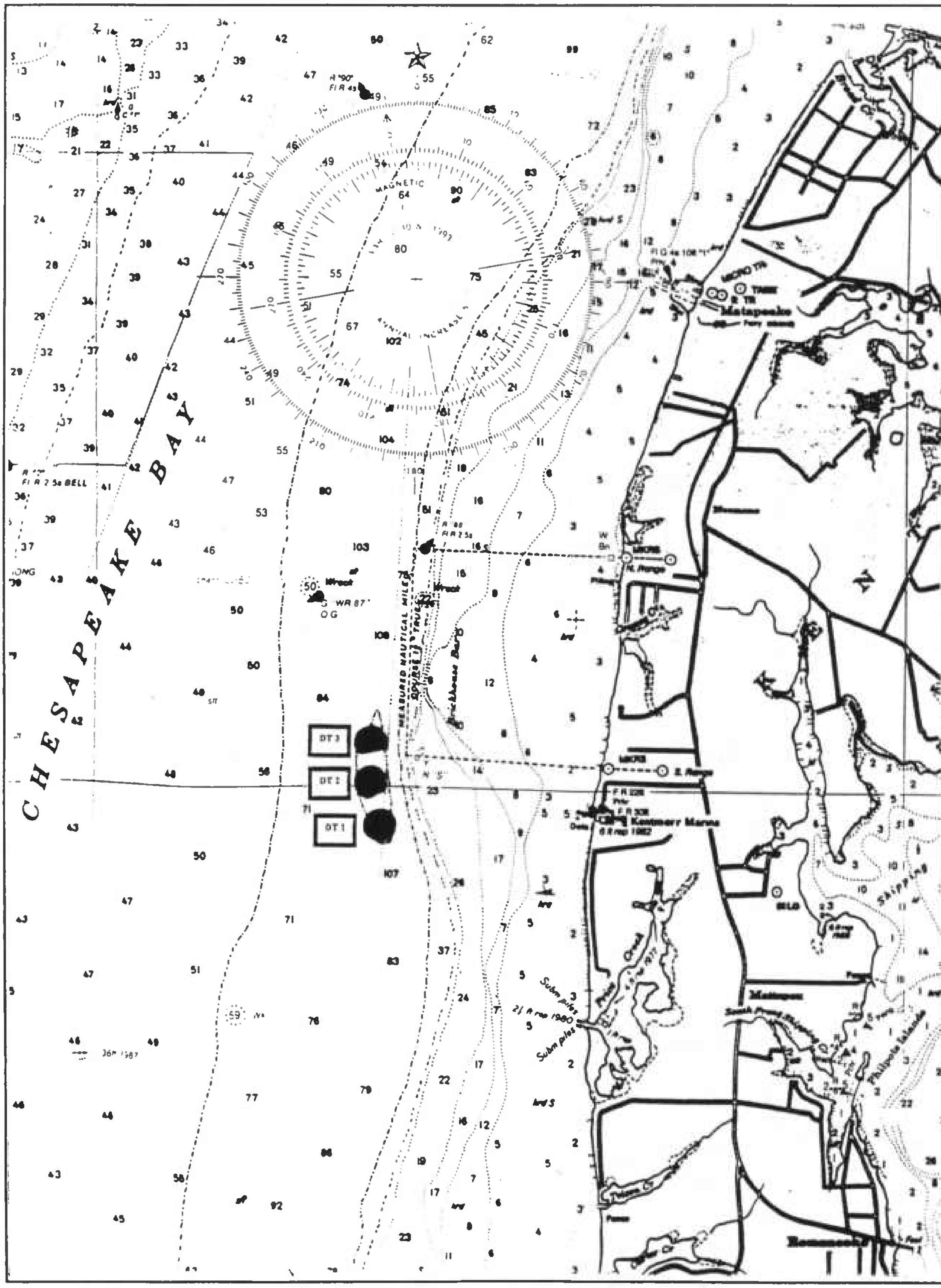

Figure 2-2. Sampling stations in the Deep Trough reach.

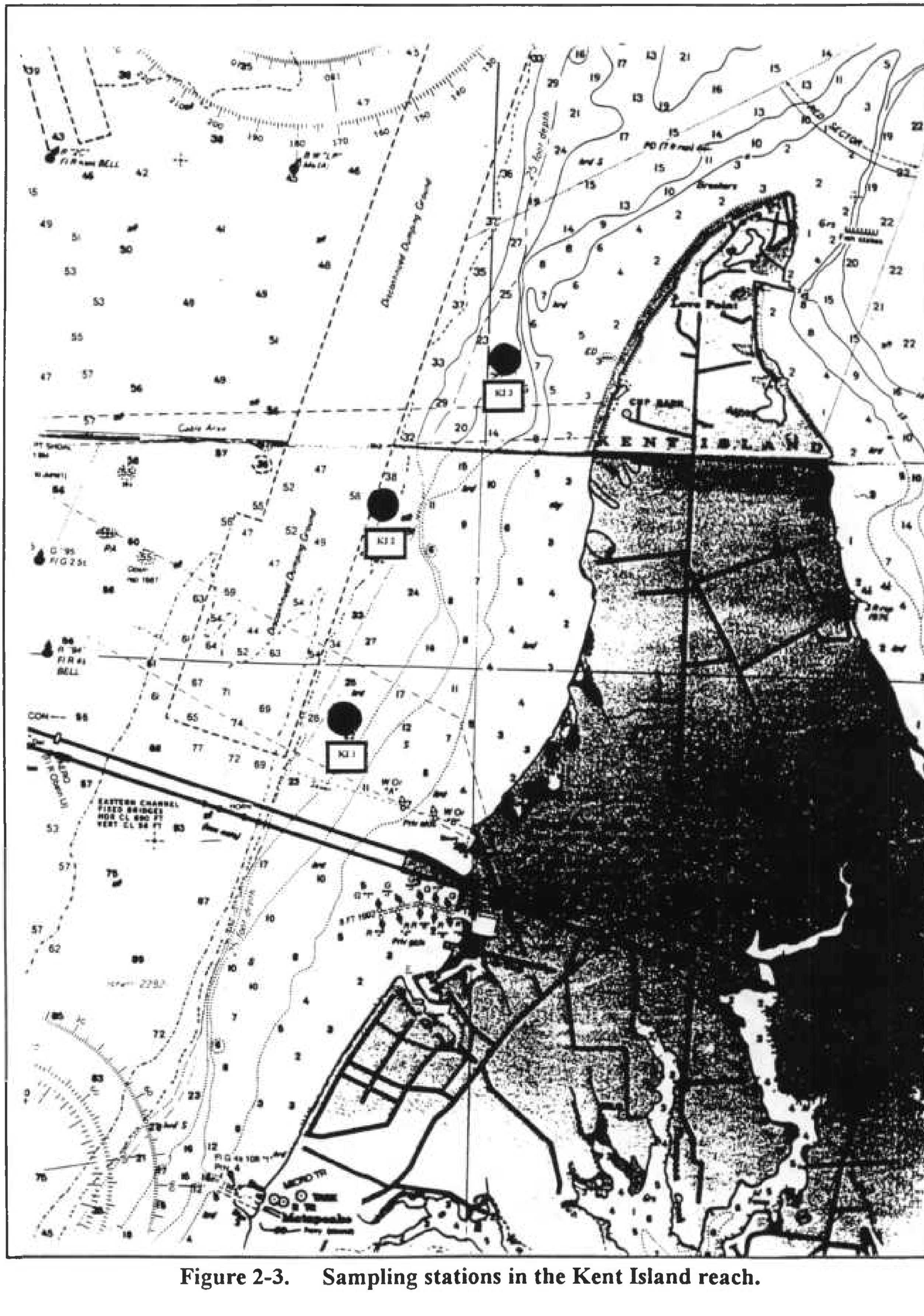

Figure 2-3. Sampling stations in the Kent Island reach.

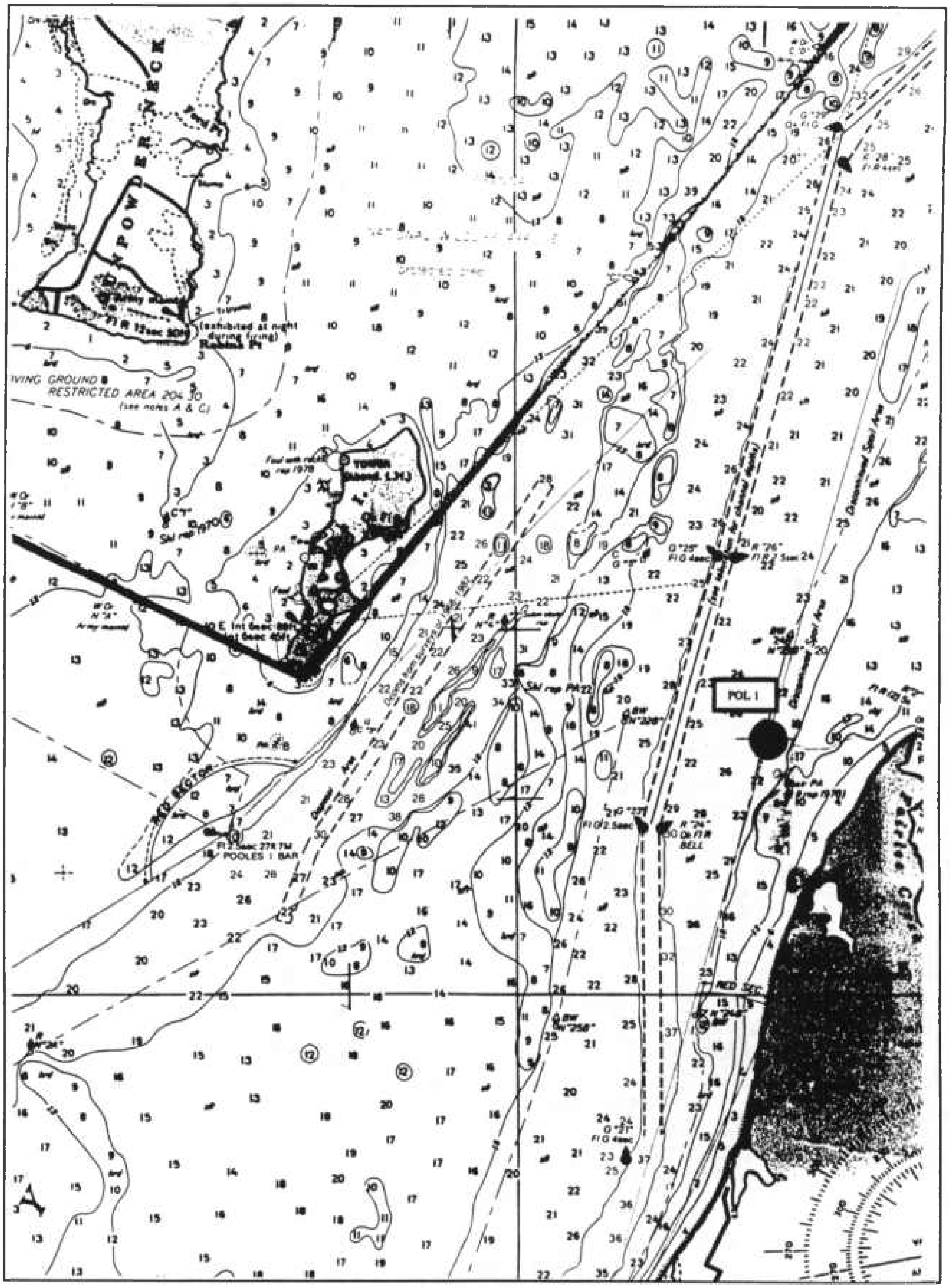

Figure 2-4. Sampling stations near Pooles Island.

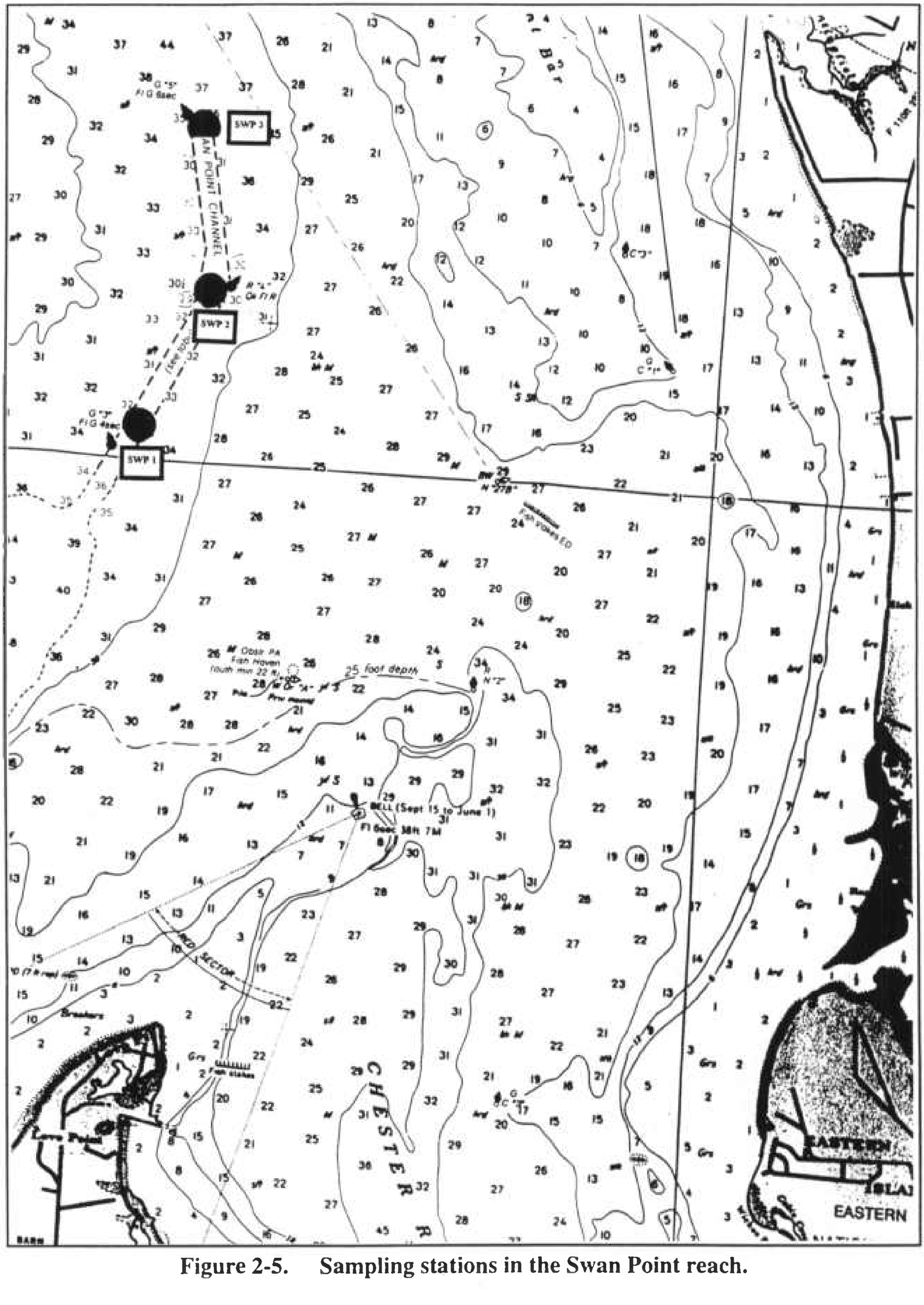

Figure 2-5. Sampling stations in the Swan Point reach.

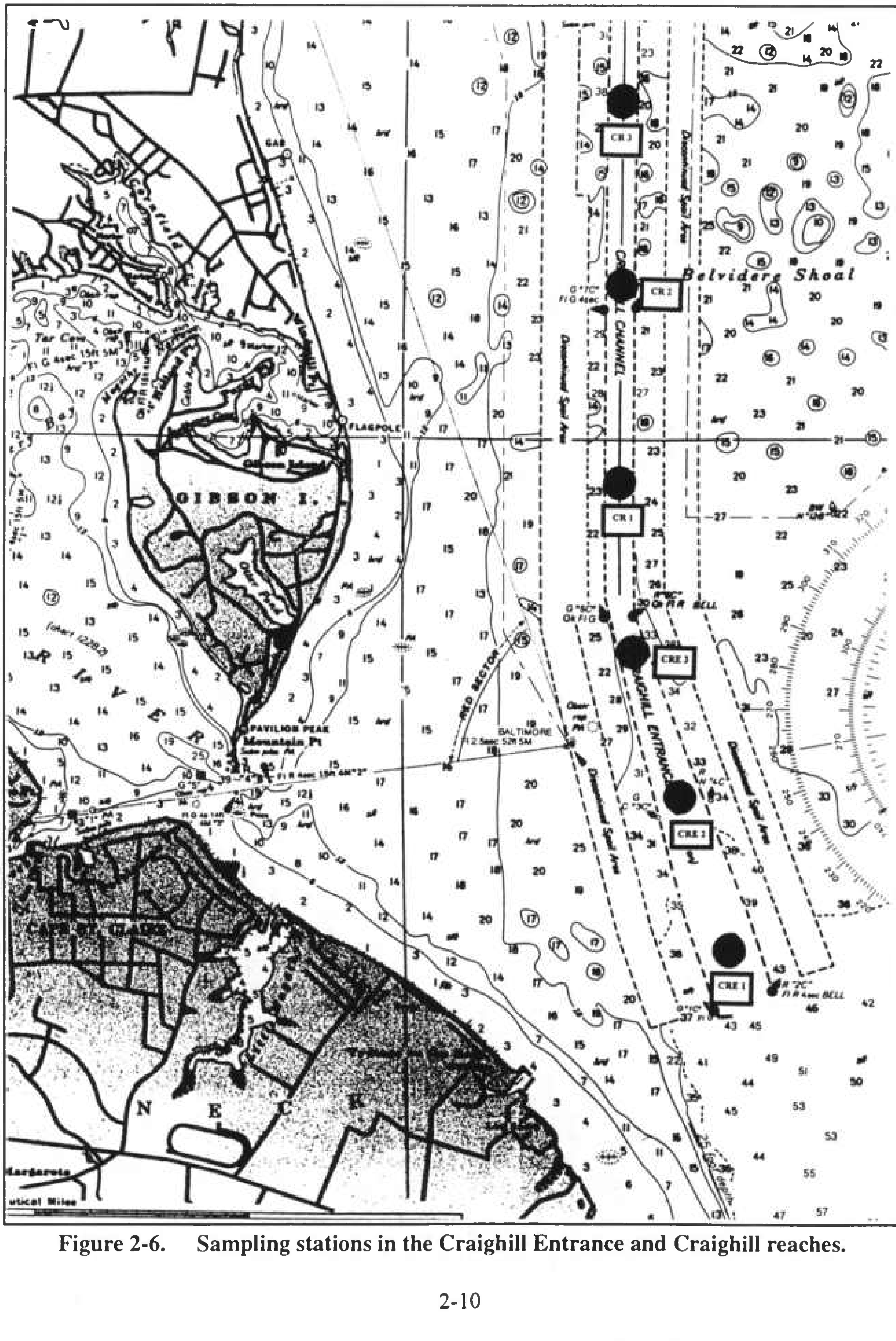

Figure 2-6. Sampling stations in the Craighill Entrance and Craighill reaches.

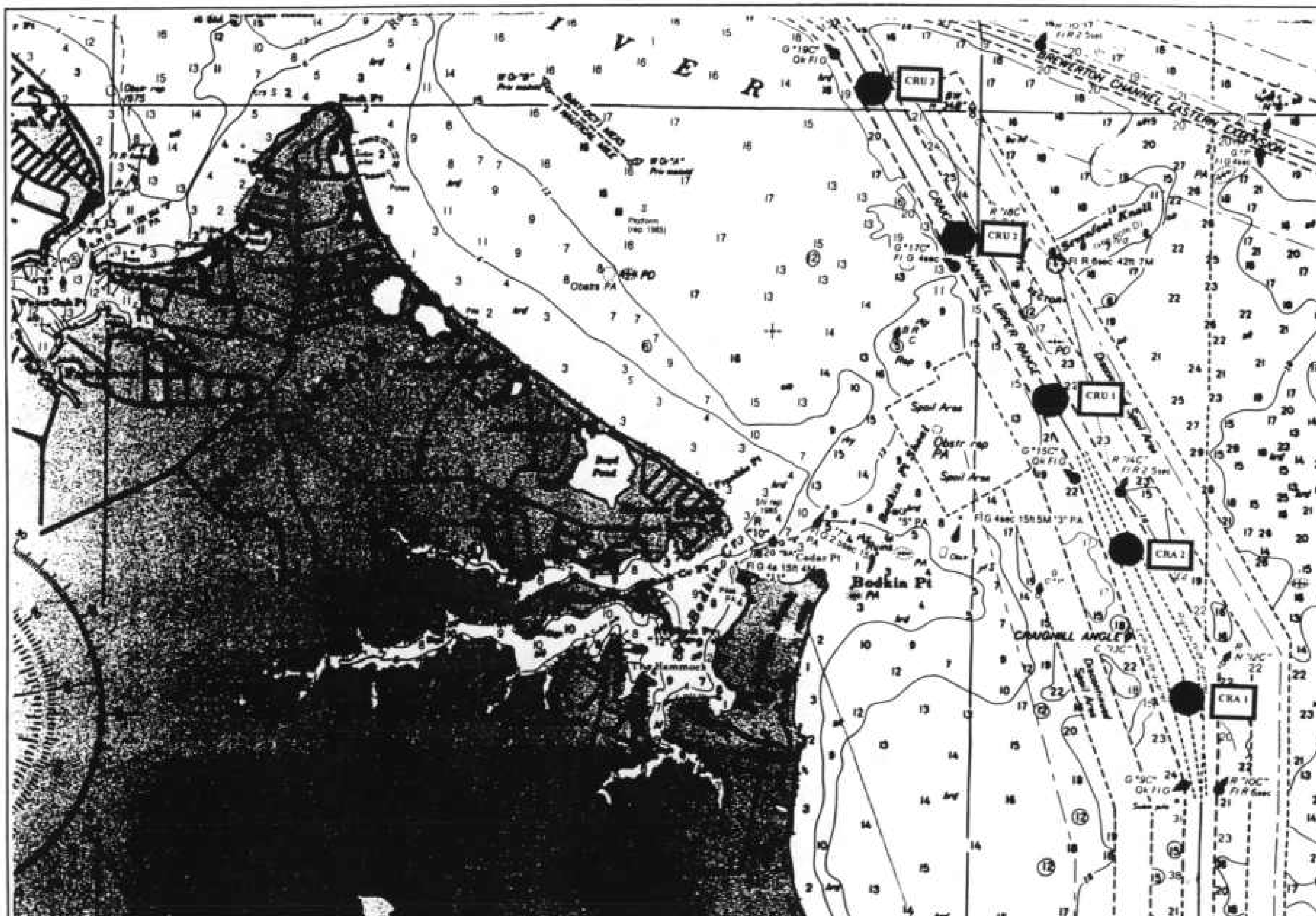

Figure 2-7. Sampling stations in the Craighill Angle and Craighill Upper Range reaches.

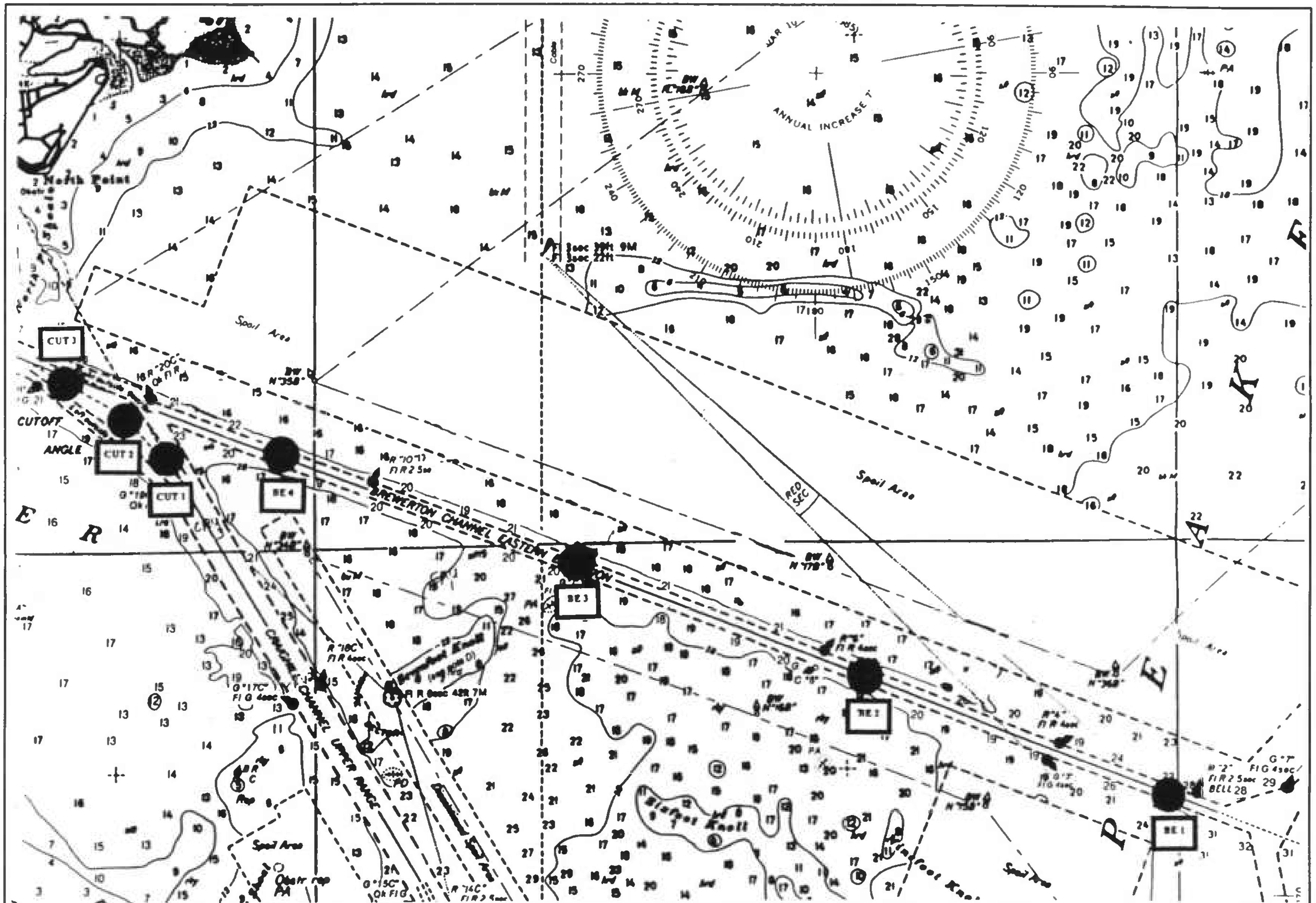

Figure 2-8. Van Veen sampling stations in the Cutoff Angle and Brewerton Eastern Extension reaches.

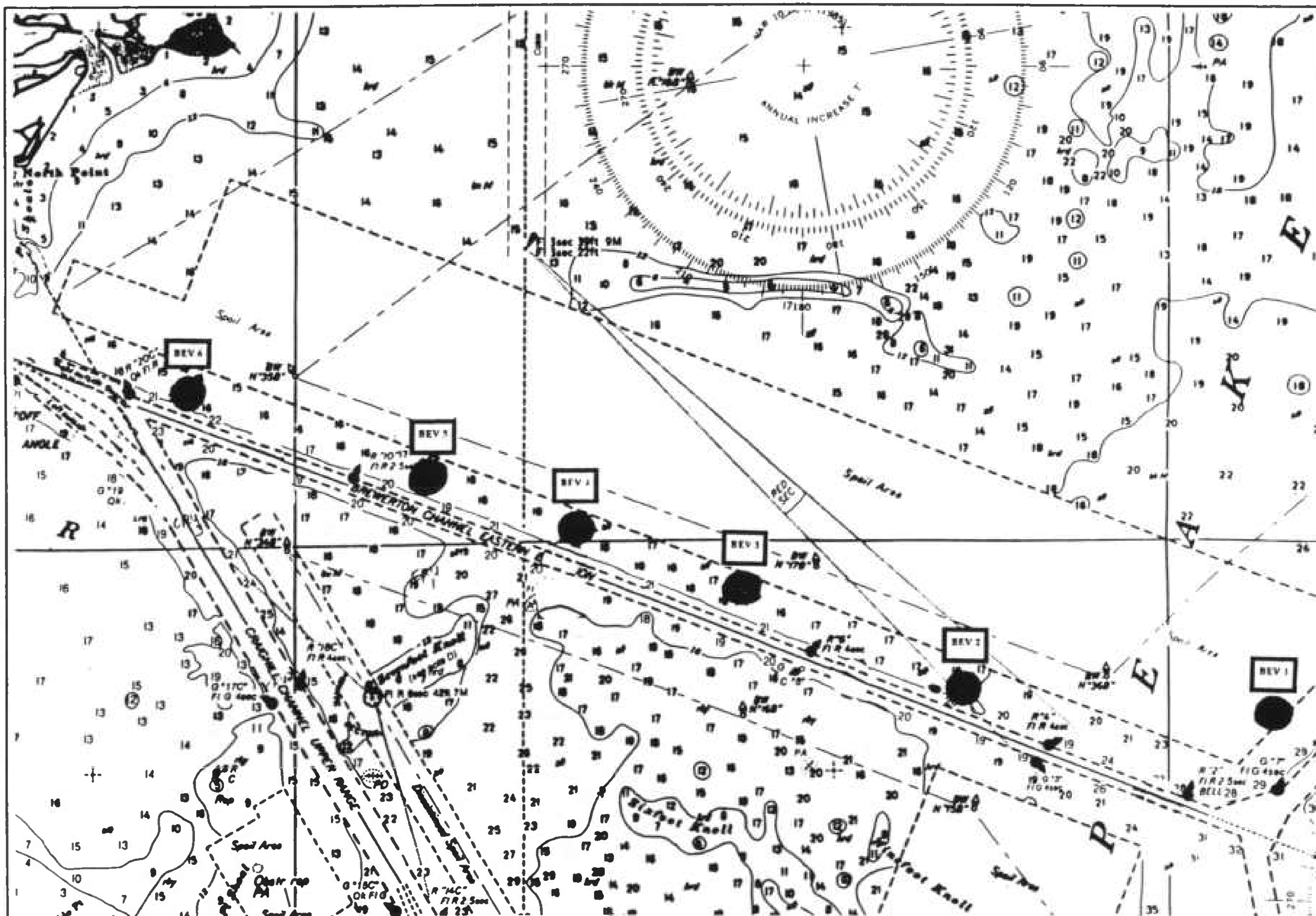

Figure 2-9. Gravity core sampling stations in the Brewerton Eastern Extension.

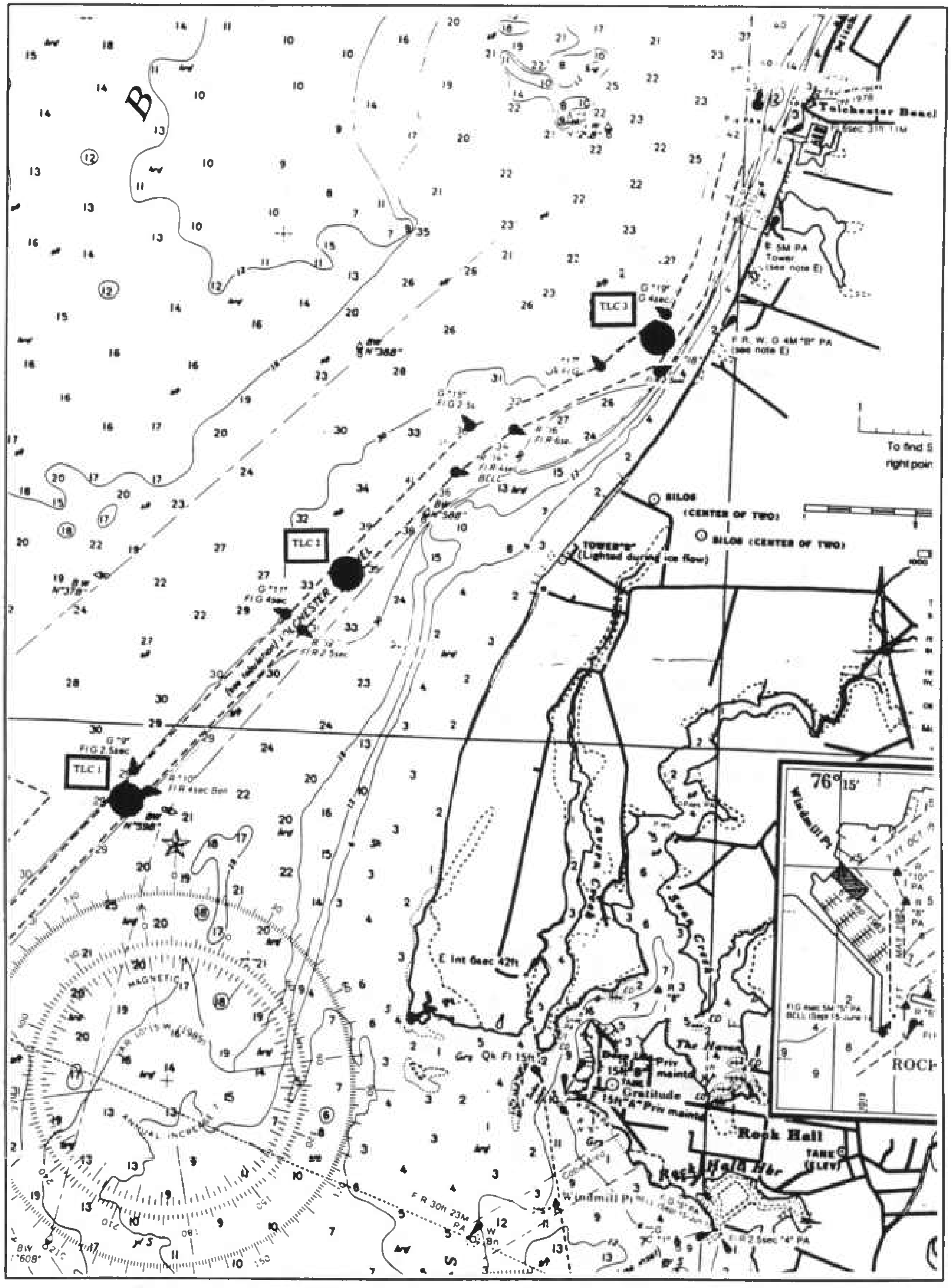

Figure 2-10. Van Veen sampling stations in the Tolchester reach.

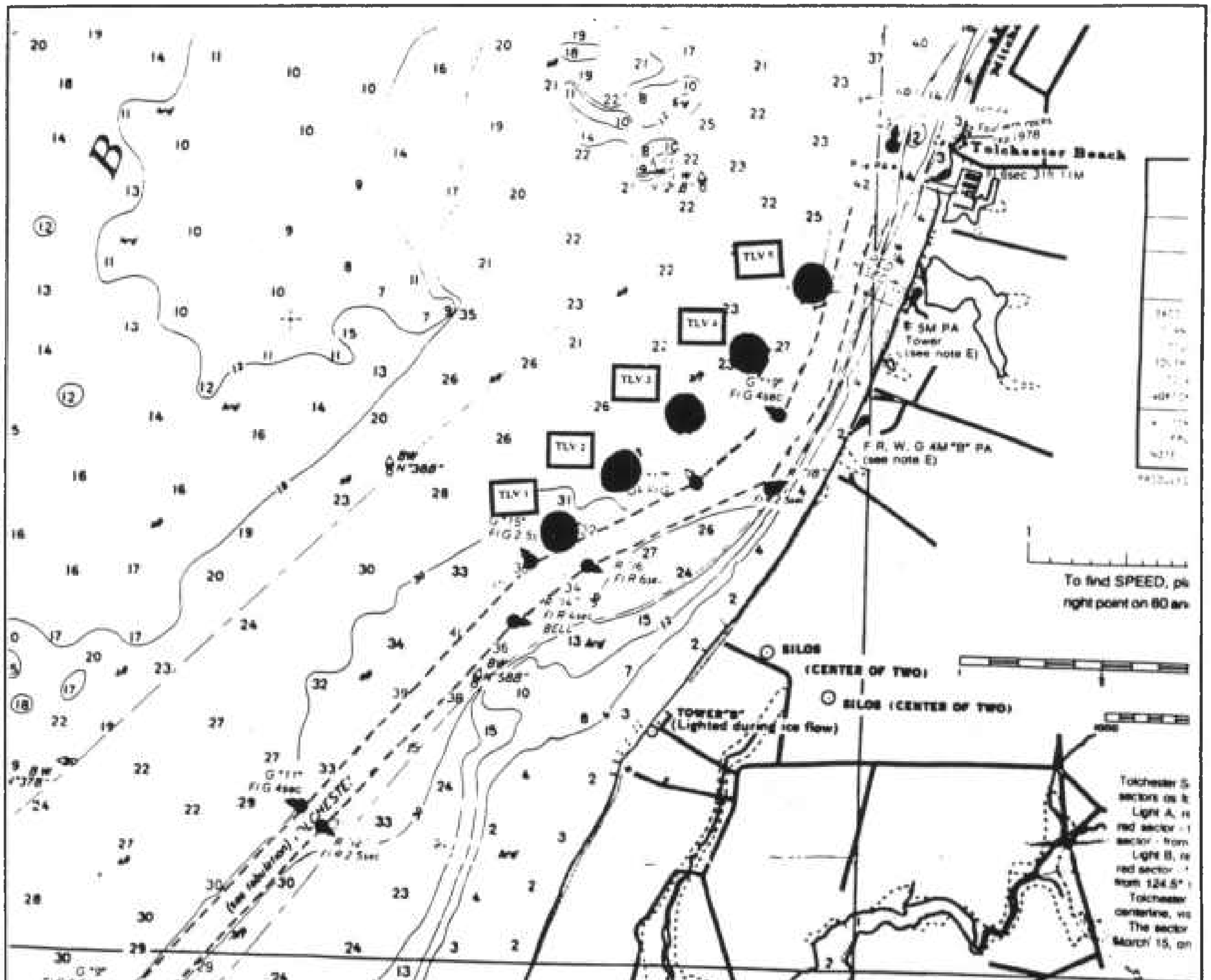

Figure 2-11. Gravity core sampling stations in Tolchester reach.

Figure 2-12. Sampling stations in the Brewerton and Brewerton Angle reaches.

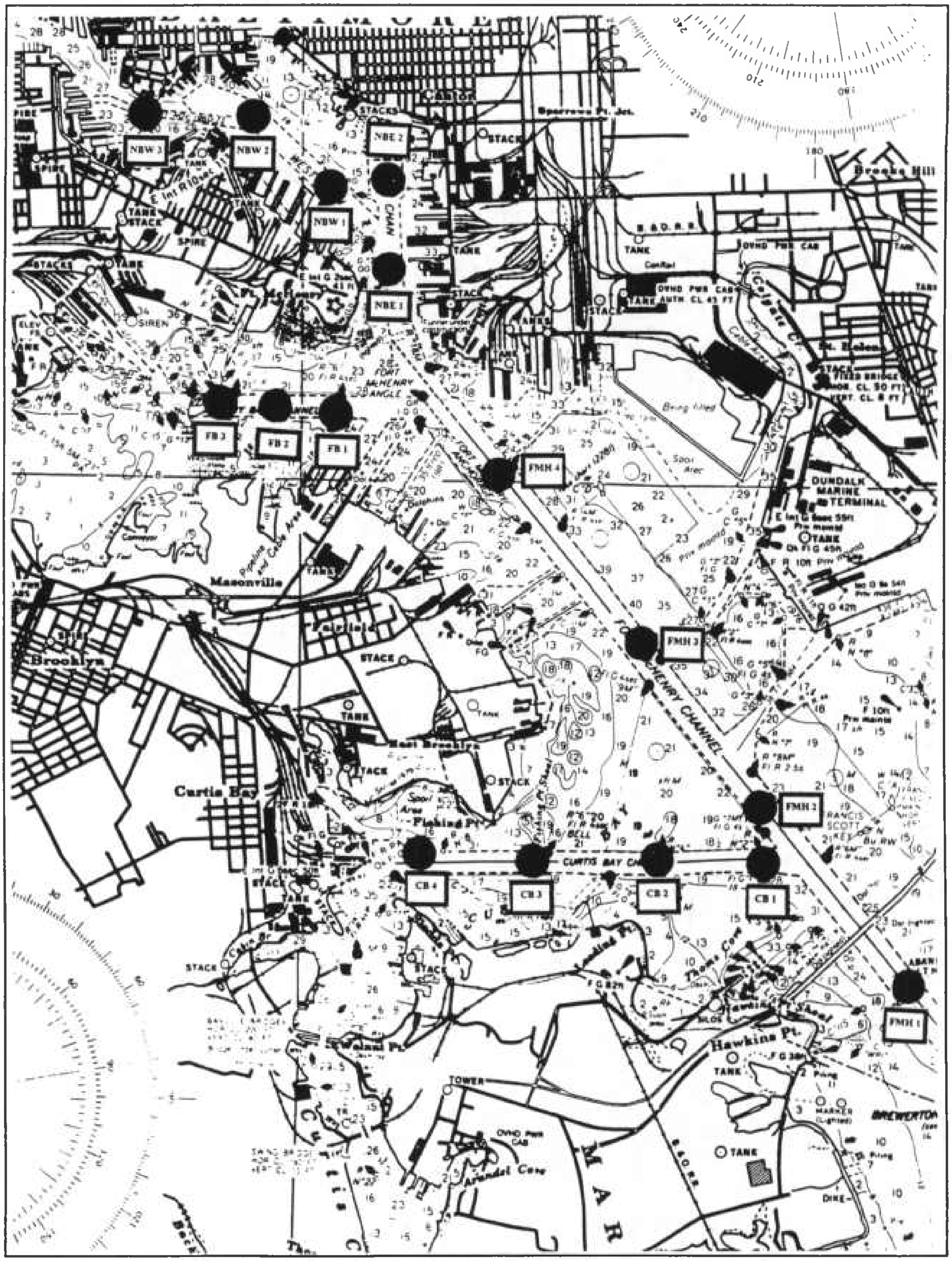

Figure 2-13. Sampling stations in the Curtis Bay, Ft. McHenry, Ferry Bar, Northwest Branch East and Northwest Branch West reaches.

TABLE 2-1 SEDIMENT SAMPLING LOCATIONS

Sampling Reach	Station	Latitude	Longitude	Sampling Method	Approximate Station Depth (ft)
Poplar Island	PI 1	38° 44' 05" N	76° 22' 16" W	Van Veen	11
	PI 2	38° 44' 59" N	76° 23' 29" W	Van Veen	7
	PI 3	38° 46' 14" N	76° 23' 07" W	Van Veen	7
	PI 4	38° 46' 40" N	76° 21' 55" W	Van Veen	7
	PI 5	38° 45' 43" N	76° 21' 41" W	Van Veen	9
Deep Trough	DT 1	38° 54' 48" N	76° 23' 13" W	Van Veen	97
	DT 2	38° 54' 59" N	76° 23' 10" W	Van Veen	105
	DT 3	38° 55' 12" N	76° 23' 18" W	Van Veen	100
Kent Island Deep	KI 1	38° 59' 42" N	76° 20' 48" W	Van Veen	20
	KI 2	39° 00' 51" N	76° 20' 26" W	Van Veen	30
	KI 3	39° 01' 31" N	76° 19' 54" W	Van Veen	17
Pooles Island	POL 1	39° 16' 11" N	76° 13' 34" W	Van Veen	26
Swan Point	SWP 1	39° 05' 11" N	76° 18' 27" W	Van Veen	34
	SWP 2	39° 05' 47" N	76° 18' 04" W	Van Veen	35
	SWP 3	39° 06' 32" N	76° 18' 11" W	Van Veen	36
Craighill Entrance	CRE 1	39° 02' 34" N	76° 23' 03" W	Van Veen	51
	CRE 2	39° 03' 18" N	76° 23' 20" W	Van Veen	57
	CRE 3	39° 04' 00" N	76° 23' 36" W	Van Veen	58
Craighill	CR 1	39° 04' 48" N	76° 23' 42" W	Van Veen	52
	CR 2	39° 05' 44" N	76° 23' 41" W	Van Veen	53
	CR 3	39° 06' 35" N	76° 23' 41" W	Van Veen	57
Craighill Angle	CRA 1	39° 07' 24" N	76° 23' 48" W	Van Veen	54
	CRA 2	39° 08' 05" N	76° 24' 09" W	Van Veen	54

TABLE 2-1 (Continued)

Sampling Reach	Station	Latitude	Longitude	Sampling Method	Approximate Station Depth (ft)
Craighill Upper Range	CRU 1	39° 08' 43" N	76° 24' 36" W	Van Veen	52
	CRU 2	39° 09' 23" N	76° 25' 03" W	Van Veen	53
	CRU 3	39° 10' 07" N	76° 25' 36" W	Van Veen	55
Cutoff Angle	CUT 1	39° 10' 26" N	76° 25' 53" W	Van Veen	54
	CUT 2	39° 10' 38" N	76° 26' 09" W	Van Veen	52
	CUT 3	39° 10' 45" N	76° 26' 27" W	Van Veen	52
Tolchester (Van Veen)	TLC 1	39° 09' 39" N	76° 18' 24" W	Van Veen	35
	TLC 2	39° 10' 44" N	76° 17' 12" W	Van Veen	38
	TLC 3	39° 11' 53" N	76° 15' 29" W	Van Veen	40
Tolchester (Gravity Core)	TLV 1	39° 11' 32" N	76° 16' 23" W	Gravity Core	33
	TLV 2	39° 11' 46" N	76° 16' 07" W	Gravity Core	26
	TLV 3	39° 11' 59" N	76° 15' 51" W	Gravity Core	24
	TLV 4	39° 12' 13" N	76° 15' 33" W	Gravity Core	22
	TLV 5	39° 12' 26" N	76° 15' 16" W	Gravity Core	24
Brewerton, Eastern Ext. (Van Veen)	BE 1	39° 08' 50" N	76° 20' 01" W	Van Veen	42
	BE 2	39° 09' 23" N	76° 21' 47" W	Van Veen	41
	BE 3	39° 09' 54" N	76° 23' 27" W	Van Veen	41
	BE 4	39° 10' 24" N	76° 25' 10" W	Van Veen	39
Brewerton, Eastern Ext. (Gravity Core)	BEV 1	39° 08' 57" N	76° 19' 47" W	Gravity Core	28
	BEV 2	39° 09' 21" N	76° 21' 12" W	Gravity Core	20
	BEV 3	39° 09' 50" N	76° 22' 35" W	Gravity Core	20
	BEV 4	39° 10' 03" N	76° 23' 22" W	Gravity Core	20
	BEV 5	39° 10' 18" N	76° 24' 15" W	Gravity Core	19
	BEV 6	39° 10' 41" N	76° 25' 37" W	Gravity Core	19

TABLE 2-1 (Continued)

Sampling Reach	Station	Latitude	Longitude	Sampling Method	Approximate Station Depth (ft)
Brewerton	BR 1	39° 11' 04" N	76° 27' 22" W	Van Veen	53
	BR 2	39° 11' 19" N	76° 28' 12" W	Van Veen	53
	BR 3	39° 11' 35" N	76° 29' 06" W	Van Veen	53
	BR 4	39° 11' 52" N	76° 30' 01" W	Van Veen	53
Brewerton Angle	BRA 1	39° 12' 03" N	76° 30' 31" W	Van Veen	53
	BRA 2	39° 12' 15" N	76° 30' 52" W	Van Veen	53
Curtis Bay	CB 1	39° 13' 18" N	76° 32' 20" W	Van Veen	50
	CB 2	39° 13' 21" N	76° 32' 59" W	Van Veen	50
	CB 3	39° 13' 17" N	76° 33' 36" W	Van Veen	50
	CB 4	39° 13' 18" N	76° 34' 18" W	Van Veen	50
Ft. McHenry	FMH 1	39° 12' 47" N	76° 31' 31" W	Van Veen	50
	FMH 2	39° 13' 32" N	76° 32' 20" W	Van Veen	51
	FMH 3	39° 14' 16" N	76° 33' 02" W	Van Veen	50
	FMH 4	39° 15' 03" N	76° 33' 50" W	Van Veen	50
Ferry Bar	FB 1	39° 15' 18" N	76° 34' 47" W	Van Veen	35
	FB 2	39° 15' 21" N	76° 35' 06" W	Van Veen	40
	FB 3	39° 15' 20" N	76° 35' 28" W	Van Veen	42
Northwest Branch East	NBE 1	39° 15' 57" N	76° 34' 30" W	Van Veen	51
	NBE 2	39° 16' 21" N	76° 34' 31" W	Van Veen	50
Northwest Branch West	NBW 1	39° 16' 19" N	76° 34' 50" W	Van Veen	40
	NBW 2	39° 16' 38" N	76° 35' 17" W	Van Veen	38
	NBW 3	39° 16' 38" N	76° 35' 55" W	Van Veen	26

TABLE 2-2 REFERENCE WATER AND ELUTRIATE PREPARATION WATER SAMPLING LOCATIONS

Sampling Reach	Latitude	Longitude	Sampling Method	Approximate Sample Depth (ft)
Reference Locations				
Poplar Island	38° 44' 05" N	76° 22' 16" W	Teflon® bailer	6
	38° 45' 43" N	76° 21' 41" W	Teflon® bailer	4
Deep Trough	38° 54' 48" N	76° 23' 13" W	Niskin	9
Kent Island Deep	39° 01' 31" N	76° 19' 54" W	Teflon® bailer	12
Pooles Island	39° 16' 11" N	76° 13' 34" W	Teflon® bailer	20
Elutriate Preparation Water				
Swan Point	39° 05' 47" N	76° 18' 04" W	Pump	25
Craighill Entrance/Craighill	39° 04' 27" N	76° 23' 41" W	Pump	51
Craighill Angle	39° 08' 05" N	76° 24' 09" W	Pump	48
Craighill Upper Range/ Cutoff Angle	39° 10' 26" N	76° 25' 44" W	Pump	27
Tolchester (Van Veen)	39° 10' 44" N	76° 17' 12" W	Pump	32
Tolchester (Gravity Core)	39° 11' 32" N	76° 16' 23" W	Pump	27
Brewerton East. Ext. (Van Veen)	39° 10' 24" N	76° 25' 10" W	Pump	34
Brewerton East. Ext. (Gravity Core)	39° 10' 18" N	76° 24' 15" W	Pump	15
Brewerton/Brewerton Angle	39° 11' 56" N	76° 30' 14" W	Pump	48
Curtis Bay	39° 13' 17" N	76° 33' 36" W	Pump	45
Fort McHenry	39° 12' 47" N	76° 31' 31" W	Pump	45
Ferry Bar	39° 15' 20" N	76° 35' 28" W	Pump	38
Northwest Branch East/ Northwest Branch West	39° 16' 09" N	76° 34' 33" W	Pump	38

2-3 GRAVITY CORER SAMPLING DEPTHS

Sample ID	Number of Composited Cores	Average Depth of Sediment Core (inches)	Average Depth of Unconsolidated Surface Layer (inches)
TLV1SED	1	50	2.5
TLV2SED	2	46	3.1
TLV3SED	3	40.3	2.2
TLV4SED	2	37.5	4.5
TLV5SED	2	46.5	8.5
BEV1SED	2	55.5	17.5
BEV2SED	2	47.5	8.8
BEV3SED	2	40	6.5
BEV4SED	2	45.5	8.5
BEV5SED	2	44	6.5

TABLE 2-4 REQUIRED CONTAINERS, PRESERVATION TECHNIQUE, AND HOLDING TIMES[a] FOR SEDIMENT SAMPLES

Parameter	Mass Required (g)[b]	Container[c]	Preservative	Holding Time
Inorganics				
Mercury	5	P	≤20C	30 days
Other Metals	5	P	≤20C	6 months
Cyanide	50	P,G	4C	14 days
Sulfide	10	P,G	4C	7 days
Biochemical Oxygen Demand	10	G	4C	48 hours
Chemical Oxygen Demand	50	P,G	≤20C	28 days
Nitrogen (Ammonia, Total Kjeldahl, Nitrate + Nitrite) Phosphorus	150	P,G	4C	28 days
Physical Parameters				
Total Moisture, Atterberg Limits, Grain Size	1000	P,G	≤20C	6 months
Organics				
Tributyltin	50	Solvent rinsed glass jar with Teflon-lined lid	≤20C	6 months
Total Organic Carbon	5	Heat treated glass vial with Teflon-lined lid	4C	14 days
Pesticides PCB Congeners Semivolatile Organics	400	Solvent rinsed glass jar with Teflon-lined lid	≤20C	10 days until extraction 40 days after extraction
Volatile Organics	50	Heat treated glass vial with Teflon-lined lid	≤20C	10 days

(a) From time of sample collection per *USACE/EPA. 1991. Evaluation of Dredged Material Proposed for Ocean Disposal.*
(b) 3 liters of sediment will be collected for laboratory preparation of each elutriate sample.
(c) P = plastic; G = glass. *National Oceanographic and Atmospheric Administration. July, 1993. Sampling and Analytical Methods of the National Status and Trends Program. National Benthic Surveillance and Mussel Watch Projects. 1984-1992. NOS ORCA 71. NOAA, Silver Spring, Maryland.*

TABLE 2-6 SAMPLES USED FOR PREPARATION OF ELUTRIATE SAMPLES FOR CHESAPEAKE BAY / BALTIMORE HARBOR SEDIMENT QUALITY ANALYSES

Sampling Reach	Station	Sediment Sample IDs	Sediment Aliquot to be Used for Elutriate	Elutriate Water Samples	Water Vol. to be Used for Elutriate	Sample ID for Resulting Composited Elutriate Sample
Swan Point	SWP 1	SWP1SED	666 ml	SWPEW (1 composite)	8 liters	SWPEL
	SWP 2	SWP2SED	666 ml			
	SWP 3	SWP3SED	666 ml			
Craighill Entrance	CRE 1	CRE1SED	333 ml	CRE/CREW (1 composite)	8 liters	CRE/CREL
	CRE 2	CRE2SED	333 ml			
	CRE 3	CRE3SED	333 ml			
Craighill	CR 1	CR1SED	333 ml			
	CR 2	CR2SED	333 ml			
	CR 3	CR3SED	333 ml			
Craighill Angle	CRA 1	CRA1SED	1000 ml	CRAEW (1 composite)	8 liters	CRAEL
	CRA 2	CRA2SED	1000 ml			
Craighill Upper Range	CRU 1	CRU1SED	333 ml	CRU/CUTEW (1 composite)	8 liters	CRU/CUTEL
	CRU 2	CRU2SED	333 ml			
	CRU 3	CRU3SED	333 ml			
Cutoff Angle	CUT 1	CUT1SED	333 ml			
	CUT 2	CUT2SED	333 ml			
	CUT 3	CUT3SED	333 ml			
Tolchester	TLC 1	TLC1SED	666 ml	TLCEW (1 composite)	8 liters	TLCEL
	TLC 2	TLC2SED	666 ml			
	TLC 3	TLC3SED	666 ml			
	TLV 1	TLV1SED	400 ml	TLVEW (1 composite)	8 liters	TLVEL
	TLV 2	TLV2SED	400 ml			
	TLV 3	TLV3SED	400 ml			
	TLV 4	TLV4SED	400 ml			
	TLV 5	TLV5SED	400 ml			

TABLE 2-6 . (CONTINUED)

Sampling Reach	Station	Sediment Sample IDs	Sediment Aliquot to be Used for Elutriate	Elutriate Water Samples	Water Vol. to be Used for Elutriate	Sample ID for Resulting Composited Elutriate Sample
Brewerton, Eastern Ext.	BE 1	BE1SED	500 ml	BEEW (1 composite)	8 liters	BEEL
	BE 2	BE2SED	500 ml			
	BE 3	BE3SED	500 ml			
	BE 4	BE4SED	500 ml			
	BEV 1	BEV1SED	333 ml	BEVEW (1 composite)	8 liters	BEVEL
	BEV 2	BEV2SED	333 ml			
	BEV 3	BEV3SED	333 ml			
	BEV 4	BEV4SED	333 ml			
	BEV 5	BEV5SED	333 ml			
	BEV 6	BEV6SED	333 ml			
Brewerton	BR 1	BR1SED	333 ml	BR/BRAEW (1 composite)	8 liters	BR/BRAEL
	BR 2	BR2SED	333 ml			
	BR 3	BR3SED	333 ml			
	BR 4	BR4SED	333 ml			
Brewerton Angle	BRA 1	BRA1SED	333 ml			
	BRA 2	BRA2SED	333 ml			
Curtis Bay	CB 1	CB1SED	500 ml	CBEW (1 composite)	8 liters	CBEL
	CB 2	CB2SED	500 ml			
	CB 3	CB3SED	500 ml			
	CB 4	CB4SED	500 ml			
Ft. McHenry	FMH 1	FMH1SED	500 ml	FMHEW (1 composite)	8 liters	FMHEL
	FMH 2	FMH2SED	500 ml			
	FMH 3	FMH3SED	500 ml			
	FMH 4	FMH4SED	500 ml			

TABLE 2-6 (CONTINUED)

Sampling Reach	Station	Sediment Sample IDs	Sediment Aliquot to be Used for Elutriate	Elutriate Water Samples	Water Vol. to be Used for Elutriate	Sample ID for Resulting Composited Elutriate Sample
Ferry Bar	FB 1	FB1SED	666 ml	FBEW (1 composite)	8 liters	FBEL
	FB 2	FB2SED	666 ml			
	FB 3	FB3SED	666 ml			
Northwest Branch East	NBE 1	NBE1SED	400 ml	NBE/NBWEW (1 composite)	8 liters	NBE/NBWEL
	NBE 2	NBE2SED	400 ml			
Northwest Branch West	NBW 1	NBW1SED	400 ml			
	NBW 2	NBW2SED	400 ml			
	NBW 3	NBW3SED	400 ml			
Total No. Samples		57		13		13

TABLE 2-7 REQUIRED CONTAINERS, PRESERVATION TECHNIQUE, AND HOLDING TIMES [a] FOR SITE WATER AND ELUTRIATE WATER SAMPLES

Parameter	Volume Required (mL)[b]	Container[c]	Preservative	Holding Time
Inorganics				
Mercury	100	P	pH <2 with HNO_3 Cool, 4 C	14 days
Other Metals	100	P	pH <2 with HNO_3 Cool, 4 C	6 months
Cyanide	500	P,G	NaOH to pH >12 Ascorbic Acid Cool, 4 C	14 days 24 hours in presence of S^{2-}
Sulfide	500	P,G	NaOH to pH >9 Zinc Acetate Cool, 4 C	7 days
Biochemical Oxygen Demand	1000	P,G	Cool, 4 C	48 hours
Chemical Oxygen Demand	50	P,G	H_2SO_4 to pH <2	28 days
Nitrogen (Ammonia, Total Kjeldahl, Nitrate + Nitrite) Total Phosphorus	1050	P,G	H_2SO_4 to pH <2 Cool, 4 C	28 days
Organics				
Tributyltin	2000	G	Cool, 4 C	6 months
Total Organic Carbon	50	P,G	H_2SO_4 or HCl to pH <2 Cool, 4 C	28 days
Pesticides PCB Congeners Semivolatile Organics	2000	G, teflon-lined cap	Cool, 4 C	7 days until extraction 40 days after extraction
Volatile Organics	80	G, teflon-lined septum	Cool, 4 C	14 days

(a) From time of sample collection per *USACE/EPA. 1991. Evaluation of Dredged Material Proposed for Ocean Disposal.*
(b) 16 liters (4 gal) of water will be collected for preparation of each elutriate sample.
(c) P = plastic; G = glass. *National Oceanographic and Atmospheric Administration. July 1993. Sampling and Analytical Methods of the National Status and Trends Program. National Benthic Surveillance and Mussel Watch Projects. 1984-1992. NOS ORCA 71. NOAA, Silver Spring, Maryland.*

3. LABORATORY ANALYSIS

Laboratory procedures for sample handling, analyte detection, quality assurance, and data reduction/handling are detailed in the Final Quality Assurance Project Plan (EA 1995b) (Appendix B). Summaries of analytical and QA/QC procedures are presented below.

3.1 SAMPLE ANALYSES

Upon receipt at EA Laboratories, all samples were logged for tracking purposes and stored at 4°C until processing. Copies of all laboratory Chain-Of-Custody sheets are provided in Appendix F. Aliquots of the appropriately preserved sample were distributed to each analytical group (ex. Metals, GC/MS) for analysis. The methods used for each analysis are summarized in Table 3-1 (sediments) and Table 3-2 (reference waters/elutriates). Sample preparation techniques for each matrix are also included in Tables 3-1 and 3-2. Some samples, particularly waters, had to be concentrated to achieved the target detection limits in the ITM. All cases where samples were concentrated prior to analysis are indicated in the laboratory data summary sheets in Appendices C and D.

To meet program specific regulatory requirements for chemicals of concern, all analytical methods were followed as stated in Tables 3-1 and 3-2 with exceptions as noted below:

3.1.1 PCB Congeners

For all sediment samples taken outside of Baltimore Harbor and all split samples, PCB concentrations were determined separately from pesticides and the PCB extract was acidified to remove interfering compounds. This procedure was expected to lower the MDL to approximately 10 μg/kg for all Aroclors that would otherwise have MDL's greater than 10 μg/kg.

The Baltimore District USACE determined that if total PCB concentration was greater than 11.6 μg/kg, congeners would be determined. Only samples from outside of Baltimore Harbor were subject to the 11.6 μg/kg test. The laboratory determined this cutoff using a wet weight criteria. Samples taken inside the Harbor (22 samples) were not subjected to congener analysis.

In order to achieve the required detection limits for PCB Aroclors in the sediment samples taken outside the harbor, pesticides and PCBs were extracted separately using two aliquots of sample. The pesticide fraction, extracted with only one surrogate, tetrachloro-m-xylene, was analyzed in the usual manner and the extract was saved for PCB Congener analysis, if required. The PCB extract was concentrated to 2 ml (five times less than the volume specified in the standard method), subjected to acid cleanup according to SW846 Method 3665 to eliminate possible interferences, and analyzed by dual-column gas chromatography. Total arochlor concentrations in the PCB extract (from outside the Harbor) were not detected, so no congener analyses were conducted for this project.

3.1.2 Elutriate Test

Each elutriate was prepared by sub-sampling approximately 1 L of the dredged material from the well-mixed original sample. The dredged material and unfiltered site water are then combined in a sediment-to-water ratio of 1:4 on a volume basis at room temperature (22° ± 2°C). This was accomplished by volumetric displacement. After the correct ratio was achieved, the mixture was stirred vigorously for 30 min with a magnetic stirrer. At 10-min intervals, the mixture was also stirred manually to ensure complete mixing. After the 30-min mixing period, the mixture was allowed to settle for 1 hour. The supernatant was then siphoned off and filtered through a 0.45-µm-mesh filter to remove particulates prior to chemical analysis.

3.1.3 Semivolatile Organics - PAHs

In order to achieve the target detection limits (TDLs) referenced in *QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations - Chemical Evaluations* (EPA 823-B-95-001, April 1995) for sediment samples, PAHs were analyzed utilizing the alternative SW846 Method 8310 (HPLC).

3.1.4 Pesticides

For sediment samples only, a surrogate sample was prepared for pesticides analysis using TCX, a spiking compound used in QA/QC for pesticide/PCB analyses. This was done to allow for a separate PCB analysis. Several pesticides that are not typically analyzed using the standard USEPA SW-846, Method 8080 were also required for compliance with ITM requirements. These include: methyl parathion, malathion, ethyl parathion, dacthal, chlorbenside, mirex, demeton, aziphos (methyl-extraction). Water/elutriate samples had to be concentrated to meet the target detection limits for these compounds. All additional pesticides, except demeton and aziphos methyl, were analyzed using a modified Method 8080 from the original semivolatile extraction for each matrix. Demeton and aziphos methyl were analyzed using Method 8140 from the original semivolatile extraction. Further details of these methods are included in the Analytical Narratives included in the Appendices C and D.

3.2 LABORATORY QA/QC SAMPLES

Quality control measurements for analytical protocols were designed to evaluate laboratory performance, and measurement biases resulting from the sample matrix and field performance.

- *Laboratory method performance:* All quality control criteria for method performance must be met for all target analytes for data to be reported. These criteria generally apply to instrument tune, calibration, method blanks, laboratory control samples (LCS), MDL verification sample, and Standard Analytical Reference Materials (SARM). In some instances where method criteria fail, useable data can be obtained and reported with client approval. The Analytical Narrative (Appendices C and D) includes a thorough discussion of the impact on data quality.

- *Sample performance:* The accuracy and precision of sample analyses are influenced by both internal and external factors. Internal factors are those associated with sample preparation and analysis. Internal factors were monitored by the use of internal quality control samples. Quality control field samples were analyzed to determine any measurement bias due to the sample matrix based on evaluation of matrix spikes (MS) and matrix spike duplicates (MSD). If acceptance criteria were not met, matrix interferences were confirmed either by reanalysis or by inspection of the LCS results to verify that laboratory method performance was within control limits. Data were reported with appropriate qualifiers or discussion.

- *Field performance:* Quality control samples were used to evaluate the effectiveness of the sampling program to obtain representative samples, eliminating any cross contamination. These include trip blanks (for volatile organics), field replicates and field blanks.

Detailed QA/QC procedures are included in the QAPP (Appendix B). The various QA/QC analyses utilized for this project are outlined briefly in the following section. Results of these analyses will be provided in the Chapter 5 Addendum to this report.

3.2.1 Standard Analytical Reference Material (SARM)

Standard Analytical Reference Materials (SARM) represent performance-based QA/QC. A standard analytical reference material is a soil/solution with a certified concentration that is analyzed as a sample and is used to monitor analytical accuracy. Standard Analytical Reference Materials (SARMs) were obtained from National Institute of Standards and Technology (NIST). Acceptance criteria are listed in QAPP (Appendix B). With concurrence of the U.S. Army Corps of Engineers, Baltimore District, a single SARM was acquired for all available target analytes for sediments only and was analyzed using the methods in Table 3-1. SARM results will be provided in the Chapter 5 Addendum to this report.

3.2.2 Method Blanks

The method (reagent) blank is used to monitor laboratory contamination. This is usually a sample of laboratory reagent water processed through the same analytical procedure as the sample (i.e., digested, extracted, distilled). One method blank was prepared and analyzed every day that samples were prepared.

The method blank must contain less than or equal to three times the method detection limit (MDL) limit for the compounds of interest. If this criteria was not met, then all sample processing was halted until corrective measures are taken and documented. All samples processed with the out-of-control method blank were reprocessed and reanalyzed. All instances of out-of control performance are detailed in the Analytical Narratives (Appendices C and D) and are flagged (if necessary) in the data summaries (Chapter 4).

3.2.3 Laboratory Control Sample (LCS)

The Laboratory Control Sample is a fortified method blank analyzed with each analytical batch of twenty (20) or fewer samples. These samples generally consist of reagent water or solid fortified with the analytes of interest for single-analyte methods and selected analytes for multi-analyte methods according to the appropriate analytical method. Laboratory Control samples were prepared and analyzed with the associated sample batch. The analyte recovery from each LCS was used to monitor analytical accuracy.

The percent recovery was calculated and plotted onto control charts with warning limits at two (2) standard deviations (95% confidence limit), and control limits at three standard deviations (99% confidence limit). Control charts are used to alert the laboratory of the need to check method procedure through trend analysis of the charts (EAL-SOP-247). Laboratory control results are detailed in Analytical Narratives in Appendices C and D.

3.2.4 Matrix Spike/Matrix Spike Duplicate (MS / MSD)

A matrix spike (MS) is a field sample to which a known amount of analyte is added before sample preparation and analysis to evaluate the potential effects of matrix interference. Analyte concentrations in the spiked and unspiked sample were used to calculate percent recovery as a measure of the extent of matrix interference. Five percent of the samples collected within each matrix (sediment and water) were designated for MS analysis (U.S. EPA 1995).

For organic methods, the MS was duplicated, providing a matrix spike duplicate (MSD). For inorganic analytes, a method duplicate was analyzed in addition to the MS. Five percent of the samples collected for each matrix (sediment and water) were designated for MSD or duplicate analysis (U.S. EPA 1995). For this sampling program, EA Laboratories analyzed four MS/MSD sediment samples and one MS/MSD water sample. Samples designated for MS/MSD analysis (organic analyses) or MS and duplicate analysis (inorganic analyses) were collected in duplicate. Sampling locations where MS/MSD samples were collected are indicated to Table 2-5 (sediment) and Table 2-8 (water). Recoveries for matrix spike and matrix spike duplicates will br presented in the Chapter 5 Addendum to this report.

3.2.5 Surrogates

Surrogates are organic compounds that are similar to analytes of interest in chemical composition, extraction, and chromatography, but are not normally found in environmental samples. These compounds were spiked into all blank, standards, samples, and spiked samples prior to analysis for organic parameters. Generally, surrogates are not used for inorganic analyses. Percent recoveries were calculated for each surrogate. Surrogates were be spiked into samples according to the appropriate analytical method (Section 7 of the QAPP) (Appendix B). Surrogate spike recoveries should fall within the control limits set in accordance with procedures specified in the method. Surrogate recoveries were calculated if sample dilution caused the surrogate concentration to fall below the quantitation limit. Results of surrogate analyses are included in Analytical Narratives in the Appendices C and D.

TABLE 3-1. ANALYTICAL PARAMETERS AND ANALYTICAL METHODS FOR SEDIMENTS

Parameter	Method	Method Number	Matrix	Reference
SAMPLE PREPARATION				
Semivolatile Organics Extraction	Soxhlet Extraction	3540	SO	(2)
Metals Digestion	Nitric Acid - Hydrogen Peroxide	3050	SO	(2)
ORGANICS				
Acid Extractable Organic Compounds	Gas Chromatography/Mass Spectrometry	8270	SO	(2)
Base-Neutral Extractable Organic Compounds	Gas Chromatography/Mass Spectrometry	8270	SO	(2)
Biochemical Oxygen Demand	BOD (5 day, 20C)	405.1	SO	(1)
Chemical Oxygen Demand	Colorimetric - Manual	410.4	SO	(1)
Halogenated Hydrocarbon Pesticides	Gas Chromatography - ECD	8080	SO	(2)
Polychlorinated Biphenyls	Gas Chromatography - ECD	8080	SO	(2)
Polynuclear aromatic hydrocarbons (PAH)	High Performance Liquid Chromatography - UV, fluorescence	8310	SO	(2)
Total Organic Carbon	Oxidation - Infrared	9060	SO	(2)
Volatile Organic Compounds	Gas Chromatography/Mass Spectrometry	8240	SO	(2)

TABLE 3-1. ANALYTICAL PARAMETERS AND ANALYTICAL METHODS FOR SEDIMENTS

Parameter	Method	Method Number	Matrix	Reference
METALS				
Aluminum	Atomic Emission - ICP	6010	SO	(2)
Antimony	Atomic Emission - ICP	6010	SO	(2)
Arsenic	Atomic Emission - ICP	6010	SO	(2)
Beryllium	Atomic Emission - ICP	6010	SO	(2)
Cadmium	Atomic Emission - ICP	6010	SO	(2)
Calcium	Atomic Emission - ICP	6010	SO	(2)
Chromium, Total	Atomic Emission - ICP	6010	SO	(2)
Copper	Atomic Emission - ICP	6010	SO	(2)
Iron	Atomic Emission - ICP	6010	SO	(2)
Lead	Atomic Emission - ICP	6010	SO	(2)
Manganese	Atomic Emission - ICP	6010	SO	(2)
Mercury	Atomic Absorption - Cold Vapor	7471	SO	(2)
Nickel	Atomic Emission - ICP	6010	SO	(2)
Selenium	Atomic Emission - ICP	6010	SO	(2)
Silver	Atomic Emission - ICP	6010	SO	(2)
Thallium	Atomic Absorption - Furnace	7841	SO	(2)

TABLE 3-1. ANALYTICAL METHODS

Zinc	Atomic Emission - ICP	6010	SO	(2)
INORGANIC NONMETALS				
Cyanide, Total and Amenable	Colorimetric - Automated UV	9012	SO	(2)
Nitrogen, Ammonia	Colorimetric - Automated Phenate	350.1	SO	(1)
Nitrogen, Total Kjeldahl	Colorimetric - Autoanalyzer II	351.2	SO	(1)
Nitrogen, Nitrate+Nitrite	Colorimetric - Cadmium Reduction	353.2	SO	(1)
Phosphorus, Total	Persulfate Digestion	365.1	SO	(1)
Sulfide, total	Titrimetric	9030	SO	(2)
PHYSICAL DETERMINATIONS				
Atterburg Limits	Physical Measurement	D4318	SO	(3)
Percent Moisture	Gravimetric	D4959	SO	(3)

Matrix codes:

SO -Soils, sludges, sediments, wastes

References:

1. United States Environmental Protection Agency. 1979. Methods for Chemical Analysis of Water and Wastes. EPA-600/4-79-020. U.S. EPA, Cincinnati, Ohio.

2. United States Environmental Protection Agency. August 1993. Test Methods for Evaluating Solid Waste. Physical/Chemical Methods. EPA SW-846, 3rd edition, including Final Update I. U.S. EPA, Washington, D.C.

3. American Society for Testing and Materials. Annual Book of ASTM Standards. Volume 4.08. ASTM, Philadelphia, PA.

TABLE 3-2. ANALYTICAL PARAMETERES AND ANALYTICAL METHODS FOR REFERENCE WATER AND ELUTRIATE WATER

Parameter	Method	Method Number	Matrix	Reference
SAMPLE PREPARATION				
Organics Extraction	Continuous Extraction	3520	W	(2)
Total Metals Digestion (FAA/ICP)	Nitric Acid - Hydrochloric Acid	3010	W	(2)
Total Metals Digestion (GFAA)	Nitric Acid	3020	W	(2)
ORGANICS				
Acid Extractable Organic Compounds	Gas Chromatography/Mass Spectrometry	8270	W	(2)
Base-Neutral Extractable Organic Compounds	Gas Chromatography/Mass Spectrometry	8270	W	(2)
Biochemical Oxygen Demand	BOD (5 day, 20C)	405.1M	W	(1)
Chemical Oxygen Demand	Colorimetric - Manual	410.4M	W	(1)
Halogenated Hydrocarbon Pesticides	Gas Chromatography - ECD	8080	W	(2)
Polychlorinated Biphenyls	Gas Chromatography - ECD	8080	W	(2)
Total Organic Carbon	Oxidation - Infrared	9060	W	(2)
Volatile Organic Compounds	Gas Chromatography/Mass Spectrometry	8240	W	(2)
METALS				
Aluminum	Atomic Emission - ICP	6010	W	(2)

TABLE 3-2. ANALYTICAL PARAMETERES AND ANALYTICAL METHODS FOR REFERENCE WATER AND ELUTRIATE WATER

Parameter	Method	Method Number	Matrix	Reference
Antimony	Atomic Emission - ICP	6010	W	(2)
Arsenic	Atomic Absorption - Furnace	7060	W	(2)
Beryllium	Atomic Emission - ICP	6010	W	(2)
Cadmium	Atomic Emission - ICP	6010	W	(2)
Calcium	Atomic Emission - ICP	6010	W	(2)
Chromium, Total	Atomic Emission - ICP	6010	W	(2)
Copper	Atomic Emission - ICP	6010	W	(2)
Iron	Atomic Emission - ICP	6010	W	(2)
Lead	Atomic Absorption - Furnace	7421	W	(2)
Manganese	Atomic Emission - ICP	6010	W	(2)
Mercury	Atomic Absorption - Cold Vapor	7470	W	(2)
Nickel	Atomic Emission - ICP	6010	W	(2)
Selenium	Atomic Emission - ICP	6010	W	(2)
Silver	Atomic Emission - ICP	6010	W	(2)
Thallium	Atomic Emission - ICP	6010	W	(2)

TABLE 3-2. ANALYTICAL METHODS

Zinc	Atomic Emission - ICP	6010	W	(2)
INORGANIC NONMETALS				
Cyanide, Total and Amenable	Colorimetric - Automated UV	9012	W	(2)
Nitrogen, Ammonia	Colorimetric - Automated Phenate	350.1	W	(1)
Nitrogen, Total Kjeldahl	Colorimetric - Autoanalyzer II	351.2	W	(1)
Nitrogen, Nitrate+Nitrite	Colorimetric - Cadmium Reduction	353.2	W	(1)
Phosphorus, Total	Persulfate Digestion	365.1	W	(1)
Sulfide, total	Titrimetric	9030	W	(2)

Matrix codes:

W - Estuarine water, ground water, leachates, ocean water, surface water, and wastewater

References:

1. United States Environmental Protection Agency. 1979. Methods for Chemical Analysis of Water and Wastes. EPA-600/4-79-020. U.S. EPA, Cincinnati, Ohio.

2. United States Environmental Protection Agency. August 1993. Test Methods for Evaluating Solid Waste. Physical/Chemical Methods. EPA SW-846, 3rd edition, including Final Update I. U.S. EPA, Washington, D.C.

4. SAMPLE RESULTS

Results of all analyses are presented in tabular format in the following chapter.

The qualifiers associated with these data tables are described in Table 4-1 (organic compounds) and Table 4-2 (inorganic compounds).

The analytical results are presented by matrix in the following subsections. Summaries of laboratory results are provided in Appendices C, D, and E. This chapter is organized as follows:

4.1 Sediment Analyses

- 4.1.1 Volatiles
- 4.1.2 Semivolatiles
- 4.1.3 Semivolatile PAHs
- 4.1.4 Pesticides and PCBs
- 4.1.5 Metals
- 4.1.6 Organotins
- 4.1.7 General Chemistry
- 4.1.8 Grain Size, Atterberg Limits, Moisture Content

4.2 Reference Water/Elutriate Water

- 4.2.1 Volatiles
- 4.2.2 Semivolatiles
- 4.2.3 Pesticides and PCBs
- 4.2.4 Metals
- 4.2.5 General Chemistry

TABLE 4-1. ORGANIC DATA QUALIFIERS FOR ANALYTICAL RESULTS

ND or U Indicates a compound on the target compound list (TCL) was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and, if a soil sample, for percent moisture. For example, 10 U is used for phenol in water if the sample final volume is the protocol-specified final volume. If a 1-to-10 dilution of the extract was necessary, the reported limit is (10 x 10 U) or 100 U. For a soil sample, the value is also adjusted for percent moisture. For example, if the sample had 24% moisture and a 1-to-10 dilution factor, the soil sample quantitation limit for phenol (330 U) would be corrected as follows:

Reported limit = (330 U) x df / D

where: df = dilution factor = 10
D = (100 - % moisture) / 100 (At 24% moisture, D = (100-24) / 100 = 0.76)
Reported limit = (330 U) x 10 / 0.76 = 4300 U (rounded to two significant figures)

For soil samples subjected to gel permeation chromatography (GPC) cleanup procedures, the contract required quantitation limit (CRQL) is also multiplied by 2 to account for the fact that only half of the extract is recovered. Note: If GPC procedures are employed, the factor of 2 is not included in the dilution factor reported; a "Y" is entered for GPC (Y/N).

TR or J Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, 2) when the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the CRQL but greater than zero, 3) when the retention time data indicate the presence of a compound that meets the pesticide/Aroclor identification criteria and the result is less than the CRQL but greater than zero. Note: the "J" code is not used and the compound is not reported as being identified for pesticide/Aroclor results less than the CRQL, if the technical judgement of the pesticide residue analysis expert determines that the peaks used for compound identification resulted from instrument noise or other interferences (column bleed, solvent contamination, etc.). For example, if the sample quantitation limit is 10 ug/L but a concentration of 3 ug/L is calculated, report it as 3 J. The sample quantitation limit must be adjusted for dilution as discussed for the U flag

C This flag applies to pesticide results where the identification has been confirmed by GC/MS. Single component pesticides with concentration equal to or greater than 10 ng/uL in the final extract must be confirmed by GC/MS.

B This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag is used for a TIC as well as for a positively identified TCL compound.

E This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. This flag does not apply to pesticides/PCBs analyzed by GC/EC methods. If one or more compounds have a response greater that full scale, the sample or extract must be diluted and reanalyzed according to the specifications listed in the SOW. All such compounds with a response greater than full scale should have a concentration flagged with an "E" on Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses are reported on separate Forms I. The Form I for the diluted sample will have the "DL" suffix appended to the sample number. NOTE: For total xylenes, where three isomers are quantified as two peaks, the calibration range of each peak is considered separately; e.g., a diluted analysis is not required for total xylenes unless the concentration of either peak separately exceeds 200 ug/L.

D This flag identifies all compounds identified in the analysis at a secondary dilution factor. If a sample or extract is reanalyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that Form I are flagged with the "D" flag.

A This flag indicates that a TIC is a suspected aldol-condensation product.

X Other specific flags may be required to properly define the results. If used, they are fully described and such description attached to the Sample Data Summary Package and the Case Narrative. The flags begin by using "X". If more that one flag is required, "Y" and "Z" are used, as needed. For instance, the "X" flag might combine the "A", "B", and "D" flags for some sample.

N Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

P This flag is used for GC analyses when there is greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form I and flagged with a "P".

TABLE 4-2. INORGANIC DATA QUALIFIERS FOR ANALYTICAL RESULTS

C (Concentration) qualifiers:

B	Reported value is less than the Contract Required Detection Limit (CRDL), but greater than the Instrument Detection Limit (IDL).
U	Analyte analyzed for but not detected (concentration is less than IDL).

Q (Quality control) qualifiers:

E	Reported value is estimated because of presence of interference.
M	Duplicate injection precision not met.
N	Spiked sample recovery is not within control limits.
S	Reported value is determined by the method of standard additions (MSA).
W	Postdigestion spike for furnace AAS analysis is out of control limits (85-115%) and sample absorbance is less than 50% of spike absorbance.
*	Duplicate analyses is not within control limits.
+	Correlation coefficient for MSA is less than 0.995.

M (Method) qualifiers:

P	Inductively Coupled Plasma (ICP)
A	Flame Atomic Absorption Spectrophotometric (AAS)
F	Furnace AAS
CV	Cold Vapor AAS
AV	Automated Cold Vapor AAS
AS	Semiautomated Spectrophotometric
C	Manual Spectrophotometric
T	Titrimetric
NR	Analyte is not required to be determined.

4.1 SEDIMENT ANALYSES

TABLE 4-3 SEDIMENT SAMPLE IDS, COLLECTION DATES, LABORATORY ACCESSION NUMBERS, AND LABORATORY REPORT NUMBERS.

REACH	STATION / SAMPLE TYPE	SAMPLE ID	COLLECTION DATE	LABORATORY ACCESSION NUMBER	LABORATORY REPORT NUMBER
Poplar Island	PI1	PI1SED	10-26-95	9515621	951703
	PI2	PI2SED	10-26-95	9515620	951703
	PI3	PI3SED	10-27-95	9515671	951703
	PI4	PI4SED	10-27-95	9515672	951703
	PI5	PI5SED	10-27-95	9515673	951703
Deep Trough	DT1	DT1SED	10-30-95	9515769	951721
	DT2	DT2SED	10-30-95	9515770	951721
	DT3	DT3SED	10-30-95	9515771	951721
Kent Island Deep	KI1	KI1SED	10-31-95	9515820	951721
	KI2	KI2SED	10-30-95	9515772	951721
	KI3	KI3SED	10-30-95	9515773	951721
Pooles Island	POL1	POL1SED	11-13-95	9516355	951789
Swan Point	SWP1	SWP1SED	10-31-95	9515821	951721
	SWP2	SWP2SED	11-06-95	9516025	951753
	SWP3	SWP3SED	11-06-95	9516026	951753
Craighill Entrance	CRE1	CRE1SED	11-17-95	9516701	951820
	CRE2	CRE2SED	11-17-95	9516702	951820
	CRE3	CRE3SED	11-17-95	9516703	951820

TABLE 4-3 CONTINUED.

REACH	STATION / SAMPLE TYPE	SAMPLE ID	COLLECTION DATE	LABORATORY ACCESSION NUMBER	LABORATORY REPORT NUMBER
Craighill	CR1	CR1SED	11-17-95	9516704	951820
	CR2	CR2SED	11-17-95	9516705	951820
	CR2FD (Field Duplicate)	CR2SEDFD	11-17-95	9516706	951820
	CR3	CR3SED	11-17-95	9516707	951820
Craighill Angle	CRA1	CRA1SED	11-17-95	9516711	951822
	CRA2	CRA2SED	11-17-95	9516712	951822
Craighill Upper Range	CRU1	CRU1SED	11-17-95	9516715	951824
	CRU2	CRU2SED	11-17-95	9516716	951824
	CRU3	CRU3SED	11-18-95	9516734	951824
Cutoff Angle	CUT1	CUT1SED	11-18-95	9516735	951824
	CUT2	CUT2SED	11-18-95	9516736	951824
	CUT3	CUT3SED	11-18-95	9516737	951824
Tolchester (Van Veen)	TLC1	TLC1SED	11-13-95	9516350	951752
	TLC2	TLC2SED	11-13-95	9516351	951752
	TLC2FD (Field Duplicate)	TLCS2SEDFD	11-13-95	9516352	951752
	TLC3	TLC3SED	11-10-95	9516214	951752
Tolchester (Gravity Core)	TLV1	TLV1SED	11-10-95	9516211	951752
	TLV2	TLV2SED	11-10-95	9516212	951752
	TLV3	TLV3SED	11-10-95	9516213	951752
	TLV4	TLV4SED	11-06-95	9516022	951752
	TLV5	TLV5SED	11-06-95	9516023	951752

TABLE 4-3 CONTINUED.

REACH	STATION / SAMPLE TYPE	SAMPLE ID	COLLECTION DATE	LABORATORY ACCESSION NUMBER	LABORATORY REPORT NUMBER
Brewerton, Eastern Ext. (Van Veen)	BE1	BE1SED	11-28-95	9517142	951885
	BE2	BE2SED	11-28-95	9517143	951885
	BE3	BE3SED	11-28-95	9517144	951885
	BE4	BE4SED	11-28-95	9517145	951885
Brewerton, Eastern Ext. (Gravity Core)	BEV1	BEV1SED	11-28-95	9517147	951886
	BEV2	BEV2SED	11-28-95	9517148	951886
	BEV3	BEV3SED	11-28-95	9517149	951886
	BEV4	BEV4SED	11-28-95	9517150	951886
	BEV5	BEV5SED	11-28-95	9517151	951886
	BEV6	BEV6SED	11-28-95	9517152	951886
Brewerton	BR1	BR1SED	11-28-95	9517173	951882
	BR2	BR2SED	11-28-95	9517129	951882
	BR3	BR3SED	11-28-95	9517130	951882
	BR4	BR4SED	11-28-95	9517131	951882
	BR1 (Blind Duplicate)	BLINDSPLIT1A	11-28-95	9517136	951883
	BR3 (Blind Duplicate)	BLINDSPLIT2A	11-28-95	9517137	951883
Brewerton Angle	BRA1	BRA1SED	11-28-95	9517132	951882
	BRA2	BRA2SED	11-28-95	9517133	951882

TABLE 4-3 CONTINUED.

REACH	STATION / SAMPLE TYPE	SAMPLE ID	COLLECTION DATE	LABORATORY ACCESSION NUMBER	LABORATORY REPORT NUMBER
Ft. McHenry	FMH1	FMH1SED	11-29-95	9517175	951893
	FMH2	FMH2SED	11-29-95	9517176	951893
	FMH3	FMH3SED	11-29-95	9517177	951893
	FMH4	FMH4SED	11-29-95	9517178	951893
Curtis Bay	CB1	CB1SED	11-29-95	9517180	951894
	CB2	CB2SED	11-29-95	9517181	951894
	CB3	CB3SED	11-29-95	9517182	951894
	CB4	CB4SED	11-29-95	9517183	951894
Ferry Bar	FB1	FB1SED	11-29-95	9517187	951896
	FB2	FB2SED	11-29-95	9517188	951896
	FB3	FB3SED	11-29-95	9517189	951896
Northwest Branch East	NBE1	NBE1SED	11-29-95	9517192	951898
	NBE2	NBE2SED	11-29-95	9517193	951898
Northwest Branch West	NBW1	NBW1SED	11-29-95	9517194	951898
	NBW2	NBW2SED	11-29-95	9517195	951898
	NBW3	NBW3SED	11-29-95	9517196	951898

Table 4-4. Volatiles results for Chesapeake Bay and Baltimore Harbor sediments presented by sampling reach.

POPLAR ISLAND

Analyte	PI1SED(a)				PI2SED(a)				PI3SED				PI4SED				PI5SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	0.6	ND		1x	2	ND		1x	0.5	ND		1x	0.6	ND		1x	0.6
1,1-Dichloroethene	ND		1x	0.6	ND		1x	2	ND		1x	0.5	ND		1x	0.6	ND		1x	0.6
1,1,1-Trichloroethane	ND		1x	0.4	ND		1x	1	ND		1x	0.4	ND		1x	0.4	ND		1x	0.5
1,1,2-Trichloroethane	ND		1x	0.9	ND		1x	3	ND		1x	0.8	ND		1x	0.9	ND		1x	1
1,1,2,2-Tetrachloroethane	ND		1x	0.6	ND		1x	2	ND		1x	0.5	ND		1x	0.6	ND		1x	0.6
1,2-Dichloroethane	ND		1x	0.9	ND		1x	3	ND		1x	0.8	ND		1x	0.9	ND		1x	1
1,2-Dichloropropane	ND		1x	1	ND		1x	3	ND		1x	0.9	ND		1x	1	ND		1x	1
2-Butanone	ND		1x	1	ND		1x	4	ND		1x	1	ND		1x	1	ND		1x	1
2-Chloroethyl vinyl ether	ND		1x	0.6	ND		1x	2	ND		1x	0.5	ND		1x	0.6	ND		1x	0.6
Acrolein	ND		1x	7	ND	(b)	1x	22	ND		1x	6	ND		1x	7	ND		1x	7
Acrylonitrile	ND		1x	5	ND		1x	15	ND		1x	4	ND		1x	4	ND		1x	5
Benzene	ND		1x	0.6	ND		1x	2	ND		1x	0.5	ND		1x	0.6	ND		1x	0.6
Bromodichloromethane	ND		1x	0.7	ND		1x	2	ND		1x	0.6	ND		1x	0.7	ND		1x	0.8
Bromoform	ND		1x	0.6	ND		1x	2	ND		1x	0.5	ND		1x	0.6	ND		1x	0.6
Bromomethane	ND		1x	0.7	ND		1x	2	ND		1x	0.6	ND		1x	0.7	ND		1x	0.8
Carbon tetrachloride	ND		1x	0.3	ND		1x	1	ND		1x	0.3	ND		1x	0.3	ND		1x	0.3
Chlorobenzene	ND		1x	0.4	ND		1x	1	ND		1x	0.4	ND		1x	0.4	ND		1x	0.5
Chloroethane	ND		1x	1	ND		1x	4	ND		1x	1	ND		1x	1	ND		1x	1
Chlororform	ND		1x	0.6	ND		1x	2	ND		1x	0.5	ND		1x	0.6	ND		1x	0.6
Chloromethane	ND		1x	1	ND		1x	4	ND		1x	1	ND		1x	1	ND		1x	1
cis-1,3-Dichloropropene	ND		1x	0.4	ND		1x	1	ND		1x	0.4	ND		1x	0.4	ND		1x	0.5
Dibromochloromethane	ND		1x	0.9	ND		1x	3	ND		1x	0.8	ND		1x	0.9	ND		1x	1
Dichlorodifluoromethane	ND		1x	0.9	ND		1x	3	ND		1x	0.8	ND		1x	0.9	ND		1x	1
Ethylbenzene	ND		1x	0.7	ND		1x	2	ND		1x	0.6	ND		1x	0.7	ND		1x	0.8
Methylene chloride	ND		1x	0.9	ND		1x	3	ND		1x	0.8	ND		1x	0.9	ND		1x	1
Tetrachlorethene	ND		1x	0.7	ND		1x	2	ND		1x	0.6	ND		1x	0.7	ND		1x	0.8
Toluene	ND		1x	0.4	ND		1x	1	ND		1x	0.4	ND		1x	0.4	ND		1x	0.5
trans-1,2-Dichloroethene	ND		1x	0.9	ND		1x	3	ND		1x	0.8	ND		1x	0.9	ND		1x	1
trans-1,3-Dichloropropene	ND		1x	0.7	ND		1x	2	ND		1x	0.6	ND		1x	0.7	ND		1x	0.8
Trichloroethene	ND		1x	0.4	ND		1x	1	ND		1x	0.4	ND		1x	0.4	ND		1x	0.5
Trichlorofluoromethane	ND		1x	0.7	ND		1x	2	ND		1x	0.6	ND		1x	0.7	ND		1x	0.8
Vinyl chloride	ND		1x	0.6	ND		1x	2	ND		1x	0.5	ND		1x	0.6	ND		1x	0.6

ND=Not detected
(a)=Samples analyzed one day beyond project specified holding time(10 days from collection date).

Table 4-4. Continued.

DEEP TROUGH

Analyte	DT1SED				DT2SED				DT3SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	2	ND		1x	0.9	ND		1x	2
1,1-Dichloroethene	ND		1x	2	ND		1x	0.9	ND		1x	2
1,1,1-Trichloroethane	ND		1x	2	ND		1x	0.7	ND		1x	1
1,1,2-Trichloroethane	ND		1x	3	ND		1x	1	ND		1x	3
1,1,2,2-Tetrachloroethane	ND		1x	2	ND		1x	0.9	ND		1x	2
1,2-Dichloroethane	ND		1x	3	ND		1x	1	ND		1x	3
1,2-Dichloropropane	ND		1x	4	ND		1x	2	ND		1x	3
2-Butanone	ND		1x	4	ND		1x	2	110		1x	4
2-Chloroethyl vinyl ether	ND		1x	2	ND		1x	0.9	ND		1x	2
Acrolein	ND		1x	24	ND		1x	10	ND	(b)	1x	22
Acrylonitrile	ND		1x	16	ND		1x	7	ND		1x	15
Benzene	ND		1x	2	ND		1x	0.9	ND		1x	2
Bromodichloromethane	ND		1x	2	ND		1x	1	ND		1x	2
Bromoform	ND		1x	2	ND		1x	0.9	ND		1x	2
Bromomethane	ND		1x	2	ND		1x	1	ND		1x	2
Carbon tetrachloride	ND		1x	1	ND		1x	0.4	ND		1x	1
Chlorobenzene	ND		1x	2	ND		1x	0.7	ND		1x	1
Chloroethane	ND		1x	4	ND		1x	2	ND		1x	4
Chlororform	ND		1x	2	ND		1x	0.9	ND		1x	2
Chloromethane	ND		1x	4	ND		1x	2	ND		1x	4
cis-1,3-Dichloropropene	ND		1x	2	ND		1x	0.7	ND		1x	1
Dibromochloromethane	ND		1x	3	ND		1x	1	ND		1x	3
Dichlorodifluoromethane	ND		1x	3	ND		1x	1	ND		1x	3
Ethylbenzene	ND		1x	2	ND		1x	1	ND		1x	2
Methylene chloride	ND		1x	3	ND		1x	1	ND		1x	3
Tetrachlorethene	ND		1x	2	ND		1x	1	ND		1x	2
Toluene	ND		1x	2	ND		1x	0.7	ND		1x	1
trans-1,2-Dichloroethene	ND		1x	3	ND		1x	1	ND		1x	3
trans-1,3-Dichloropropene	ND		1x	2	ND		1x	1	ND		1x	2
Trichloroethene	ND		1x	2	ND		1x	0.7	ND		1x	1
Trichlorofluoromethane	ND		1x	2	ND		1x	1	ND		1x	2
Vinyl chloride	ND		1x	2	ND		1x	0.9	ND		1x	2

ND=Not detected
(b)=Analyte not recovered in MS/MSD.

Table 4-4. Continued.

KENT ISLAND DEEP

Analyte	KI1SED				KI2SED				KI3SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	0.5	ND		1x	1	ND		1x	0.6
1,1-Dichloroethene	ND		1x	0.5	ND		1x	1	ND		1x	0.6
1,1,1-Trichloroethane	ND		1x	0.4	ND		1x	0.9	ND		1x	0.4
1,1,2-Trichloroethane	ND		1x	0.8	ND		1x	2	ND		1x	0.9
1,1,2,2-Tetrachloroethane	ND		1x	0.5	ND		1x	1	ND		1x	0.6
1,2-Dichloroethane	ND		1x	0.8	ND		1x	2	ND		1x	0.9
1,2-Dichloropropane	ND		1x	0.9	ND		1x	2	ND		1x	1
2-Butanone	ND		1x	1	ND		1x	2	ND		1x	1
2-Chloroethyl vinyl ether	ND		1x	0.5	ND		1x	1	ND		1x	0.6
Acrolein	ND		1x	6	ND		1x	14	ND		1x	7
Acrylonitrile	ND		1x	4	ND		1x	9	ND		1x	4
Benzene	ND		1x	0.5	ND		1x	1	ND		1x	0.6
Bromodichloromethane	ND		1x	0.7	ND		1x	1	ND		1x	0.7
Bromoform	ND		1x	0.5	ND		1x	1	ND		1x	0.6
Bromomethane	ND		1x	0.7	ND		1x	1	ND		1x	0.7
Carbon tetrachloride	ND		1x	0.3	ND		1x	0.6	ND		1x	0.3
Chlorobenzene	ND		1x	0.4	ND		1x	0.9	ND		1x	0.4
Chloroethane	ND		1x	1	ND		1x	3	ND		1x	1
Chlororform	ND		1x	0.5	ND		1x	1	ND		1x	0.6
Chloromethane	ND		1x	1	ND		1x	3	ND		1x	1
cis-1,3-Dichloropropene	ND		1x	0.4	ND		1x	0.9	ND		1x	0.4
Dibromochloromethane	ND		1x	0.8	ND		1x	2	ND		1x	0.9
Dichlorodifluoromethane	ND		1x	0.8	ND		1x	2	ND		1x	0.9
Ethylbenzene	ND		1x	0.7	ND		1x	1	ND		1x	0.7
Methylene chloride	ND		1x	0.8	ND		1x	2	ND		1x	0.9
Tetrachlorethene	ND		1x	0.7	ND		1x	1	ND		1x	0.7
Toluene	ND		1x	0.4	ND		1x	0.9	ND		1x	0.4
trans-1,2-Dichloroethene	ND		1x	0.8	ND		1x	2	ND		1x	0.9
trans-1,3-Dichloropropene	ND		1x	0.7	ND		1x	1	ND		1x	0.7
Trichloroethene	ND		1x	0.4	ND		1x	0.9	ND		1x	0.4
Trichlorofluoromethane	ND		1x	0.7	ND		1x	1	ND		1x	0.7
Vinyl chloride	ND		1x	0.5	ND		1x	1	ND		1x	0.6

ND=Not detected

Table 4-4. Continued.

POOLES ISLAND

Analyte ug/kg	POLISED Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	1
1,1-Dichloroethene	ND		1x	1
1,1,1-Trichloroethane	ND		1x	0.8
1,1,2-Trichloroethane	ND		1x	2
1,1,2,2-Tetrachloroethane	ND		1x	1
1,2-Dichloroethane	ND		1x	2
1,2-Dichloropropane	ND		1x	2
2-Butanone	ND		1x	2
2-Chloroethyl vinyl ether	ND		1x	1
Acrolein	ND		1x	12
Acrylonitrile	ND		1x	8
Benzene	ND		1x	1
Bromodichloromethane	ND		1x	1
Bromoform	ND		1x	1
Bromomethane	ND		1x	1
Carbon tetrachloride	ND		1x	0.8
Chlorobenzene	ND		1x	0.8
Chloroethane	ND		1x	2
Chlororform	ND		1x	1
Chloromethane	ND		1x	2
cis-1,3-Dichloropropene	ND		1x	0.8
Dibromochloromethane	ND		1x	2
Dichlorodifluoromethane	ND		1x	2
Ethylbenzene	ND		1x	1
Methylene chloride	ND		1x	2
Tetrachlorethene	ND		1x	1
Toluene	ND		1x	0.8
trans-1,2-Dichloroethene	ND		1x	2
trans-1,3-Dichloropropene	ND		1x	1
Trichloroethene	ND		1x	0.8
Trichlorofluoromethane	ND		1x	1
Vinyl chloride	ND		1x	1

ND=Not detected

Table 4-4. Continued.

SWAN POINT CHANNEL

Analyte	SWP1SED				SWP2SED				SWP3SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	2	ND		1x	2	ND		1x	2
1,1-Dichloroethene	ND		1x	2	ND		1x	2	ND		1x	2
1,1,1-Trichloroethane	ND		1x	1	ND		1x	1	ND		1x	1
1,1,2-Trichloroethane	ND		1x	3	ND		1x	3	ND		1x	2
1,1,2,2-Tetrachloroethane	ND		1x	2	ND		1x	2	ND		1x	2
1,2-Dichloroethane	ND		1x	3	ND		1x	3	ND		1x	2
1,2-Dichloropropane	ND		1x	3	ND		1x	3	ND		1x	3
2-Butanone	ND		1x	3	ND		1x	4	140		1x	3
2-Chloroethyl vinyl ether	ND		1x	2	ND		1x	2	ND		1x	2
Acrolein	ND		1x	20	ND		1x	21	ND		1x	19
Acrylonitrile	ND		1x	13	ND		1x	14	ND		1x	12
Benzene	ND		1x	2	ND		1x	2	ND		1x	2
Bromodichloromethane	ND		1x	2	ND		1x	2	ND		1x	2
Bromoform	ND		1x	2	ND		1x	2	ND		1x	2
Bromomethane	ND		1x	2	ND		1x	2	ND		1x	2
Carbon tetrachloride	ND		1x	0.[illegible]	ND		1x	1	ND		1x	1
Chlorobenzene	ND		1x	1	ND		1x	1	ND		1x	1
Chloroethane	ND		1x	4	ND		1x	4	ND		1x	4
Chlororform	ND		1x	2	ND		1x	2	ND		1x	2
Chloromethane	ND		1x	4	ND		1x	4	ND		1x	4
cis-1,3-Dichloropropene	ND		1x	1	ND		1x	1	ND		1x	1
Dibromochloromethane	ND		1x	3	ND		1x	3	ND		1x	2
Dichlorodifluoromethane	ND		1x	3	ND		1x	3	ND		1x	2
Ethylbenzene	ND		1x	2	ND		1x	2	ND		1x	2
Methylene chloride	ND		1x	3	ND		1x	3	ND		1x	3
Tetrachlorethene	ND		1x	2	ND		1x	2	ND		1x	2
Toluene	ND		1x	1	ND		1x	1	ND		1x	1
trans-1,2-Dichloroethene	ND		1x	3	ND		1x	3	ND		1x	2
trans-1,3-Dichloropropene	ND		1x	2	ND		1x	2	ND		1x	2
Trichloroethene	ND		1x	1	ND		1x	1	ND		1x	1
Trichlorofluoromethane	ND		1x	2	ND		1x	2	ND		1x	2
Vinyl chloride	ND		1x	2	ND		1x	2	ND		1x	2

ND=Not detected

Table 4-4. Continued.

CRAIGHILL ENTRANCE

Analyte ug/kg	CRE1SED Result	CRE1SED Qual.	CRE1SED Dil.	CRE1SED Limit	CRE2SED Result	CRE2SED Qual.	CRE2SED Dil.	CRE2SED Limit	CRE3SED Result	CRE3SED Qual.	CRE3SED Dil.	CRE3SED Limit
1,1-Dichluroethane	ND		1x	1	ND		1x	1	ND		1x	0.9
1,1-Dichloroethene	ND		1x	1	ND		1x	1	ND		1x	0.9
1,1,1-Trichloroethane	ND		1x	0.8	ND		1x	0.7	ND		1x	0.7
1,1,2-Trichloruethane	ND		1x	2	ND		1x	1	ND		1x	1
1,1,2,2-Tetrachluroethane	ND		1x	1	ND		1x	1	ND		1x	0.9
1,2-Dichloroethane	ND		1x	2	ND		1x	1	ND		1x	1
1,2-Dichloropropane	ND		1x	2	ND		1x	2	ND		1x	2
2-Butanone	ND		1x	2	ND		1x	2	ND		1x	2
2-Chloroethyl vinyl ether	ND		1x	1	ND		1x	1	ND		1x	0.9
Acrolein	ND		1x	12	ND		1x	11	ND		1x	11
Acrylonitrile	ND		1x	8	ND		1x	8	ND		1x	7
Benzene	ND		1x	1	ND		1x	1	ND		1x	0.9
Bromodichloromethane	ND		1x	1	ND		1x	1	ND		1x	1
Bromoform	ND		1x	1	ND		1x	1	ND		1x	0.9
Bromomethane	ND		1x	1	ND		1x	1	ND		1x	1
Carbon tetrachloride	ND		1x	0.5	ND		1x	0.5	ND		1x	0.5
Chlorobenzene	ND		1x	0.8	ND		1x	0.7	ND		1x	0.7
Chloroethane	ND		1x	2	ND		1x	2	ND		1x	2
Chlororform	ND		1x	1	ND		1x	1	ND		1x	0.9
Chloromethane	ND		1x	2	ND		1x	2	ND		1x	2
cis-1,3-Dichloropropene	ND		1x	0.8	ND		1x	0.7	ND		1x	0.7
Dibromochloromethane	ND		1x	2	ND		1x	1	ND		1x	1
Dichlorodifluoromethane	ND		1x	2	ND		1x	1	ND		1x	1
Ethylbenzene	ND		1x	1	ND		1x	1	ND		1x	1
Methylene chloride	ND		1x	2	ND		1x	1	ND		1x	1
Tetrachlorethene	ND		1x	1	ND		1x	1	ND		1x	1
Toluene	ND		1x	0.8	ND		1x	0.7	ND		1x	0.7
trans-1,2-Dichloroethene	ND		1x	2	ND		1x	1	ND		1x	1
trans-1,3-Dichloropropene	ND		1x	1	ND		1x	1	ND		1x	1
Trichloroethene	ND		1x	0.8	ND		1x	0.7	ND		1x	0.7
Trichlorofluoromethane	ND		1x	1	ND		1x	1	ND		1x	1
Vinyl chloride	ND		1x	1	ND		1x	1	ND		1x	0.9

ND=Not detected

Table 4-4. Continued.

CRAIGHILL CHANNEL

Analyte	CR1SED				CR2SED				CR2SEDFD				CR3SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	0.6	ND		1x	0.9	ND		1x	1	ND		1x	1
1,1-Dichloroethene	ND		1x	0.6	ND		1x	0.9	ND		1x	1	ND		1x	1
1,1,1-Trichloroethane	ND		1x	0.4	ND		1x	0.6	ND		1x	1	ND		1x	0.7
1,1,2-Trichloroethane	ND		1x	0.9	ND		1x	1	ND		1x	2	ND		1x	1
1,1,2,2-Tetrachloroethane	ND		1x	0.6	ND		1x	0.9	ND		1x	1	ND		1x	1
1,2-Dichloroethane	ND		1x	0.9	ND		1x	1	ND		1x	2	ND		1x	1
1,2-Dichloropropane	ND		1x	1	ND		1x	1	ND		1x	2	ND		1x	2
2-Butanone	ND		1x	1	ND		1x	2	ND		1x	3	ND		1x	2
2-Chloroethyl vinyl ether	ND		1x	0.6	ND		1x	0.9	ND		1x	1	ND		1x	1
Acrolein	ND		1x	7	ND		1x	10	ND		1x	16	ND		1x	11
Acrylonitrile	ND		1x	4	ND		1x	7	ND		1x	10	ND		1x	8
Benzene	ND		1x	0.6	ND		1x	0.9	ND		1x	1	ND		1x	1
Bromodichloromethane	ND		1x	0.7	ND		1x	1	ND		1x	2	ND		1x	1
Bromoform	ND		1x	0.6	ND		1x	0.9	ND		1x	1	ND		1x	1
Bromomethane	ND		1x	0.7	ND		1x	1	ND		1x	2	ND		1x	1
Carbon tetrachloride	ND		1x	0.3	ND		1x	0.4	ND		1x	0.7	ND		1x	0.5
Chlorobenzene	ND		1x	0.4	ND		1x	0.6	ND		1x	1	ND		1x	0.7
Chloroethane	ND		1x	1	ND		1x	2	ND		1x	3	ND		1x	2
Chlororform	ND		1x	0.6	ND		1x	0.9	ND		1x	1	ND		1x	1
Chloromethane	ND		1x	1	ND		1x	2	ND		1x	3	ND		1x	2
cis-1,3-Dichloropropene	ND		1x	0.4	ND		1x	0.6	ND		1x	1	ND		1x	0.7
Dibromochloromethane	ND		1x	0.9	ND		1x	1	ND		1x	2	ND		1x	1
Dichlorodifluoromethane	ND		1x	0.9	ND		1x	1	ND		1x	2	ND		1x	1
Ethylbenzene	ND		1x	0.7	ND		1x	1	ND		1x	2	ND		1x	1
Methylene chloride	ND		1x	0.9	ND		1x	1	ND		1x	2	ND		1x	1
Tetrachlorethene	ND		1x	0.7	ND		1x	1	ND		1x	2	ND		1x	1
Toluene	ND		1x	0.4	ND		1x	0.6	ND		1x	1	ND		1x	0.7
trans-1,2-Dichloroethene	ND		1x	0.9	ND		1x	1	ND		1x	2	ND		1x	1
trans-1,3-Dichloropropene	ND		1x	0.7	ND		1x	1	ND		1x	2	ND		1x	1
Trichloroethene	ND		1x	0.4	ND		1x	0.6	ND		1x	1	ND		1x	0.7
Trichlorofluoromethane	ND		1x	0.7	ND		1x	1	ND		1x	2	ND		1x	1
Vinyl chloride	ND		1x	0.6	ND		1x	0.9	ND		1x	1	ND		1x	1

ND=Not detected

Table 4-4. Continued.

CRAIGHILL ANGLE

Analyte ug/kg	CRA1SED Result	Qual.	Dil.	Limit	CRA2SED Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	1	ND		1x	1
1,1-Dichloroethene	ND		1x	1	ND		1x	1
1,1,1-Trichloroethane	ND		1x	0.9	ND		1x	1
1,1,2-Trichloroethane	ND		1x	2	ND		1x	2
1,1,2,2-Tetrachloroethane	ND		1x	1	ND		1x	1
1,2-Dichloroethane	ND		1x	2	ND		1x	2
1,2-Dichloropropane	ND		1x	2	ND		1x	3
2-Butanone	140		1x	2	ND		1x	3
2-Chloroethyl vinyl ether	ND		1x	1	ND		1x	1
Acrolein	ND		1x	14	ND		1x	17
Acrylonitrile	ND		1x	9	ND		1x	11
Benzene	ND		1x	1	ND		1x	1
Bromodichloromethane	ND		1x	2	ND		1x	2
Bromoform	ND		1x	1	ND		1x	1
Bromomethane	ND		1x	2	ND		1x	2
Carbon tetrachloride	ND		1x	0.6	ND		1x	0.7
Chlorobenzene	ND		1x	0.9	ND		1x	1
Chloroethane	ND		1x	3	ND		1x	3
Chlororform	ND		1x	1	ND		1x	1
Chloromethane	ND		1x	3	ND		1x	3
cis-1,3-Dichloropropene	ND		1x	0.9	ND		1x	1
Dibromochloromethane	ND		1x	2	ND		1x	2
Dichlorodifluoromethane	ND		1x	2	ND		1x	2
Ethylbenzene	ND		1x	2	ND		1x	2
Methylene chloride	ND		1x	2	ND		1x	2
Tetrachlorethene	ND		1x	2	ND		1x	2
Toluene	ND		1x	0.9	ND		1x	1
trans-1,2-Dichloroethene	ND		1x	2	ND		1x	2
trans-1,3-Dichloropropene	ND		1x	2	ND		1x	2
Trichloroethene	ND		1x	0.9	ND		1x	1
Trichlorofluoromethane	ND		1x	2	ND		1x	2
Vinyl chloride	ND		1x	1	ND		1x	1

ND=Not detected

Table 4-4. Continued.

CRAIGHILL UPPER RANGE

Analyte	CRU1SED				CRU2SED				CRU3SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	1	ND		1x	0.6	ND		1x	0.9
1,1-Dichloroethene	ND		1x	1	ND		1x	0.6	ND		1x	0.9
1,1,1-Trichloroethane	ND		1x	1	ND		1x	0.5	ND		1x	0.7
1,1,2-Trichloroethane	ND		1x	2	ND		1x	1	ND		1x	1
1,1,2,2-Tetrachloroethane	ND		1x	1	ND		1x	0.6	ND		1x	0.9
1,2-Dichloroethane	ND		1x	2	ND		1x	1	ND		1x	1
1,2-Dichloropropane	ND		1x	2	ND		1x	1	ND		1x	2
2-Butanone	ND		1x	3	ND		1x	1	ND		1x	2
2-Chloroethyl vinyl ether	ND		1x	1	ND		1x	0.6	ND		1x	0.9
Acrolein	ND		1x	17	ND		1x	7	ND		1x	11
Acrylonitrile	ND		1x	11	ND		1x	5	ND		1x	7
Benzene	ND		1x	1	ND		1x	0.6	ND		1x	0.9
Bromodichloromethane	ND		1x	2	ND		1x	0.8	ND		1x	1
Bromoform	ND		1x	1	ND		1x	0.6	ND		1x	0.9
Bromomethane	ND		1x	2	ND		1x	0.8	ND		1x	1
Carbon tetrachloride	ND		1x	0.7	ND		1x	0.3	ND		1x	0.5
Chlorobenzene	ND		1x	1	ND		1x	0.5	ND		1x	0.7
Chloroethane	ND		1x	3	ND		1x	1	ND		1x	2
Chlororform	ND		1x	1	ND		1x	0.6	ND		1x	0.9
Chloromethane	ND		1x	3	ND		1x	1	ND		1x	2
cis-1,3-Dichloropropene	ND		1x	1	ND		1x	0.5	ND		1x	0.7
Dibromochloromethane	ND		1x	2	ND		1x	1	ND		1x	1
Dichlorodifluoromethane	ND		1x	2	ND		1x	1	ND		1x	1
Ethylbenzene	ND		1x	2	ND		1x	0.8	ND		1x	1
Methylene chloride	ND		1x	2	ND		1x	1	ND		1x	1
Tetrachlorethene	ND		1x	2	ND		1x	0.8	ND		1x	1
Toluene	ND		1x	1	ND		1x	0.5	ND		1x	0.7
trans-1,2-Dichloroethene	ND		1x	2	ND		1x	1	ND		1x	1
trans-1,3-Dichloropropene	ND		1x	2	ND		1x	0.8	ND		1x	1
Trichloroethene	ND		1x	1	ND		1x	0.5	ND		1x	0.7
Trichlorofluoromethane	ND		1x	2	ND		1x	0.8	ND		1x	1
Vinyl chloride	ND		1x	1	ND		1x	0.6	ND		1x	0.9

ND=Not detected

Table 4-4. Continued.

CUTOFF ANGLE

Analyte	CUT1SED				CUT2SED				CUT3SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	1	ND		1x	2	ND		1x	1
1,1-Dichloroethene	ND		1x	1	ND		1x	2	ND		1x	1
1,1,1-Trichloroethane	ND		1x	1	ND		1x	1	ND		1x	0.9
1,1,2-Trichloroethane	ND		1x	2	ND		1x	2	ND		1x	2
1,1,2,2-Tetrachloroethane	ND		1x	1	ND		1x	2	ND		1x	1
1,2-Dichloroethane	ND		1x	2	ND		1x	2	ND		1x	2
1,2-Dichloropropane	ND		1x	2	ND		1x	3	ND		1x	2
2-Butanone	ND		1x	3	ND		1x	3	ND		1x	2
2-Chloroethyl vinyl ether	ND		1x	1	ND		1x	2	ND		1x	1
Acrolein	ND		1x	16	ND		1x	19	ND		1x	15
Acrylonitrile	ND		1x	10	ND		1x	12	ND		1x	10
Benzene	ND		1x	1	ND		1x	2	ND		1x	1
Bromodichloromethane	ND		1x	2	ND		1x	2	ND		1x	2
Bromoform	ND		1x	1	ND		1x	2	ND		1x	1
Bromomethane	ND		1x	2	ND		1x	2	ND		1x	2
Carbon tetrachloride	ND		1x	0.7	ND		1x	0.8	ND		1x	0.6
Chlorobenzene	ND		1x	1	ND		1x	1	ND		1x	0.9
Chloroethane	ND		1x	3	ND		1x	4	ND		1x	3
Chlororform	ND		1x	1	ND		1x	2	ND		1x	1
Chloromethane	ND		1x	3	ND		1x	4	ND		1x	3
cis-1,3-Dichloropropene	ND		1x	1	ND		1x	1	ND		1x	0.9
Dibromochloromethane	ND		1x	2	ND		1x	2	ND		1x	2
Dichlorodifluoromethane	ND		1x	2	ND		1x	2	ND		1x	2
Ethylbenzene	ND		1x	2	ND		1x	2	ND		1x	2
Methylene chloride	ND		1x	2	ND		1x	2	ND		1x	2
Tetrachlorethene	ND		1x	2	ND		1x	2	ND		1x	2
Toluene	ND		1x	1	ND		1x	1	ND		1x	0.9
trans-1,2-Dichloroethene	ND		1x	2	ND		1x	2	ND		1x	2
trans-1,3-Dichloropropene	ND		1x	2	ND		1x	2	ND		1x	2
Trichloroethene	ND		1x	1	ND		1x	1	ND		1x	0.9
Trichlorofluoromethane	ND		1x	2	ND		1x	2	ND		1x	2
Vinyl chloride	ND		1x	1	ND		1x	2	ND		1x	1

ND=Not detected

Table 4-4. Continued.

TOLCHESTER CHANNEL-VAN VEEN

Analyte	TLC1SED				TLC2SED				TLC2SEDFD				TLC3SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	0.8	ND		1x	0.8	ND		1x	0.9	ND		1x	1
1,1-Dichloroethene	ND		1x	0.8	ND		1x	0.8	ND		1x	0.9	ND		1x	1
1,1,1-Trichloroethane	ND		1x	0.6	ND		1x	0.6	ND		1x	0.7	ND		1x	0.9
1,1,2-Trichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	2
1,1,2,2-Tetrachloroethane	ND		1x	0.8	ND		1x	0.8	ND		1x	0.9	ND		1x	1
1,2-Dichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	2
1,2-Dichloropropane	ND		1x	1	ND		1x	1	ND		1x	2	ND		1x	2
2-Butanone	ND		1x	2	ND		1x	2	88		1x	2	160		1x	2
2-Chloroethyl vinyl ether	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Acrolein	ND		1x	9	ND		1x	10	ND		1x	10	ND		1x	14
Acrylonitrile	ND		1x	6	ND		1x	6	ND		1x	7	ND		1x	9
Benzene	ND		1x	0.8	ND		1x	0.8	ND		1x	0.9	ND		1x	1
Bromodichloromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Bromoform	ND		1x	0.8	ND		1x	0.8	ND		1x	0.9	ND		1x	1
Bromomethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Carbon tetrachloride	ND		1x	0.6	ND		1x	0.6	ND		1x	0.7	ND		1x	0.9
Chlorobenzene	ND		1x	0.6	ND		1x	0.6	ND		1x	0.7	ND		1x	0.9
Chloroethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	3
Chlororform	ND		1x	0.8	ND		1x	0.8	ND		1x	0.9	ND		1x	1
Chloromethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	3
cis-1,3-Dichloropropene	ND		1x	0.6	ND		1x	0.6	ND		1x	0.7	ND		1x	0.9
Dibromochloromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	2
Dichlorodifluoromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	2
Ethylbenzene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Methylene chloride	ND		1x	1	ND		1x	1	ND		1x	2	ND		1x	2
Tetrachlorethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Toluene	ND		1x	0.6	ND		1x	0.6	ND		1x	0.7	ND		1x	0.9
trans-1,2-Dichloroethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	2
trans-1,3-Dichloropropene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Trichloroethene	ND		1x	0.6	ND		1x	0.6	ND		1x	0.7	ND		1x	0.9
Trichlorofluoromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Vinyl chloride	ND		1x	0.8	ND		1x	0.8	ND		1x	0.9	ND		1x	1

ND=Not detected

Table 4-4. Continued.

TOLCHESTER CHANNEL-GRAVITY CORE

Analyte ug/kg	TLV1SED Result	TLV1SED Qual.	TLV1SED Dil.	TLV1SED Limit	TLV2SED Result	TLV2SED Qual.	TLV2SED Dil.	TLV2SED Limit	TLV3SED Result	TLV3SED Qual.	TLV3SED Dil.	TLV3SED Limit	TLV4SED Result	TLV4SED Qual.	TLV4SED Dil.	TLV4SED Limit	TLV5SED Result	TLV5SED Qual.	TLV5SED Dil.	TLV5SED Limit
1,1-Dichloroethane	ND		1x	0.8	ND		1x	0.8	ND		1x	0.8	ND		1x	0.9	ND		1x	0.9
1,1-Dichloroethene	ND		1x	0.8	ND		1x	0.8	ND		1x	0.8	ND		1x	0.9	ND		1x	0.9
1,1,1-Trichloroethane	ND		1x	0.6	ND		1x	0.6	ND		1x	0.6	ND		1x	0.9	ND		1x	0.9
1,1,2-Trichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	0.7	ND		1x	0.7
1,1,2,2-Tetrachloroethane	ND		1x	0.8	ND		1x	0.8	ND		1x	0.8	ND		1x	1	ND		1x	1
1,2-Dichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	0.9	ND		1x	0.9
1,2-Dichloropropane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
2-Butanone	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2-Chloroethyl vinyl ether	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	2	ND		1x	2
Acrolein	ND		1x	10	ND		1x	9	ND		1x	9	ND		1x	1	ND		1x	1
Acrylonitrile	ND		1x	6	ND		1x	6	ND		1x	6	ND		1x	10	ND		1x	10
Benzene	ND		1x	0.8	ND		1x	0.8	ND		1x	0.8	ND		1x	7	ND		1x	7
Bromodichloromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	0.9	ND		1x	0.9
Bromoform	ND		1x	0.8	ND		1x	0.8	ND		1x	0.8	ND		1x	1	ND		1x	1
Bromomethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	0.9	ND		1x	0.9
Carbon tetrachloride	ND		1x	0.6	ND		1x	0.6	ND		1x	0.6	ND		1x	1	ND		1x	1
Chlorobenzene	ND		1x	0.6	ND		1x	0.6	ND		1x	0.6	ND		1x	0.7	ND		1x	0.7
Chloroethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	0.7	ND		1x	0.7
Chlororform	ND		1x	0.8	ND		1x	0.8	ND		1x	0.8	ND		1x	2	ND		1x	2
Chloromethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	0.9	ND		1x	0.9
cis-1,3-Dichloropropene	ND		1x	0.6	ND		1x	0.6	ND		1x	0.6	ND		1x	2	ND		1x	2
Dibromochloromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	0.7	ND		1x	0.7
Dichlorodifluoromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Ethylbenzene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Methylene chloride	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Tetrachlorethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	2	ND		1x	2
Toluene	ND		1x	0.6	ND		1x	0.6	ND		1x	0.6	ND		1x	1	ND		1x	1
trans-1,2-Dichloroethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	0.7	ND		1x	0.7
trans-1,3-Dichloropropene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Trichloroethene	ND		1x	0.6	ND		1x	0.6	ND		1x	0.6	ND		1x	1	ND		1x	1
Trichlorofluoromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	0.7	ND		1x	0.7
Vinyl chloride	ND		1x	0.8	ND		1x	0.8	ND		1x	0.8	ND		1x	1	ND		1x	1

ND=Not detected

Table 4-4. Continued.

BREWERTON EASTERN EXTENSION-VAN VEEN

Analyte	BE1SED				BE2SED				BE3SED				BE4SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	2	ND		1x	1	ND		1x	1	ND		1x	1
1,1-Dichloroethene	ND		1x	2	ND		1x	1	ND		1x	1	ND		1x	1
1,1,1-Trichloroethane	ND		1x	1	ND		1x	0.9	ND		1x	0.9	ND		1x	1
1,1,2-Trichloroethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
1,1,2,2-Tetrachloroethane	ND		1x	2	ND		1x	1	ND		1x	1	ND		1x	1
1,2-Dichloroethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
1,2-Dichloropropane	ND		1x	3	ND		1x	2	ND		1x	2	ND		1x	2
2-Butanone	ND		1x	3	ND		1x	2	ND		1x	2	ND		1x	3
2-Chloroethyl vinyl ether	ND		1x	2	ND		1x	1	ND		1x	1	ND		1x	1
Acrolein	ND		1x	20	ND		1x	14	ND		1x	14	ND	(b)	1x	17
Acrylonitrile	ND		1x	13	ND		1x	9	ND		1x	9	ND		1x	11
Benzene	ND		1x	2	ND		1x	1	ND		1x	1	ND		1x	1
Bromodichloromethane	ND		1x	2	ND		1x	2	ND		1x	1	ND		1x	2
Bromoform	ND		1x	2	ND		1x	1	ND		1x	1	ND		1x	1
Bromomethane	ND		1x	2	ND		1x	2	ND		1x	1	ND		1x	2
Carbon tetrachloride	ND		1x	0.8	ND		1x	0.6	ND		1x	0.6	ND		1x	0.7
Chlorobenzene	ND		1x	1	ND		1x	0.9	ND		1x	0.9	ND		1x	1
Chloroethane	ND		1x	4	ND		1x	3	ND		1x	3	ND		1x	3
Chlororform	ND		1x	2	ND		1x	1	ND		1x	1	ND		1x	1
Chloromethane	ND		1x	4	ND		1x	3	ND		1x	3	ND		1x	3
cis-1,3-Dichloropropene	ND		1x	1	ND		1x	0.9	ND		1x	0.9	ND		1x	1
Dibromochloromethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Dichlorodifluoromethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Ethylbenzene	ND		1x	2	ND		1x	2	ND		1x	1	ND		1x	2
Methylene chloride	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Tetrachlorethene	ND		1x	2	ND		1x	2	ND		1x	1	ND		1x	2
Toluene	ND		1x	1	ND		1x	0.9	ND		1x	0.9	ND		1x	1
trans-1,2-Dichloroethene	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
trans-1,3-Dichloropropene	ND		1x	2	ND		1x	2	ND		1x	1	ND		1x	2
Trichloroethene	ND		1x	1	ND		1x	0.9	ND		1x	0.9	ND		1x	1
Trichlorofluoromethane	ND		1x	2	ND		1x	2	ND		1x	1	ND		1x	2
Vinyl chloride	ND		1x	2	ND		1x	1	ND		1x	1	ND		1x	1

ND=Not detected

(b)=Analyte not recovered in MS/MSD.

Table 4-4. Continued.

BREWERTON EASTERN EXTENSION -GRAVITY CORE

Analyte	BEV1SED				BEV1SEDRE(c)				BEV2SED				BEV2SEDRE(c)				BEV3SED				BEV3SEDRE(c)			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	1	ND		1x	1	ND		1x	0.9	ND		1x	0.9	ND		1x	1	ND		1x	1
1,1-Dichloroethene	ND		1x	1	ND		1x	1	ND		1x	0.9	ND		1x	0.9	ND		1x	1	ND		1x	1
1,1,1-Trichloroethane	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7
1,1,2-Trichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1,2,2-Tetrachloroethane	ND		1x	1	ND		1x	1	ND		1x	0.9	ND		1x	0.9	ND		1x	1	ND		1x	1
1,2-Dichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,2-Dichloropropane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2-Butanone	190		1x	2	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2-Chloroethyl vinyl ether	ND		1x	1	ND		1x	1	ND		1x	0.9	ND		1x	0.9	ND		1x	1	ND		1x	1
Acrolein	ND		1x	11	ND		1x	11	ND		1x	11	ND		1x	11	ND		1x	11	ND		1x	11
Acrylonitrile	ND		1x	7	ND		1x	7	ND		1x	7	ND		1x	7	ND		1x	7	ND		1x	7
Benzene	ND		1x	1	ND		1x	1	ND		1x	0.9	ND		1x	0.9	ND		1x	1	ND		1x	1
Bromodichloromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Bromoform	ND		1x	1	ND		1x	1	ND		1x	0.9	ND		1x	0.9	ND		1x	1	ND		1x	1
Bromomethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Carbon tetrachloride	ND		1x	0.5	ND		1x	0.5	ND		1x	0.5	ND		1x	0.5	ND		1x	0.5	ND		1x	0.5
Chlorobenzene	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7
Chloroethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Chlororform	ND		1x	1	ND		1x	1	ND		1x	0.9	ND		1x	0.9	ND		1x	1	ND		1x	1
Chloromethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
cis-1,3-Dichloropropene	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7
Dibromochloromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Dichlorodifluoromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Ethylbenzene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Methylene chloride	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Tetrachlorethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Toluene	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7
trans-1,2-Dichloroethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
trans-1,3-Dichloropropene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Trichloroethene	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7
Trichlorofluoromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Vinyl chloride	ND		1x	1	ND		1x	1	ND		1x	0.9	ND		1x	0.9	ND		1x	1	ND		1x	1

ND=Not detected
(c)=Sample reanalyzed because recoveries of surrogates were outside of QC limits.

Table 4-4. Continued.

BREWERTON EASTERN EXTENSION -GRAVITY CORE

Analyte	BEV4SED				BEV4SEDRE(c)				BEV5SED				BEV6SED				BEV6SEDRE(c)			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	0.9	ND		1x	0.9	ND		1x	1	ND		1x	1	ND		1x	1
1,1-Dichloroethene	ND		1x	0.9	ND		1x	0.9	ND		1x	1	ND		1x	1	ND		1x	1
1,1,1-Trichloroethane	ND		1x	0.7	ND		1x	0.7	ND		1x	0.8	ND		1x	0.8	ND		1x	0.8
1,1,2-Trichloroethane	ND		1x	1	ND		1x	1	ND		1x	2	ND		1x	2	ND		1x	2
1,1,2,2-Tetrachloroethane	ND		1x	0.9	ND		1x	0.9	ND		1x	1	ND		1x	1	ND		1x	1
1,2-Dichloroethane	ND		1x	1	ND		1x	1	ND		1x	2	ND		1x	2	ND		1x	2
1,2-Dichloropropane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2-Butanone	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2-Chloroethyl vinyl ether	ND		1x	0.9	ND		1x	0.9	ND		1x	1	ND		1x	1	ND		1x	1
Acrolein	ND		1x	10	ND		1x	10	ND		1x	12	ND		1x	12	ND		1x	12
Acrylonitrile	ND		1x	7	ND		1x	7	ND		1x	8	ND		1x	8	ND		1x	8
Benzene	ND		1x	0.9	ND		1x	0.9	ND		1x	1	ND		1x	1	ND		1x	1
Bromodichloromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Bromoform	ND		1x	0.9	ND		1x	0.9	ND		1x	1	ND		1x	1	ND		1x	1
Bromomethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Carbon tetrachloride	ND		1x	0.4	ND		1x	0.4	ND		1x	0.5	ND		1x	0.5	ND		1x	0.5
Chlorobenzene	ND		1x	0.7	ND		1x	0.7	ND		1x	0.8	ND		1x	0.8	ND		1x	0.8
Chloroethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Chlororform	ND		1x	0.9	ND		1x	0.9	ND		1x	1	ND		1x	1	ND		1x	1
Chloromethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
cis-1,3-Dichloropropene	ND		1x	0.7	ND		1x	0.7	ND		1x	0.8	ND		1x	0.8	ND		1x	0.8
Dibromochloromethane	ND		1x	1	ND		1x	1	ND		1x	2	ND		1x	2	ND		1x	2
Dichlorodifluoromethane	ND		1x	1	ND		1x	1	ND		1x	2	ND		1x	2	ND		1x	2
Ethylbenzene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Methylene chloride	ND		1x	1	ND		1x	1	ND		1x	2	ND		1x	2	ND		1x	2
Tetrachlorethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Toluene	ND		1x	0.7	ND		1x	0.7	ND		1x	0.8	ND		1x	0.8	ND		1x	0.8
trans-1,2-Dichloroethene	ND		1x	1	ND		1x	1	ND		1x	2	ND		1x	2	ND		1x	2
trans-1,3-Dichloropropene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Trichloroethene	ND		1x	0.7	ND		1x	0.7	ND		1x	0.8	ND		1x	0.8	ND		1x	0.8
Trichlorofluoromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Vinyl chloride	ND		1x	0.9	ND		1x	0.9	ND		1x	1	ND		1x	1	ND		1x	1

ND=Not detected
(c)=Sample reanalyzed because recoveries of surrogates were outside of QC limits.

Table 4-4. Continued.

BREWERTON REACH

Analyte ug/kg	BR1 SED Result	Qual.	Dil.	Limit	BR2 SED Result	Qual.	Dil.	Limit	BR3 SED Result	Qual.	Dil.	Limit	BR4 SED Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1-Dichloroethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1,1-Trichloroethane	ND		1x	1	ND		1x	0.9	ND		1x	0.9	ND		1x	1
1,1,2-Trichloroethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
1,1,2,2-Tetrachloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,2-Dichloroethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
1,2-Dichloropropane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2-Butanone	ND		1x	3	ND		1x	2	ND		1x	2	ND		1x	3
2-Chloroethyl vinyl ether	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Acrolein	ND		1x	16	ND		1x	15	ND		1x	14	ND	(b)	1x	16
Acrylonitrile	ND		1x	10	ND		1x	10	ND		1x	9	ND		1x	11
Benzene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Bromodichloromethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Bromoform	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Bromomethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Carbon tetrachloride	ND		1x	0.7	ND		1x	0.6	ND		1x	0.6	ND		1x	0.7
Chlorobenzene	ND		1x	1	ND		1x	0.9	ND		1x	0.9	ND		1x	1
Chloroethane	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
Chlororform	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Chloromethane	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
cis-1,3-Dichloropropene	ND		1x	1	ND		1x	0.9	ND		1x	0.9	ND		1x	1
Dibromochloromethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Dichlorodifluoromethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Ethylbenzene	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Methylene chloride	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Tetrachlorethene	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Toluene	ND		1x	1	ND		1x	0.9	ND		1x	0.9	ND		1x	1
trans-1,2-Dichloroethene	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
trans-1,3-Dichloropropene	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Trichloroethene	ND		1x	1	ND		1x	0.9	ND		1x	0.9	ND		1x	1
Trichlorofluoromethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Vinyl chloride	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1

ND=Not detected

(b)=Analyte not recovered in MS/MSD.

Table 4-4. Continued.

BLIND SPLITS

Analyte ug/kg	BLINDSPLIT1A(BR1) Result	Qual.	Dil.	Limit	BLINDSPLIT2A(BR3) Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	1	ND		1x	1
1,1-Dichloroethene	ND		1x	1	ND		1x	1
1,1,1-Trichloroethane	ND		1x	0.9	ND		1x	0.8
1,1,2-Trichloroethane	ND		1x	2	ND		1x	2
1,1,2,2-Tetrachloroethane	ND		1x	1	ND		1x	1
1,2-Dichloroethane	ND		1x	2	ND		1x	2
1,2-Dichloropropane	ND		1x	2	ND		1x	2
2-Butanone	ND		1x	2	120		1x	2
2-Chloroethyl vinyl ether	ND		1x	1	ND		1x	1
Acrolein	ND		1x	14	ND		1x	13
Acrylonitrile	ND		1x	9	ND		1x	8
Benzene	ND		1x	1	ND		1x	1
Bromodichloromethane	ND		1x	2	ND		1x	1
Bromoform	ND		1x	1	ND		1x	1
Bromomethane	ND		1x	2	ND		1x	1
Carbon tetrachloride	ND		1x	0.6	ND		1x	0.5
Chlorobenzene	ND		1x	0.9	ND		1x	0.8
Chloroethane	ND		1x	3	ND		1x	2
Chlororform	ND		1x	1	ND		1x	1
Chloromethane	ND		1x	3	ND		1x	2
cis-1,3-Dichloropropene	ND		1x	0.9	ND		1x	0.8
Dibromochloromethane	ND		1x	2	ND		1x	2
Dichlorodifluoromethane	ND		1x	2	ND		1x	2
Ethylbenzene	ND		1x	2	ND		1x	1
Methylene chloride	ND		1x	2	ND		1x	2
Tetrachlorethene	ND		1x	2	ND		1x	1
Toluene	ND		1x	0.9	ND		1x	0.8
trans-1,2-Dichloroethene	ND		1x	2	ND		1x	2
trans-1,3-Dichloropropene	ND		1x	2	ND		1x	1
Trichloroethene	ND		1x	0.9	ND		1x	0.8
Trichlorofluoromethane	ND		1x	2	ND		1x	1
Vinyl chloride	ND		1x	1	ND		1x	1

ND=Not detected

Table 4-4. Continued.

BREWERTON ANGLE REACH

Analyte ug/kg	BRA1 SED Result	BRA1 SED Qual.	BRA1 SED Dil.	BRA1 SED Limit	BRA1 SEDRE(c) Result	BRA1 SEDRE(c) Qual.	BRA1 SEDRE(c) Dil.	BRA1 SEDRE(c) Limit	BRA2 SED Result	BRA2 SED Qual.	BRA2 SED Dil.	BRA2 SED Limit	BRA2 SEDRE(c) Result	BRA2 SEDRE(c) Qual.	BRA2 SEDRE(c) Dil.	BRA2 SEDRE(c) Limit
1,1-Dichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1-Dichloroethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1,1-Trichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1,2-Trichloroethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
1,1,2,2-Tetrachloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,2-Dichloroethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
1,2-Dichloropropane	ND		1x	3	ND		1x	3	ND		1x	2	ND		1x	2
2-Butanone	320		1x	3	280		1x	3	ND		1x	3	ND		1x	3
2-Chloroethyl vinyl ether	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Acrolein	ND		1x	17	ND		1x	17	ND		1x	17	ND		1x	17
Acrylonitrile	ND		1x	11	ND		1x	11	ND		1x	11	ND		1x	11
Benzene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Bromodichloromethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Bromoform	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Bromomethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Carbon tetrachloride	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7	ND		1x	0.7
Chlorobenzene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Chloroethane	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
Chlororform	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Chloromethane	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
cis-1,3-Dichloropropene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Dibromochloromethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Dichlorodifluoromethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Ethylbenzene	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Methylene chloride	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Tetrachlorethene	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Toluene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
trans-1,2-Dichloroethene	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
trans-1,3-Dichloropropene	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Trichloroethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Trichlorofluoromethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Vinyl chloride	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1

ND=Not detected

(c)=Sample reanalyzed because internal standards were below laboratory QC limit.

Table 4-4. Continued.

FT McHENRY REACH

Analyte	FMH1 SED				FMH2 SED				FMH3 SED				FMH4 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	1	ND		1x	2	ND		1x	1	ND		1x	1
1,1-Dichloroethene	ND		1x	1	ND		1x	2	ND		1x	1	ND		1x	1
1,1,1-Trichloroethane	ND		1x	1	ND		1x	1	ND		1x	0.9	ND		1x	0.8
1,1,2-Trichloroethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
1,1,2,2-Tetrachloroethane	ND		1x	1	ND		1x	2	ND		1x	1	ND		1x	1
1,2-Dichloroethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
1,2-Dichloropropane	ND		1x	2	ND		1x	3	ND		1x	2	ND		1x	2
2-Butanone	ND		1x	3	ND		1x	3	ND		1x	2	ND		1x	2
2-Chloroethyl vinyl ether	ND		1x	1	ND		1x	2	ND		1x	1	ND		1x	1
Acrolein	ND		1x	16	ND		1x	18	ND		1x	14	ND	(b)	1x	12
Acrylonitrile	ND		1x	10	ND		1x	12	ND		1x	9	ND		1x	8
Benzene	ND		1x	1	ND		1x	2	ND		1x	1	ND		1x	1
Bromodichloromethane	ND		1x	2	ND		1x	2	ND		1x	1	ND		1x	1
Bromoform	ND		1x	1	ND		1x	2	ND		1x	1	ND		1x	1
Bromomethane	ND		1x	2	ND		1x	2	ND		1x	1	ND		1x	1
Carbon tetrachloride	ND		1x	0.7	ND		1x	0.8	ND		1x	0.6	ND		1x	0.5
Chlorobenzene	ND		1x	1	ND		1x	1	ND		1x	0.9	ND		1x	0.8
Chloroethane	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	2
Chlororform	ND		1x	1	ND		1x	2	ND		1x	1	ND		1x	1
Chloromethane	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	2
cis-1,3-Dichloropropene	ND		1x	1	ND		1x	1	ND		1x	0.9	ND		1x	0.8
Dibromochloromethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Dichlorodifluoromethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Ethylbenzene	ND		1x	2	ND		1x	2	ND		1x	1	ND		1x	1
Methylene chloride	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Tetrachlorethene	ND		1x	2	ND		1x	2	ND		1x	1	ND		1x	1
Toluene	ND		1x	1	ND		1x	1	ND		1x	0.9	ND		1x	0.8
trans-1,2-Dichloroethene	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
trans-1,3-Dichloropropene	ND		1x	2	ND		1x	2	ND		1x	1	ND		1x	1
Trichloroethene	ND		1x	1	ND		1x	1	ND		1x	0.9	ND		1x	0.8
Trichlorofluoromethane	ND		1x	2	ND		1x	2	ND		1x	1	ND		1x	1
Vinyl chloride	ND		1x	1	ND		1x	2	ND		1x	1	ND		1x	1

ND=Not detected

(b)=Analyte not recovered in MS/MSD

Table 4-4. Continued.

CURTIS BAY REACH

Analyte	CB1 SED				CB2 SED				CB3 SED				CB4 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	2	ND		1x	0.8	ND		1x	2	ND		1x	2
1,1-Dichloroethene	ND		1x	2	ND		1x	0.8	ND		1x	2	ND		1x	2
1,1,1-Trichloroethane	ND		1x	1	ND		1x	0.6	ND		1x	1	ND		1x	1
1,1,2-Trichloroethane	ND		1x	3	ND		1x	1	ND		1x	2	ND		1x	3
1,1,2,2-Tetrachloroethane	ND		1x	2	ND		1x	0.8	ND		1x	2	ND		1x	2
1,2-Dichloroethane	ND		1x	3	ND		1x	1	ND		1x	2	ND		1x	3
1,2-Dichloropropane	ND		1x	3	ND		1x	1	ND		1x	3	ND		1x	3
2-Butanone	ND		1x	3	ND		1x	2	220		1x	3	160		1x	3
2-Chloroethyl vinyl ether	ND		1x	2	ND		1x	0.8	ND		1x	2	ND		1x	2
Acrolein	ND		1x	20	ND		1x	10	ND		1x	19	ND		1x	20
Acrylonitrile	ND		1x	13	ND		1x	6	ND		1x	12	ND		1x	13
Benzene	ND		1x	2	ND		1x	0.8	ND		1x	2	ND		1x	2
Bromodichloromethane	ND		1x	2	ND		1x	1	ND		1x	2	ND		1x	2
Bromoform	ND		1x	2	ND		1x	0.8	ND		1x	2	ND		1x	2
Bromomethane	ND		1x	2	ND		1x	1	ND		1x	2	ND		1x	2
Carbon tetrachloride	ND		1x	0.9	ND		1x	0.4	ND		1x	0.8	ND		1x	0.9
Chlorobenzene	ND		1x	1	ND		1x	0.6	ND		1x	1	ND		1x	1
Chloroethane	ND		1x	4	ND		1x	2	ND		1x	4	ND		1x	4
Chlororform	ND		1x	2	ND		1x	0.8	ND		1x	2	ND		1x	2
Chloromethane	ND		1x	4	ND		1x	2	ND		1x	4	ND		1x	4
cis-1,3-Dichloropropene	ND		1x	1	ND		1x	0.6	ND		1x	1	ND		1x	1
Dibromochloromethane	ND		1x	3	ND		1x	1	ND		1x	2	ND		1x	3
Dichlorodifluoromethane	ND		1x	3	ND		1x	1	ND		1x	2	ND		1x	3
Ethylbenzene	ND		1x	2	ND		1x	1	ND		1x	2	ND		1x	2
Methylene chloride	ND		1x	3	ND		1x	1	ND		1x	2	ND		1x	3
Tetrachlorethene	ND		1x	2	ND		1x	1	ND		1x	2	ND		1x	2
Toluene	ND		1x	1	ND		1x	0.6	ND		1x	1	ND		1x	1
trans-1,2-Dichloroethene	ND		1x	3	ND		1x	1	ND		1x	2	ND		1x	3
trans-1,3-Dichloropropene	ND		1x	2	ND		1x	1	ND		1x	2	ND		1x	2
Trichloroethene	ND		1x	1	ND		1x	0.6	ND		1x	1	ND		1x	1
Trichlorofluoromethane	ND		1x	2	ND		1x	1	ND		1x	2	ND		1x	2
Vinyl chloride	ND		1x	2	ND		1x	0.8	ND		1x	2	ND		1x	2

ND=Not detected

Table 4-4. Continued.

FERRY BAR REACH

Analyte	FB1 SED				FB2 SED				FB3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	2	ND		1x	2	ND		1x	2
1,1-Dichloroethene	ND		1x	2	ND		1x	2	ND		1x	2
1,1,1-Trichloroethane	ND		1x	1	ND		1x	2	ND		1x	1
1,1,2-Trichloroethane	ND		1x	3	ND		1x	3	ND		1x	2
1,1,2,2-Tetrachloroethane	ND		1x	2	ND		1x	2	ND		1x	2
1,2-Dichloroethane	ND		1x	3	ND		1x	3	ND		1x	2
1,2-Dichloropropane	ND		1x	3	ND		1x	4	ND		1x	3
2-Butanone	290		1x	4	350		1x	4	220		1x	3
2-Chloroethyl vinyl ether	ND		1x	2	ND		1x	2	ND		1x	2
Acrolein	ND		1x	21	ND		1x	24	ND		1x	19
Acrylonitrile	ND		1x	14	ND		1x	16	ND		1x	12
Benzene	ND		1x	2	ND		1x	2	ND		1x	2
Bromodichloromethane	ND		1x	2	ND		1x	2	ND		1x	2
Bromoform	ND		1x	2	ND		1x	2	ND		1x	2
Bromomethane	ND		1x	2	ND		1x	2	ND		1x	2
Carbon tetrachloride	ND		1x	0.9	ND		1x	1	ND		1x	0.8
Chlorobenzene	ND		1x	1	ND		1x	2	ND		1x	1
Chloroethane	ND		1x	4	ND		1x	4	ND		1x	4
Chlororform	ND		1x	2	ND		1x	2	ND		1x	2
Chloromethane	ND		1x	4	ND		1x	4	ND		1x	4
cis-1,3-Dichloropropene	ND		1x	1	ND		1x	2	ND		1x	1
Dibromochloromethane	ND		1x	3	ND		1x	3	ND		1x	2
Dichlorodifluoromethane	ND		1x	3	ND		1x	3	ND		1x	2
Ethylbenzene	ND		1x	2	ND		1x	2	ND		1x	2
Methylene chloride	ND		1x	3	ND		1x	3	ND		1x	2
Tetrachlorethene	ND		1x	2	ND		1x	2	ND		1x	2
Toluene	ND		1x	1	ND		1x	2	ND		1x	1
trans-1,2-Dichloroethene	ND		1x	3	ND		1x	3	ND		1x	2
trans-1,3-Dichloropropene	ND		1x	2	ND		1x	2	ND		1x	2
Trichloroethene	ND		1x	1	ND		1x	2	ND		1x	1
Trichlorofluoromethane	ND		1x	2	ND		1x	2	ND		1x	2
Vinyl chloride	ND		1x	2	ND		1x	2	ND		1x	2

ND=Not detected

Table 4-4. Continued.

NORTHWEST BRANCH EAST

Analyte	NBE1 SED				NBE2 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	2	ND		1x	2
1,1-Dichloroethene	ND		1x	2	ND		1x	2
1,1,1-Trichloroethane	ND		1x	1	ND		1x	2
1,1,2-Trichloroethane	ND		1x	3	ND		1x	3
1,1,2,2-Tetrachloroethane	ND		1x	2	ND		1x	2
1,2-Dichloroethane	ND		1x	3	ND		1x	3
1,2-Dichloropropane	ND		1x	3	ND		1x	4
2-Butanone	260		1x	4	330		1x	4
2-Chloroethyl vinyl ether	ND		1x	2	ND		1x	2
Acrolein	ND		1x	21	ND		1x	25
Acrylonitrile	ND		1x	14	ND		1x	16
Benzene	ND		1x	2	ND		1x	2
Bromodichloromethane	ND		1x	2	ND		1x	3
Bromoform	ND		1x	2	ND		1x	2
Bromomethane	ND		1x	2	ND		1x	3
Carbon tetrachloride	ND		1x	0.9	ND		1x	1
Chlorobenzene	ND		1x	1	ND		1x	2
Chloroethane	ND		1x	4	ND		1x	5
Chlororform	ND		1x	2	ND		1x	2
Chloromethane	ND		1x	4	ND		1x	5
cis-1,3-Dichloropropene	ND		1x	1	ND		1x	2
Dibromochloromethane	ND		1x	3	ND		1x	3
Dichlorodifluoromethane	ND		1x	3	ND		1x	3
Ethylbenzene	ND		1x	2	ND		1x	3
Methylene chloride	ND		1x	3	ND		1x	3
Tetrachlorethene	ND		1x	2	ND		1x	3
Toluene	ND		1x	1	ND		1x	2
trans-1,2-Dichloroethene	ND		1x	3	ND		1x	3
trans-1,3-Dichloropropene	ND		1x	2	ND		1x	3
Trichloroethene	ND		1x	1	ND		1x	2
Trichlorofluoromethane	ND		1x	2	ND		1x	3
Vinyl chloride	ND		1x	2	ND		1x	2

ND=Not detected

Table 4-4. Continued.

NORTHWEST BRANCH WEST

Analyte ug/kg	NBW1 SED				NBW2 SED				NBW3 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	1	ND		1x	0.9	ND		1x	2
1,1-Dichloroethene	ND		1x	1	ND		1x	0.9	ND		1x	2
1,1,1-Trichloroethane	ND		1x	0.9	ND		1x	0.7	ND		1x	1
1,1,2-Trichloroethane	ND		1x	2	ND		1x	1	ND		1x	3
1,1,2,2-Tetrachloroethane	ND		1x	1	ND		1x	0.9	ND		1x	2
1,2-Dichloroethane	ND		1x	2	ND		1x	1	ND		1x	3
1,2-Dichloropropane	ND		1x	2	ND		1x	2	ND		1x	3
2-Butanone	ND		1x	2	50		1x	2	350		1x	3
2-Chloroethyl vinyl ether	ND		1x	1	ND		1x	0.9	ND		1x	2
Acrolein	ND		1x	14	ND		1x	11	ND	(b)	1x	20
Acrylonitrile	ND		1x	9	ND		1x	7	ND		1x	13
Benzene	ND		1x	1	ND		1x	0.9	ND		1x	2
Bromodichloromethane	ND		1x	1	ND		1x	1	ND		1x	2
Bromoform	ND		1x	1	ND		1x	0.9	ND		1x	2
Bromomethane	ND		1x	1	ND		1x	1	ND		1x	2
Carbon tetrachloride	ND		1x	0.6	ND		1x	0.5	ND		1x	0.9
Chlorobenzene	ND		1x	0.9	ND		1x	0.7	ND		1x	1
Chloroethane	ND		1x	3	ND		1x	2	ND		1x	4
Chlororform	ND		1x	1	ND		1x	0.9	ND		1x	2
Chloromethane	ND		1x	3	ND		1x	2	ND		1x	4
cis-1,3-Dichloropropene	ND		1x	0.9	ND		1x	0.7	ND		1x	1
Dibromochloromethane	ND		1x	2	ND		1x	1	ND		1x	3
Dichlorodifluoromethane	ND		1x	2	ND		1x	1	ND		1x	3
Ethylbenzene	ND		1x	1	ND		1x	1	ND		1x	2
Methylene chloride	ND		1x	2	ND		1x	1	ND		1x	3
Tetrachlorethene	ND		1x	1	ND		1x	1	ND		1x	2
Toluene	ND		1x	0.9	ND		1x	0.7	ND		1x	1
trans-1,2-Dichloroethene	ND		1x	2	ND		1x	1	ND		1x	3
trans-1,3-Dichloropropene	ND		1x	1	ND		1x	1	ND		1x	2
Trichloroethene	ND		1x	0.9	ND		1x	0.7	ND		1x	1
Trichlorofluoromethane	ND		1x	1	ND		1x	1	ND		1x	2
Vinyl chloride	ND		1x	1	ND		1x	0.9	ND		1x	2

ND=Not detected

(b)=Analyte not recovered in MS/MSD

Table 4-5. Semivolatiles results for Chesapeake Bay and Baltimore Harbor sediments presented by sampling reach.

POPLAR ISLAND

Analyte	PI1 SED				PI2 SED				PI3 SED				PI4 SED				PI5 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	280	ND		1x	900	ND		1x	240	ND		1x	270	ND		1x	300
1,2-Diphenylhydrazine	ND		1x	53	ND		1x	170	ND		1x	46	ND		1x	51	ND		1x	57
1,2,4-Trichlorobenzene	ND		1x	210	ND		1x	670	ND		1x	180	ND		1x	200	ND		1x	220
1,3-Dichlorobenzene	ND		1x	280	ND		1x	900	ND		1x	240	ND		1x	270	ND		1x	300
1,4-Dichlorobenzene	ND		1x	260	ND		1x	860	ND		1x	230	ND		1x	260	ND		1x	290
2-Chloronaphthalene	ND		1x	87	ND		1x	280	ND		1x	76	ND		1x	84	ND		1x	94
2-Chlorophenol	ND		1x	180	ND		1x	570	ND		1x	150	ND		1x	170	ND		1x	190
2-Methyl-4,6-dinitrophenol	ND		1x	91	ND		1x	300	ND		1x	79	ND		1x	89	ND		1x	98
2-Methylphenol	ND		1x	120	ND		1x	400	ND		1x	110	ND		1x	120	ND		1x	130
2-Nitroaniline	ND		1x	85	ND		1x	280	ND		1x	74	ND		1x	83	ND		1x	92
2-Nitrophenol	ND		1x	160	ND		1x	520	ND		1x	140	ND		1x	160	ND		1x	170
2,2'-oxybis(1-Chloropropane)	ND		1x	180	ND		1x	570	ND		1x	150	ND		1x	170	ND		1x	190
2,4-Dichlorophenol	ND		1x	90	ND		1x	290	ND		1x	78	ND		1x	87	ND		1x	97
2,4-Dimethylphenol	ND		1x	240	ND		1x	760	ND		1x	210	ND		1x	230	ND		1x	250
2,4-Dinitrophenol	ND		1x	160	ND		1x	520	ND		1x	140	ND		1x	160	ND		1x	170
2,4-Dinitrotoluene	ND		1x	76	ND		1x	250	ND		1x	67	ND		1x	74	ND		1x	83
2,4,5-Trichlorophenol	ND		1x	47	ND		1x	150	ND		1x	41	ND		1x	46	ND		1x	51
2,4,6-Trichlorophenol	ND		1x	88	ND		1x	290	ND		1x	77	ND		1x	86	ND		1x	95
2,6-Dinitrotoluene	ND		1x	100	ND		1x	330	ND		1x	90	ND		1x	100	ND		1x	110
3-Nitroaniline	ND		1x	310	ND		1x	1000	ND		1x	270	ND		1x	300	ND		1x	340
3+4-Methylphenol	ND		1x	120	ND		1x	380	ND		1x	100	ND		1x	110	ND		1x	130
3,3'-Dichlorobenzidine	ND		1x	430	ND		1x	1400	ND		1x	370	ND		1x	410	ND		1x	460
4-Bromophenyl phenyl ether	ND		1x	46	ND		1x	150	ND		1x	40	ND		1x	44	ND		1x	49
4-Chloro-3-methylphenol	ND		1x	71	ND		1x	230	ND		1x	62	ND		1x	69	ND		1x	76
4-Chloroaniline	ND		1x	390	ND		1x	1300	ND		1x	340	ND		1x	380	ND		1x	420
4-Chlorophenyl phenyl ether	ND		1x	96	ND		1x	310	ND		1x	83	ND		1x	93	ND		1x	100
4-Nitroaniline	ND		1x	130	ND		1x	410	ND		1x	110	ND		1x	120	ND		1x	140
4-Nitrophenol	ND		1x	91	ND		1x	300	ND		1x	79	ND		1x	89	ND		1x	98
Benzidine	ND		1x	410	ND		1x	1300	ND		1x	360	ND		1x	400	ND		1x	440
Benzoic acid	ND		1x	560	ND		1x	1800	ND		1x	490	ND		1x	550	ND		1x	610
Benzyl alcohol	ND		1x	130	ND		1x	430	ND		1x	120	ND		1x	130	ND		1x	140
Benzyl butyl phthalate	ND		1x	130	ND		1x	410	ND		1x	110	ND		1x	120	ND		1x	140
bis(2-Chloroethoxy)methane	ND		1x	120	ND		1x	390	ND		1x	100	ND		1x	120	ND		1x	130
bis(2-Chloroethyl) ether	ND		1x	210	ND		1x	670	ND		1x	180	ND		1x	200	ND		1x	220
bis(2-Ethylhexyl) phthalate	ND		1x	190	ND		1x	620	ND		1x	170	ND		1x	190	ND		1x	210

analyte list continued on following page

ND=Not detected

Table 4-5. Semivolatiles results for Chesapeake Bay and Baltimore Harbor sediments presented by sampling reach.

POPLAR ISLAND

Analyte	P11 SED				P12 SED				P13 SED				P14 SED				P15 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	72	ND		1x	230	ND		1x	63	ND		1x	70	ND		1x	78
Cyclohexanone	ND		1x	290	ND		1x	940	ND		1x	250	ND		1x	280	ND		1x	310
Dibenzofuran	ND		1x	65	ND		1x	210	ND		1x	56	ND		1x	63	ND		1x	70
Diethyl phthalate	ND		1x	71	ND		1x	230	ND		1x	62	ND		1x	69	ND		1x	76
Dimethyl phthalate	ND		1x	60	ND		1x	200	ND		1x	53	ND		1x	59	ND		1x	65
Di-n-butyl phthalate	ND		1x	72	660		1x	230	180		1x	63	150		1x	70	ND		1x	78
Di-n-octyl phthalate	ND		1x	50	ND		1x	160	ND		1x	44	ND		1x	49	ND		1x	54
Hexachlorobenzene	ND		1x	88	ND		1x	290	ND		1x	77	ND		1x	86	ND		1x	95
Hexachlorobutadiene	ND		1x	220	ND		1x	710	ND		1x	190	ND		1x	210	ND		1x	240
Hexachlorocyclopentadiene	ND		1x	110	ND		1x	350	ND		1x	95	ND		1x	110	ND		1x	120
Hexachloroethane	ND		1x	260	ND		1x	860	ND		1x	230	ND		1x	260	ND		1x	290
Isophorone	ND		1x	110	ND		1x	360	ND		1x	97	ND		1x	110	ND		1x	120
Nitrobenzene	ND		1x	180	ND		1x	570	ND		1x	150	ND		1x	170	ND		1x	190
N-Nitrosodimethylamine	ND		1x	240	ND		1x	760	ND		1x	210	ND		1x	230	ND		1x	250
N-Nitrosodi-n-propylamine	ND		1x	120	ND		1x	380	ND		1x	100	ND		1x	110	ND		1x	130
N-Nitrosodiphenylamine	ND		1x	90	ND		1x	290	ND		1x	78	ND		1x	87	ND		1x	97
Pentachlorophenol	ND		1x	100	ND		1x	330	ND		1x	88	ND		1x	99	ND		1x	110
Phenol	ND		1x	130	ND		1x	430	ND		1x	120	ND		1x	130	140	J	1x	140
Pyridine	ND		1x	170	ND		1x	560	ND		1x	150	ND		1x	170	ND		1x	190

Table 4-5. Continued

DEEP TROUGH

Analyte	DT1 SED				DT2 SED				DT3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	950	ND		1x	410	ND		1x	900
1,2-Diphenylhydrazine	ND		1x	180	ND		1x	78	ND		1x	170
1,2,4-Trichlorobenzene	ND		1x	700	ND		1x	300	ND		1x	670
1,3-Dichlorobenzene	ND		1x	950	ND		1x	410	ND		1x	900
1,4-Dichlorobenzene	ND		1x	900	ND		1x	390	ND		1x	860
2-Chloronaphthalene	ND		1x	300	ND		1x	130	ND		1x	280
2-Chlorophenol	ND		1x	600	ND		1x	260	ND		1x	570
2-Methyl-4,6-dinitrophenol	ND		1x	310	ND		1x	130	ND		1x	300
2-Methylphenol	ND		1x	420	ND		1x	180	ND		1x	400
2-Nitroaniline	ND		1x	290	ND		1x	130	ND		1x	280
2-Nitrophenol	ND		1x	550	ND		1x	240	ND		1x	520
2,2'-oxybis(1-Chloropropane)	ND		1x	600	ND		1x	260	ND		1x	570
2,4-Dichlorophenol	ND		1x	300	ND		1x	130	ND		1x	290
2,4-Dimethylphenol	ND		1x	800	ND		1x	350	ND		1x	760
2,4-Dinitrophenol	ND		1x	550	ND		1x	240	ND		1x	520
2,4-Dinitrotoluene	ND		1x	260	ND		1x	110	ND		1x	250
2,4,5-Trichlorophenol	ND		1x	160	ND		1x	70	ND		1x	150
2,4,6-Trichlorophenol	ND		1x	300	ND		1x	130	ND		1x	290
2,6-Dinitrotoluene	ND		1x	350	ND		1x	150	ND		1x	330
3-Nitroaniline	ND		1x	1100	ND		1x	460	ND		1x	1000
3+4-Methylphenol	ND		1x	400	ND		1x	170	740		1x	380
3,3'-Dichlorobenzidine	ND		1x	1400	ND		1x	630	ND		1x	1400
4-Bromophenyl phenyl ether	ND		1x	160	ND		1x	67	ND		1x	150
4-Chloro-3-methylphenol	ND		1x	240	ND		1x	100	ND		1x	230
4-Chloroaniline	ND		1x	1300	ND		1x	580	ND		1x	1300
4-Chlorophenyl phenyl ether	ND		1x	320	ND		1x	140	ND		1x	310
4-Nitroaniline	ND		1x	430	ND		1x	190	ND		1x	410
4-Nitrophenol	ND		1x	310	ND		1x	130	ND		1x	300
Benzidine	ND		1x	1400	ND		1x	610	ND		1x	1300
Benzoic acid	ND		1x	1900	ND		1x	830	ND		1x	1800
Benzyl alcohol	ND		1x	450	ND		1x	200	ND		1x	430
Benzyl butyl phthalate	ND		1x	430	ND		1x	190	ND		1x	410
bis(2-Chloroethoxy)methane	ND		1x	400	ND		1x	180	ND		1x	390
bis(2-Chloroethyl) ether	ND		1x	700	ND		1x	300	ND		1x	670
bis(2-Ethylhexyl) phthalate	ND		1x	650	ND		1x	280	ND		1x	620

analyte list continued on following page

ND=Not detected

Table 4-5. Continued

DEEP TROUGH

Analyte ug/kg	DT1 SED				DT2 SED				DT3 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	240	ND		1x	110	ND		1x	230
Cyclohexanone	ND		1x	990	ND		1x	430	ND		1x	940
Dibenzofuran	ND		1x	220	ND		1x	96	ND		1x	210
Diethyl phthalate	ND		1x	240	ND		1x	100	ND		1x	230
Dimethyl phthalate	ND		1x	200	ND		1x	89	ND		1x	200
Di-n-butyl phthalate	ND		1x	240	190		1x	110	ND		1x	230
Di-n-octyl phthalate	ND		1x	170	ND		1x	74	ND		1x	160
Hexachlorobenzene	ND		1x	300	ND		1x	130	ND		1x	290
Hexachlorobutadiene	ND		1x	750	ND		1x	330	ND		1x	710
Hexachlorocyclopentadiene	ND		1x	370	ND		1x	160	ND		1x	350
Hexachloroethane	ND		1x	900	ND		1x	390	ND		1x	860
Isophorone	ND		1x	380	ND		1x	170	ND		1x	360
Nitrobenzene	ND		1x	600	ND		1x	260	ND		1x	570
N-Nitrosodimethylamine	ND		1x	800	ND		1x	350	ND		1x	760
N-Nitrosodi-n-propylamine	ND		1x	400	ND		1x	170	ND		1x	380
N-Nitrosodiphenylamine	ND		1x	300	ND		1x	130	ND		1x	290
Pentachlorophenol	ND		1x	340	ND		1x	150	ND		1x	330
Phenol	ND		1x	460	ND		1x	200	ND		1x	430
Pyridine	ND		1x	590	ND		1x	260	ND		1x	560

Table 4-5. Continued

KENT ISLAND DEEP

Analyte	KI1 SED				KI2 SED				KI3SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	250	ND		1x	560	ND		1x	280
1,2-Diphenylhydrazine	ND		1x	48	ND		1x	110	ND		1x	52
1,2,4-Trichlorobenzene	ND		1x	190	ND		1x	410	ND		1x	200
1,3-Dichlorobenzene	ND		1x	250	ND		1x	560	ND		1x	280
1,4-Dichlorobenzene	ND		1x	240	ND		1x	530	ND		1x	260
2-Chloronaphthalene	ND		1x	79	ND		1x	170	ND		1x	86
2-Chlorophenol	ND		1x	160	ND		1x	350	ND		1x	170
2-Methyl-4,6-dinitrophenol	ND		1x	83	ND		1x	180	ND		1x	90
2-Methylphenol	ND		1x	110	ND		1x	250	ND		1x	120
2-Nitroaniline	ND		1x	77	ND		1x	170	ND		1x	84
2-Nitrophenol	ND		1x	150	ND		1x	320	ND		1x	160
2,2'-oxybis(1-Chloropropane)	ND		1x	160	ND		1x	350	ND		1x	170
2,4-Dichlorophenol	ND		1x	81	ND		1x	180	ND		1x	88
2,4-Dimethylphenol	ND		1x	210	ND		1x	470	ND		1x	230
2,4-Dinitrophenol	ND		1x	150	ND		1x	320	ND		1x	160
2,4-Dinitrotoluene	ND		1x	69	ND		1x	150	ND		1x	75
2,4,5-Trichlorophenol	ND		1x	43	ND		1x	94	ND		1x	46
2,4,6-Trichlorophenol	ND		1x	80	ND		1x	180	ND		1x	87
2,6-Dinitrotoluene	ND		1x	93	ND		1x	210	ND		1x	100
3-Nitroaniline	ND		1x	280	ND		1x	630	ND		1x	310
3+4-Methylphenol	ND		1x	110	390		1x	240	ND		1x	120
3,3'-Dichlorobenzidine	ND		1x	390	ND		1x	850	ND		1x	420
4-Bromophenyl phenyl ether	ND		1x	41	ND		1x	91	ND		1x	45
4-Chloro-3-methylphenol	ND		1x	64	ND		1x	140	ND		1x	70
4-Chloroaniline	ND		1x	350	ND		1x	780	ND		1x	390
4-Chlorophenyl phenyl ether	ND		1x	87	ND		1x	190	ND		1x	94
4-Nitroaniline	ND		1x	110	ND		1x	250	ND		1x	120
4-Nitrophenol	ND		1x	83	ND		1x	180	ND		1x	90
Benzidine	ND		1x	370	ND		1x	820	ND		1x	410
Benzoic acid	ND		1x	510	ND		1x	1100	ND		1x	560
Benzyl alcohol	ND		1x	120	ND		1x	260	ND		1x	130
Benzyl butyl phthalate	ND		1x	110	ND		1x	250	ND		1x	120
bis(2-Chloroethoxy)methane	ND		1x	110	ND		1x	240	ND		1x	120
bis(2-Chloroethyl) ether	ND		1x	190	ND		1x	410	ND		1x	200
bis(2-Ethylhexyl) phthalate	ND		1x	170	ND		1x	380	ND		1x	190

analyte list continued on following page

ND=Not detected

Table 4-5. Continued

KENT ISLAND DEEP

Analyte ug/kg	KI1 SED Result	KI1 SED Qual.	KI1 SED Dil.	KI1 SED Limit	KI2 SED Result	KI2 SED Qual.	KI2 SED Dil.	KI2 SED Limit	KI3SED Result	KI3SED Qual.	KI3SED Dil.	KI3SED Limit
Carbazole	ND		1x	65	ND		1x	140	ND		1x	71
Cyclohexanone	ND		1x	260	ND		1x	580	ND		1x	290
Dibenzofuran	ND		1x	59	ND		1x	130	ND		1x	64
Diethyl phthalate	ND		1x	64	ND		1x	140	ND		1x	70
Dimethyl phthalate	ND		1x	55	ND		1x	120	ND		1x	59
Di-n-butyl phthalate	ND		1x	65	ND		1x	140	ND		1x	71
Di-n-octyl phthalate	ND		1x	45	ND		1x	100	ND		1x	49
Hexachlorobenzene	ND		1x	80	ND		1x	180	ND		1x	87
Hexachlorobutadiene	ND		1x	200	ND		1x	440	ND		1x	220
Hexachlorocyclopentadiene	ND		1x	99	ND		1x	220	ND		1x	110
Hexachloroethane	ND		1x	240	ND		1x	530	ND		1x	260
Isophorone	ND		1x	100	ND		1x	220	ND		1x	110
Nitrobenzene	ND		1x	160	ND		1x	350	ND		1x	170
N-Nitrosodimethylamine	ND		1x	210	ND		1x	470	ND		1x	230
N-Nitrosodi-n-propylamine	ND		1x	110	ND		1x	230	ND		1x	110
N-Nitrosodiphenylamine	ND		1x	81	ND		1x	180	ND		1x	88
Pentachlorophenol	ND		1x	92	ND		1x	200	ND		1x	100
Phenol	ND		1x	120	ND		1x	270	ND		1x	130
Pyridine	ND		1x	160	ND		1x	350	ND		1x	170

Table 4-5. Continued

POOLES ISLAND

Analyte ug/kg	POLISED Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	480
1,2-Diphenylhydrazine	ND		1x	90
1,2,4-Trichlorobenzene	ND		1x	350
1,3-Dichlorobenzene	ND		1x	480
1,4-Dichlorobenzene	ND		1x	450
2-Chloronaphthalene	ND		1x	150
2-Chlorophenol	ND		1x	300
2-Methyl-4,6-dinitrophenol	ND		1x	160
2-Methylphenol	ND		1x	210
2-Nitroaniline	ND		1x	140
2-Nitrophenol	ND		1x	280
2,2'-oxybis(1-Chloropropane)	ND		1x	300
2,4-Dichlorophenol	ND		1x	150
2,4-Dimethylphenol	ND		1x	400
2,4-Dinitrophenol	ND		1x	280
2,4-Dinitrotoluene	ND		1x	130
2,4,5-Trichlorophenol	ND		1x	80
2,4,6-Trichlorophenol	ND		1x	150
2,6-Dinitrotoluene	ND		1x	180
3-Nitroaniline	ND		1x	530
3+4-Methylphenol	ND		1x	200
3,3'-Dichlorobenzidine	ND		1x	720
4-Bromophenyl phenyl ether	ND		1x	78
4-Chloro-3-methylphenol	ND		1x	120
4-Chloroaniline	ND		1x	660
4-Chlorophenyl phenyl ether	ND		1x	160
4-Nitroaniline	ND		1x	220
4-Nitrophenol	ND		1x	160
Benzidine	ND		1x	700
Benzoic acid	ND		1x	960
Benzyl alcohol	ND		1x	220
Benzyl butyl phthalate	ND		1x	220
bis(2-Chloroethoxy)methane	ND		1x	200
bis(2-Chloroethyl) ether	ND		1x	350
bis(2-Ethylhexyl) phthalate	ND		1x	320

analyte list continued on following page

ND=Not detected

Table 4-5. Continued

POOLES ISLAND

Analyte ug/kg	POLISED Result	Qual.	Dil.	Limit
Carbazole	ND		1x	120
Cyclohexanone	ND		1x	500
Dibenzofuran	ND		1x	110
Diethyl phthalate	ND		1x	120
Dimethyl phthalate	ND		1x	100
Di-n-butyl phthalate	ND		1x	120
Di-n-octyl phthalate	ND		1x	85
Hexachlorobenzene	ND		1x	150
Hexachlorobutadiene	ND		1x	380
Hexachlorocyclopentadiene	ND		1x	180
Hexachloroethane	ND		1x	450
Isophorone	ND		1x	190
Nitrobenzene	ND		1x	300
N-Nitrosodimethylamine	ND		1x	400
N-Nitrosodi-n-propylamine	ND		1x	200
N-Nitrosodiphenylamine	ND		1x	150
Pentachlorophenol	ND		1x	170
Phenol	ND		1x	230
Pyridine	ND		1x	300

Table 4-5. Continued

SWAN POINT CHANNEL

Analyte ug/kg	SWP1 SED Result	Qual.	Dil.	Limit	SWP2 SED Result	Qual.	Dil.	Limit	SWP3 SED Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	440	ND		1x	830	ND		1x	760
1,2-Diphenylhydrazine	ND		1x	84	ND		1x	160	ND		1x	140
1,2,4-Trichlorobenzene	ND		1x	330	ND		1x	610	ND		1x	560
1,3-Dichlorobenzene	ND		1x	440	ND		1x	830	ND		1x	760
1,4-Dichlorobenzene	ND		1x	420	ND		1x	780	ND		1x	720
2-Chloronaphthalene	ND		1x	140	ND		1x	260	ND		1x	240
2-Chlorophenol	ND		1x	280	ND		1x	520	ND		1x	480
2-Methyl-4,6-dinitrophenol	ND		1x	140	ND		1x	270	ND		1x	250
2-Methylphenol	ND		1x	200	ND		1x	370	ND		1x	340
2-Nitroaniline	ND		1x	130	ND		1x	250	ND		1x	230
2-Nitrophenol	ND		1x	260	ND		1x	480	ND		1x	440
2,2'-oxybis(1-Chloropropane)	ND		1x	280	ND		1x	520	ND		1x	480
2,4-Dichlorophenol	ND		1x	140	ND		1x	270	ND		1x	240
2,4-Dimethylphenol	ND		1x	370	ND		1x	700	ND		1x	640
2,4-Dinitrophenol	ND		1x	260	ND		1x	480	ND		1x	440
2,4-Dinitrotoluene	ND		1x	120	ND		1x	230	ND		1x	210
2,4,5-Trichlorophenol	ND		1x	74	ND		1x	140	ND		1x	130
2,4,6-Trichlorophenol	ND		1x	140	ND		1x	260	ND		1x	240
2,6-Dinitrotoluene	ND		1x	160	ND		1x	300	ND		1x	280
3-Nitroaniline	ND		1x	500	ND		1x	930	ND		1x	850
3+4-Methylphenol	170	J	1x	190	310	J	1x	350	310	J	1x	320
3,3'-Dichlorobenzidine	ND		1x	670	ND		1x	1300	ND		1x	1200
4-Bromophenyl phenyl ether	ND		1x	72	ND		1x	130	ND		1x	120
4-Chloro-3-methylphenol	ND		1x	110	ND		1x	210	ND		1x	190
4-Chloroaniline	ND		1x	620	ND		1x	1200	ND		1x	1100
4-Chlorophenyl phenyl ether	ND		1x	150	ND		1x	280	ND		1x	260
4-Nitroaniline	ND		1x	200	ND		1x	370	ND		1x	340
4-Nitrophenol	ND		1x	140	ND		1x	270	ND		1x	250
Benzidine	ND		1x	650	ND		1x	1200	ND		1x	1100
Benzoic acid	ND		1x	890	ND		1x	1700	ND		1x	1500
Benzyl alcohol	ND		1x	210	ND		1x	390	ND		1x	360
Benzyl butyl phthalate	ND		1x	200	ND		1x	370	ND		1x	340
bis(2-Chloroethoxy)methane	ND		1x	190	ND		1x	350	ND		1x	320
bis(2-Chloroethyl) ether	ND		1x	330	ND		1x	610	ND		1x	560
bis(2-Ethylhexyl) phthalate	ND		1x	300	ND		1x	570	ND		1x	520

analyte list continued on following page

ND=Not detected J=Estimated

Table 4-5. Continued

SWAN POINT CHANNEL

Analyte ug/kg	SWP1 SED				SWP2 SED				SWP3 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	110	ND		1x	210	ND		1x	200
Cyclohexanone	ND		1x	460	ND		1x	860	ND		1x	790
Dibenzofuran	ND		1x	100	ND		1x	190	ND		1x	180
Diethyl phthalate	ND		1x	110	ND		1x	210	ND		1x	190
Dimethyl phthalate	ND		1x	95	ND		1x	180	ND		1x	160
Di-n-butyl phthalate	ND		1x	110	ND		1x	210	ND		1x	200
Di-n-octyl phthalate	ND		1x	79	ND		1x	150	ND		1x	140
Hexachlorobenzene	ND		1x	140	ND		1x	260	ND		1x	240
Hexachlorobutadiene	ND		1x	350	ND		1x	650	ND		1x	600
Hexachlorocyclopentadiene	ND		1x	170	ND		1x	320	ND		1x	300
Hexachloroethane	ND		1x	420	ND		1x	780	ND		1x	720
Isophorone	ND		1x	180	ND		1x	330	ND		1x	300
Nitrobenzene	ND		1x	280	ND		1x	520	ND		1x	480
N-Nitrosodimethylamine	ND		1x	370	ND		1x	700	ND		1x	640
N-Nitrosodi-n-propylamine	ND		1x	180	ND		1x	340	ND		1x	320
N-Nitrosodiphenylamine	ND		1x	140	ND		1x	270	ND		1x	240
Pentachlorophenol	ND		1x	160	ND		1x	300	ND		1x	280
Phenol	ND		1x	210	ND		1x	400	ND		1x	360
Pyridine	ND		1x	270	ND		1x	510	ND		1x	470

Table 4-5. Continued

CRAIGHILL ENTRANCE

Analyte ug/kg	CRE1 SED Result	Qual.	Dil.	Limit	CRE2 SED Result	Qual.	Dil.	Limit	CRE3 SED Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	490	ND		1x	460	ND		1x	440
1,2-Diphenylhydrazine	ND		1x	92	ND		1x	88	ND		1x	84
1,2,4-Trichlorobenzene	ND		1x	360	ND		1x	340	ND		1x	330
1,3-Dichlorobenzene	ND		1x	490	ND		1x	460	ND		1x	440
1,4-Dichlorobenzene	ND		1x	460	ND		1x	440	ND		1x	420
2-Chloronaphthalene	ND		1x	150	ND		1x	140	ND		1x	140
2-Chlorophenol	ND		1x	310	ND		1x	290	ND		1x	280
2-Methyl-4,6-dinitrophenol	ND		1x	160	ND		1x	150	ND		1x	140
2-Methylphenol	ND		1x	220	ND		1x	200	ND		1x	200
2-Nitroaniline	ND		1x	150	ND		1x	140	ND		1x	130
2-Nitrophenol	ND		1x	280	ND		1x	270	ND		1x	260
2,2'-oxybis(1-Chloropropane)	ND		1x	310	ND		1x	290	ND		1x	280
2,4-Dichlorophenol	ND		1x	160	ND		1x	150	ND		1x	140
2,4-Dimethylphenol	ND		1x	410	ND		1x	390	ND		1x	370
2,4-Dinitrophenol	ND		1x	280	ND		1x	270	ND		1x	260
2,4-Dinitrotoluene	ND		1x	130	ND		1x	130	ND		1x	120
2,4,5-Trichlorophenol	ND		1x	82	ND		1x	78	ND		1x	74
2,4,6-Trichlorophenol	ND		1x	150	ND		1x	150	ND		1x	140
2,6-Dinitrotoluene	ND		1x	180	ND		1x	170	ND		1x	160
3-Nitroaniline	ND		1x	550	ND		1x	520	ND		1x	500
3+4-Methylphenol	ND		1x	210	ND		1x	200	ND		1x	190
3,3'-Dichlorobenzidine	ND		1x	740	ND		1x	710	ND		1x	670
4-Bromophenyl phenyl ether	ND		1x	79	ND		1x	76	ND		1x	72
4-Chloro-3-methylphenol	ND		1x	120	ND		1x	120	ND		1x	110
4-Chloroaniline	ND		1x	680	ND		1x	650	ND		1x	620
4-Chlorophenyl phenyl ether	ND		1x	170	ND		1x	160	ND		1x	150
4-Nitroaniline	ND		1x	220	ND		1x	210	ND		1x	200
4-Nitrophenol	ND		1x	160	ND		1x	150	ND		1x	140
Benzidine	ND		1x	720	ND		1x	680	ND		1x	650
Benzoic acid	ND		1x	980	ND		1x	940	ND		1x	890
Benzyl alcohol	ND		1x	230	ND		1x	220	ND		1x	210
Benzyl butyl phthalate	ND		1x	220	ND		1x	210	ND		1x	200
bis(2-Chloroethoxy)methane	ND		1x	210	ND		1x	200	ND		1x	190
bis(2-Chloroethyl) ether	ND		1x	360	ND		1x	340	ND		1x	330
bis(2-Ethylhexyl) phthalate	ND		1x	330	ND		1x	320	ND		1x	300

analyte list continued on following page

ND=Not detected

Table 4-5. Continued

CRAIGHILL ENTRANCE

Analyte ug/kg	CRE1 SED Result	Qual.	Dil.	Limit	CRE2 SED Result	Qual.	Dil.	Limit	CRE3 SED Result	Qual.	Dil.	Limit
Carbazole	ND		1x	130	ND		1x	120	ND		1x	110
Cyclohexanone	ND		1x	510	ND		1x	480	ND		1x	460
Dibenzofuran	ND		1x	110	ND		1x	110	ND		1x	100
Diethyl phthalate	ND		1x	120	ND		1x	120	ND		1x	110
Dimethyl phthalate	ND		1x	110	ND		1x	100	ND		1x	95
Di-n-butyl phthalate	270		1x	130	ND		1x	120	ND		1x	110
Di-n-octyl phthalate	ND		1x	87	ND		1x	83	ND		1x	79
Hexachlorobenzene	ND		1x	150	ND		1x	150	ND		1x	140
Hexachlorobutadiene	ND		1x	380	ND		1x	370	ND		1x	350
Hexachlorocyclopentadiene	ND		1x	190	ND		1x	180	ND		1x	170
Hexachloroethane	ND		1x	460	ND		1x	440	ND		1x	420
Isophorone	ND		1x	190	ND		1x	190	ND		1x	180
Nitrobenzene	ND		1x	310	ND		1x	290	ND		1x	280
N-Nitrosodimethylamine	ND		1x	410	ND		1x	390	ND		1x	370
N-Nitrosodi-n-propylamine	ND		1x	200	ND		1x	190	ND		1x	180
N-Nitrosodiphenylamine	ND		1x	160	ND		1x	150	ND		1x	140
Pentachlorophenol	ND		1x	180	ND		1x	170	ND		1x	160
Phenol	ND		1x	230	ND		1x	220	ND		1x	210
Pyridine	ND		1x	300	ND		1x	290	ND		1x	270

Table 4-5. Continued

CRAIGHILL CHANNEL

Analyte	CR1 SED				CR2 SED				CR2FD SED				CR3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	280	ND		1x	400	ND		1x	630	ND		1x	460
1,2-Diphenylhydrazine	ND		1x	52	ND		1x	77	ND		1x	120	ND		1x	88
1,2,4-Trichlorobenzene	ND		1x	200	ND		1x	300	ND		1x	470	ND		1x	340
1,3-Dichlorobenzene	ND		1x	280	ND		1x	400	ND		1x	630	ND		1x	460
1,4-Dichlorobenzene	ND		1x	260	ND		1x	380	ND		1x	600	ND		1x	440
2-Chloronaphthalene	ND		1x	86	ND		1x	130	ND		1x	200	ND		1x	140
2-Chlorophenol	ND		1x	170	ND		1x	260	ND		1x	400	ND		1x	290
2-Methyl-4,6-dinitrophenol	ND		1x	90	ND		1x	130	ND		1x	210	ND		1x	150
2-Methylphenol	ND		1x	120	ND		1x	180	ND		1x	280	ND		1x	200
2-Nitroaniline	ND		1x	84	ND		1x	120	ND		1x	190	ND		1x	140
2-Nitrophenol	ND		1x	160	ND		1x	230	ND		1x	370	ND		1x	270
2,2'-oxybis(1-Chloropropane)	ND		1x	170	ND		1x	260	ND		1x	400	ND		1x	290
2,4-Dichlorophenol	ND		1x	88	ND		1x	130	ND		1x	200	ND		1x	150
2,4-Dimethylphenol	ND		1x	230	ND		1x	340	ND		1x	530	ND		1x	390
2,4-Dinitrophenol	ND		1x	160	ND		1x	230	ND		1x	370	ND		1x	270
2,4-Dinitrotoluene	ND		1x	75	ND		1x	110	ND		1x	170	ND		1x	130
2,4,5-Trichlorophenol	ND		1x	46	ND		1x	68	ND		1x	110	ND		1x	78
2,4,6-Trichlorophenol	ND		1x	87	ND		1x	130	ND		1x	200	ND		1x	150
2,6-Dinitrotoluene	ND		1x	100	ND		1x	150	ND		1x	230	ND		1x	170
3-Nitroaniline	ND		1x	310	ND		1x	450	ND		1x	710	ND		1x	520
3+4-Methylphenol	ND		1x	120	ND		1x	170	940		1x	270	ND		1x	200
3,3'-Dichlorobenzidine	ND		1x	420	ND		1x	620	ND		1x	970	ND		1x	710
4-Bromophenyl phenyl ether	ND		1x	45	ND		1x	66	ND		1x	100	ND		1x	76
4-Chloro-3-methylphenol	ND		1x	70	ND		1x	100	ND		1x	160	ND		1x	120
4-Chloroaniline	ND		1x	390	ND		1x	570	ND		1x	890	ND		1x	650
4-Chlorophenyl phenyl ether	ND		1x	94	ND		1x	140	ND		1x	220	ND		1x	160
4-Nitroaniline	ND		1x	120	ND		1x	180	ND		1x	290	ND		1x	210
4-Nitrophenol	ND		1x	90	ND		1x	130	ND		1x	210	ND		1x	150
Benzidine	ND		1x	410	ND		1x	600	ND		1x	930	ND		1x	680
Benzoic acid	ND		1x	560	ND		1x	820	ND		1x	1300	ND		1x	940
Benzyl alcohol	ND		1x	130	ND		1x	190	ND		1x	300	ND		1x	220
Benzyl butyl phthalate	ND		1x	120	ND		1x	180	ND		1x	290	ND		1x	210
bis(2-Chloroethoxy)methane	ND		1x	120	ND		1x	170	ND		1x	270	ND		1x	200
bis(2-Chloroethyl) ether	ND		1x	200	ND		1x	300	ND		1x	470	ND		1x	340
bis(2-Ethylhexyl) phthalate	ND		1x	190	ND		1x	280	ND		1x	430	ND		1x	320

analyte list continued on following page

ND=Not detected

Table 4-5. Continued

CRAIGHILL CHANNEL

Analyte	CR1 SED				CR2 SED				CR2FD SED				CR3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	71	ND		1x	100	ND		1x	160	ND		1x	120
Cyclohexanone	ND		1x	290	ND		1x	420	ND		1x	660	ND		1x	480
Dibenzofuran	ND		1x	64	ND		1x	94	ND		1x	150	ND		1x	110
Diethyl phthalate	ND		1x	70	ND		1x	100	ND		1x	160	ND		1x	120
Dimethyl phthalate	ND		1x	59	ND		1x	87	ND		1x	140	ND		1x	100
Di-n-butyl phthalate	780		1x	71	1100		1x	100	ND		1x	160	ND		1x	120
Di-n-octyl phthalate	ND		1x	49	ND		1x	72	ND		1x	110	ND		1x	83
Hexachlorobenzene	ND		1x	87	ND		1x	130	ND		1x	200	ND		1x	150
Hexachlorobutadiene	ND		1x	220	ND		1x	320	ND		1x	500	ND		1x	370
Hexachlorocyclopentadiene	ND		1x	110	ND		1x	160	ND		1x	250	ND		1x	180
Hexachloroethane	ND		1x	260	ND		1x	380	ND		1x	600	ND		1x	440
Isophorone	ND		1x	110	ND		1x	160	ND		1x	250	ND		1x	190
Nitrobenzene	ND		1x	170	ND		1x	260	ND		1x	400	ND		1x	290
N-Nitrosodimethylamine	ND		1x	230	ND		1x	340	ND		1x	530	ND		1x	390
N-Nitrosodi-n-propylamine	ND		1x	110	ND		1x	170	ND		1x	260	ND		1x	190
N-Nitrosodiphenylamine	ND		1x	88	ND		1x	130	ND		1x	200	ND		1x	150
Pentachlorophenol	ND		1x	100	ND		1x	150	ND		1x	230	ND		1x	170
Phenol	ND		1x	130	ND		1x	190	ND		1x	300	ND		1x	220
Pyridine	ND		1x	170	ND		1x	250	ND		1x	390	ND		1x	290

Table 4-5. Continued

CRAIGHILL ANGLE

Analyte	CRA1 SED				CRA2 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	580	ND		1x	700
1,2-Diphenylhydrazine	ND		1x	110	ND		1x	130
1,2,4-Trichlorobenzene	ND		1x	420	ND		1x	520
1,3-Dichlorobenzene	ND		1x	580	ND		1x	700
1,4-Dichlorobenzene	ND		1x	550	ND		1x	670
2-Chloronaphthalene	ND		1x	180	ND		1x	220
2-Chlorophenol	ND		1x	360	ND		1x	440
2-Methyl-4,6-dinitrophenol	ND		1x	190	ND		1x	230
2-Methylphenol	ND		1x	250	ND		1x	310
2-Nitroaniline	ND		1x	180	ND		1x	210
2-Nitrophenol	ND		1x	330	ND		1x	410
2,2'-oxybis(1-Chloropropane)	ND		1x	360	ND		1x	440
2,4-Dichlorophenol	ND		1x	180	ND		1x	230
2,4-Dimethylphenol	ND		1x	480	ND		1x	590
2,4-Dinitrophenol	ND		1x	330	ND		1x	410
2,4-Dinitrotoluene	ND		1x	160	ND		1x	190
2,4,5-Trichlorophenol	ND		1x	97	ND		1x	120
2,4,6-Trichlorophenol	ND		1x	180	ND		1x	220
2,6-Dinitrotoluene	ND		1x	210	ND		1x	260
3-Nitroaniline	ND		1x	650	ND		1x	790
3+4-Methylphenol	720		1x	240	460		1x	300
3,3'-Dichlorobenzidine	ND		1x	880	ND		1x	1100
4-Bromophenyl phenyl ether	ND		1x	94	ND		1x	110
4-Chloro-3-methylphenol	ND		1x	150	ND		1x	180
4-Chloroaniline	ND		1x	810	ND		1x	990
4-Chlorophenyl phenyl ether	ND		1x	200	ND		1x	240
4-Nitroaniline	ND		1x	260	ND		1x	320
4-Nitrophenol	ND		1x	190	ND		1x	230
Benzidine	ND		1x	850	ND		1x	1000
Benzoic acid	ND		1x	1200	ND		1x	1400
Benzyl alcohol	ND		1x	270	ND		1x	330
Benzyl butyl phthalate	ND		1x	260	ND		1x	320
bis(2-Chloroethoxy)methane	ND		1x	250	ND		1x	300
bis(2-Chloroethyl) ether	ND		1x	420	ND		1x	520
bis(2-Ethylhexyl) phthalate	ND		1x	390	ND		1x	480

analyte list continued on following page

ND=Not detected

Table 4-5. Continued

CRAIGHILL ANGLE

Analyte	CRA1 SED				CRA2 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	150	ND		1x	180
Cyclohexanone	ND		1x	600	ND		1x	730
Dibenzofuran	ND		1x	130	ND		1x	160
Diethyl phthalate	ND		1x	150	ND		1x	180
Dimethyl phthalate	ND		1x	120	ND		1x	150
Di-n-butyl phthalate	210		1x	150	1500		1x	180
Di-n-octyl phthalate	ND		1x	100	ND		1x	130
Hexachlorobenzene	ND		1x	180	ND		1x	220
Hexachlorobutadiene	ND		1x	450	ND		1x	560
Hexachlorocyclopentadiene	ND		1x	220	ND		1x	270
Hexachloroethane	ND		1x	550	ND		1x	670
Isophorone	ND		1x	230	ND		1x	280
Nitrobenzene	ND		1x	360	ND		1x	440
N-Nitrosodimethylamine	ND		1x	480	ND		1x	590
N-Nitrosodi-n-propylamine	ND		1x	240	ND		1x	290
N-Nitrosodiphenylamine	ND		1x	180	ND		1x	230
Pentachlorophenol	ND		1x	210	ND		1x	260
Phenol	ND		1x	280	ND		1x	340
Pyridine	ND		1x	360	ND		1x	440

Table 4-5. Continued

CRAIGHILL UPPER RANGE

Analyte	CRU1 SED				CRU2 SED				CRU3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	680	ND		1x	300	ND		1x	440
1,2-Diphenylhydrazine	ND		1x	130	ND		1x	57	ND		1x	84
1,2,4-Trichlorobenzene	ND		1x	500	ND		1x	220	ND		1x	330
1,3-Dichlorobenzene	ND		1x	680	ND		1x	300	ND		1x	440
1,4-Dichlorobenzene	ND		1x	640	ND		1x	290	ND		1x	420
2-Chloronaphthalene	ND		1x	210	ND		1x	94	ND		1x	140
2-Chlorophenol	ND		1x	430	ND		1x	190	ND		1x	280
2-Methyl-4,6-dinitrophenol	ND		1x	220	ND		1x	98	ND		1x	140
2-Methylphenol	ND		1x	300	ND		1x	130	ND		1x	200
2-Nitroaniline	ND		1x	210	ND		1x	92	ND		1x	130
2-Nitrophenol	ND		1x	390	ND		1x	170	ND		1x	260
2,2'-oxybis(1-Chloropropane)	ND		1x	430	ND		1x	190	ND		1x	280
2,4-Dichlorophenol	ND		1x	220	ND		1x	97	ND		1x	140
2,4-Dimethylphenol	ND		1x	570	ND		1x	250	ND		1x	370
2,4-Dinitrophenol	ND		1x	390	ND		1x	170	ND		1x	260
2,4-Dinitrotoluene	ND		1x	190	ND		1x	83	ND		1x	120
2,4,5-Trichlorophenol	ND		1x	110	ND		1x	51	ND		1x	74
2,4,6-Trichlorophenol	ND		1x	210	ND		1x	95	ND		1x	140
2,6-Dinitrotoluene	ND		1x	250	ND		1x	110	ND		1x	160
3-Nitroaniline	ND		1x	760	ND		1x	340	ND		1x	500
3+4-Methylphenol	350		1x	290	110	J	1x	130	ND		1x	190
3,3'-Dichlorobenzidine	ND		1x	1000	ND		1x	460	ND		1x	670
4-Bromophenyl phenyl ether	ND		1x	110	ND		1x	49	ND		1x	72
4-Chloro-3-methylphenol	ND		1x	170	ND		1x	76	ND		1x	110
4-Chloroaniline	ND		1x	950	ND		1x	420	ND		1x	620
4-Chlorophenyl phenyl ether	ND		1x	230	ND		1x	100	ND		1x	150
4-Nitroaniline	ND		1x	310	ND		1x	140	ND		1x	200
4-Nitrophenol	ND		1x	220	ND		1x	98	ND		1x	140
Benzidine	ND		1x	1000	ND		1x	440	ND		1x	650
Benzoic acid	ND		1x	1400	ND		1x	610	ND		1x	890
Benzyl alcohol	ND		1x	320	ND		1x	140	ND		1x	210
Benzyl butyl phthalate	ND		1x	310	ND		1x	140	350		1x	200
bis(2-Chloroethoxy)methane	ND		1x	290	ND		1x	130	ND		1x	190
bis(2-Chloroethyl) ether	ND		1x	500	ND		1x	220	ND		1x	330
bis(2-Ethylhexyl) phthalate	ND		1x	460	ND		1x	210	180	J	1x	300

analyte list continued on following page

ND=Not detected J=Estimated

Table 4-5. Continued

CRAIGHILL UPPER RANGE

Analyte ug/kg	CRU1 SED				CRU2 SED				CRU3 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	180	ND		1x	78	ND		1x	110
Cyclohexanone	ND		1x	710	ND		1x	310	ND		1x	460
Dibenzofuran	ND		1x	160	ND		1x	70	ND		1x	100
Diethyl phthalate	ND		1x	170	ND		1x	76	ND		1x	110
Dimethyl phthalate	ND		1x	150	ND		1x	65	ND		1x	95
Di-n-butyl phthalate	ND		1x	180	ND		1x	78	ND		1x	110
Di-n-octyl phthalate	ND		1x	120	ND		1x	54	ND		1x	79
Hexachlorobenzene	ND		1x	210	ND		1x	95	ND		1x	140
Hexachlorobutadiene	ND		1x	540	ND		1x	240	ND		1x	350
Hexachlorocyclopentadiene	ND		1x	260	ND		1x	120	ND		1x	170
Hexachloroethane	ND		1x	640	ND		1x	290	ND		1x	420
Isophorone	ND		1x	270	ND		1x	120	ND		1x	180
Nitrobenzene	ND		1x	430	ND		1x	190	ND		1x	280
N-Nitrosodimethylamine	ND		1x	570	ND		1x	250	ND		1x	370
N-Nitrosodi-n-propylamine	ND		1x	280	ND		1x	130	ND		1x	180
N-Nitrosodiphenylamine	ND		1x	220	ND		1x	97	ND		1x	140
Pentachlorophenol	ND		1x	250	ND		1x	110	ND		1x	160
Phenol	ND		1x	320	ND		1x	140	ND		1x	210
Pyridine	ND		1x	420	ND		1x	190	ND		1x	270

Table 4-5. Continued

CUTOFF ANGLE

Analyte	CUT1 SED				CUT2 SED				CUT3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	630	ND		1x	760	ND		1x	590
1,2-Diphenylhydrazine	ND		1x	120	ND		1x	140	ND		1x	110
1,2,4-Trichlorobenzene	ND		1x	470	ND		1x	560	ND		1x	440
1,3-Dichlorobenzene	ND		1x	630	ND		1x	760	ND		1x	590
1,4-Dichlorobenzene	ND		1x	600	ND		1x	720	ND		1x	560
2-Chloronaphthalene	ND		1x	200	ND		1x	240	ND		1x	180
2-Chlorophenol	ND		1x	400	ND		1x	480	ND		1x	380
2-Methyl-4,6-dinitrophenol	ND		1x	210	ND		1x	250	ND		1x	190
2-Methylphenol	ND		1x	280	ND		1x	340	ND		1x	260
2-Nitroaniline	ND		1x	190	ND		1x	230	ND		1x	180
2-Nitrophenol	ND		1x	370	ND		1x	440	ND		1x	340
2,2'-oxybis(1-Chloropropane)	ND		1x	400	ND		1x	480	ND		1x	380
2,4-Dichlorophenol	ND		1x	200	ND		1x	240	ND		1x	190
2,4-Dimethylphenol	ND		1x	530	ND		1x	640	ND		1x	500
2,4-Dinitrophenol	ND		1x	370	ND		1x	440	ND		1x	340
2,4-Dinitrotoluene	ND		1x	170	ND		1x	210	ND		1x	160
2,4,5-Trichlorophenol	ND		1x	110	ND		1x	130	ND		1x	100
2,4,6-Trichlorophenol	ND		1x	200	ND		1x	240	ND		1x	190
2,6-Dinitrotoluene	ND		1x	230	ND		1x	280	ND		1x	220
3-Nitroaniline	ND		1x	710	ND		1x	850	ND		1x	670
3+4-Methylphenol	360		1x	270	430		1x	320	370		1x	250
3,3'-Dichlorobenzidine	ND		1x	970	ND		1x	1200	ND		1x	910
4-Bromophenyl phenyl ether	ND		1x	100	ND		1x	120	ND		1x	97
4-Chloro-3-methylphenol	ND		1x	160	ND		1x	190	ND		1x	150
4-Chloroaniline	ND		1x	890	ND		1x	1100	ND		1x	830
4-Chlorophenyl phenyl ether	ND		1x	220	ND		1x	260	ND		1x	200
4-Nitroaniline	ND		1x	290	ND		1x	340	ND		1x	270
4-Nitrophenol	ND		1x	210	ND		1x	250	ND		1x	190
Benzidine	ND		1x	930	ND		1x	1100	ND		1x	880
Benzoic acid	ND		1x	1300	ND		1x	1500	ND		1x	1200
Benzyl alcohol	ND		1x	300	ND		1x	360	ND		1x	280
Benzyl butyl phthalate	ND		1x	290	ND		1x	340	ND		1x	270
bis(2-Chloroethoxy)methane	ND		1x	270	ND		1x	320	ND		1x	250
bis(2-Chloroethyl) ether	ND		1x	470	ND		1x	560	ND		1x	440
bis(2-Ethylhexyl) phthalate	ND		1x	430	ND		1x	520	ND		1x	410

analyte list continued on following page

ND=Not detected

Table 4-5. Continued

CUTOFF ANGLE

Analyte	CUT1 SED				CUT2 SED				CUT3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	160	ND		1x	200	ND		1x	150
Cyclohexanone	ND		1x	660	ND		1x	790	ND		1x	620
Dibenzofuran	ND		1x	150	ND		1x	180	ND		1x	140
Diethyl phthalate	ND		1x	160	ND		1x	190	ND		1x	150
Dimethyl phthalate	ND		1x	140	ND		1x	160	ND		1x	130
Di-n-butyl phthalate	370		1x	160	270		1x	200	ND		1x	150
Di-n-octyl phthalate	ND		1x	110	ND		1x	140	ND		1x	110
Hexachlorobenzene	ND		1x	200	ND		1x	240	ND		1x	190
Hexachlorobutadiene	ND		1x	500	ND		1x	600	ND		1x	470
Hexachlorocyclopentadiene	ND		1x	250	ND		1x	300	ND		1x	230
Hexachloroethane	ND		1x	600	ND		1x	720	ND		1x	560
Isophorone	ND		1x	250	ND		1x	300	ND		1x	240
Nitrobenzene	ND		1x	400	ND		1x	480	ND		1x	380
N-Nitrosodimethylamine	ND		1x	530	ND		1x	640	ND		1x	500
N-Nitrosodi-n-propylamine	ND		1x	260	ND		1x	320	ND		1x	250
N-Nitrosodiphenylamine	ND		1x	200	ND		1x	240	ND		1x	190
Pentachlorophenol	ND		1x	230	ND		1x	280	ND		1x	220
Phenol	ND		1x	300	ND		1x	360	ND		1x	280
Pyridine	ND		1x	390	ND		1x	470	ND		1x	370

Table 4-5. Continued

TOLCHESTER CHANNEL-VAN VEEN

Analyte ug/kg	TLC1 SED				TLC2 SED				TLC2FD SED				TLC3 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	370	ND		1x	400	ND		1x	420	ND		1x	560
1,2-Diphenylhydrazine	ND		1x	69	ND		1x	75	ND		1x	80	ND		1x	110
1,2,4-Trichlorobenzene	ND		1x	270	ND		1x	290	ND		1x	310	ND		1x	410
1,3-Dichlorobenzene	ND		1x	370	ND		1x	400	ND		1x	420	ND		1x	560
1,4-Dichlorobenzene	ND		1x	350	ND		1x	380	ND		1x	400	ND		1x	530
2-Chloronaphthalene	ND		1x	110	ND		1x	120	ND		1x	130	ND		1x	170
2-Chlorophenol	ND		1x	230	ND		1x	250	ND		1x	270	ND		1x	350
2-Methyl-4,6-dinitrophenol	ND		1x	120	ND		1x	130	ND		1x	140	ND		1x	180
2-Methylphenol	ND		1x	160	ND		1x	180	ND		1x	190	ND		1x	250
2-Nitroaniline	ND		1x	110	ND		1x	120	ND		1x	130	ND		1x	170
2-Nitrophenol	ND		1x	210	ND		1x	230	ND		1x	240	ND		1x	320
2,2'-oxybis(1-Chloropropane)	ND		1x	230	ND		1x	250	ND		1x	270	ND		1x	350
2,4-Dichlorophenol	ND		1x	120	ND		1x	130	ND		1x	140	ND		1x	180
2,4-Dimethylphenol	ND		1x	310	ND		1x	330	ND		1x	360	ND		1x	470
2,4-Dinitrophenol	ND		1x	210	ND		1x	230	ND		1x	240	ND		1x	320
2,4-Dinitrotoluene	ND		1x	100	ND		1x	110	ND		1x	120	ND		1x	150
2,4,5-Trichlorophenol	ND		1x	62	ND		1x	67	ND		1x	71	ND		1x	94
2,4,6-Trichlorophenol	ND		1x	120	ND		1x	120	ND		1x	130	ND		1x	180
2,6-Dinitrotoluene	ND		1x	130	ND		1x	150	ND		1x	160	ND		1x	210
3-Nitroaniline	ND		1x	410	ND		1x	440	ND		1x	470	ND		1x	630
3+4-Methylphenol	140	J	1x	150	ND		1x	170	ND		1x	180	300		1x	240
3,3'-Dichlorobenzidine	ND		1x	560	ND		1x	600	ND		1x	640	ND		1x	850
4-Bromophenyl phenyl ether	ND		1x	60	ND		1x	65	ND		1x	69	ND		1x	91
4-Chloro-3-methylphenol	ND		1x	92	ND		1x	100	ND		1x	110	ND		1x	140
4-Chloroaniline	ND		1x	510	ND		1x	550	ND		1x	590	ND		1x	780
4-Chlorophenyl phenyl ether	ND		1x	120	ND		1x	140	ND		1x	140	ND		1x	190
4-Nitroaniline	ND		1x	170	ND		1x	180	ND		1x	190	ND		1x	250
4-Nitrophenol	ND		1x	120	ND		1x	130	ND		1x	140	ND		1x	180
Benzidine	ND		1x	540	ND		1x	580	ND		1x	620	ND		1x	820
Benzoic acid	ND		1x	740	ND		1x	800	ND		1x	850	ND		1x	1100
Benzyl alcohol	ND		1x	170	ND		1x	190	ND		1x	200	ND		1x	260
Benzyl butyl phthalate	ND		1x	170	ND		1x	180	ND		1x	190	ND		1x	250
bis(2-Chloroethoxy)methane	ND		1x	160	ND		1x	170	ND		1x	180	ND		1x	240
bis(2-Chloroethyl) ether	ND		1x	270	ND		1x	290	ND		1x	310	ND		1x	410
bis(2-Ethylhexyl) phthalate	ND		1x	250	ND		1x	270	170	J	1x	290	ND		1x	380

analyte list continued on following page

ND=Not detected J=Estimated

Table 4-5. Continued

TOLCHESTER CHANNEL-VAN VEEN

Analyte	TLC1 SED				TLC2 SED				TLC2FD SED				TLC3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	94	ND		1x	100	ND		1x	110	ND		1x	140
Cyclohexanone	ND		1x	380	ND		1x	410	ND		1x	440	ND		1x	580
Dibenzofuran	ND		1x	85	ND		1x	92	ND		1x	98	ND		1x	130
Diethyl phthalate	ND		1x	92	ND		1x	100	ND		1x	110	ND		1x	140
Dimethyl phthalate	ND		1x	79	ND		1x	85	ND		1x	91	ND		1x	120
Di-n-butyl phthalate	ND		1x	94	ND		1x	100	ND		1x	110	ND		1x	140
Di-n-octyl phthalate	ND		1x	65	ND		1x	71	ND		1x	76	ND		1x	100
Hexachlorobenzene	ND		1x	120	ND		1x	120	ND		1x	130	ND		1x	180
Hexachlorobutadiene	ND		1x	290	ND		1x	310	ND		1x	330	ND		1x	440
Hexachlorocyclopentadiene	ND		1x	140	ND		1x	150	ND		1x	160	ND		1x	220
Hexachloroethane	ND		1x	350	ND		1x	380	ND		1x	400	ND		1x	530
Isophorone	ND		1x	150	ND		1x	160	ND		1x	170	ND		1x	220
Nitrobenzene	ND		1x	230	ND		1x	250	ND		1x	270	ND		1x	350
N-Nitrosodimethylamine	ND		1x	310	ND		1x	330	ND		1x	360	ND		1x	470
N-Nitrosodi-n-propylamine	ND		1x	150	ND		1x	160	ND		1x	180	ND		1x	230
N-Nitrosodiphenylamine	ND		1x	120	ND		1x	130	ND		1x	140	ND		1x	180
Pentachlorophenol	ND		1x	130	ND		1x	140	ND		1x	150	ND		1x	200
Phenol	ND		1x	180	ND		1x	190	ND		1x	200	ND		1x	270
Pyridine	ND		1x	230	ND		1x	250	ND		1x	260	ND		1x	350

Table 4-5. Continued

TOLCHESTER CHANNEL-GRAVITY CORE

Analyte	TLV1 SED				TLV2 SED				TLV3 SED				TLV4 SED				TLV5 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	390	ND		1x	370	ND		1x	380	ND		1x	420	ND		1x	410
1,2-Diphenylhydrazine	ND		1x	73	ND		1x	69	ND		1x	72	ND		1x	80	ND		1x	78
1,2,4-Trichlorobenzene	ND		1x	290	ND		1x	270	ND		1x	280	ND		1x	310	ND		1x	300
1,3-Dichlorobenzene	ND		1x	390	ND		1x	370	ND		1x	380	ND		1x	420	ND		1x	410
1,4-Dichlorobenzene	ND		1x	370	ND		1x	350	ND		1x	360	ND		1x	400	ND		1x	390
2-Chloronaphthalene	ND		1x	120	ND		1x	110	ND		1x	120	ND		1x	130	ND		1x	130
2-Chlorophenol	ND		1x	240	ND		1x	230	ND		1x	240	ND		1x	270	ND		1x	260
2-Methyl-4,6-dinitrophenol	ND		1x	130	ND		1x	120	ND		1x	120	ND		1x	140	ND		1x	130
2-Methylphenol	ND		1x	170	ND		1x	160	ND		1x	170	ND		1x	190	ND		1x	180
2-Nitroaniline	ND		1x	120	ND		1x	110	ND		1x	120	ND		1x	130	ND		1x	130
2-Nitrophenol	ND		1x	220	ND		1x	210	ND		1x	220	ND		1x	240	ND		1x	240
2,2'-oxybis(1-Chloropropane)	ND		1x	240	ND		1x	230	ND		1x	240	ND		1x	270	ND		1x	260
2,4-Dichlorophenol	ND		1x	120	ND		1x	120	ND		1x	120	ND		1x	140	ND		1x	130
2,4-Dimethylphenol	ND		1x	330	ND		1x	310	ND		1x	320	ND		1x	360	ND		1x	350
2,4-Dinitrophenol	ND		1x	220	ND		1x	210	ND		1x	220	ND		1x	240	ND		1x	240
2,4-Dinitrotoluene	ND		1x	110	ND		1x	100	ND		1x	100	ND		1x	120	ND		1x	110
2,4,5-Trichlorophenol	ND		1x	65	ND		1x	62	ND		1x	64	ND		1x	71	ND		1x	70
2,4,6-Trichlorophenol	ND		1x	120	ND		1x	120	ND		1x	120	ND		1x	130	ND		1x	130
2,6-Dinitrotoluene	ND		1x	140	ND		1x	130	ND		1x	140	ND		1x	160	ND		1x	150
3-Nitroaniline	ND		1x	430	ND		1x	410	ND		1x	430	ND		1x	470	ND		1x	460
3+4-Methylphenol	680		1x	160	460		1x	150	500		1x	160	430		1x	180	590		1x	170
3,3'-Dichlorobenzidine	ND		1x	590	ND		1x	560	ND		1x	580	ND		1x	640	ND		1x	630
4-Bromophenyl phenyl ether	ND		1x	63	ND		1x	60	ND		1x	62	ND		1x	69	ND		1x	67
4-Chloro-3-methylphenol	ND		1x	98	ND		1x	92	ND		1x	96	ND		1x	110	ND		1x	100
4-Chloroaniline	ND		1x	540	ND		1x	510	ND		1x	530	ND		1x	590	ND		1x	580
4-Chlorophenyl phenyl ether	ND		1x	130	ND		1x	120	ND		1x	130	ND		1x	140	ND		1x	140
4-Nitroaniline	ND		1x	180	ND		1x	170	ND		1x	170	ND		1x	190	ND		1x	190
4-Nitrophenol	ND		1x	130	ND		1x	120	ND		1x	120	ND		1x	140	ND		1x	130
Benzidine	ND		1x	570	ND		1x	540	ND		1x	560	ND		1x	620	ND		1x	610
Benzoic acid	ND		1x	780	ND		1x	740	ND		1x	770	ND		1x	850	ND		1x	830
Benzyl alcohol	ND		1x	180	ND		1x	170	ND		1x	180	ND		1x	200	ND		1x	200
Benzyl butyl phthalate	ND		1x	180	ND		1x	170	ND		1x	170	ND		1x	190	ND		1x	190
bis(2-Chloroethoxy)methane	ND		1x	170	ND		1x	160	ND		1x	160	ND		1x	180	ND		1x	180
bis(2-Chloroethyl) ether	ND		1x	290	ND		1x	270	ND		1x	280	ND		1x	310	ND		1x	300
bis(2-Ethylhexyl) phthalate	ND		1x	270	ND		1x	250	ND		1x	260	ND		1x	290	ND		1x	280

analyte list continued on following page

ND=Not detected

Table 4-5. Continued

TOLCHESTER CHANNEL-GRAVITY CORE

Analyte	TLV1 SED				TLV2 SED				TLV3 SED				TLV4 SED				TLV5 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	100	ND		1x	94	ND		1x	98	ND		1x	110	ND		1x	110
Cyclohexanone	ND		1x	400	ND		1x	380	ND		1x	400	ND		1x	440	ND		1x	430
Dibenzofuran	ND		1x	90	ND		1x	85	ND		1x	88	ND		1x	98	ND		1x	96
Diethyl phthalate	ND		1x	98	ND		1x	92	ND		1x	96	ND		1x	110	ND		1x	100
Dimethyl phthalate	ND		1x	84	ND		1x	79	ND		1x	82	ND		1x	91	ND		1x	89
Di-n-butyl phthalate	ND		1x	100	ND		1x	94	ND		1x	98	770		1x	110	ND		1x	110
Di-n-octyl phthalate	ND		1x	69	ND		1x	65	ND		1x	68	ND		1x	76	ND		1x	74
Hexachlorobenzene	ND		1x	120	ND		1x	120	ND		1x	120	ND		1x	130	ND		1x	130
Hexachlorobutadiene	ND		1x	310	ND		1x	290	ND		1x	300	ND		1x	330	ND		1x	330
Hexachlorocyclopentadiene	ND		1x	150	ND		1x	140	ND		1x	150	ND		1x	160	ND		1x	160
Hexachloroethane	ND		1x	370	ND		1x	350	ND		1x	360	ND		1x	400	ND		1x	390
Isophorone	ND		1x	160	ND		1x	150	ND		1x	150	ND		1x	170	ND		1x	170
Nitrobenzene	ND		1x	240	ND		1x	230	ND		1x	240	ND		1x	270	ND		1x	260
N-Nitrosodimethylamine	ND		1x	330	ND		1x	310	ND		1x	320	ND		1x	360	ND		1x	350
N-Nitrosodi-n-propylamine	ND		1x	160	ND		1x	150	ND		1x	160	ND		1x	180	ND		1x	170
N-Nitrosodiphenylamine	ND		1x	120	ND		1x	120	ND		1x	120	ND		1x	140	ND		1x	130
Pentachlorophenol	ND		1x	140	ND		1x	130	ND		1x	140	ND		1x	150	ND		1x	150
Phenol	ND		1x	190	ND		1x	180	ND		1x	180	ND		1x	200	ND		1x	200
Pyridine	ND		1x	240	ND		1x	230	ND		1x	240	ND		1x	260	ND		1x	260

Table 4-5. Continued

BREWERTON EASTERN EXTENSION-VAN VEEN

Analyte	BE1 SED				BE2 SED				BE3 SED				BE4 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	790	ND		1x	580	ND		1x	560	ND		1x	680
1,2-Diphenylhydrazine	ND		1x	150	ND		1x	110	ND		1x	110	ND		1x	130
1,2,4-Trichlorobenzene	ND		1x	580	ND		1x	420	ND		1x	410	ND		1x	500
1,3-Dichlorobenzene	ND		1x	790	ND		1x	580	ND		1x	560	ND		1x	680
1,4-Dichlorobenzene	ND		1x	750	ND		1x	550	ND		1x	530	ND		1x	640
2-Chloronaphthalene	ND		1x	250	ND		1x	180	ND		1x	170	ND		1x	210
2-Chlorophenol	ND		1x	500	ND		1x	360	ND		1x	350	ND		1x	430
2-Methyl-4,6-dinitrophenol	ND		1x	260	ND		1x	190	ND		1x	180	ND		1x	220
2-Methylphenol	ND		1x	350	ND		1x	250	ND		1x	250	ND		1x	300
2-Nitroaniline	ND		1x	240	ND		1x	180	ND		1x	170	ND		1x	210
2-Nitrophenol	ND		1x	460	ND		1x	330	ND		1x	320	ND		1x	390
2,2'-oxybis(1-Chloropropane)	ND		1x	500	ND		1x	360	ND		1x	350	ND		1x	430
2,4-Dichlorophenol	ND		1x	250	ND		1x	180	ND		1x	180	ND		1x	220
2,4-Dimethylphenol	ND		1x	670	ND		1x	480	ND		1x	470	ND		1x	570
2,4-Dinitrophenol	ND		1x	460	ND		1x	330	ND		1x	320	ND		1x	390
2,4-Dinitrotoluene	ND		1x	220	ND		1x	160	ND		1x	150	ND		1x	190
2,4,5-Trichlorophenol	ND		1x	130	ND		1x	97	ND		1x	94	ND		1x	110
2,4,6-Trichlorophenol	ND		1x	250	ND		1x	180	ND		1x	180	ND		1x	210
2,6-Dinitrotoluene	ND		1x	290	ND		1x	210	ND		1x	210	ND		1x	250
3-Nitroaniline	ND		1x	890	ND		1x	650	ND		1x	630	ND		1x	760
3+4-Methylphenol	ND		1x	330	ND		1x	240	ND		1x	240	ND		1x	290
3,3'-Dichlorobenzidine	ND		1x	1200	ND		1x	880	ND		1x	850	ND		1x	1000
4-Bromophenyl phenyl ether	ND		1x	130	ND		1x	94	ND		1x	91	ND		1x	110
4-Chloro-3-methylphenol	ND		1x	200	ND		1x	150	ND		1x	140	ND		1x	170
4-Chloroaniline	ND		1x	1100	ND		1x	810	ND		1x	780	ND		1x	950
4-Chlorophenyl phenyl ether	ND		1x	270	ND		1x	200	ND		1x	190	ND		1x	230
4-Nitroaniline	ND		1x	360	ND		1x	260	ND		1x	250	ND		1x	310
4-Nitrophenol	ND		1x	260	ND		1x	190	ND		1x	180	ND		1x	220
Benzidine	ND		1x	1200	ND		1x	850	ND		1x	820	ND		1x	1000
Benzoic acid	ND		1x	1600	ND		1x	1200	ND		1x	1100	ND		1x	1400
Benzyl alcohol	ND		1x	380	ND		1x	270	ND		1x	260	ND		1x	320
Benzyl butyl phthalate	ND		1x	360	ND		1x	260	ND		1x	250	ND		1x	310
bis(2-Chloroethoxy)methane	ND		1x	340	ND		1x	250	ND		1x	240	ND		1x	290
bis(2-Chloroethyl) ether	ND		1x	580	ND		1x	420	ND		1x	410	ND		1x	500
bis(2-Ethylhexyl) phthalate	ND		1x	540	ND		1x	390	ND		1x	380	ND		1x	460

analyte list continued on following page

ND=Not detected

Table 4-5. Continued

BREWERTON EASTERN EXTENSION-VAN VEEN

Analyte	BE1 SED				BE2 SED				BE3 SED				BE4 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	200	ND		1x	150	ND		1x	140	ND		1x	180
Cyclohexanone	ND		1x	820	ND		1x	600	ND		1x	580	ND		1x	710
Dibenzofuran	ND		1x	180	ND		1x	130	ND		1x	130	ND		1x	160
Diethyl phthalate	ND		1x	200	ND		1x	150	ND		1x	140	ND		1x	170
Dimethyl phthalate	ND		1x	170	ND		1x	120	ND		1x	120	ND		1x	150
Di-n-butyl phthalate	ND		1x	200	ND		1x	150	ND		1x	140	ND		1x	180
Di-n-octyl phthalate	ND		1x	140	ND		1x	100	ND		1x	100	ND		1x	120
Hexachlorobenzene	ND		1x	250	ND		1x	180	ND		1x	180	ND		1x	210
Hexachlorobutadiene	ND		1x	620	ND		1x	450	ND		1x	440	ND		1x	540
Hexachlorocyclopentadiene	ND		1x	310	ND		1x	220	ND		1x	220	ND		1x	260
Hexachloroethane	ND		1x	750	ND		1x	550	ND		1x	530	ND		1x	640
Isophorone	ND		1x	320	ND		1x	230	ND		1x	220	ND		1x	270
Nitrobenzene	ND		1x	500	ND		1x	360	ND		1x	350	ND		1x	430
N-Nitrosodimethylamine	ND		1x	670	ND		1x	480	ND		1x	470	ND		1x	570
N-Nitrosodi-n-propylamine	ND		1x	330	ND		1x	240	ND		1x	240	ND		1x	280
N-Nitrosodiphenylamine	ND		1x	250	ND		1x	180	ND		1x	180	ND		1x	220
Pentachlorophenol	ND		1x	290	ND		1x	210	ND		1x	200	ND		1x	250
Phenol	ND		1x	380	ND		1x	280	ND		1x	270	ND		1x	320
Pyridine	ND		1x	490	ND		1x	360	ND		1x	350	ND		1x	420

Table 4-5. Continued

BREWERTON EASTERN EXTENSION-GRAVITY CORE

Analyte	BEV1 SED				BEV2 SED				BEV3 SED				BEV4 SED				BEV5 SED				BEV6 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	450	ND		1x	430	ND		1x	450	ND		1x	420	ND		1x	490	ND		1x	480
1,2-Diphenylhydrazine	ND		1x	86	ND		1x	82	ND		1x	86	ND		1x	80	ND		1x	92	ND		1x	90
1,2,4-Trichlorobenzene	ND		1x	330	ND		1x	320	ND		1x	330	ND		1x	310	ND		1x	360	ND		1x	350
1,3-Dichlorobenzene	ND		1x	450	ND		1x	430	ND		1x	450	ND		1x	420	ND		1x	490	ND		1x	480
1,4-Dichlorobenzene	ND		1x	430	ND		1x	410	ND		1x	430	ND		1x	400	ND		1x	460	ND		1x	450
2-Chloronaphthalene	ND		1x	140	ND		1x	130	ND		1x	140	ND		1x	130	ND		1x	150	ND		1x	150
2-Chlorophenol	ND		1x	290	ND		1x	270	ND		1x	290	ND		1x	270	ND		1x	310	ND		1x	300
2-Methyl-4,6-dinitrophenol	ND		1x	150	ND		1x	140	ND		1x	150	ND		1x	140	ND		1x	160	ND		1x	160
2-Methylphenol	ND		1x	200	ND		1x	190	ND		1x	200	ND		1x	190	ND		1x	220	ND		1x	210
2-Nitroaniline	ND		1x	140	ND		1x	130	ND		1x	140	ND		1x	130	ND		1x	150	ND		1x	140
2-Nitrophenol	ND		1x	260	ND		1x	250	ND		1x	260	ND		1x	240	ND		1x	280	ND		1x	280
2,2'-oxybis(1-Chloropropane)	ND		1x	290	ND		1x	270	ND		1x	290	ND		1x	270	ND		1x	310	ND		1x	300
2,4-Dichlorophenol	ND		1x	150	ND		1x	140	ND		1x	150	ND		1x	140	ND		1x	160	ND		1x	150
2,4-Dimethylphenol	ND		1x	380	ND		1x	360	ND		1x	380	ND		1x	360	ND		1x	410	ND		1x	400
2,4-Dinitrophenol	ND		1x	260	ND		1x	250	ND		1x	260	ND		1x	240	ND		1x	280	ND		1x	280
2,4-Dinitrotoluene	ND		1x	120	ND		1x	120	ND		1x	120	ND		1x	120	ND		1x	130	ND		1x	130
2,4,5-Trichlorophenol	ND		1x	76	ND		1x	73	ND		1x	76	ND		1x	71	ND		1x	82	ND		1x	80
2,4,6-Trichlorophenol	ND		1x	140	ND		1x	140	ND		1x	140	ND		1x	130	ND		1x	150	ND		1x	150
2,6-Dinitrotoluene	ND		1x	170	ND		1x	160	ND		1x	170	ND		1x	160	ND		1x	180	ND		1x	180
3-Nitroaniline	ND		1x	510	ND		1x	480	ND		1x	510	ND		1x	470	ND		1x	550	ND		1x	530
3+4-Methylphenol	ND		1x	190	ND		1x	180	660		1x	190	ND		1x	180	ND		1x	210	ND		1x	200
3,3'-Dichlorobenzidine	ND		1x	690	ND		1x	660	ND		1x	690	ND		1x	640	ND		1x	740	ND		1x	720
4-Bromophenyl phenyl ether	ND		1x	74	ND		1x	70	ND		1x	74	ND		1x	69	ND		1x	79	ND		1x	78
4-Chloro-3-methylphenol	ND		1x	110	ND		1x	110	ND		1x	110	ND		1x	110	ND		1x	120	ND		1x	120
4-Chloroaniline	ND		1x	630	ND		1x	600	ND		1x	630	ND		1x	590	ND		1x	680	ND		1x	660
4-Chlorophenyl phenyl ether	ND		1x	150	ND		1x	150	ND		1x	150	ND		1x	140	ND		1x	170	ND		1x	160
4-Nitroaniline	ND		1x	200	ND		1x	200	ND		1x	200	ND		1x	190	ND		1x	220	ND		1x	220
4-Nitrophenol	ND		1x	150	ND		1x	140	ND		1x	150	ND		1x	140	ND		1x	160	ND		1x	160
Benzidine	ND		1x	670	ND		1x	640	ND		1x	670	ND		1x	620	ND		1x	720	ND		1x	700
Benzoic acid	ND		1x	910	ND		1x	870	ND		1x	910	ND		1x	850	ND		1x	980	ND		1x	960
Benzyl alcohol	ND		1x	210	ND		1x	200	ND		1x	210	ND		1x	200	ND		1x	230	ND		1x	220
Benzyl butyl phthalate	ND		1x	200	ND		1x	200	ND		1x	200	ND		1x	190	ND		1x	220	ND		1x	220
bis(2-Chloroethoxy)methane	ND		1x	190	ND		1x	180	ND		1x	190	ND		1x	180	ND		1x	210	ND		1x	200
bis(2-Chloroethyl) ether	ND		1x	330	ND		1x	320	ND		1x	330	ND		1x	310	ND		1x	360	ND		1x	350
bis(2-Ethylhexyl) phthalate	ND		1x	310	ND		1x	300	ND		1x	310	ND		1x	290	ND		1x	330	ND		1x	320

analyte list continued on following page

ND=Not detected

Table 4-5. Continued

BREWERTON EASTERN EXTENSION-GRAVITY CORE

Analyte	BEV1 SED				BEV2 SED				BEV3 SED				BEV4 SED				BEV5 SED				BEV6 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	120	ND		1x	110	ND		1x	120	ND		1x	110	ND		1x	130	ND		1x	120
Cyclohexanone	ND		1x	470	ND		1x	450	ND		1x	470	ND		1x	440	ND		1x	510	ND		1x	500
Dibenzofuran	ND		1x	100	ND		1x	100	ND		1x	100	ND		1x	98	ND		1x	110	ND		1x	110
Diethyl phthalate	ND		1x	110	ND		1x	110	ND		1x	110	ND		1x	110	ND		1x	120	ND		1x	120
Dimethyl phthalate	ND		1x	98	ND		1x	93	ND		1x	98	ND		1x	91	ND		1x	110	ND		1x	100
Di-n-butyl phthalate	ND		1x	120	ND		1x	110	ND		1x	120	ND		1x	110	ND		1x	130	ND		1x	120
Di-n-octyl phthalate	ND		1x	81	ND		1x	77	ND		1x	81	ND		1x	76	ND		1x	87	ND		1x	85
Hexachlorobenzene	ND		1x	140	ND		1x	140	ND		1x	140	ND		1x	130	ND		1x	150	ND		1x	150
Hexachlorobutadiene	ND		1x	360	ND		1x	340	ND		1x	360	ND		1x	330	ND		1x	380	ND		1x	380
Hexachlorocyclopentadiene	ND		1x	180	ND		1x	170	ND		1x	180	ND		1x	160	ND		1x	190	ND		1x	180
Hexachloroethane	ND		1x	430	ND		1x	410	ND		1x	430	ND		1x	400	ND		1x	460	ND		1x	450
Isophorone	ND		1x	180	ND		1x	170	ND		1x	180	ND		1x	170	ND		1x	190	ND		1x	190
Nitrobenzene	ND		1x	290	ND		1x	270	ND		1x	290	ND		1x	270	ND		1x	310	ND		1x	300
N-Nitrosodimethylamine	ND		1x	380	ND		1x	360	ND		1x	380	ND		1x	360	ND		1x	410	ND		1x	400
N-Nitrosodi-n-propylamine	ND		1x	190	ND		1x	180	ND		1x	190	ND		1x	180	ND		1x	200	ND		1x	200
N-Nitrosodiphenylamine	ND		1x	150	ND		1x	140	ND		1x	150	ND		1x	140	ND		1x	160	ND		1x	150
Pentachlorophenol	ND		1x	160	ND		1x	160	ND		1x	160	ND		1x	150	ND		1x	180	ND		1x	170
Phenol	ND		1x	220	ND		1x	210	ND		1x	220	ND		1x	200	ND		1x	230	ND		1x	230
Pyridine	ND		1x	280	ND		1x	270	ND		1x	280	ND		1x	260	ND		1x	300	ND		1x	300

Table 4-5. Continued

BREWERTON REACH

Analyte	BR1 SED				BR2 SED				BR3 SED				BR4 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil	Limit
1,2-Dichlorobenzene	ND		1x	630	ND		1x	590	ND		1x	580	ND		1x	660
1,2-Diphenylhydrazine	ND		1x	120	ND		1x	110	ND		1x	110	ND		1x	120
1,2,4-Trichlorobenzene	ND		1x	470	ND		1x	440	ND		1x	420	ND		1x	480
1,3-Dichlorobenzene	ND		1x	630	ND		1x	590	ND		1x	580	ND		1x	660
1,4-Dichlorobenzene	ND		1x	600	ND		1x	560	ND		1x	550	ND		1x	620
2-Chloronaphthalene	ND		1x	200	ND		1x	180	ND		1x	180	ND		1x	200
2-Chlorophenol	ND		1x	400	ND		1x	380	ND		1x	360	ND		1x	410
2-Methyl-4,6-dinitrophenol	ND		1x	210	ND		1x	190	ND		1x	190	ND		1x	210
2-Methylphenol	ND		1x	280	ND		1x	260	ND		1x	250	ND		1x	290
2-Nitroaniline	ND		1x	190	ND		1x	180	ND		1x	180	ND		1x	200
2-Nitrophenol	ND		1x	370	ND		1x	340	ND		1x	330	ND		1x	380
2,2'-oxybis(1-Chloropropane)	ND		1x	400	ND		1x	380	ND		1x	360	ND		1x	410
2,4-Dichlorophenol	ND		1x	200	ND		1x	190	ND		1x	180	ND		1x	210
2,4-Dimethylphenol	ND		1x	530	ND		1x	500	ND		1x	480	ND		1x	550
2,4-Dinitrophenol	ND		1x	370	ND		1x	340	ND		1x	330	ND		1x	380
2,4-Dinitrotoluene	ND		1x	170	ND		1x	160	ND		1x	160	ND		1x	180
2,4,5-Trichlorophenol	ND		1x	110	ND		1x	100	ND		1x	97	ND		1x	110
2,4,6-Trichlorophenol	ND		1x	200	ND		1x	190	ND		1x	180	ND		1x	210
2,6-Dinitrotoluene	ND		1x	230	ND		1x	220	ND		1x	210	ND		1x	240
3-Nitroaniline	ND		1x	710	ND		1x	670	ND		1x	650	ND		1x	730
3+4-Methylphenol	ND		1x	270	ND		1x	250	ND		1x	240	ND		1x	280
3,3'-Dichlorobenzidine	ND		1x	970	ND		1x	910	ND		1x	880	ND		1x	1000
4-Bromophenyl phenyl ether	ND		1x	100	ND		1x	97	ND		1x	94	ND		1x	110
4-Chloro-3-methylphenol	ND		1x	160	ND		1x	150	ND		1x	150	ND		1x	170
4-Chloroaniline	ND		1x	890	ND		1x	830	ND		1x	810	ND		1x	920
4-Chlorophenyl phenyl ether	ND		1x	220	ND		1x	200	ND		1x	200	ND		1x	220
4-Nitroaniline	ND		1x	290	ND		1x	270	ND		1x	260	ND		1x	300
4-Nitrophenol	ND		1x	210	ND		1x	190	ND		1x	190	ND		1x	210
Benzidine	ND		1x	930	ND		1x	880	ND		1x	850	ND		1x	970
Benzoic acid	ND		1x	1300	ND		1x	1200	ND		1x	1200	ND		1x	1300
Benzyl alcohol	ND		1x	300	ND		1x	280	ND		1x	270	ND		1x	310
Benzyl butyl phthalate	ND		1x	290	ND		1x	270	ND		1x	260	ND		1x	300
bis(2-Chloroethoxy)methane	ND		1x	270	ND		1x	250	ND		1x	250	ND		1x	280
bis(2-Chloroethyl) ether	ND		1x	470	ND		1x	440	ND		1x	420	ND		1x	480
bis(2-Ethylhexyl) phthalate	ND		1x	430	ND		1x	410	ND		1x	390	ND		1x	450

analyte list continued on following page

ND=Not detected

Table 4-5. Continued

BREWERTON REACH

Analyte	BR1 SED				BR2 SED				BR3 SED				BR4 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	160	ND		1x	150	ND		1x	150	ND		1x	170
Cyclohexanone	ND		1x	660	ND		1x	620	ND		1x	600	ND		1x	680
Dibenzofuran	ND		1x	150	ND		1x	140	ND		1x	130	ND		1x	150
Diethyl phthalate	ND		1x	160	ND		1x	150	ND		1x	150	ND		1x	170
Dimethyl phthalate	ND		1x	140	ND		1x	130	ND		1x	120	ND		1x	140
Di-n-butyl phthalate	ND		1x	160	ND		1x	150	ND		1x	150	ND		1x	170
Di-n-octyl phthalate	ND		1x	110	ND		1x	110	ND		1x	100	ND		1x	120
Hexachlorobenzene	ND		1x	200	ND		1x	190	ND		1x	180	ND		1x	210
Hexachlorobutadiene	ND		1x	500	ND		1x	470	ND		1x	450	ND		1x	520
Hexachlorocyclopentadiene	ND		1x	250	ND		1x	230	ND		1x	220	ND		1x	260
Hexachloroethane	ND		1x	600	ND		1x	560	ND		1x	550	ND		1x	620
Isophorone	ND		1x	250	ND		1x	240	ND		1x	230	ND		1x	260
Nitrobenzene	ND		1x	400	ND		1x	380	ND		1x	360	ND		1x	410
N-Nitrosodimethylamine	ND		1x	530	ND		1x	500	ND		1x	480	ND		1x	550
N-Nitrosodi-n-propylamine	ND		1x	260	ND		1x	250	ND		1x	240	ND		1x	270
N-Nitrosodiphenylamine	ND		1x	200	ND		1x	190	ND		1x	180	ND		1x	210
Pentachlorophenol	ND		1x	230	ND		1x	220	ND		1x	210	ND		1x	240
Phenol	ND		1x	300	ND		1x	280	ND		1x	280	ND		1x	310
Pyridine	ND		1x	390	ND		1x	370	ND		1x	360	ND		1x	410

ND=Not detected

Table 4-5. Continued.

BLIND SPLITS

Analyte ug/kg	BLINDSPLIT1A(BR1) Result	Qual.	Dil.	Limit	BLINDSPLIT2A(BR3) Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	580	ND		1x	510
1,2-Diphenylhydrazine	ND		1x	110	ND		1x	97
1,2,4-Trichlorobenzene	ND		1x	420	ND		1x	380
1,3-Dichlorobenzene	ND		1x	580	ND		1x	510
1,4-Dichlorobenzene	ND		1x	550	ND		1x	490
2-Chloronaphthalene	ND		1x	180	ND		1x	160
2-Chlorophenol	ND		1x	360	ND		1x	320
2-Methyl-4,6-dinitrophenol	ND		1x	190	ND		1x	170
2-Methylphenol	ND		1x	250	ND		1x	230
2-Nitroaniline	ND		1x	180	ND		1x	160
2-Nitrophenol	ND		1x	330	ND		1x	300
2,2'-oxybis(1-Chloropropane)	ND		1x	360	ND		1x	320
2,4-Dichlorophenol	ND		1x	180	ND		1x	160
2,4-Dimethylphenol	ND		1x	480	ND		1x	430
2,4-Dinitrophenol	ND		1x	330	ND		1x	300
2,4-Dinitrotoluene	ND		1x	160	ND		1x	140
2,4,5-Trichlorophenol	ND		1x	97	ND		1x	86
2,4,6-Trichlorophenol	ND		1x	180	ND		1x	160
2,6-Dinitrotoluene	ND		1x	210	ND		1x	190
3-Nitroaniline	ND		1x	650	ND		1x	580
3+4-Methylphenol	ND		1x	240	ND		1x	220
3,3'-Dichlorobenzidine	ND		1x	880	ND		1x	780
4-Bromophenyl phenyl ether	ND		1x	94	ND		1x	84
4-Chloro-3-methylphenol	ND		1x	150	ND		1x	130
4-Chloroaniline	ND		1x	810	ND		1x	720
4-Chlorophenyl phenyl ether	ND		1x	200	ND		1x	180
4-Nitroaniline	ND		1x	260	ND		1x	230
4-Nitrophenol	ND		1x	190	ND		1x	170
Benzidine	ND		1x	850	ND		1x	760
Benzoic acid	ND		1x	1200	ND		1x	1000
Benzyl alcohol	ND		1x	270	ND		1x	240
Benzyl butyl phthalate	ND		1x	260	ND		1x	230
bis(2-Chloroethoxy)methane	ND		1x	250	ND		1x	220
bis(2-Chloroethyl) ether	ND		1x	420	ND		1x	380
bis(2-Ethylhexyl) phthalate	ND		1x	390	ND		1x	350

analyte list continued on following page

ND=Not detected

Table 4-5. Continued.

BLIND SPLITS

Analyte ug/kg	BLINDSPLIT1A(BR1) Result	Qual.	Dil.	Limit	BLINDSPLIT2A(BR3) Result	Qual.	Dil.	Limit
Carbazole	ND		1x	150	ND		1x	130
Cyclohexanone	ND		1x	600	ND		1x	540
Dibenzofuran	ND		1x	130	ND		1x	120
Diethyl phthalate	ND		1x	150	ND		1x	130
Dimethyl phthalate	ND		1x	120	ND		1x	110
Di-n-butyl phthalate	ND		1x	150	ND		1x	130
Di-n-octyl phthalate	ND		1x	100	ND		1x	92
Hexachlorobenzene	ND		1x	180	ND		1x	160
Hexachlorobutadiene	ND		1x	450	ND		1x	410
Hexachlorocyclopentadiene	ND		1x	220	ND		1x	200
Hexachloroethane	ND		1x	550	ND		1x	490
Isophorone	ND		1x	230	ND		1x	210
Nitrobenzene	ND		1x	360	ND		1x	320
N-Nitrosodimethylamine	ND		1x	480	ND		1x	430
N-Nitrosodi-n-propylamine	ND		1x	240	ND		1x	210
N-Nitrosodiphenylamine	ND		1x	180	ND		1x	160
Pentachlorophenol	ND		1x	210	ND		1x	190
Phenol	ND		1x	280	ND		1x	250
Pyridine	ND		1x	360	ND		1x	320

ND=Not detected

Table 4-5. Continued.

BREWERTON ANGLE

Analyte ug/kg	BRA1 SED				BRA2 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	700	ND		1x	680
1,2-Diphenylhydrazine	ND		1x	130	ND		1x	130
1,2,4-Trichlorobenzene	ND		1x	520	ND		1x	500
1,3-Dichlorobenzene	ND		1x	700	ND		1x	680
1,4-Dichlorobenzene	ND		1x	670	ND		1x	640
2-Chloronaphthalene	ND		1x	220	ND		1x	210
2-Chlorophenol	ND		1x	440	ND		1x	430
2-Methyl-4,6-dinitrophenol	ND		1x	230	ND		1x	220
2-Methylphenol	ND		1x	310	ND		1x	300
2-Nitroaniline	ND		1x	210	ND		1x	210
2-Nitrophenol	ND		1x	410	ND		1x	390
2,2'-oxybis(1-Chloropropane)	ND		1x	440	ND		1x	430
2,4-Dichlorophenol	ND		1x	230	ND		1x	220
2,4-Dimethylphenol	ND		1x	590	ND		1x	570
2,4-Dinitrophenol	ND		1x	410	ND		1x	390
2,4-Dinitrotoluene	ND		1x	190	ND		1x	190
2,4,5-Trichlorophenol	ND		1x	120	ND		1x	110
2,4,6-Trichlorophenol	ND		1x	220	ND		1x	210
2,6-Dinitrotoluene	ND		1x	260	ND		1x	250
3-Nitroaniline	ND		1x	790	ND		1x	760
3+4-Methylphenol	320		1x	300	ND		1x	290
3,3'-Dichlorobenzidine	ND		1x	1100	ND		1x	1000
4-Bromophenyl phenyl ether	ND		1x	110	ND		1x	110
4-Chloro-3-methylphenol	ND		1x	180	ND		1x	170
4-Chloroaniline	ND		1x	990	ND		1x	950
4-Chlorophenyl phenyl ether	ND		1x	240	ND		1x	230
4-Nitroaniline	ND		1x	320	ND		1x	310
4-Nitrophenol	ND		1x	230	ND		1x	220
Benzidine	ND		1x	1000	ND		1x	1000
Benzoic acid	ND		1x	1400	ND		1x	1400
Benzyl alcohol	ND		1x	330	ND		1x	320
Benzyl butyl phthalate	ND		1x	320	ND		1x	310
bis(2-Chloroethoxy)methane	ND		1x	300	ND		1x	290
bis(2-Chloroethyl) ether	ND		1x	520	ND		1x	500
bis(2-Ethylhexyl) phthalate	ND		1x	480	ND		1x	460

analyte list continued on following page

ND=Not detected

Table 4-5. Continued.

BREWERTON ANGLE

Analyte	BRA1 SED				BRA2 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	180	ND		1x	180
Cyclohexanone	ND		1x	730	ND		1x	710
Dibenzofuran	ND		1x	160	ND		1x	160
Diethyl phthalate	ND		1x	180	ND		1x	170
Dimethyl phthalate	ND		1x	150	ND		1x	150
Di-n-butyl phthalate	ND		1x	180	ND		1x	180
Di-n-octyl phthalate	ND		1x	130	ND		1x	120
Hexachlorobenzene	ND		1x	220	ND		1x	210
Hexachlorobutadiene	ND		1x	560	ND		1x	540
Hexachlorocyclopentadiene	ND		1x	270	ND		1x	260
Hexachloroethane	ND		1x	670	ND		1x	640
Isophorone	ND		1x	280	ND		1x	270
Nitrobenzene	ND		1x	440	ND		1x	430
N-Nitrosodimethylamine	ND		1x	590	ND		1x	570
N-Nitrosodi-n-propylamine	ND		1x	290	ND		1x	280
N-Nitrosodiphenylamine	ND		1x	230	ND		1x	220
Pentachlorophenol	ND		1x	260	ND		1x	250
Phenol	ND		1x	340	ND		1x	320
Pyridine	ND		1x	440	ND		1x	420

ND=Not detected

Table 4-5. Continued.

FT. McHENRY REACH

Analyte ug/kg	FMH1 SED Result	Qual.	Dil.	Limit	FMH2 SED Result	Qual.	Dil.	Limit	FMH3 SED Result	Qual.	Dil.	Limit	FMH4 SED Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	630	ND		1x	730	ND		1x	560	ND		1x	480
1,2-Diphenylhydrazine	ND		1x	120	ND		1x	140	ND		1x	110	ND		1x	90
1,2,4-Trichlorobenzene	ND		1x	470	ND		1x	540	ND		1x	410	ND		1x	350
1,3-Dichlorobenzene	ND		1x	630	ND		1x	730	ND		1x	560	ND		1x	480
1,4-Dichlorobenzene	ND		1x	600	ND		1x	690	ND		1x	530	ND		1x	450
2-Chloronaphthalene	ND		1x	200	ND		1x	230	ND		1x	170	ND		1x	150
2-Chlorophenol	ND		1x	400	ND		1x	460	ND		1x	350	ND		1x	300
2-Methyl-4,6-dinitrophenol	ND		1x	210	ND		1x	240	ND		1x	180	ND		1x	160
2-Methylphenol	ND		1x	280	ND		1x	320	ND		1x	250	ND		1x	210
2-Nitroaniline	ND		1x	190	ND		1x	220	ND		1x	170	ND		1x	140
2-Nitrophenol	ND		1x	370	ND		1x	420	ND		1x	320	ND		1x	280
2,2'-oxybis(1-Chloropropane)	ND		1x	400	ND		1x	460	ND		1x	350	ND		1x	300
2,4-Dichlorophenol	ND		1x	200	ND		1x	230	ND		1x	180	ND		1x	150
2,4-Dimethylphenol	ND		1x	530	ND		1x	620	ND		1x	470	ND		1x	400
2,4-Dinitrophenol	ND		1x	370	ND		1x	420	ND		1x	320	ND		1x	280
2,4-Dinitrotoluene	ND		1x	170	ND		1x	200	ND		1x	150	ND		1x	130
2,4,5-Trichlorophenol	ND		1x	110	ND		1x	120	ND		1x	94	ND		1x	80
2,4,6-Trichlorophenol	ND		1x	200	ND		1x	230	ND		1x	180	ND		1x	150
2,6-Dinitrotoluene	ND		1x	230	ND		1x	270	ND		1x	210	ND		1x	180
3-Nitroaniline	ND		1x	710	ND		1x	820	ND		1x	630	ND		1x	530
3+4-Methylphenol	ND		1x	270	ND		1x	310	ND		1x	240	ND		1x	200
3,3'-Dichlorobenzidine	ND		1x	970	ND		1x	1100	ND		1x	850	ND		1x	720
4-Bromophenyl phenyl ether	ND		1x	100	ND		1x	120	ND		1x	91	ND		1x	78
4-Chloro-3-methylphenol	ND		1x	160	ND		1x	180	ND		1x	140	ND		1x	120
4-Chloroaniline	ND		1x	890	ND		1x	1000	ND		1x	780	ND		1x	660
4-Chlorophenyl phenyl ether	ND		1x	220	ND		1x	250	ND		1x	190	ND		1x	160
4-Nitroaniline	ND		1x	290	ND		1x	330	ND		1x	250	ND		1x	220
4-Nitrophenol	ND		1x	210	ND		1x	240	ND		1x	180	ND		1x	160
Benzidine	ND		1x	930	ND		1x	1100	ND		1x	820	ND		1x	700
Benzoic acid	ND		1x	1300	ND		1x	1500	ND		1x	1100	ND		1x	960
Benzyl alcohol	ND		1x	300	ND		1x	350	ND		1x	260	ND		1x	220
Benzyl butyl phthalate	ND		1x	290	ND		1x	330	ND		1x	250	ND		1x	220
bis(2-Chloroethoxy)methane	ND		1x	270	ND		1x	310	ND		1x	240	ND		1x	200
bis(2-Chloroethyl) ether	ND		1x	470	ND		1x	540	ND		1x	410	ND		1x	350
bis(2-Ethylhexyl) phthalate	ND		1x	430	ND		1x	500	ND		1x	380	ND		1x	320

analyte list continued on following page

ND=Not detected

Table 4-5. Continued.

FT. McHENRY REACH

Analyte	FMH1 SED				FMH2 SED				FMH3 SED				FMH4 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	160	ND		1x	190	ND		1x	140	ND		1x	120
Cyclohexanone	ND		1x	660	ND		1x	760	ND		1x	580	ND		1x	500
Dibenzofuran	ND		1x	150	ND		1x	170	ND		1x	130	ND		1x	110
Diethyl phthalate	ND		1x	160	ND		1x	180	ND		1x	140	ND.		1x	120
Dimethyl phthalate	ND		1x	140	ND		1x	160	ND		1x	120	ND		1x	100
Di-n-butyl phthalate	ND		1x	160	ND		1x	190	ND		1x	140	ND		1x	120
Di-n-octyl phthalate	ND		1x	110	ND		1x	130	ND		1x	100	ND		1x	85
Hexachlorobenzene	ND		1x	200	ND		1x	230	ND		1x	180	ND		1x	150
Hexachlorobutadiene	ND		1x	500	ND		1x	580	ND		1x	440	ND		1x	380
Hexachlorocyclopentadiene	ND		1x	250	ND		1x	280	ND		1x	220	ND		1x	180
Hexachloroethane	ND		1x	600	ND		1x	690	ND		1x	530	ND		1x	450
Isophorone	ND		1x	250	ND		1x	290	ND		1x	220	ND		1x	190
Nitrobenzene	ND		1x	400	ND		1x	460	ND		1x	350	ND		1x	300
N-Nitrosodimethylamine	ND		1x	530	ND		1x	620	ND		1x	470	ND		1x	400
N-Nitrosodi-n-propylamine	ND		1x	260	ND		1x	300	ND		1x	230	ND		1x	200
N-Nitrosodiphenylamine	ND		1x	200	ND		1x	230	ND		1x	180	ND		1x	150
Pentachlorophenol	ND		1x	230	ND		1x	270	ND		1x	200	ND		1x	170
Phenol	ND		1x	300	ND		1x	350	ND		1x	270	ND		1x	230
Pyridine	ND		1x	390	ND		1x	450	ND		1x	350	ND		1x	300

ND=Not detected

Table 4-5. Continued.

CURTIS BAY REACH

Analyte ug/kg	CB1 SED				CB2 SED				CB3 SED				CB4 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	830	ND		1x	390	ND		1x	760	ND		1x	830
1,2-Diphenylhydrazine	ND		1x	160	ND		1x	73	ND		1x	140	ND		1x	160
1,2,4-Trichlorobenzene	ND		1x	610	ND		1x	290	ND		1x	560	ND		1x	610
1,3-Dichlorobenzene	ND		1x	830	ND		1x	390	ND		1x	760	ND		1x	830
1,4-Dichlorobenzene	ND		1x	780	ND		1x	370	ND		1x	720	ND		1x	780
2-Chloronaphthalene	ND		1x	260	ND		1x	120	ND		1x	240	ND		1x	260
2-Chlorophenol	ND		1x	520	ND		1x	240	ND		1x	480	ND		1x	520
2-Methyl-4,6-dinitrophenol	ND		1x	270	ND		1x	130	ND		1x	250	ND		1x	270
2-Methylphenol	ND		1x	370	ND		1x	170	ND		1x	340	ND		1x	370
2-Nitroaniline	ND		1x	250	ND		1x	120	ND		1x	230	ND		1x	250
2-Nitrophenol	ND		1x	480	ND		1x	220	ND		1x	440	ND		1x	480
2,2'-oxybis(1-Chloropropane)	ND		1x	520	ND		1x	240	ND		1x	480	ND		1x	520
2,4-Dichlorophenol	ND		1x	270	ND		1x	120	ND		1x	240	ND		1x	270
2,4-Dimethylphenol	ND		1x	700	ND		1x	330	ND		1x	640	ND		1x	700
2,4-Dinitrophenol	ND		1x	480	ND		1x	220	ND		1x	440	ND		1x	480
2,4-Dinitrotoluene	ND		1x	230	ND		1x	110	ND		1x	210	ND		1x	230
2,4,5-Trichlorophenol	ND		1x	140	ND		1x	65	ND		1x	130	ND		1x	140
2,4,6-Trichlorophenol	ND		1x	260	ND		1x	120	ND		1x	240	ND		1x	260
2,6-Dinitrotoluene	ND		1x	300	ND		1x	140	ND		1x	280	ND		1x	300
3-Nitroaniline	ND		1x	930	ND		1x	430	ND		1x	850	ND		1x	930
3+4-Methylphenol	ND		1x	350	ND		1x	160	ND		1x	320	ND		1x	350
3,3'-Dichlorobenzidine	ND		1x	1300	ND		1x	590	ND		1x	1200	ND		1x	1300
4-Bromophenyl phenyl ether	ND		1x	130	ND		1x	63	ND		1x	120	ND		1x	130
4-Chloro-3-methylphenol	ND		1x	210	ND		1x	98	ND		1x	190	ND		1x	210
4-Chloroaniline	ND		1x	1200	ND		1x	540	ND		1x	1100	ND		1x	1200
4-Chlorophenyl phenyl ether	ND		1x	280	ND		1x	130	ND		1x	260	ND		1x	280
4-Nitroaniline	ND		1x	370	ND		1x	180	ND		1x	340	ND		1x	370
4-Nitrophenol	ND		1x	270	ND		1x	130	ND		1x	250	ND		1x	270
Benzidine	ND		1x	1200	ND		1x	570	ND		1x	1100	ND		1x	1200
Benzoic acid	ND		1x	1700	ND		1x	780	ND		1x	1500	ND		1x	1700
Benzyl alcohol	ND		1x	390	ND		1x	180	ND		1x	360	ND		1x	390
Benzyl butyl phthalate	ND		1x	370	ND		1x	180	ND		1x	340	ND		1x	370
bis(2-Chloroethoxy)methane	ND		1x	350	ND		1x	170	ND		1x	320	ND		1x	350
bis(2-Chloroethyl) ether	ND		1x	610	ND		1x	290	ND		1x	560	ND		1x	610
bis(2-Ethylhexyl) phthalate	ND		1x	570	ND		1x	270	ND		1x	520	ND		1x	570

analyte list continued on following page

ND=Not detected

Table 4-5. Continued.

CURTIS BAY REACH

Analyte	CB1 SED				CB2 SED				CB3 SED				CB4 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	210	ND		1x	100	ND		1x	200	ND		1x	210
Cyclohexanone	ND		1x	860	ND		1x	400	ND		1x	790	ND		1x	860
Dibenzofuran	ND		1x	190	ND		1x	90	ND		1x	180	ND		1x	190
Diethyl phthalate	ND		1x	210	ND		1x	98	ND		1x	190	ND		1x	210
Dimethyl phthalate	ND		1x	180	ND		1x	84	ND		1x	160	ND		1x	180
Di-n-butyl phthalate	ND		1x	210	ND		1x	100	ND		1x	200	ND		1x	210
Di-n-octyl phthalate	ND		1x	150	ND		1x	69	ND		1x	140	ND		1x	150
Hexachlorobenzene	ND		1x	260	ND		1x	120	ND		1x	240	ND		1x	260
Hexachlorobutadiene	ND		1x	650	ND		1x	310	ND		1x	600	ND		1x	650
Hexachlorocyclopentadiene	ND		1x	320	ND		1x	150	ND		1x	300	ND		1x	320
Hexachloroethane	ND		1x	780	ND		1x	370	ND		1x	720	ND		1x	780
Isophorone	ND		1x	330	ND		1x	160	ND		1x	300	ND		1x	330
Nitrobenzene	ND		1x	520	ND		1x	240	ND		1x	480	ND		1x	520
N-Nitrosodimethylamine	ND		1x	700	ND		1x	330	ND		1x	640	ND		1x	700
N-Nitrosodi-n-propylamine	ND		1x	340	ND		1x	160	ND		1x	320	ND		1x	340
N-Nitrosodiphenylamine	ND		1x	270	ND		1x	120	ND		1x	240	ND		1x	270
Pentachlorophenol	ND		1x	300	ND		1x	140	ND		1x	280	ND		1x	300
Phenol	ND		1x	400	ND		1x	190	ND		1x	360	ND		1x	400
Pyridine	ND		1x	510	ND		1x	240	ND		1x	470	ND		1x	510

ND=Not detected

Table 4-5. Continued.

FERRY BAR REACH

Analyte	FB1 SED				FB2 SED				FB3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	860	ND		1x	950	ND		1x	760
1,2-Diphenylhydrazine	ND		1x	160	ND		1x	180	ND		1x	140
1,2,4-Trichlorobenzene	ND		1x	640	ND		1x	700	ND		1x	560
1,3-Dichlorobenzene	ND		1x	860	ND		1x	950	ND		1x	760
1,4-Dichlorobenzene	ND		1x	820	ND		1x	900	ND		1x	720
2-Chloronaphthalene	ND		1x	270	ND		1x	300	ND		1x	240
2-Chlorophenol	ND		1x	550	ND		1x	600	ND		1x	480
2-Methyl-4,6-dinitrophenol	ND		1x	280	ND		1x	310	ND		1x	250
2-Methylphenol	ND		1x	380	ND		1x	420	ND		1x	340
2-Nitroaniline	ND		1x	260	ND		1x	290	ND		1x	230
2-Nitrophenol	ND		1x	500	ND		1x	550	ND		1x	440
2,2'-oxybis(1-Chloropropane)	ND		1x	550	ND		1x	600	ND		1x	480
2,4-Dichlorophenol	ND		1x	280	ND		1x	300	ND		1x	240
2,4-Dimethylphenol	ND		1x	730	ND		1x	800	ND		1x	640
2,4-Dinitrophenol	ND		1x	500	ND		1x	550	ND		1x	440
2,4-Dinitrotoluene	ND		1x	240	ND		1x	260	ND		1x	210
2,4,5-Trichlorophenol	ND		1x	150	ND		1x	160	ND		1x	130
2,4,6-Trichlorophenol	ND		1x	270	ND		1x	300	ND		1x	240
2,6-Dinitrotoluene	ND		1x	320	ND		1x	350	ND		1x	280
3-Nitroaniline	ND		1x	970	ND		1x	1100	ND		1x	850
3+4-Methylphenol	ND		1x	360	ND		1x	400	ND		1x	320
3,3'-Dichlorobenzidine	ND		1x	1300	ND		1x	1400	ND		1x	1200
4-Bromophenyl phenyl ether	ND		1x	140	ND		1x	160	ND		1x	120
4-Chloro-3-methylphenol	ND		1x	220	ND		1x	240	ND		1x	190
4-Chloroaniline	ND		1x	1200	ND		1x	1300	ND		1x	1100
4-Chlorophenyl phenyl ether	ND		1x	300	ND		1x	320	ND		1x	260
4-Nitroaniline	ND		1x	390	ND		1x	430	ND		1x	340
4-Nitrophenol	ND		1x	280	ND		1x	310	ND		1x	250
Benzidine	ND		1x	1300	ND		1x	1400	ND		1x	1100
Benzoic acid	ND		1x	1700	ND		1x	1900	ND		1x	1500
Benzyl alcohol	ND		1x	410	ND		1x	450	ND		1x	360
Benzyl butyl phthalate	ND		1x	390	ND		1x	430	ND		1x	340
bis(2-Chloroethoxy)methane	ND		1x	370	ND		1x	400	ND		1x	320
bis(2-Chloroethyl) ether	ND		1x	640	ND		1x	700	ND		1x	560
bis(2-Ethylhexyl) phthalate	ND		1x	590	ND		1x	650	ND		1x	520

analyte list continued on following page

ND=Not detected

Table 4-5. Continued.

FERRY BAR REACH

Analyte	FB1 SED				FB2 SED				FB3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	220	ND		1x	240	ND		1x	200
Cyclohexanone	ND		1x	900	ND		1x	990	ND		1x	790
Dibenzofuran	ND		1x	200	ND		1x	220	ND		1x	180
Diethyl phthalate	ND		1x	220	ND		1x	240	ND		1x	190
Dimethyl phthalate	ND		1x	190	ND		1x	200	ND		1x	160
Di-n-butyl phthalate	ND		1x	220	ND		1x	240	ND		1x	200
Di-n-octyl phthalate	ND		1x	150	ND		1x	170	ND		1x	140
Hexachlorobenzene	ND		1x	270	ND		1x	300	ND		1x	240
Hexachlorobutadiene	ND		1x	680	ND		1x	750	ND		1x	600
Hexachlorocyclopentadiene	ND		1x	340	ND		1x	370	ND		1x	300
Hexachloroethane	ND		1x	820	ND		1x	900	ND		1x	720
Isophorone	ND		1x	350	ND		1x	380	ND		1x	300
Nitrobenzene	ND		1x	550	ND		1x	600	ND		1x	480
N-Nitrosodimethylamine	ND		1x	730	ND		1x	800	ND		1x	640
N-Nitrosodi-n-propylamine	ND		1x	360	ND		1x	400	ND		1x	320
N-Nitrosodiphenylamine	ND		1x	280	ND		1x	300	ND		1x	240
Pentachlorophenol	ND		1x	310	ND		1x	340	ND		1x	280
Phenol	ND		1x	410	ND		1x	460	ND		1x	360
Pyridine	ND		1x	540	ND		1x	590	ND		1x	470

ND=Not detected

Table 4-5. Continued.

NORTHWEST BRANCH EAST

Analyte	NBE1 SED				NBE2 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	860	ND		1x	1000
1,2-Diphenylhydrazine	ND		1x	160	ND		1x	190
1,2,4-Trichlorobenzene	ND		1x	640	ND		1x	740
1,3-Dichlorobenzene	ND		1x	860	ND		1x	1000
1,4-Dichlorobenzene	ND		1x	820	ND		1x	950
2-Chloronaphthalene	ND		1x	270	ND		1x	310
2-Chlorophenol	ND		1x	550	ND		1x	630
2-Methyl-4,6-dinitrophenol	ND		1x	280	ND		1x	330
2-Methylphenol	ND		1x	380	ND		1x	440
2-Nitroaniline	ND		1x	260	ND		1x	310
2-Nitrophenol	ND		1x	500	ND		1x	580
2,2'-oxybis(1-Chloropropane)	ND		1x	550	ND		1x	630
2,4-Dichlorophenol	ND		1x	280	ND		1x	320
2,4-Dimethylphenol	ND		1x	730	ND		1x	840
2,4-Dinitrophenol	ND		1x	500	ND		1x	580
2,4-Dinitrotoluene	ND		1x	240	ND		1x	270
2,4,5-Trichlorophenol	ND		1x	150	ND		1x	170
2,4,6-Trichlorophenol	ND		1x	270	ND		1x	320
2,6-Dinitrotoluene	ND		1x	320	ND		1x	370
3-Nitroaniline	ND		1x	970	ND		1x	1100
3+4-Methylphenol	ND		1x	360	ND		1x	420
3,3'-Dichlorobenzidine	ND		1x	1300	ND		1x	1500
4-Bromophenyl phenyl ether	ND		1x	140	ND		1x	160
4-Chloro-3-methylphenol	ND		1x	220	ND		1x	250
4-Chloroaniline	ND		1x	1200	ND		1x	1400
4-Chlorophenyl phenyl ether	ND		1x	300	ND		1x	340
4-Nitroaniline	ND		1x	390	ND		1x	450
4-Nitrophenol	ND		1x	280	ND		1x	330
Benzidine	ND		1x	1300	ND		1x	1500
Benzoic acid	ND		1x	1700	ND		1x	2000
Benzyl alcohol	ND		1x	410	ND		1x	470
Benzyl butyl phthalate	ND		1x	390	ND		1x	450
bis(2-Chloroethoxy)methane	ND		1x	370	ND		1x	430
bis(2-Chloroethyl) ether	ND		1x	640	ND		1x	740
bis(2-Ethylhexyl) phthalate	ND		1x	590	ND		1x	680

analyte list continued on following page

ND=Not detected

Table 4-5. Continued.

NORTHWEST BRANCH EAST

Analyte ug/kg	NBE1 SED				NBE2 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	220	ND		1x	260
Cyclohexanone	ND		1x	900	ND		1x	1000
Dibenzofuran	ND		1x	200	ND		1x	230
Diethyl phthalate	ND		1x	220	ND		1x	250
Dimethyl phthalate	ND		1x	190	ND		1x	220
Di-n-butyl phthalate	ND		1x	220	ND		1x	260
Di-n-octyl phthalate	ND		1x	150	ND		1x	180
Hexachlorobenzene	ND		1x	270	ND		1x	320
Hexachlorobutadiene	ND		1x	680	ND		1x	790
Hexachlorocyclopentadiene	ND		1x	340	ND		1x	390
Hexachloroethane	ND		1x	820	ND		1x	950
Isophorone	ND		1x	350	ND		1x	400
Nitrobenzene	ND		1x	550	ND		1x	630
N-Nitrosodimethylamine	ND		1x	730	ND		1x	840
N-Nitrosodi-n-propylamine	ND		1x	360	ND		1x	420
N-Nitrosodiphenylamine	ND		1x	280	ND		1x	320
Pentachlorophenol	ND		1x	310	ND		1x	360
Phenol	ND		1x	410	ND		1x	480
Pyridine	ND		1x	540	ND		1x	620

ND=Not detected

Table 4-5. Continued.

NORTHWEST BRANCH WEST

Analyte	NBW1 SED				NBW2 SED				NBW3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	560	ND		1x	430	ND		1x	830
1,2-Diphenylhydrazine	ND		1x	110	ND		1x	82	ND		1x	160
1,2,4-Trichlorobenzene	ND		1x	410	ND		1x	320	ND		1x	610
1,3-Dichlorobenzene	ND		1x	560	ND		1x	430	ND		1x	830
1,4-Dichlorobenzene	ND		1x	530	ND		1x	410	ND		1x	780
2-Chloronaphthalene	ND		1x	170	ND		1x	130	ND		1x	260
2-Chlorophenol	ND		1x	350	ND		1x	270	ND		1x	520
2-Methyl-4,6-dinitrophenol	ND		1x	180	ND		1x	140	ND		1x	270
2-Methylphenol	ND		1x	250	ND		1x	190	ND		1x	370
2-Nitroaniline	ND		1x	170	ND		1x	130	ND		1x	250
2-Nitrophenol	ND		1x	320	ND		1x	250	ND		1x	480
2,2'-oxybis(1-Chloropropane)	ND		1x	350	ND		1x	270	ND		1x	520
2,4-Dichlorophenol	ND		1x	180	ND		1x	140	ND		1x	270
2,4-Dimethylphenol	ND		1x	470	ND		1x	360	ND		1x	700
2,4-Dinitrophenol	ND		1x	320	ND		1x	250	ND		1x	480
2,4-Dinitrotoluene	ND		1x	150	ND		1x	120	ND		1x	230
2,4,5-Trichlorophenol	ND		1x	94	ND		1x	73	ND		1x	140
2,4,6-Trichlorophenol	ND		1x	180	ND		1x	140	ND		1x	260
2,6-Dinitrotoluene	ND		1x	210	ND		1x	160	ND		1x	300
3-Nitroaniline	ND		1x	630	ND		1x	480	ND		1x	930
3+4-Methylphenol	ND		1x	240	ND		1x	180	ND		1x	350
3,3'-Dichlorobenzidine	ND		1x	850	ND		1x	660	ND		1x	1300
4-Bromophenyl phenyl ether	ND		1x	91	ND		1x	70	ND		1x	130
4-Chloro-3-methylphenol	ND		1x	140	ND		1x	110	ND		1x	210
4-Chloroaniline	ND		1x	780	ND		1x	600	ND		1x	1200
4-Chlorophenyl phenyl ether	ND		1x	190	ND		1x	150	ND		1x	280
4-Nitroaniline	ND		1x	250	ND		1x	200	ND		1x	370
4-Nitrophenol	ND		1x	180	ND		1x	140	ND		1x	270
Benzidine	ND		1x	820	ND		1x	640	ND		1x	1200
Benzoic acid	ND		1x	1100	ND		1x	870	ND		1x	1700
Benzyl alcohol	ND		1x	260	ND		1x	200	ND		1x	390
Benzyl butyl phthalate	ND		1x	250	ND		1x	200	ND		1x	370
bis(2-Chloroethoxy)methane	ND		1x	240	ND		1x	180	ND		1x	350
bis(2-Chloroethyl) ether	ND		1x	410	ND		1x	320	ND		1x	610
bis(2-Ethylhexyl) phthalate	ND		1x	380	ND		1x	300	640		1x	570

analyte list continued on following page

ND=Not detected

Table 4-5. Continued.

NORTHWEST BRANCH WEST

Analyte ug/kg	NBW1 SED Result	Qual.	Dil.	Limit	NBW2 SED Result	Qual.	Dil.	Limit	NBW3 SED Result	Qual.	Dil.	Limit
Carbazole	ND		1x	140	ND		1x	110	ND		1x	210
Cyclohexanone	ND		1x	580	ND		1x	450	ND		1x	860
Dibenzofuran	ND		1x	130	ND		1x	100	ND		1x	190
Diethyl phthalate	ND		1x	140	ND		1x	110	ND		1x	210
Dimethyl phthalate	ND		1x	120	ND		1x	93	ND		1x	180
Di-n-butyl phthalate	ND		1x	140	ND		1x	110	ND		1x	210
Di-n-octyl phthalate	ND		1x	100	ND		1x	77	ND		1x	150
Hexachlorobenzene	ND		1x	180	ND		1x	140	ND		1x	260
Hexachlorobutadiene	ND		1x	440	ND		1x	340	ND		1x	650
Hexachlorocyclopentadiene	ND		1x	220	ND		1x	170	ND		1x	320
Hexachloroethane	ND		1x	530	ND		1x	410	ND		1x	780
Isophorone	ND		1x	220	ND		1x	170	ND		1x	330
Nitrobenzene	ND		1x	350	ND		1x	270	ND		1x	520
N-Nitrosodimethylamine	ND		1x	470	ND		1x	360	ND		1x	700
N-Nitrosodi-n-propylamine	ND		1x	230	ND		1x	180	ND		1x	340
N-Nitrosodiphenylamine	ND		1x	180	ND		1x	140	ND		1x	270
Pentachlorophenol	ND		1x	200	ND		1x	160	ND		1x	300
Phenol	ND		1x	270	ND		1x	210	ND		1x	400
Pyridine	ND		1x	350	ND		1x	270	ND		1x	510

ND=Not detected

Table 4-6. Semivolatile polynuclear aromatic hydrocarbons (PAHs) results for Chesapeake Bay and Baltimore Harbor sediments presented by sampling reach.

POPLAR ISLAND

Analyte	PI1 SED				PI2 SED				PI3 SED				PI4 SED				PI5 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	20	ND		1x	67	ND		1x	18	ND		1x	20	ND		1x	22
2-Methylnaphthalene	ND		1x	20	ND		1x	67	ND		1x	18	ND		1x	20	ND		1x	22
Acenaphthene	ND		1x	20	ND		1x	67	ND		1x	18	ND		1x	20	ND		1x	22
Acenaphthylene	ND		1x	35	ND		1x	110	ND		1x	31	ND		1x	34	ND		1x	38
Anthracene	ND		1x	2	ND		1x	6.7	ND		1x	1.8	ND		1x	2	ND		1x	2.2
Benzo[a]pyrene	ND		1x	2.8	ND		1x	9	ND		1x	2.4	ND		1x	2.7	ND		1x	3
Benzo[b]fluoranthene	ND		1x	3.1	ND		1x	10	ND		1x	2.7	ND		1x	3	ND		1x	3.3
Benzo[g,h,i]perylene	ND		1x	2.8	ND		1x	9	ND		1x	2.4	ND		1x	2.7	ND		1x	3
Benzo[k]fluoranthene	ND		1x	1.3	ND		1x	4.1	ND		1x	1.1	ND		1x	1.2	ND		1x	1.4
Benz[a]anthracene	ND		1x	1	ND		1x	3.3	ND		1x	0.88	ND		1x	0.98	ND		1x	1.1
Chrysene	ND		1x	1.3	ND		1x	4.[illegible]	ND		1x	1.1	ND		1x	1.3	ND		1x	1.4
Dibenz[a,h]anthracene	ND		1x	1.4	ND		1x	4.6	ND		1x	1.2	ND		1x	1.4	ND		1x	1.5
Fluoranthene	ND		1x	2.8	ND		1x	9	ND		1x	2.4	ND		1x	2.7	ND		1x	3
Fluorene	ND		1x	4.2	ND		1x	14	ND		1x	3.7	ND		1x	4.1	ND		1x	4.6
Indeno[1,2,3-cd]pyrene	ND		1x	2.3	ND		1x	7.6	ND		1x	2	ND		1x	2.3	ND		1x	2.6
Naphthalene	ND		1x	20	ND		1x	67	ND		1x	18	ND		1x	20	ND		1x	22
Phenanthrene	1.4		1x	1.2	4.7		1x	4	1.1		1x	1.1	ND		1x	1.2	2.8		1x	1.3
Pyrene	ND		1x	2.6	ND		1x	8.6	ND		1x	2.3	ND		1x	2.6	ND		1x	2.9

ND= Not detected

Table 4-6. Continued.

DEEP TROUGH

Analyte ug/kg	DT1 SED				DT2 SED				DT3 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	70	ND		1x	30	ND		1x	66
2-Methylnaphthalene	ND		1x	70	ND		1x	30	ND		1x	66
Acenaphthene	ND		1x	70	ND		1x	30	ND		1x	66
Acenaphthylene	ND		1x	120	ND		1x	52	ND		1x	110
Anthracene	ND		1x	7	ND		1x	3	ND		1x	6.6
Benzo[a]pyrene	ND		1x	9.5	ND		1x	4.1	ND		1x	9
Benzo[b]fluoranthene	ND		1x	11	ND		1x	4.5	ND		1x	9.9
Benzo[g,h,i]perylene	ND		1x	9.5	ND		1x	4.1	ND		1x	9
Benzo[k]fluoranthene	ND		1x	4.4	ND		1x	1.9	ND		1x	4.1
Benz[a]anthracene	ND		1x	3.5	ND		1x	1.5	ND		1x	3.3
Chrysene	ND		1x	4.5	ND		1x	1.9	ND		1x	4.2
Dibenz[a,h]anthracene	ND		1x	4.9	ND		1x	2.1	ND		1x	4.6
Fluoranthene	ND		1x	9.5	ND		1x	4.1	ND		1x	9
Fluorene	ND		1x	15	ND		1x	6.2	17		1x	13.68
Indeno[1,2,3-cd]pyrene	ND		1x	8	ND		1x	3.4	ND		1x	7.5
Naphthalene	ND		1x	70	ND		1x	30	ND		1x	66
Phenanthrene	4.6		1x	4.22	ND		1x	1.8	11		1x	3.96
Pyrene	ND		1x	9	ND		1x	3.9	ND		1x	8.5

ND= Not detected

Table 4-6. Continued.

KENT ISLAND DEEP

Analyte ug/kg	KI1 SED Result	KI1 SED Qual.	KI1 SED Dil.	KI1 SED Limit	KI2 SED Result	KI2 SED Qual.	KI2 SED Dil.	KI2 SED Limit	KI3SED Result	KI3SED Qual.	KI3SED Dil.	KI3SED Limit
1-Methylnaphthalene	ND		1x	19	ND		1x	42	ND		1x	20
2-Methylnaphthalene	ND		1x	19	ND		1x	42	ND		1x	20
Acenaphthene	ND		1x	19	ND		1x	42	ND		1x	20
Acenaphthylene	ND		1x	32	ND		1x	71	ND		1x	35
Anthracene	ND		1x	1.9	ND		1x	4.2	ND		1x	2
Benzo[a]pyrene	4.7		1x	2.52	ND		1x	5.6	6.8		1x	2.73
Benzo[b]fluoranthene	7		1x	2.79	ND		1x	6.2	10		1x	3.02
Benzo[g,h,i]perylene	4.1		1x	2.52	ND		1x	5.6	5.2		1x	2.73
Benzo[k]fluoranthene	2.1		1x	1.15	ND		1x	2.6	3.3		1x	1.25
Benz[a]anthracene	3.7		1x	0.92	ND		1x	2	6.3		1x	0.99
Chrysene	4.2		1x	1.18	ND		1x	2.6	7.1		1x	1.28
Dibenz[a,h]anthracene	ND		1x	1.3	ND		1x	2.9	ND		1x	1.4
Fluoranthene	7.7		1x	2.52	ND		1x	5.6	8.2		1x	2.73
Fluorene	4.7		1x	3.85	12		1x	8.61	5.7		1x	4.17
Indeno[1,2,3-cd]pyrene	ND		1x	2.1	ND		1x	4.7	3.3		1x	2.30
Naphthalene	ND		1x	19	ND		1x	42	ND		1x	20
Phenanthrene	7.2		1x	1.11	7.2		1x	2.49	6.5		1x	1.21
Pyrene	8.1		1x	2.39	ND		1x	5.3	7.6		1x	2.59

ND= Not detected

Table 4-6. Continued.

POOLES ISLAND

Analyte ug/kg	POLISED Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	35
2-Methylnaphthalene	ND		1x	35
Acenaphthene	ND		1x	35
Acenaphthylene	ND		1x	59
Anthracene	ND		1x	3.5
Benzo[a]pyrene	ND		1x	4.7
Benzo[b]fluoranthene	59		1x	4.1
Benzo[g,h,i]perylene	ND		1x	4.7
Benzo[k]fluoranthene	ND		1x	2.1
Benz[a]anthracene	ND		1x	1.7
Chrysene	ND		1x	2.2
Dibenz[a,h]anthracene	ND		1x	2.4
Fluoranthene	ND		1x	4.7
Fluorene	ND		1x	7.2
Indeno[1,2,3-cd]pyrene	ND		1x	4
Naphthalene	ND		1x	35
Phenanthrene	5.8		1x	1.6
Pyrene	ND		1x	4.4

ND= Not detected

Table 4-6. Continued.

SWAN POINT CHANNEL

Analyte	SWP1 SED				SWP2 SED				SWP3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	60	ND		1x	63	ND		1x	56
2-Methylnaphthalene	ND		1x	60	ND		1x	63	100		1x	56
Acenaphthene	ND		1x	60	ND		1x	63	ND		1x	56
Acenaphthylene	ND		1x	100	ND		1x	110	ND		1x	96
Anthracene	ND		1x	6	ND		1x	6.3	10		1x	5.6
Benzo[a]pyrene	ND		1x	8.2	ND		1x	8.6	13		1x	7.6
Benzo[b]fluoranthene	13		1x	9.05	20		1x	9.50	19		1x	8.4
Benzo[g,h,i]perylene	ND		1x	8.2	ND		1x	8.6	9.9		1x	7.6
Benzo[k]fluoranthene	ND		1x	3.8	4.3		1x	3.94	5.2		1x	3.48
Benz[a]anthracene	4.5		1x	2.97	5.1		1x	3.12	8.9		1x	2.76
Chrysene	5.9		1x	3.84	7.2		1x	4.03	12		1x	3.56
Dibenz[a,h]anthracene	ND		1x	4.2	ND		1x	4.4	ND		1x	3.9
Fluoranthene	8.9		1x	8.19	14		1x	8.60	19		1x	7.6
Fluorene	60		1x	12.5	62		1x	13.12	320		1x	11.6
Indeno[1,2,3-cd]pyrene	ND		1x	6.9	7.8		1x	7.24	10		1x	6.4
Naphthalene	76		1x	60.34	77		1x	63.35	280		1x	56
Phenanthrene	23		1x	3.62	25		1x	3.80	42		1x	3.36
Pyrene	14		1x	7.76	19		1x	8.14	22		1x	7.2

ND= Not detected

Table 4-6. Continued.

CRAIGHILL ENTRANCE

Analyte ug/kg	CRE1 SED				CRE2 SED				CRE3 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	35	ND		1x	34	ND		1x	33
2-Methylnaphthalene	69		1x	35.44	ND		1x	34	ND		1x	33
Acenaphthene	39		1x	35.44	ND		1x	34	ND		1x	33
Acenaphthylene	ND		1x	61	ND		1x	58	ND		1x	56
Anthracene	6.7		1x	3.54	ND		1x	3.4	ND		1x	3.3
Benzo[a]pyrene	11		1x	4.81	ND		1x	4.6	ND		1x	4.4
Benzo[b]fluoranthene	17		1x	5.32	ND		1x	5.1	8.5		1x	4.92
Benzo[g,h,i]perylene	10		1x	4.81	ND		1x	4.6	ND		1x	4.4
Benzo[k]fluoranthene	6		1x	2.20	ND		1x	2.1	ND		1x	2
Benz[a]anthracene	10		1x	1.75	ND		1x	1.7	ND		1x	1.6
Chrysene	16		1x	2.25	ND		1x	2.2	3.5		1x	2.08
Dibenz[a,h]anthracene	ND		1x	2.5	ND		1x	2.3	ND		1x	2.3
Fluoranthene	23		1x	4.81	ND		1x	4.6	4.5		1x	4.45
Fluorene	ND		1x	7.3	ND		1x	7	13		1x	6.79
Indeno[1,2,3-cd]pyrene	6.4		1x	4.05	ND		1x	3.9	ND		1x	3.7
Naphthalene	ND		1x	35	ND		1x	34	ND		1x	33
Phenanthrene	24		1x	2.13	ND		1x	2	9		1x	1.97
Pyrene	19		1x	4.56	ND		1x	4.4	6.5		1x	4.22

ND= Not detected

Table 4-6. Continued.

CRAIGHILL CHANNEL

Analyte	CR1 SED				CR2 SED				CR2FD SED				CR3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	20	ND		1x	30	ND		1x	47	ND		1x	34
2-Methylnaphthalene	ND		1x	20	ND		1x	30	ND		1x	47	ND		1x	34
Acenaphthene	ND		1x	20	ND		1x	30	ND		1x	47	ND		1x	34
Acenaphthylene	ND		1x	35	ND		1x	52	ND		1x	80	ND		1x	58
Anthracene	ND		1x	2	ND		1x	3	ND		1x	4.7	ND		1x	3.4
Benzo[a]pyrene	ND		1x	2.8	5.4		1x	4.09	ND		1x	6.4	ND		1x	4.6
Benzo[b]fluoranthene	12		1x	3.04	8.5		1x	4.52	10		1x	7	5.8		1x	5.10
Benzo[g,h,i]perylene	ND		1x	2.8	4.4		1x	4.09	ND		1x	6.4	ND		1x	4.6
Benzo[k]fluoranthene	ND		1x	1.3	2.7		1x	1.87	ND		1x	2.9	ND		1x	2.1
Benz[a]anthracene	ND		1x	1	ND		1x	1.5	3.3		1x	2.3	ND		1x	1.7
Chrysene	7.3		1x	1.29	4.2		1x	1.91	3.5		1x	2.97	ND		1x	2.2
Dibenz[a,h]anthracene	ND		1x	1.4	ND		1x	2.1	ND		1x	3.2	ND		1x	2.4
Fluoranthene	ND		1x	2.8	ND		1x	4.1	9.1		1x	6.33	ND		1x	4.6
Fluorene	6.8		1x	4.20	8.9		1x	6.24	29		1x	9.67	ND		1x	7.1
Indeno[1,2,3-cd]pyrene	ND		1x	2.3	ND		1x	3.4	ND		1x	5.4	ND		1x	3.9
Naphthalene	ND		1x	20	ND		1x	30	ND		1x	47	ND		1x	34
Phenanthrene	5		1x	1.22	9.2		1x	1.81	17		1x	2.8	4.2		1x	2.04
Pyrene	2.9		1x	2.61	6.9		1x	3.87	13		1x	6	ND		1x	4.4

ND= Not detected

Table 4-6. Continued.

CRAIGHILL ANGLE

Analyte	CRA1 SED				CRA2 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	42	ND		1x	53
2-Methylnaphthalene	ND		1x	42	ND		1x	53
Acenaphthene	ND		1x	42	ND		1x	53
Acenaphthylene	ND		1x	72	ND		1x	90
Anthracene	ND		1x	4.2	ND		1x	5.3
Benzo[a]pyrene	ND		1x	5.7	ND		1x	7.1
Benzo[b]fluoranthene	6.5		1x	6.3	ND		1x	7.9
Benzo[g,h,i]perylene	ND		1x	5.7	ND		1x	7.1
Benzo[k]fluoranthene	ND		1x	2.6	ND		1x	3.3
Benz[a]anthracene	ND		1x	2.1	2.6		1x	2.6
Chrysene	5.4		1x	2.7	ND		1x	3.3
Dibenz[a,h]anthracene	ND		1x	2.9	ND		1x	3.6
Fluoranthene	6.2		1x	5.7	7.6		1x	7.1
Fluorene	18		1x	8.7	20		1x	11
Indeno[1,2,3-cd]pyrene	ND		1x	4.8	ND		1x	6
Naphthalene	67		1x	42	ND		1x	53
Phenanthrene	11		1x	2.5	14		1x	3.2
Pyrene	8		1x	5.4	13		1x	6.8

ND= Not detected

Table 4-6. Continued.

CRAIGHILL UPPER RANGE

Analyte	CRU1 SED				CRU2 SED				CRU3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	50	ND		1x	22	ND		1x	33
2-Methylnaphthalene	ND		1x	50	ND		1x	22	ND		1x	33
Acenaphthene	ND		1x	50	ND		1x	22	ND		1x	33
Acenaphthylene	ND		1x	85	ND		1x	38	ND		1x	56
Anthracene	ND		1x	5	ND		1x	2.2	3.3		1x	3.27
Benzo[a]pyrene	13		1x	6.74	ND		1x	3	7.3		1x	4.44
Benzo[b]fluoranthene	20		1x	7.45	5		1x	3.32	15		1x	4.91
Benzo[g,h,i]perylene	13		1x	6.74	ND		1x	3	5.9		1x	4.44
Benzo[k]fluoranthene	6.6		1x	3.09	ND		1x	1.4	2.9		1x	2.03
Benz[a]anthracene	9.9		1x	2.45	ND		1x	1.1	3.4		1x	1.61
Chrysene	11		1x	3.16	ND		1x	1.4	5.5		1x	2.08
Dibenz[a,h]anthracene	6.6		1x	3.44	ND		1x	1.5	ND		1x	2.3
Fluoranthene	15		1x	6.74	3		1x	3.01	5.8		1x	4.44
Fluorene	22		1x	10.28	6.5		1x	4.59	28		1x	6.78
Indeno[1,2,3-cd]pyrene	9.5		1x	5.67	ND		1x	2.5	ND		1x	3.7
Naphthalene	ND		1x	50	30		1x	22.15	45		1x	32.71
Phenanthrene	18		1x	2.98	4.8		1x	1.33	12		1x	1.96
Pyrene	18		1x	6.38	4.2		1x	2.85	8.9		1x	4.21

ND= Not detected

Table 4-6. Continued.

CUTOFF ANGLE

Analyte	CUT1 SED				CUT2 SED				CUT3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	47	ND		1x	56	ND		1x	44
2-Methylnaphthalene	ND		1x	47	ND		1x	56	ND		1x	44
Acenaphthene	ND		1x	47	ND		1x	56	ND		1x	44
Acenaphthylene	ND		1x	81	ND		1x	96	ND		1x	44
Anthracene	ND		1x	4.7	ND		1x	5.6	ND		1x	75
Benzo[a]pyrene	15		1x	6.40	11		1x	7.57	ND		1x	4.4
Benzo[b]fluoranthene	17		1x	7.07	21		1x	8.37	13		1x	5.97
Benzo]g,h,i]perylene	13		1x	6.40	10		1x	7.57	18		1x	6.60
Benzo[k]fluoranthene	5.3		1x	2.93	4.5		1x	3.47	11		1x	5.97
Benz[a]anthracene	8.8		1x	2.32	6.9		1x	2.75	5.4		1x	2.74
Chrysene	10		1x	3.00	7.6		1x	3.55	9		1x	2.17
Dibenz[a,h]anthracene	ND		1x	3.3	ND		1x	3.9	11		1x	2.80
Fluoranthene	16		1x	6.40	14		1x	7.57	ND		1x	3.1
Fluorene	36		1x	9.76	24		1x	11.55	15		1x	5.97
Indeno[1,2,3-cd]pyrene	9.1		1x	5.39	ND		1x	6.4	17		1x	9.12
Naphthalene	73		1x	47.14	ND		1x	56	6.1		1x	5.03
Phenanthrene	22		1x	2.83	18		1x	3.35	66		1x	44.03
Pyrene	22		1x	6.06	18		1x	7.17	15		1x	2.64
									17		1x	5.66

ND= Not detected

Table 4-6. Continued.

TOLCHESTER CHANNEL-VAN VEEN

Analyte	TLC1 SED				TLC2 SED				TLC2FD SED				TLC3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	27	ND		1x	29	ND		1x	31	ND		1x	41
2-Methylnaphthalene	37		1x	27.08	ND		1x	29	ND		1x	31	ND		1x	41
Acenaphthene	ND		1x	27	ND		1x	29	ND		1x	31	ND		1x	41
Acenaphthylene	ND		1x	46	ND		1x	50	ND		1x	53	ND		1x	71
Anthracene	9.2		1x	2.71	ND		1x	2.9	ND		1x	3.1	ND		1x	4.1
Benzo[a]pyrene	14		1x	3.68	ND		1x	4	ND		1x	4.2	20		1x	5.62
Benzo[b]fluoranthene	49		1x	4.06	98		1x	4.41	52		1x	4.62	30		1x	6.21
Benzo[g,h,i]perylene	12		1x	3.68	ND		1x	4	ND		1x	4.2	12		1x	5.62
Benzo[k]fluoranthene	4.5		1x	1.68	ND		1x	1.8	ND		1x	1.9	7.3		1x	2.57
Benz[a]anthracene	8.5		1x	1.33	ND		1x	1.4	ND		1x	1.5	13		1x	2.04
Chrysene	10		1x	1.72	ND		1x	1.9	ND		1x	2	16		1x	2.63
Dibenz[a,h]anthracene	ND		1x	1.9	ND		1x	2	ND		1x	2.1	ND		1x	2.9
Fluoranthene	24		1x	3.68	4.5		1x	3.99	ND		1x	4.2	21		1x	5.62
Fluorene	180		1x	5.61	21		1x	6.09	ND		1x	6.4	27		1x	8.58
Indeno[1,2,3-cd]pyrene	11		1x	3.09	ND		1x	3.4	ND		1x	3.5	13		1x	4.73
Naphthalene	160		1x	27.08	ND		1x	29	ND		1x	31	ND		1x	41
Phenanthrene	32		1x	1.62	12		1x	1.76	2.7		1x	1.85	16		1x	2.49
Pyrene	27		1x	3.48	8.5		1x	3.78	4.5		1x	3.96	21		1x	5.33

ND= Not detected

Table 4-6. Continued.

TOLCHESTER CHANNEL-GRAVITY CORE

Analyte	TLV1 SED				TLV2 SED				TLV3 SED				TLV4 SED				TLV4SEDDL				TLV5 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	28	ND		1x	27	ND		1x	28	170		1x	30.91	120		4x	123.6	ND		1x	30
2-Methylnaphthalene	59		1x	28.28	44		1x	26.72	75		1x	27.78	380		1x	30.91	320		4x	123.6	75		1x	30.43
Acenaphthene	51		1x	28.28	40		1x	26.72	60		1x	27.78	180		1x	30.91	150		4x	123.6	61		1x	30.43
Acenaphthylene	ND		1x	48	ND		1x	46	ND		1x	48	ND		1x	53	ND		4x	210	ND		1x	52
Anthracene	19		1x	2.83	7.6		1x	2.67	10		1x	2.78	42		1x	3.09	40		4x	12.36	12		1x	3.04
Benzo[a]pyrene	31		1x	3.84	19		1x	3.63	34		1x	3.77	57		1x	4.19	81		4x	16.78	28		1x	4.13
Benzo[b]fluoranthene	43		1x	4.24	22		1x	4.01	43		1x	4.17	120		1x	4.64	110		4x	18.54	87		1x	4.57
Benzo[g,h,i]perylene	14		1x	3.84	10		1x	3.63	20		1x	3.77	46		1x	4.19	25		4x	16.78	22		1x	4.13
Benzo[k]fluoranthene	13		1x	1.76	7.4		1x	1.66	13		1x	1.73	24		1x	1.92	25		4x	7.68	11		1x	1.89
Benz[a]anthracene	19		1x	1.39	14		1x	1.32	24		1x	1.37	44		1x	1.52	41		4x	6.09	20		1x	1.5
Chrysene	22		1x	1.80	16		1x	1.70	28		1x	1.77	56		1x	1.96	52		4x	7.86	27		1x	1.93
Dibenz[a,h]anthracene	2.8		1x	1.96	ND		1x	1.9	2.8		1x	1.92	5.7		1x	2.14	9.5		4x	8.57	2.5		1x	2.11
Fluoranthene	36		1x	3.84	28		1x	3.63	47		1x	3.77	120		1x	4.19	120		4x	16.78	55		1x	4.13
Fluorene	260		1x	5.86	140		1x	5.53	130		1x	5.75	1100	E	1x	6.40	1100		4x	25.61	150		1x	6.30
Indeno[1,2,3-cd]pyrene	23		1x	3.23	12		1x	3.05	23		1x	3.17	41		1x	3.53	70		4x	14.13	22		1x	3.48
Naphthalene	89		1x	28.28	99		1x	26.72	120		1x	27.78	650		1x	30.91	510		4x	123.6	75		1x	30.43
Phenanthrene	41		1x	1.70	25		1x	1.60	32		1x	1.67	160		1x	1.85	170		4x	7.42	48		1x	1.83
Pyrene	15		1x	3.64	21		1x	3.44	33		1x	3.57	110		1x	3.97	110		4x	15.89	49		1x	3.91

ND= Not detected E=Outside calibration range

Table 4-6. Continued.

BREWERTON EASTERN EXTENSION-VAN VEEN

Analyte	BE1 SED				BE2 SED				BE3 SED				BE4 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	59	ND		1x	42	ND		1x	42	ND		1x	50
2-Methylnaphthalene	ND		1x	59	ND		1x	42	ND		1x	42	ND		1x	50
Acenaphthene	ND		1x	59	59		1x	41.92	ND		1x	42	ND		1x	50
Acenaphthylene	ND		1x	100	ND		1x	72	ND		1x	71	ND		1x	85
Anthracene	ND		1x	5.9	4.7		1x	4.19	ND		1x	4.2	ND		1x	5
Benzo[a]pyrene	ND		1x	7.9	14		1x	5.69	ND		1x	5.6	ND		1x	6.8
Benzo[b]fluoranthene	9		1x	8.75	28		1x	6.29	9.2		1x	6.23	8.7		1x	7.47
Benzo[g,h,i]perylene	ND		1x	7.9	8.4		1x	5.69	ND		1x	5.6	ND		1x	6.8
Benzo[k]fluoranthene	ND		1x	3.6	6.2		1x	2.60	ND		1x	2.6	ND		1x	3.1
Benz[a]anthracene	ND		1x	2.9	7.3		1x	2.07	3.4		1x	2.05	3.2		1x	2.46
Chrysene	ND		1x	3.7	39		1x	2.66	4.1		1x	2.64	ND		1x	3.2
Dibenz[a,h]anthracene	ND		1x	4.1	ND		1x	2.9	ND		1x	2.9	ND		1x	3.5
Fluoranthene	ND		1x	7.9	24		1x	5.69	ND		1x	5.6	ND		1x	6.8
Fluorene	ND		1x	12	170		1x	8.68	ND		1x	8.6	ND		1x	10
Indeno[1,2,3-cd]pyrene	ND		1x	6.7	9		1x	4.79	5.3		1x	4.75	ND		1x	5.7
Naphthalene	ND		1x	59	72		1x	41.92	ND		1x	42	ND		1x	50
Phenanthrene	3.9		1x	3.5	18		1x	2.52	4.3		1x	2.49	4.1		1x	2.99
Pyrene	8.1		1x	7.5	22		1x	5.39	7.5		1x	5.34	6.7		1x	6.41

ND= Not detected

Table 4-6. Continued.

BREWERTON EASTERN EXTENSION-GRAVITY CORE

Analyte	BEV1 SED				BEV2 SED				BEV3 SED				BEV4 SED				BEV5 SED				BEV6 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	33	ND		1x	32	78		1x	33.41	ND		1x	31	ND		1x	36	ND		1x	35
2-Methylnaphthalene	ND		1x	33	ND		1x	32	190		1x	33.41	ND		1x	31	ND		1x	36	ND		1x	35
Acenaphthene	ND		1x	33	ND		1x	32	420		1x	33.41	ND		1x	31	ND		1x	36	ND		1x	35
Acenaphthylene	ND		1x	57	ND		1x	55	ND		1x	57	ND		1x	54	ND		1x	61	ND		1x	60
Anthracene	3.7		1x	3.30	ND		1x	3.2	44		1x	3.34	3.3		1x	3.14	ND		1x	3.6	ND		1x	3.5
Benzo[a]pyrene	14		1x	4.48	4.8		1x	4.34	120		1x	4.53	9.9		1x	4.26	ND		1x	4.9	ND		1x	4.8
Benzo[b]fluoranthene	25		1x	4.95	10		1x	4.79	160		1x	5.01	21		1x	4.71	12		1x	5.37	ND		1x	5.3
Benzo[g,h,i]perylene	11		1x	4.48	4.7		1x	4.34	89		1x	4.53	12		1x	4.26	ND		1x	4.9	ND		1x	4.8
Benzo[k]fluoranthene	6.3		1x	2.05	ND		1x	2	62		1x	2.08	4.1		1x	1.95	ND		1x	2.2	ND		1x	2.2
Benz[a]anthracene	11		1x	1.63	3.1		1x	1.58	96		1x	1.65	7.5		1x	1.55	1.9		1x	1.76	ND		1x	1.7
Chrysene	14		1x	2.10	3.5		1x	2.03	120		1x	2.12	8.8		1x	2.00	2.4		1x	2.28	ND		1x	2.2
Dibenz[a,h]anthracene	ND		1x	2.3	ND		1x	2.2	12		1x	2.32	ND		1x	2.2	ND		1x	2.5	ND		1x	2.4
Fluoranthene	19		1x	4.48	6.1		1x	4.34	290		1x	4.53	14		1x	4.26	ND		1x	4.9	ND		1x	4.8
Fluorene	36		1x	6.84	24		1x	6.62	77		1x	6.92	23		1x	6.50	ND		1x	7.4	ND		1x	7.3
Indeno[1,2,3-cd]pyrene	9.8		1x	3.77	ND		1x	3.7	98		1x	3.82	8.8		1x	3.59	ND		1x	4.1	ND		1x	4
Naphthalene	110		1x	33.02	ND		1x	32	73		1x	33.41	ND		1x	31	ND		1x	36	ND		1x	35
Phenanthrene	15		1x	1.98	8.4		1x	1.92	170		1x	2.00	10		1x	1.88	ND		1x	2.1	ND		1x	2.1
Pyrene	19		1x	4.25	8.1		1x	4.11	150		1x	4.30	12		1x	4.04	ND		1x	4.6	ND		1x	4.5

ND= Not detected

Table 4-6. Continued.

BREWERTON REACH

Analyte ug/kg	BR1 SED				BR2 SED				BR3 SED				BR4 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	46	ND		1x	44	ND		1x	42	ND		1x	49
2-Methylnaphthalene	ND		1x	46	ND		1x	44	150		1x	41.79	ND		1x	49
Acenaphthene	ND		1x	46	ND		1x	44	400		1x	41.79	54		1x	48.95
Acenaphthylene	ND		1x	79	ND		1x	75	ND		1x	72	ND		1x	84
Anthracene	ND		1x	4.6	ND		1x	4.4	55		1x	4.18	12		1x	4.90
Benzo[a]pyrene	7.3		1x	6.29	ND		1x	5.9	97		1x	5.67	37		1x	6.64
Benzo[b]fluoranthene	11		1x	6.95	ND		1x	6.6	160		1x	6.27	96		1x	7.34
Benzo[g,h,i]perylene	6.9		1x	6.29	ND		1x	5.9	64		1x	5.67	39		1x	6.64
Benzo[k]fluoranthene	3.2		1x	2.88	ND		1x	2.7	55		1x	2.60	22		1x	3.04
Benz[a]anthracene	4		1x	2.28	ND		1x	2.2	120		1x	2.06	31		1x	2.41
Chrysene	3.8		1x	2.95	ND		1x	2.8	130		1x	2.66	38		1x	3.11
Dibenz[a,h]anthracene	ND		1x	3.2	ND		1x	3	13		1x	2.90	5		1x	3.39
Fluoranthene	6.9		1x	6.29	ND		1x	5.9	260		1x	5.67	65		1x	6.64
Fluorene	ND		1x	9.6	ND		1x	9.1	72		1x	8.66	26		1x	10.14
Indeno[1,2,3-cd]pyrene	ND		1x	5.3	ND		1x	5	67		1x	4.78	37		1x	5.59
Naphthalene	ND		1x	46	ND		1x	44	56		1x	41.79	ND		1x	49
Phenanthrene	4.4		1x	2.78	ND		1x	2.6	120		1x	2.51	28		1x	2.94
Pyrene	9.3		1x	5.96	ND		1x	5.6	160		1x	5.37	57		1x	6.29

ND= Not detected

Table 4-6. Continued.

BLIND SPLITS

Analyte ug/kg	BLINDSPLIT1A(BR1) Result	Qual.	Dil.	Limit	BLINDSPLIT2A(BR3) Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	42	ND		1x	38
2-Methylnaphthalene	ND		1x	42	ND		1x	38
Acenaphthene	ND		1x	42	ND		1x	38
Acenaphthylene	ND		1x	73	ND		1x	64
Anthracene	ND		1x	4.2	ND		1x	3.8
Benzo[a]pyrene	ND		1x	5.8	7.8		1x	5.08
Benzo[b]fluoranthene	12		1x	6.36	16		1x	5.62
Benzo[g,h,i]perylene	6.5		1x	5.76	7.9		1x	5.08
Benzo[k]fluoranthene	ND		1x	2.6	4.3		1x	2.33
Benz[a]anthracene	3.4		1x	2.09	4.7		1x	1.84
Chrysene	4.4		1x	2.70	5.6		1x	2.38
Dibenz[a,h]anthracene	ND		1x	2.9	ND		1x	2.6
Fluoranthene	ND		1x	5.8	6		1x	5.08
Fluorene	ND		1x	8.8	ND		1x	7.8
Indeno[1,2,3-cd]pyrene	7.9		1x	4.85	7.8		1x	4.28
Naphthalene	ND		1x	42	ND		1x	38
Phenanthrene	3.1		1x	2.55	3.2		1x	2.25
Pyrene	7.6		1x	5.45	9.4		1x	4.81

ND= Not detected

Table 4-6. Continued.

BREWERTON ANGLE REACH

Analyte ug/kg	BRA1 SED Result	Qual.	Dil.	Limit	BRA2 SED Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	51	ND		1x	49
2-Methylnaphthalene	ND		1x	51	ND		1x	49
Acenaphthene	ND		1x	51	ND		1x	49
Acenaphthylene	ND		1x	88	ND		1x	85
Anthracene	ND		1x	5.1	ND		1x	4.9
Benzo[a]pyrene	14		1x	6.96	8.1		1x	6.71
Benzo[b]fluoranthene	24		1x	7.69	21		1x	7.42
Benzo[g,h,i]perylene	17		1x	6.96	8.6		1x	6.71
Benzo[k]fluoranthene	6.1		1x	3.19	4		1x	3.07
Benz[a]anthracene	9.2		1x	2.53	5.3		1x	2.44
Chrysene	11		1x	3.26	6.3		1x	3.14
Dibenz[a,h]anthracene	ND		1x	3.5	ND		1x	3.4
Fluoranthene	15		1x	6.96	8.6		1x	6.71
Fluorene	ND		1x	11	ND		1x	10
Indeno[1,2,3-cd]pyrene	14		1x	5.86	ND		1x	5.7
Naphthalene	ND		1x	51	ND		1x	49
Phenanthrene	8.2		1x	3.08	8.4		1x	2.97
Pyrene	21		1x	6.59	14		1x	6.36

ND= Not detected

Table 4-6. Continued.

FT. McHENRY REACH

Analyte	FMH1 SED				FMH2 SED				FMH3 SED				FMH4 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	47	ND		1x	54	ND		1x	41	ND		1x	35
2-Methylnaphthalene	ND		1x	47	110		1x	54.26	ND		1x	41	ND		1x	35
Acenaphthene	63		1x	46.98	140		1x	54.26	ND		1x	41	ND		1x	35
Acenaphthylene	ND		1x	81	ND		1x	93	ND		1x	71	ND		1x	60
Anthracene	10		1x	4.70	30		1x	5.43	ND		1x	4.1	ND		1x	3.5
Benzo[a]pyrene	30		1x	6.38	59		1x	7.36	ND		1x	5.6	10		1x	4.71
Benzo[b]fluoranthene	72		1x	7.05	170		1x	8.14	15		1x	6.18	21		1x	5.21
Benzo[g,h,i]perylene	24		1x	6.38	51		1x	7.36	6.2		1x	5.59	13		1x	4.71
Benzo[k]fluoranthene	17		1x	2.92	33		1x	3.37	ND		1x	2.6	6.1		1x	2.16
Benz[a]anthracene	26		1x	2.32	46		1x	2.67	3.8		1x	2.03	6.6		1x	1.71
Chrysene	34		1x	2.99	62		1x	3.45	19		1x	2.62	11		1x	2.21
Dibenz[a,h]anthracene	3.6		1x	3.26	7.1		1x	3.76	ND		1x	2.9	ND		1x	2.4
Fluoranthene	57		1x	6.38	120		1x	7.36	9.1		1x	5.59	12		1x	4.71
Fluorene	26		1x	9.73	95		1x	11.24	ND		1x	8.5	7.7		1x	7.20
Indeno[1,2,3-cd]pyrene	25		1x	5.37	54		1x	6.20	ND		1x	4.7	13		1x	3.97
Naphthalene	ND		1x	47	69		1x	54.26	ND		1x	41	ND		1x	35
Phenanthrene	25		1x	2.82	64		1x	3.26	13		1x	2.47	6.2		1x	2.08
Pyrene	50		1x	6.04	90		1x	6.98	9.3		1x	5.29	14		1x	4.47

ND= Not detected

Table 4-6. Continued.

CURTIS BAY REACH

Analyte ug/kg	CB1 SED Result	Qual.	Dil.	Limit	CB2 SED Result	Qual.	Dil.	Limit	CB3 SED Result	Qual.	Dil.	Limit	CB4 SED Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	61	ND		1x	29	ND		1x	57	ND		1x	61
2-Methylnaphthalene	ND		1x	61	ND		1x	29	ND		1x	57	67		1x	60.87
Acenaphthene	ND		1x	61	ND		1x	29	ND		1x	57	81		1x	60.87
Acenaphthylene	ND		1x	100	ND		1x	49	ND		1x	97	ND		1x	100
Anthracene	8.7		1x	6.09	ND		1x	2.9	ND		1x	5.7	8.6		1x	6.09
Benzo[a]pyrene	29		1x	8.26	9.7		1x	3.87	9.6		1x	7.72	20		1x	8.26
Benzo[b]fluoranthene	52		1x	9.13	21		1x	4.28	21		1x	8.54	43		1x	9.13
Benzo[g,h,i]perylene	27		1x	8.26	9		1x	3.87	11		1x	7.72	19		1x	8.26
Benzo[k]fluoranthene	15		1x	3.78	5.1		1x	1.77	5.5		1x	3.54	11		1x	3.78
Benz[a]anthracene	22		1x	3	7.1		1x	1.41	7.2		1x	2.80	17		1x	3
Chrysene	29		1x	3.87	10		1x	1.81	11		1x	3.62	29		1x	3.87
Dibenz[a,h]anthracene	ND		1x	4.2	ND		1x	2	ND		1x	3.9	ND		1x	4.2
Fluoranthene	41		1x	8.26	15		1x	3.87	14		1x	7.72	38		1x	8.26
Fluorene	23		1x	12.61	7.4		1x	5.91	12		1x	11.79	17		1x	12.61
Indeno[1,2,3-cd]pyrene	27		1x	6.96	8.9		1x	3.26	8.7		1x	6.50	17		1x	6.96
Naphthalene	67		1x	60.87	ND		1x	29	ND		1x	57	ND		1x	61
Phenanthrene	22		1x	3.65	6.7		1x	1.71	9.5		1x	3.41	24		1x	3.65
Pyrene	39		1x	7.83	15		1x	3.67	17		1x	7.32	33		1x	7.83

ND= Not detected

Table 4-6. Continued.

FERRY BAR REACH

Analyte ug/kg	FB1 SED				FB2 SED				FB3 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	65	ND		1x	69	ND		1x	55
2-Methylnaphthalene	85		1x	64.81	ND		1x	69	120		1x	55.12
Acenaphthene	130		1x	64.81	ND		1x	69	180		1x	55.12
Acenaphthylene	ND		1x	110	ND		1x	120	ND		1x	94
Anthracene	23		1x	6.48	ND		1x	6.9	24		1x	5.51
Benzo[a]pyrene	47		1x	8.80	19		1x	9.41	54		1x	7.48
Benzo[b]fluoranthene	80		1x	9.72	34		1x	10.4	140		1x	8.27
Benzo[g,h,i]perylene	36		1x	8.80	19		1x	9.41	49		1x	7.48
Benzo[k]fluoranthene	26		1x	4.03	9.2		1x	4.31	30		1x	3.43
Benz[a]anthracene	39		1x	3.19	13		1x	3.42	40		1x	2.72
Chrysene	65		1x	4.12	20		1x	4.41	69		1x	3.50
Dibenz[a,h]anthracene	4.9		1x	4.49	ND		1x	4.8	6.1		1x	3.82
Fluoranthene	100		1x	8.80	36		1x	9.41	130		1x	7.48
Fluorene	36		1x	13.43	17		1x	14.36	62		1x	11.42
Indeno[1,2,3-cd]pyrene	32		1x	7.41	17		1x	7.92	51		1x	6.30
Naphthalene	ND		1x	65	ND		1x	69	ND		1x	55
Phenanthrene	46		1x	3.89	24		1x	4.16	52		1x	3.31
Pyrene	85		1x	8.33	32		1x	8.91	98		1x	7.09

ND= Not detected

Table 4-6. Continued.

NORTHWEST BRANCH EAST

Analyte ug/kg	NBE1 SED				NBE2 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	64	ND		1x	73
2-Methylnaphthalene	77		1x	64.22	220		1x	73.3
Acenaphthene	96		1x	64.22	250		1x	73.3
Acenaphthylene	ND		1x	110	ND		1x	130
Anthracene	22		1x	6.42	58		1x	7.33
Benzo[a]pyrene	34		1x	8.72	76		1x	9.95
Benzo[b]fluoranthene	75		1x	9.63	170		1x	10.99
Benzo[g,h,i]perylene	33		1x	8.72	57		1x	9.95
Benzo[k]fluoranthene	20		1x	3.99	47		1x	4.56
Benz[a]anthracene	43		1x	3.17	180		1x	3.61
Chrysene	86		1x	4.08	150		1x	4.66
Dibenz[a,h]anthracene	4.6		1x	4.45	10		1x	5.08
Fluoranthene	88		1x	8.72	220		1x	9.95
Fluorene	31		1x	13.3	64		1x	15.18
Indeno[1,2,3-cd]pyrene	34		1x	7.34	53		1x	8.38
Naphthalene	ND		1x	64	ND		1x	73
Phenanthrene	32		1x	3.85	70		1x	4.40
Pyrene	71		1x	8.26	170		1x	9.42

ND= Not detected

Table 4-6. Continued.

NORTHWEST BRANCH WEST

Analyte	NBW1 SED				NBW2 SED				NBW3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1-Methylnaphthalene	ND		1x	42	ND		1x	32	ND		1x	61
2-Methylnaphthalene	ND		1x	42	230		1x	31.89	310		1x	60.61
Acenaphthene	ND		1x	42	230		1x	31.89	680		1x	60.61
Acenaphthylene	ND		1x	71	ND		1x	55	ND		1x	100
Anthracene	ND		1x	4.2	50		1x	3.19	34		1x	6.06
Benzo[a]pyrene	ND		1x	5.6	67		1x	4.33	130		1x	8.23
Benzo[b]fluoranthene	11		1x	6.23	150		1x	4.78	180		1x	9.09
Benzo[g,h,i]perylene	ND		1x	5.6	61		1x	4.33	120		1x	8.23
Benzo[k]fluoranthene	ND		1x	2.6	40		1x	1.98	74		1x	3.77
Benz[a]anthracene	ND		1x	2	54		1x	1.57	140		1x	2.99
Chrysene	14		1x	2.64	270		1x	2.03	230		1x	3.85
Dibenz[a,h]anthracene	ND		1x	2.9	8.5		1x	2.21	14		1x	4.20
Fluoranthene	9.1		1x	5.64	220		1x	4.33	350		1x	8.23
Fluorene	ND		1x	8.6	35		1x	6.61	23		1x	12.55
Indeno[1,2,3-cd]pyrene	ND		1x	4.7	52		1x	3.64	130		1x	6.93
Naphthalene	ND		1x	42	44		1x	31.89	ND		1x	61
Phenanthrene	ND		1x	2.5	47		1x	1.91	140		1x	3.64
Pyrene	11		1x	5.34	160		1x	4.1	260		1x	7.79

ND= Not detected

Table 4-7. Pesticide and PCB results for Chesapeake Bay and Baltimore Harbor sediments presented by sample reach.

POPLAR ISLAND

Analyte	PI1 SED				PI2 SED				PI3 SED				PI4 SED				PI5 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	3	ND		1x	32	ND		1x	2.3	ND		1x	2.8	ND		1x	3.6
4,4'-DDE	ND		1x	0.62	ND		1x	6.6	ND		1x	0.48	ND		1x	0.59	ND		1x	0.74
4,4'-DDT	ND		1x	3.4	ND		1x	36	ND		1x	2.6	ND		1x	3.2	ND		1x	4.1
Aldrin	ND		1x	0.34	ND		1x	0.76	ND		1x	0.2	ND		1x	0.32	ND		1x	0.41
alpha-BHC	ND		1x	2.4	ND		1x	25	ND		1x	1.8	ND		1x	2.2	ND		1x	2.8
Azinphos methyl	ND		1x	4.9	ND		1x	16	ND		1x	4.3	ND		1x	4.8	ND		1x	5.3
beta-BHC	ND		1x	0.21	ND		1x	2.3	ND		1x	0.16	ND		1x	0.2	ND		1x	0.25
Chlordane, technical	ND		1x	7.9	ND		1x	84	ND		1x	6.1	ND		1x	7.5	ND		1x	9.4
Chlorobenside	ND		1x	4.9	ND		1x	16	ND		1x	4.2	ND		1x	4.7	ND		1x	5.2
Dacthal	ND		1x	4.9	ND		1x	16	ND		1x	4.2	ND		1x	4.7	ND		1x	5.2
delta-BHC	ND		1x	0.36	ND		1x	3.9	ND		1x	0.28	ND		1x	0.34	ND		1x	0.43
Demeton	ND		1x	4.9	ND		1x	16	ND		1x	4.3	ND		1x	4.8	ND		1x	5.3
Dieldrin	ND		1x	2.8	ND		1x	29	ND		1x	2.1	ND		1x	2.6	ND		1x	3.3
Endosulfan I	ND		1x	0.21	ND		1x	2.3	ND		1x	0.16	ND		1x	0.2	ND		1x	0.25
Endosulfan II	ND		1x	0.49	ND		1x	5.2	ND		1x	0.38	ND		1x	0.47	ND		1x	0.58
Endosulfan sulfate	ND		1x	1.1	ND		1x	12	ND		1x	0.84	ND		1x	1	ND		1x	1.3
Endrin	ND		1x	3	ND		1x	32	ND		1x	2.3	ND		1x	2.8	ND		1x	3.6
Endrin aldehyde	ND		1x	0.21	ND		1x	2.3	ND		1x	0.16	ND		1x	0.2	ND		1x	0.25
Ethyl parathion	ND		1x	4.9	ND		1x	16	ND		1x	4.2	ND		1x	4.7	ND		1x	5.2
gamma-BHC	ND		1x	1.6	ND		1x	17	ND		1x	1.2	ND		1x	1.5	ND		1x	1.9
Heptachlor	ND		1x	1.8	ND		1x	19	ND		1x	1.4	ND		1x	1.7	ND		1x	2.1
Heptachlor epoxide	ND		1x	0.15	ND		1x	0.48	ND		1x	0.13	ND		1x	0.14	ND		1x	0.16
Malathion	ND		1x	4.9	ND		1x	16	ND		1x	4.2	ND		1x	4.7	ND		1x	5.2
Methoxychlor	ND		1x	18	ND		1x	57	ND		1x	15	ND		1x	17	ND		1x	19
Methyl parathion	ND		1x	4.9	ND		1x	16	ND		1x	4.2	ND		1x	4.7	ND		1x	5.2
Mirex	ND		1x	4.9	ND		1x	16	ND		1x	4.2	ND		1x	4.7	ND		1x	5.2
Toxaphene	ND		1x	110	ND		1x	1200	ND		1x	87	ND		1x	110	ND		1x	130
Aroclor-1016	ND		1x	5.9	ND		1x	19	ND		1x	5.1	ND		1x	5.7	ND		1x	6.4
Aroclor-1221	ND		1x	15	ND		1x	48	ND		1x	13	ND		1x	14	ND		1x	16
Aroclor-1232	ND		1x	4.4	ND		1x	14	ND		1x	3.8	ND		1x	4.3	ND		1x	4.8
Aroclor-1242	ND		1x	5.9	ND		1x	19	ND		1x	5.1	ND		1x	5.7	ND		1x	6.4
Aroclor-1248	ND		1x	1.5	ND		1x	4.8	ND		1x	1.3	ND		1x	1.4	ND		1x	1.6
Aroclor-1254	ND		1x	2.9	ND		1x	10	ND		1x	2.6	ND		1x	2.8	ND		1x	3.2
Aroclor-1260	ND		1x	1.5	ND		1x	4.8	ND		1x	1.3	ND		1x	1.4	ND		1x	1.6

ND=Not detected

Table 4-7. Continued.

DEEP TROUGH

Analyte	DT1 SED				DT2 SED				DT3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	35	ND		1x	6.5	ND		1x	31
4,4'-DDE	ND		1x	7.3	ND		1x	1.3	ND		1x	6.5
4,4'-DDT	ND		1x	40	ND		1x	7.4	ND		1x	36
Aldrin	ND		1x	4	ND		1x	0.74	ND		1x	3.6
alpha-BHC	ND		1x	28	ND		1x	5.1	ND		1x	24
Azinphos methyl	ND		1x	17	ND		1x	7.2	ND		1x	16
beta-BHC	ND		1x	2.5	ND		1x	0.46	ND		1x	2.2
Chlordane, technical	ND		1x	93	ND		1x	17	ND		1x	82
Chlorobenside	ND		1x	17	ND		1x	7.2	ND		1x	16
Dacthal	ND		1x	17	ND		1x	7.2	ND		1x	16
delta-BHC	ND		1x	4.3	ND		1x	0.79	ND		1x	3.8
Demeton	ND		1x	17	ND		1x	7.2	ND		1x	16
Dieldrin	ND		1x	33	ND		1x	6	ND		1x	29
Endosulfan I	ND		1x	2.[illegible]	ND		1x	0.46	ND		1x	2.2
Endosulfan II	ND		1x	5.8	ND		1x	1.1	ND		1x	5.1
Endosulfan sulfate	ND		1x	13	ND		1x	2.4	ND		1x	11
Endrin	ND		1x	35	ND		1x	6.5	ND		1x	31
Endrin aldehyde	ND		1x	2.5	ND		1x	0.46	ND		1x	2.2
Ethyl parathion	ND		1x	17	ND		1x	7.2	ND		1x	16
gamma-BHC	ND		1x	3.7	ND		1x	3.4	ND		1x	16
Heptachlor	ND		1x	21	ND		1x	3.8	ND		1x	18
Heptachlor epoxide	ND		1x	0.5	ND		1x	0.22	ND		1x	0.47
Malathion	ND		1x	17	ND		1x	7.2	ND		1x	16
Methoxychlor	ND		1x	60	ND		1x	26	ND		1x	57
Methyl parathion	ND		1x	17	ND		1x	7.2	ND		1x	16
Mirex	ND		1x	17	ND		1x	7.2	ND		1x	16
Toxaphene	ND		1x	1300	ND		1x	250	ND		1x	1200
Aroclor-1016	ND		1x	20	ND		1x	8.6	ND		1x	19
Aroclor-1221	ND		1x	50	ND		1x	22	ND		1x	47
Aroclor-1232	ND		1x	15	ND		1x	6.5	ND		1x	14
Aroclor-1242	ND		1x	20	ND		1x	8.6	ND		1x	19
Aroclor-1248	ND		1x	5	ND		1x	2.2	ND		1x	4.7
Aroclor-1254	ND		1x	10	ND		1x	4.3	ND		1x	9.4
Aroclor-1260	ND		1x	5	ND		1x	4.8	ND		1x	4.7

ND=Not detected

Table 4-7. Continued.

KENT ISLAND DEEP

Analyte ug/kg	KI1 SED Result	Qual.	Dil.	Limit	KI2 SED Result	Qual.	Dil.	Limit	KI3SED Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	1.9	ND		1x	4.1	ND		1x	2
4,4'-DDE	ND		1x	0.39	ND		1x	0.85	ND		1x	0.42
4,4'-DDT	ND		1x	2.1	ND		1x	4.7	ND		1x	2.3
Aldrin	ND		1x	0.21	ND		1x	0.47	ND		1x	0.23
alpha-BHC	ND		1x	1.5	ND		1x	3.2	ND		1x	1.6
Azinphos methyl	ND		1x	4.4	ND		1x	9.8	ND		1x	4.8
beta-BHC	ND		1x	0.13	ND		1x	0.29	ND		1x	0.14
Chlordane, technical	ND		1x	4.9	ND		1x	11	ND		1x	5.4
Chlorobenside	ND		1x	4.4	ND		1x	9.7	ND		1x	4.8
Dacthal	ND		1x	4.4	ND		1x	9.7	ND		1x	4.8
delta-BHC	ND		1x	0.23	ND		1x	0.5	ND		1x	0.25
Demeton	ND		1x	4.4	ND		1x	9.8	ND		1x	4.8
Dieldrin	ND		1x	1.7	ND		1x	3.8	ND		1x	1.9
Endosulfan I	ND		1x	0.13	ND		1x	0.29	ND		1x	0.14
Endosulfan II	ND		1x	0.31	ND		1x	0.68	ND		1x	0.33
Endosulfan sulfate	ND		1x	0.68	ND		1x	1.5	ND		1x	0.74
Endrin	ND		1x	1.9	ND		1x	4.1	ND		1x	2
Endrin aldehyde	ND		1x	0.13	ND		1x	0.29	ND		1x	0.14
Ethyl parathion	ND		1x	4.4	ND		1x	9.7	ND		1x	4.8
gamma-BHC	ND		1x	0.97	ND		1x	2.1	ND		1x	1.1
Heptachlor	ND		1x	1.1	ND		1x	2.4	ND		1x	1.2
Heptachlor epoxide	ND		1x	0.13	ND		1x	0.29	ND		1x	0.14
Malathion	ND		1x	4.4	ND		1x	9.7	ND		1x	4.8
Methoxychlor	ND		1x	16	ND		1x	35	ND		1x	17
Methyl parathion	ND		1x	4.4	ND		1x	9.7	ND		1x	4.8
Mirex	ND		1x	4.4	ND		1x	9.7	ND		1x	4.8
Toxaphene	ND		1x	71	ND		1x	160	ND		1x	77
Aroclor-1016	ND		1x	5.3	ND		1x	12	ND		1x	5.8
Aroclor-1221	ND		1x	13	ND		1x	30	ND		1x	14
Aroclor-1232	ND		1x	4	ND		1x	8.9	ND		1x	4.3
Aroclor-1242	ND		1x	5.3	ND		1x	12	ND		1x	5.8
Aroclor-1248	ND		1x	1.3	ND		1x	3	ND		1x	1.4
Aroclor-1254	ND		1x	2.7	ND		1x	5.9	ND		1x	2.9
Aroclor-1260	ND		1x	1.3	ND		1x	4.6	ND		1x	4.6

ND=Not detected

Table 4-7. Continued.

POOLES ISLAND

Analyte ug/kg	POLISED Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	3.5
4,4'-DDE	ND		1x	0.72
4,4'-DDT	ND		1x	4
Aldrin	ND		1x	0.4
alpha-BHC	ND		1x	2.8
Azinphos methyl	ND		1x	2
beta-BHC	ND		1x	0.25
Chlordane, technical	ND		1x	9.2
Chlorobenside	ND		1x	17
Dacthal	ND		1x	17
delta-BHC	ND		1x	0.42
Demeton	ND		1x	2
Dieldrin	ND		1x	3.2
Endosulfan I	ND		1x	0.25
Endosulfan II	ND		1x	0.57
Endosulfan sulfate	ND		1x	1.3
Endrin	ND		1x	3.5
Endrin aldehyde	ND		1x	0.25
Ethyl parathion	ND		1x	17
gamma-BHC	ND		1x	1.8
Heptachlor	ND		1x	2.1
Heptachlor epoxide	ND		1x	0.25
Malathion	ND		1x	17
Methoxychlor	ND		1x	30
Methyl parathion	ND		1x	17
Mirex	ND		1x	17
Toxaphene	ND		1x	130
Aroclor-1016	ND		1x	9.9
Aroclor-1221	ND		1x	25
Aroclor-1232	ND		1x	7.4
Aroclor-1242	ND		1x	9.9
Aroclor-1248	ND		1x	2.5
Aroclor-1254	ND		1x	4.9
Aroclor-1260	ND		1x	2.5

ND=Not detected

Table 4-7. Continued.

SWAN POINT CHANNEL

Analyte	SWP1 SED				SWP2 SED				SWP3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	6.1	ND		1x	6.1	ND		1x	5.6
4,4'-DDE	ND		1x	1.3	ND		1x	1.3	ND		1x	1.2
4,4'-DDT	ND		1x	7	ND		1x	7	ND		1x	6.4
Aldrin	ND		1x	0.7	ND		1x	0.7	ND		1x	0.64
alpha-BHC	ND		1x	4.8	ND		1x	4.8	ND		1x	4.4
Azinphos methyl	ND		1x	14	ND		1x	29	ND		1x	27
beta-BHC	ND		1x	0.43	ND		1x	0.43	ND		1x	0.4
Chlordane, technical	ND		1x	16	ND		1x	16	ND		1x	15
Chlorobenside	ND		1x	14	ND		1x	2.9	ND		1x	2.7
Dacthal	ND		1x	14	ND		1x	2.9	ND		1x	2.7
delta-BHC	ND		1x	0.74	ND		1x	0.74	ND		1x	0.68
Demeton	ND		1x	14	ND		1x	29	ND		1x	27
Dieldrin	ND		1x	5.7	ND		1x	5.7	ND		1x	5.2
Endosulfan I	ND		1x	0.43	ND		1x	0.43	ND		1x	0.4
Endosulfan II	ND		1x	1	ND		1x	1	ND		1x	0.92
Endosulfan sulfate	ND		1x	2.2	ND		1x	2.2	ND		1x	2
Endrin	ND		1x	6.1	ND		1x	6.1	ND		1x	5.6
Endrin aldehyde	ND		1x	0.43	ND		1x	0.43	ND		1x	0.4
Ethyl parathion	ND		1x	14	ND		1x	2.9	ND		1x	2.7
gamma-BHC	ND		1x	3.2	ND		1x	3.2	ND		1x	2.9
Heptachlor	ND		1x	3.6	ND		1x	3.6	ND		1x	3.3
Heptachlor epoxide	ND		1x	0.43	ND		1x	0.43	ND		1x	0.4
Malathion	ND		1x	14	ND		1x	2.9	ND		1x	2.7
Methoxychlor	ND		1x	52	ND		1x	52	ND		1x	48
Methyl parathion	ND		1x	14	ND		1x	2.9	ND		1x	2.7
Mirex	ND		1x	14	ND		1x	2.9	ND		1x	2.7
Toxaphene	ND		1x	230	ND		1x	230	ND		1x	210
Aroclor-1016	ND		1x	17	ND		1x	18	ND		1x	16
Aroclor-1221	ND		1x	43	ND		1x	44	ND		1x	40
Aroclor-1232	ND		1x	13	ND		1x	13	ND		1x	12
Aroclor-1242	ND		1x	17	ND		1x	18	ND		1x	16
Aroclor-1248	ND		1x	4.3	ND		1x	4.4	ND		1x	4
Aroclor-1254	ND		1x	8.6	ND		1x	8.8	ND		1x	8.1
Aroclor-1260	ND		1x	4.3	ND		1x	4.4	ND		1x	4

ND=Not detected

Table 4-7. Continued.

CRAIGHILL ENTRANCE

Analyte ug/kg	CRE1 SED				CRE2 SED				CRE3 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	3.5	ND		1x	3.4	ND		1x	3.3
4,4'-DDE	ND		1x	0.73	ND		1x	0.7	ND		1x	0.68
4,4'-DDT	11	P	1x	4.1	ND		1x	3.9	ND		1x	3.7
Aldrin	ND		1x	0.41	ND		1x	0.39	ND		1x	0.37
alpha-BHC	ND		1x	2.8	ND		1x	2.7	ND		1x	2.6
Azinphos methyl	ND		1x	17	ND		1x	16	ND		1x	16
beta-BHC	ND		1x	0.25	ND		1x	0.24	ND		1x	0.23
Chlordane, technical	ND		1x	9.4	ND		1x	9	ND		1x	8.7
Chlorobenside	ND		1x	1.7	ND		1x	1.6	ND		1x	1.6
Dacthal	ND		1x	1.7	ND		1x	1.6	ND		1x	1.6
delta-BHC	ND		1x	0.43	ND		1x	0.41	ND		1x	0.4
Demeton	ND		1x	17	ND		1x	16	ND		1x	16
Dieldrin	ND		1x	3.3	ND		1x	3.1	ND		1x	3
Endosulfan I	ND		1x	0.25	ND		1x	0.24	ND		1x	0.23
Endosulfan II	ND		1x	0.58	ND		1x	0.56	ND		1x	0.54
Endosulfan sulfate	ND		1x	1.3	ND		1x	1.2	ND		1x	1.2
Endrin	ND		1x	3.5	ND		1x	3.4	ND		1x	3.3
Endrin aldehyde	ND		1x	0.25	ND		1x	0.24	ND		1x	0.23
Ethyl parathion	ND		1x	1.7	ND		1x	1.6	ND		1x	1.6
gamma-BHC	ND		1x	1.8	ND		1x	1.8	ND		1x	1.7
Heptachlor	ND		1x	2.1	ND		1x	2	ND		1x	1.9
Heptachlor epoxide	ND		1x	0.25	ND		1x	0.24	ND		1x	0.23
Malathion	ND		1x	1.7	ND		1x	1.6	ND		1x	1.6
Methoxychlor	ND		1x	25	ND		1x	24	ND		1x	23
Methyl parathion	ND		1x	1.7	ND		1x	1.6	ND		1x	1.6
Mirex	ND		1x	1.7	ND		1x	1.6	ND		1x	1.6
Toxaphene	ND		1x	130	ND		1x	130	ND		1x	120
Aroclor-1016	ND		1x	10	ND		1x	9.8	ND		1x	9.3
Aroclor-1221	ND		1x	26	ND		1x	24	ND		1x	23
Aroclor-1232	ND		1x	7.7	ND		1x	7.3	ND		1x	7
Aroclor-1242	ND		1x	10	ND		1x	9.8	ND		1x	9.3
Aroclor-1248	ND		1x	2.6	ND		1x	2.4	ND		1x	2.3
Aroclor-1254	ND		1x	5.1	ND		1x	4.9	ND		1x	4.7
Aroclor-1260	ND		1x	2.6	ND		1x	2.4	ND		1x	2.3

ND=Not detected P=Inductively coupled plasma

Table 4-7. Continued.

CRAIGHILL CHANNEL

Analyte	CR1 SED				CR2 SED				CR2FD SED				CR3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	2	ND		1x	3	ND		1x	4.7	ND		1x	3.4
4,4'-DDE	ND		1x	0.42	ND		1x	0.62	ND		1x	0.97	ND		1x	0.7
4,4'-DDT	ND		1x	2.3	ND		1x	3.4	ND		1x	5.3	ND		1x	3.9
Aldrin	ND		1x	0.23	ND		1x	0.34	ND		1x	0.53	ND		1x	0.39
alpha-BHC	ND		1x	1.6	ND		1x	2.4	ND		1x	3.7	ND		1x	2.7
Azinphos methyl	ND		1x	9.7	ND		1x	14	ND		1x	22	ND		1x	16
beta-BHC	ND		1x	0.14	ND		1x	0.21	ND		1x	0.33	ND		1x	0.24
Chlordane, technical	ND		1x	5.4	ND		1x	7.9	ND		1x	12	ND		1x	9
Chlorobenside	ND		1x	0.97	ND		1x	1.4	ND		1x	2.2	ND		1x	1.6
Dacthal	ND		1x	0.97	ND		1x	1.4	ND		1x	2.2	ND		1x	1.6
delta-BHC	ND		1x	0.25	ND		1x	0.36	ND		1x	0.57	ND		1x	0.41
Demeton	ND		1x	9.7	ND		1x	14	ND		1x	22	ND		1x	16
Dieldrin	ND		1x	1.9	ND		1x	2.8	ND		1x	4.3	ND		1x	3.2
Endosulfan I	ND		1x	0.14	ND		1x	0.21	ND		1x	0.33	ND		1x	0.24
Endosulfan II	ND		1x	0.33	ND		1x	0.49	ND		1x	0.77	ND		1x	0.56
Endosulfan sulfate	ND		1x	0.74	ND		1x	1.1	ND		1x	1.7	ND		1x	1.2
Endrin	ND		1x	2	ND		1x	3	ND		1x	4.7	ND		1x	3.4
Endrin aldehyde	ND		1x	0.14	ND		1x	0.21	ND		1x	0.33	ND		1x	0.24
Ethyl parathion	ND		1x	0.97	ND		1x	1.4	ND		1x	2.2	ND		1x	1.6
gamma-BHC	ND		1x	1.1	ND		1x	1.6	ND		1x	2.4	ND		1x	1.8
Heptachlor	ND		1x	1.2	ND		1x	1.8	ND		1x	2.8	ND		1x	2
Heptachlor epoxide	ND		1x	0.14	ND		1x	0.21	ND		1x	0.33	ND		1x	0.24
Malathion	ND		1x	0.97	ND		1x	1.4	ND		1x	2.2	ND		1x	1.6
Methoxychlor	ND		1x	14	ND		1x	24	ND		1x	33	ND		1x	21
Methyl parathion	ND		1x	0.97	ND		1x	1.4	ND		1x	2.2	ND		1x	1.6
Mirex	ND		1x	0.97	ND		1x	1.4	ND		1x	2.2	ND		1x	1.6
Toxaphene	ND		1x	77	ND		1x	110	ND		1x	180	ND		1x	130
Aroclor-1016	ND		1x	5.8	ND		1x	8.5	ND		1x	13	ND		1x	9.8
Aroclor-1221	ND		1x	14	ND		1x	21	ND		1x	33	ND		1x	24
Aroclor-1232	ND		1x	4.3	ND		1x	6.4	ND		1x	10	ND		1x	7.3
Aroclor-1242	ND		1x	5.8	ND		1x	8.5	ND		1x	13	ND		1x	9.8
Aroclor-1248	ND		1x	1.4	ND		1x	2.1	ND		1x	3.3	ND		1x	2.4
Aroclor-1254	ND		1x	2.9	ND		1x	4.3	ND		1x	6.7	ND		1x	4.9
Aroclor-1260	ND		1x	1.4	ND		1x	2.1	ND		1x	3.3	ND		1x	2.4

ND=Not detected

Table 4-7. Continued.

CRAIGHILL ANGLE

Analyte ug/kg	CRA1 SED				CRA2 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	4.2	ND		1x	5.2
4,4'-DDE	ND		1x	0.87	ND		1x	1.1
4,4'-DDT	ND		1x	4.8	ND		1x	6
Aldrin	ND		1x	0.48	ND		1x	0.6
alpha-BHC	ND		1x	3.3	ND		1x	4.1
Azinphos methyl	ND		1x	20	ND		1x	25
beta-BHC	ND		1x	0.3	ND		1x	0.37
Chlordane, technical	ND		1x	11	ND		1x	14
Chlorobenside	ND		1x	2	ND		1x	2.5
Dacthal	ND		1x	2	ND		1x	2.5
delta-BHC	ND		1x	0.51	ND		1x	0.64
Demeton	ND		1x	20	ND		1x	25
Dieldrin	ND		1x	3.9	ND		1x	4.9
Endosulfan I	ND		1x	0.3	ND		1x	0.37
Endosulfan II	ND		1x	0.69	ND		1x	0.86
Endosulfan sulfate	ND		1x	1.5	ND		1x	1.9
Endrin	ND		1x	4.2	ND		1x	5.2
Endrin aldehyde	ND		1x	0.3	ND		1x	0.37
Ethyl parathion	ND		1x	2	ND		1x	2.5
gamma-BHC	ND		1x	2.2	ND		1x	2.7
Heptachlor	ND		1x	2.5	ND		1x	3.1
Heptachlor epoxide	ND		1x	0.3	ND		1x	0.37
Malathion	ND		1x	2	ND		1x	2.5
Methoxychlor	ND		1x	30	ND		1x	37
Methyl parathion	ND		1x	2	ND		1x	2.5
Mirex	ND		1x	2	ND		1x	2.5
Toxaphene	ND		1x	160	ND		1x	200
Aroclor-1016	ND		1x	12	ND		1x	15
Aroclor-1221	ND		1x	30	ND		1x	37
Aroclor-1232	ND		1x	9.1	ND		1x	11
Aroclor-1242	ND		1x	12	ND		1x	15
Aroclor-1248	ND		1x	3	ND		1x	3.7
Aroclor-1254	ND		1x	6.1	ND		1x	7.4
Aroclor-1260	ND		1x	3	ND		1x	3.7

ND=Not detected

Table 4-7. Continued.

CRAIGHILL UPPER RANGE

Analyte ug/kg	CRU1 SED Result	Qual.	Dil.	Limit	CRU2 SED Result	Qual.	Dil.	Limit	CRU3 SED Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	5	ND		1x	2.2	ND		1x	3.3
4,4'-DDE	ND		1x	1	ND		1x	0.46	ND		1x	0.68
4,4'-DDT	ND		1x	5.7	ND		1x	2.5	ND		1x	3.7
Aldrin	ND		1x	0.57	ND		1x	0.25	ND		1x	0.37
alpha-BHC	ND		1x	3.9	ND		1x	1.7	ND		1x	2.6
Azinphos methyl	ND		1x	24	ND		1x	11	ND		1x	16
beta-BHC	ND		1x	0.35	ND		1x	0.16	ND		1x	0.23
Chlordane, technical	ND		1x	13	ND		1x	5.9	ND		1x	8.6
Chlorobenside	ND		1x	2.4	ND		1x	1.1	ND		1x	1.6
Dacthal	ND		1x	2.4	ND		1x	1.1	ND		1x	1.6
delta-BHC	ND		1x	0.6	ND		1x	0.27	ND		1x	0.4
Demeton	ND		1x	24	ND		1x	11	ND		1x	16
Dieldrin	ND		1x	4.6	ND		1x	2.1	ND		1x	3
Endosulfan I	ND		1x	0.35	ND		1x	0.16	ND		1x	0.23
Endosulfan II	ND		1x	0.82	ND		1x	0.36	ND		1x	0.54
Endosulfan sulfate	ND		1x	1.8	ND		1x	0.81	ND		1x	1.2
Endrin	ND		1x	5	ND		1x	2.2	ND		1x	3.3
Endrin aldehyde	ND		1x	0.35	ND		1x	0.16	ND		1x	0.23
Ethyl parathion	ND		1x	2.4	ND		1x	1.1	ND		1x	1.6
gamma-BHC	ND		1x	2.6	ND		1x	1.2	ND		1x	1.7
Heptachlor	ND		1x	2.9	ND		1x	1.3	ND		1x	1.9
Heptachlor epoxide	ND		1x	0.35	ND		1x	0.16	ND		1x	0.23
Malathion	ND		1x	2.4	ND		1x	1.1	ND		1x	1.6
Methoxychlor	ND		1x	35	ND		1x	16	ND		1x	23
Methyl parathion	ND		1x	2.4	ND		1x	1.1	ND		1x	1.6
Mirex	ND		1x	2.4	ND		1x	1.1	ND		1x	1.6
Toxaphene	ND		1x	190	ND		1x	84	ND		1x	120
Aroclor-1016	ND		1x	14	ND		1x	6.3	ND		1x	9.3
Aroclor-1221	ND		1x	36	ND		1x	16	ND		1x	23
Aroclor-1232	ND		1x	11	ND		1x	4.8	ND		1x	7
Aroclor-1242	ND		1x	14	ND		1x	6.3	ND		1x	9.3
Aroclor-1248	ND		1x	3.6	ND		1x	1.6	ND		1x	2.3
Aroclor-1254	ND		1x	7.1	ND		1x	3.2	ND		1x	4.7
Aroclor-1260	ND		1x	3.6	ND		1x	1.6	ND		1x	5

ND=Not detected

Table 4-7. Continued.

CUTOFF ANGLE

Analyte	CUT1 SED				CUT2 SED				CUT3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	4.7	ND		1x	5.6	ND		1x	4.4
4,4'-DDE	ND		1x	0.98	ND		1x	1.2	ND		1x	0.91
4,4'-DDT	ND		1x	5.4	ND		1x	6.4	ND		1x	5
Aldrin	ND		1x	0.54	ND		1x	0.64	ND		1x	0.5
alpha-BHC	ND		1x	3.7	ND		1x	4.4	ND		1x	3.5
Azinphos methyl	ND		1x	22	ND		1x	27	ND		1x	21
beta-BHC	ND		1x	0.34	ND		1x	0.4	ND		1x	0.31
Chlordane, technical	ND		1x	12	ND		1x	15	ND		1x	12
Chlorobenside	ND		1x	2.2	ND		1x	2.7	ND		1x	2.1
Dacthal	ND		1x	2.2	ND		1x	2.7	ND		1x	2.1
delta-BHC	ND		1x	0.57	ND		1x	0.68	ND		1x	0.53
Demeton	ND		1x	22	ND		1x	27	ND		1x	21
Dieldrin	ND		1x	4.4	ND		1x	5.2	ND		1x	4.1
Endosulfan I	ND		1x	0.34	ND		1x	0.4	ND		1x	0.31
Endosulfan II	ND		1x	0.77	ND		1x	0.92	ND		1x	0.72
Endosulfan sulfate	ND		1x	1.7	ND		1x	2	ND		1x	1.6
Endrin	ND		1x	4.7	ND		1x	5.6	ND		1x	4.4
Endrin aldehyde	ND		1x	0.34	ND		1x	0.4	ND		1x	0.31
Ethyl parathion	ND		1x	2.2	ND		1x	2.7	ND		1x	2.1
gamma-BHC	ND		1x	2.5	ND		1x	2.9	ND		1x	2.3
Heptachlor	ND		1x	2.8	ND		1x	3.3	ND		1x	2.6
Heptachlor epoxide	ND		1x	0.34	ND		1x	0.4	ND		1x	0.31
Malathion	ND		1x	2.2	ND		1x	2.7	ND		1x	2.1
Methoxychlor	ND		1x	34	ND		1x	40	ND		1x	31
Methyl parathion	ND		1x	2.2	ND		1x	2.7	ND		1x	2.1
Mirex	ND		1x	2.2	ND		1x	2.7	ND		1x	2.1
Toxaphene	ND		1x	180	ND		1x	210	ND		1x	170
Aroclor-1016	ND		1x	13	ND		1x	16	ND		1x	13
Aroclor-1221	ND		1x	33	ND		1x	40	ND		1x	31
Aroclor-1232	ND		1x	10	ND		1x	12	ND		1x	9.4
Aroclor-1242	ND		1x	13	ND		1x	16	ND		1x	13
Aroclor-1248	ND		1x	3.3	ND		1x	4	ND		1x	3.1
Aroclor-1254	ND		1x	6.7	ND		1x	8	ND		1x	6.3
Aroclor-1260	ND		1x	3.3	ND		1x	9	ND		1x	3.1

ND=Not detected

Table 4-7. Continued.

TOLCHESTER CHANNEL-VAN VEEN

Analyte	TLC1 SED				TLC2 SED				TLC2FD SED				TLC3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	2.7	ND		1x	2.9	ND		1x	3.1	ND		1x	4.1
4,4'-DDE	ND		1x	0.56	ND		1x	0.6	ND		1x	0.64	ND		1x	0.85
4,4'-DDT	ND		1x	3.1	ND		1x	3.3	ND		1x	3.6	ND		1x	4.7
Aldrin	ND		1x	0.31	ND		1x	0.33	ND		1x	0.36	ND		1x	0.47
alpha-BHC	ND		1x	2.1	ND		1x	2.3	ND		1x	2.4	ND		1x	3.2
Azinphos methyl	ND		1x	13	ND		1x	14	ND		1x	15	ND		1x	20
beta-BHC	ND		1x	0.19	ND		1x	0.21	ND		1x	0.22	ND		1x	0.29
Chlordane, technical	ND		1x	7.1	ND		1x	7.7	ND		1x	8.2	ND		1x	11
Chlorobenside	ND		1x	1.3	ND		1x	1.4	ND		1x	1.5	ND		1x	1.9
Dacthal	ND		1x	1.3	ND		1x	1.4	ND		1x	1.5	ND		1x	1.9
delta-BHC	ND		1x	0.33	ND		1x	0.35	ND		1x	0.38	ND		1x	0.5
Demeton	ND		1x	13	ND		1x	14	ND		1x	15	ND		1x	20
Dieldrin	ND		1x	2.5	ND		1x	2.7	ND		1x	2.9	ND		1x	3.8
Endosulfan I	ND		1x	0.19	ND		1x	0.21	ND		1x	0.22	ND		1x	0.29
Endosulfan II	ND		1x	0.44	ND		1x	0.48	ND		1x	0.51	ND		1x	0.68
Endosulfan sulfate	ND		1x	0.98	ND		1x	1.1	ND		1x	1.1	ND		1x	1.5
Endrin	ND		1x	2.7	ND		1x	2.9	ND		1x	3.1	ND		1x	4.1
Endrin aldehyde	ND		1x	0.19	ND		1x	0.21	ND		1x	0.22	ND		1x	0.29
Ethyl parathion	ND		1x	1.3	ND		1x	1.4	ND		1x	1.5	ND		1x	1.9
gamma-BHC	ND		1x	1.4	ND		1x	1.5	ND		1x	1.6	ND		1x	2.1
Heptachlor	ND		1x	1.6	ND		1x	1.7	ND		1x	1.8	ND		1x	2.4
Heptachlor epoxide	ND		1x	0.19	ND		1x	0.21	ND		1x	0.22	ND		1x	0.29
Malathion	ND		1x	1.3	ND		1x	1.4	ND		1x	1.5	ND		1x	1.9
Methoxychlor	ND		1x	23	ND		1x	25	ND		1x	27	ND		1x	35
Methyl parathion	ND		1x	1.3	ND		1x	1.4	ND		1x	1.5	ND		1x	1.9
Mirex	ND		1x	1.3	ND		1x	1.4	ND		1x	1.5	ND		1x	1.9
Toxaphene	ND		1x	100	ND		1x	110	ND		1x	120	ND		1x	160
Aroclor-1016	ND		1x	7.7	ND		1x	8.4	ND		1x	8.8	ND		1x	12
Aroclor-1221	ND		1x	19	ND		1x	21	ND		1x	22	ND		1x	30
Aroclor-1232	ND		1x	5.8	ND		1x	6.3	ND		1x	6.6	ND		1x	8.9
Aroclor-1242	ND		1x	7.7	ND		1x	8.4	ND		1x	8.8	ND		1x	12
Aroclor-1248	ND		1x	1.9	ND		1x	2.1	ND		1x	2.2	ND		1x	3
Aroclor-1254	ND		1x	3.9	ND		1x	4.2	ND		1x	4.4	ND		1x	5.9
Aroclor-1260	ND		1x	1.9	ND		1x	2.1	ND		1x	2.2	ND		1x	3

ND=Not detected

Table 4-7. Continued.

TOLCHESTER CHANNEL-GRAVITY CORE

Analyte	TLV1 SED				TLV2 SED				TLV3 SED				TLV4 SED				TLV5 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	2.9	ND		1x	2.7	ND		1x	2.8	ND		1x	3.1	ND		1x	3
4,4'-DDE	ND		1x	0.59	ND		1x	0.56	ND		1x	0.58	ND		1x	0.64	ND		1x	0.63
4,4'-DDT	ND		1x	3.3	ND		1x	3.1	ND		1x	3.2	ND		1x	3.6	ND		1x	3.5
Aldrin	ND		1x	0.33	ND		1x	0.31	ND		1x	0.32	ND		1x	0.36	ND		1x	0.35
alpha-BHC	ND		1x	2.2	ND		1x	2.1	ND		1x	2.2	ND		1x	2.4	ND		1x	2.4
Azinphos methyl	ND		1x	14	ND		1x	13	ND		1x	13	ND		1x	15	ND		1x	14
beta-BHC	ND		1x	0.2	ND		1x	0.19	ND		1x	0.2	ND		1x	0.22	ND		1x	0.22
Chlordane, technical	ND		1x	7.6	ND		1x	7.1	ND		1x	7.4	ND		1x	8.2	ND		1x	8
Chlorobenside	ND		1x	1.3	ND		1x	1.3	ND		1x	1.3	ND		1x	1.5	ND		1x	1.4
Dacthal	ND		1x	1.3	ND		1x	1.3	ND		1x	1.3	ND		1x	1.5	ND		1x	1.4
delta-BHC	ND		1x	0.35	ND		1x	0.33	ND		1x	0.34	ND		1x	0.38	ND		1x	0.37
Demeton	ND		1x	14	ND		1x	13	ND		1x	13	ND		1x	15	ND		1x	14
Dieldrin	ND		1x	2.7	ND		1x	2.5	ND		1x	2.6	ND		1x	2.9	ND		1x	2.8
Endosulfan I	ND		1x	0.2	ND		1x	0.19	ND		1x	0.2	ND		1x	0.22	ND		1x	0.22
Endosulfan II	ND		1x	0.47	ND		1x	0.44	ND		1x	0.46	ND		1x	0.51	ND		1x	0.5
Endosulfan sulfate	ND		1x	1	ND		1x	0.98	ND		1x	1	ND		1x	1.1	ND		1x	1.1
Endrin	ND		1x	2.9	ND		1x	2.7	ND		1x	2.8	ND		1x	3.1	ND		1x	3
Endrin aldehyde	ND		1x	0.2	ND		1x	0.19	ND		1x	0.2	ND		1x	0.22	ND		1x	0.22
Ethyl parathion	ND		1x	1.3	ND		1x	1.3	ND		1x	1.3	ND		1x	1.5	ND		1x	1.4
gamma-BHC	ND		1x	1.5	ND		1x	1.4	ND		1x	1.5	ND		1x	1.6	ND		1x	1.6
Heptachlor	ND		1x	1.7	ND		1x	1.6	ND		1x	1.7	ND		1x	1.8	ND		1x	1.8
Heptachlor epoxide	ND		1x	0.2	ND		1x	0.19	ND		1x	0.2	1.2	P	1x	0.22	ND		1x	0.22
Malathion	ND		1x	1.3	ND		1x	1.3	ND		1x	1.3	ND		1x	1.5	ND		1x	1.4
Methoxychlor	ND		1x	24	ND		1x	23	ND		1x	24	ND		1x	27	ND		1x	26
Methyl parathion	ND		1x	1.3	ND		1x	1.3	ND		1x	1.3	ND		1x	1.5	ND		1x	1.4
Mirex	ND		1x	1.3	ND		1x	1.3	ND		1x	1.3	ND		1x	1.5	ND		1x	1.4
Toxaphene	ND		1x	110	ND		1x	100	ND		1x	110	ND		1x	120	ND		1x	120
Aroclor-1016	ND		1x	8.1	ND		1x	7.6	ND		1x	7.9	ND		1x	8.9	ND		1x	8.7
Aroclor-1221	ND		1x	20	ND		1x	19	ND		1x	20	ND		1x	22	ND		1x	22
Aroclor-1232	ND		1x	6.1	ND		1x	5.7	ND		1x	6	ND		1x	6.7	ND		1x	6.5
Aroclor-1242	ND		1x	8.1	ND		1x	7.6	ND		1x	7.9	ND		1x	8.9	ND		1x	8.7
Aroclor-1248	ND		1x	2	ND		1x	1.9	ND		1x	2	ND		1x	2.2	ND		1x	2.2
Aroclor-1254	ND		1x	4	ND		1x	3.8	ND		1x	4	ND		1x	4.5	ND		1x	4.3
Aroclor-1260	ND		1x	2	ND		1x	1.9	ND		1x	2	ND		1x	2.2	ND		1x	2.2

ND= Not detected P=Inductively coupled plasma

Table 4-7. Continued.

BREWERTON EASTERN EXTENSION-VAN VEEN

Analyte	BE1 SED				BE2 SED				BE3 SED				BE4 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	5.8	ND		1x	4.2	ND		1x	4.1	ND		1x	5
4,4'-DDE	1.5		1x	1.2	ND		1x	0.88	ND		1x	0.85	ND		1x	1
4,4'-DDT	ND		1x	6.7	ND		1x	4.8	ND		1x	4.7	ND		1x	5.7
Aldrin	ND		1x	0.67	ND		1x	0.48	ND		1x	0.47	ND		1x	0.57
alpha-BHC	ND		1x	4.6	ND		1x	3.3	ND		1x	3.2	ND		1x	3.9
Azinphos methyl	ND		1x	28	ND		1x	20	ND		1x	20	ND		1x	24
beta-BHC	ND		1x	0.42	ND		1x	0.3	ND		1x	0.29	ND		1x	0.36
Chlordane, technical	ND		1x	15	ND		1x	11	ND		1x	11	ND		1x	13
Chlorobenside	ND		1x	2.8	ND		1x	2	ND		1x	2	ND		1x	2.4
Dacthal	ND		1x	2.8	ND		1x	2	ND		1x	2	ND		1x	2.4
delta-BHC	ND		1x	0.71	ND		1x	0.52	ND		1x	0.5	ND		1x	0.61
Demeton	ND		1x	28	ND		1x	20	ND		1x	20	ND		1x	24
Dieldrin	ND		1x	5.4	ND		1x	3.9	ND		1x	3.8	ND		1x	4.6
Endosulfan I	ND		1x	0.42	ND		1x	0.3	ND		1x	0.29	ND		1x	0.36
Endosulfan II	ND		1x	0.96	ND		1x	0.7	ND		1x	0.68	ND		1x	0.82
Endosulfan sulfate	ND		1x	2.1	ND		1x	1.5	ND		1x	1.5	ND		1x	1.8
Endrin	ND		1x	5.8	ND		1x	4.2	ND		1x	4.1	ND		1x	5
Endrin aldehyde	ND		1x	0.42	ND		1x	0.3	ND		1x	0.29	ND		1x	0.36
Ethyl parathion	ND		1x	2.8	ND		1x	2	ND		1x	2	ND		1x	2.4
gamma-BHC	ND		1x	3	ND		1x	2.2	ND		1x	2.1	ND		1x	2.6
Heptachlor	ND		1x	3.5	ND		1x	2.5	ND		1x	2.4	ND		1x	3
Heptachlor epoxide	ND		1x	0.42	ND		1x	0.3	ND		1x	0.29	ND		1x	0.36
Malathion	ND		1x	2.8	ND		1x	2	ND		1x	2	ND		1x	2.4
Methoxychlor	ND		1x	50	ND		1x	36	ND		1x	35	ND		1x	43
Methyl parathion	ND		1x	2.8	ND		1x	2	ND		1x	2	ND		1x	2.4
Mirex	ND		1x	2.8	ND		1x	2	ND		1x	2	ND		1x	2.4
Toxaphene	ND		1x	220	ND		1x	160	ND		1x	160	ND		1x	190
Aroclor-1016	ND		1x	17	ND		1x	12	ND		1x	12	ND		1x	14
Aroclor-1221	ND		1x	42	ND		1x	30	ND		1x	29	ND		1x	36
Aroclor-1232	ND		1x	13	ND		1x	9.1	ND		1x	8.8	ND		1x	11
Aroclor-1242	ND		1x	17	ND		1x	12	ND		1x	12	ND		1x	14
Aroclor-1248	ND		1x	4.2	ND		1x	3	ND		1x	2.9	ND		1x	3.6
Aroclor-1254	ND		1x	8.3	ND		1x	6.1	ND		1x	5.9	ND		1x	7.1
Aroclor-1260	ND		1x	4.2	ND		1x	3	ND		1x	2.9	ND		1x	3.6

ND=Not detected

Table 4-7. Continued.

BREWERTON EASTERN EXTENSION-GRAVITY CORE

Analyte	BEV1 SED				BEV2 SED				BEV3 SED				BEV4 SED				BEV5 SED				BEV6 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	3.3	ND		1x	3.2	ND		1x	3.3	ND		1x	3.1	ND		1x	3.6	ND		1x	3.5
4,4'-DDE	ND		1x	0.69	ND		1x	0.66	ND		1x	0.69	ND		1x	0.64	ND		1x	0.74	ND		1x	0.72
4,4'-DDT	ND		1x	3.8	ND		1x	3.6	ND		1x	3.8	ND		1x	3.6	ND		1x	4.1	ND		1x	4
Aldrin	ND		1x	0.38	ND		1x	0.36	0.38		1x	0.38	ND		1x	0.36	ND		1x	0.41	ND		1x	0.4
alpha-BHC	ND		1x	2.6	ND		1x	2.5	ND		1x	2.6	ND		1x	2.4	ND		1x	2.8	ND		1x	2.8
Azinphos methyl	ND		1x	16	ND		1x	15	ND		1x	16	ND		1x	15	ND		1x	17	ND		1x	17
beta-BHC	ND		1x	0.24	ND		1x	0.23	ND		1x	0.24	ND		1x	0.22	ND		1x	0.26	ND		1x	0.25
Chlordane, technical	ND		1x	8.8	ND		1x	8.4	ND		1x	8.8	ND		1x	8.2	ND		1x	9.5	ND		1x	9.2
Chlorobensidc	ND		1x	1.6	ND		1x	1.5	ND		1x	1.6	ND		1x	1.5	ND		1x	1.7	ND		1x	1.7
Dacthal	ND		1x	1.6	ND		1x	1.5	ND		1x	1.6	ND		1x	1.5	ND		1x	1.7	ND		1x	1.7
delta-BHC	ND		1x	0.4	ND		1x	0.39	ND		1x	0.4	ND		1x	0.38	ND		1x	0.44	ND		1x	0.42
Demeton	ND		1x	16	ND		1x	15	ND		1x	16	ND		1x	15	ND		1x	17	ND		1x	17
Dieldrin	ND		1x	3.1	ND		1x	3	ND		1x	3.1	ND		1x	2.9	ND		1x	3.3	ND		1x	3.2
Endosulfan I	ND		1x	0.24	ND		1x	0.23	ND		1x	0.24	ND		1x	0.22	ND		1x	0.26	ND		1x	0.25
Endosulfan II	ND		1x	0.55	ND		1x	0.52	ND		1x	0.55	ND		1x	0.51	ND		1x	0.59	ND		1x	0.57
Endosulfan sulfate	ND		1x	1.2	ND		1x	1.2	ND		1x	1.2	ND		1x	1.1	ND		1x	1.3	ND		1x	1.3
Endrin	ND		1x	3.3	ND		1x	3.2	ND		1x	3.3	ND		1x	3.1	ND		1x	3.6	ND		1x	3.5
Endrin aldehyde	ND		1x	0.24	ND		1x	0.23	ND		1x	0.24	ND		1x	0.22	ND		1x	0.26	ND		1x	0.25
Ethyl parathion	ND		1x	1.6	ND		1x	1.5	ND		1x	1.6	ND		1x	1.5	ND		1x	1.7	ND		1x	1.7
gamma-BHC	ND		1x	1.7	ND		1x	1.7	ND		1x	1.7	ND		1x	1.6	ND		1x	1.9	ND		1x	1.8
Heptachlor	ND		1x	2	ND		1x	1.9	ND		1x	2	ND		1x	1.8	ND		1x	2.1	ND		1x	2.1
Heptachlor epoxide	ND		1x	0.24	ND		1x	0.23	1.8	P	1x	0.24	ND		1x	0.22	ND		1x	0.26	ND		1x	0.25
Malathion	ND		1x	1.6	ND		1x	1.5	ND		1x	1.6	ND		1x	1.5	ND		1x	1.7	ND		1x	1.7
Methoxychlor	ND		1x	29	ND		1x	27	ND		1x	29	ND		1x	27	ND		1x	31	ND		1x	30
Methyl parathion	ND		1x	1.6	ND		1x	1.5	ND		1x	1.6	ND		1x	1.5	ND		1x	1.7	ND		1x	1.7
Mirex	ND		1x	1.6	ND		1x	1.5	ND		1x	1.6	ND		1x	1.5	ND		1x	1.7	ND		1x	1.7
Toxaphene	ND		1x	130	ND		1x	120	ND		1x	130	ND		1x	120	ND		1x	140	ND		1x	130
Aroclor-1016	ND		1x	9.5	ND		1x	9.1	ND		1x	9.5	ND		1x	8.9	ND		1x	10	ND		1x	10
Aroclor-1221	ND		1x	24	ND		1x	23	ND		1x	24	ND		1x	22	ND		1x	26	ND		1x	25
Aroclor-1232	ND		1x	7.1	ND		1x	6.8	ND		1x	7.1	ND		1x	6.7	ND		1x	7.7	ND		1x	7.5
Aroclor-1242	ND		1x	9.5	ND		1x	9.1	ND		1x	9.5	ND		1x	8.9	ND		1x	10	ND		1x	10
Aroclor-1248	ND		1x	2.4	ND		1x	2.3	ND		1x	2.4	ND		1x	2.2	ND		1x	2.6	ND		1x	2.5
Aroclor-1254	ND		1x	4.8	ND		1x	4.5	ND		1x	4.8	ND		1x	4.4	ND		1x	5.1	ND		1x	5
Aroclor-1260	ND		1x	2.4	ND		1x	2.3	ND		1x	2.4	ND		1x	2.2	ND		1x	2.6	ND		1x	2.5

ND=Not detected P=Inductively coupled plasma

Table 4-7. Continued.

BREWERTON REACH

Analyte	BR1 SED				BR2 SED				BR3 SED				BR4 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	4.7	ND		1x	4.4	ND		1x	4.2	ND		1x	4.8
4,4'-DDE	ND		1x	0.97	ND		1x	0.91	ND		1x	0.88	ND		1x	1
4,4'-DDT	ND		1x	5.3	ND		1x	5	ND		1x	4.8	ND		1x	5.5
Aldrin	ND		1x	0.53	ND		1x	0.5	ND		1x	0.48	ND		1x	0.55
alpha-BHC	ND		1x	3.7	ND		1x	3.4	ND		1x	3.3	ND		1x	3.8
Azinphos methyl	ND		1x	7.8	ND		1x	21	ND		1x	20	ND		1x	23
beta-BHC	ND		1x	0.33	ND		1x	0.31	ND		1x	0.3	ND		1x	0.34
Chlordane, technical	ND		1x	12	ND		1x	12	ND		1x	11	ND		1x	13
Chlorobenside	ND		1x	2.2	ND		1x	2.1	ND		1x	2	ND		1x	2.3
Dacthal	ND		1x	2.2	ND		1x	2.1	ND		1x	2	ND		1x	2.3
delta-BHC	ND		1x	0.57	ND		1x	0.53	ND		1x	0.52	ND		1x	0.59
Demeton	ND		1x	7.8	ND		1x	21	ND		1x	20	ND		1x	23
Dieldrin	ND		1x	4.3	ND		1x	4.1	ND		1x	3.9	ND		1x	4.5
Endosulfan I	ND		1x	0.33	ND		1x	0.31	ND		1x	0.3	ND		1x	0.34
Endosulfan II	ND		1x	0.77	ND		1x	0.72	ND		1x	0.7	ND		1x	0.79
Endosulfan sulfate	ND		1x	1.7	ND		1x	1.6	ND		1x	1.5	ND		1x	1.8
Endrin	ND		1x	4.7	ND		1x	4.4	ND		1x	4.2	ND		1x	4.8
Endrin aldehyde	ND		1x	0.33	ND		1x	0.31	ND		1x	0.3	ND		1x	0.34
Ethyl parathion	ND		1x	2.2	ND		1x	2.1	ND		1x	2	ND		1x	2.3
gamma-BHC	ND		1x	2.4	ND		1x	2.3	ND		1x	2.2	ND		1x	2.5
Heptachlor	ND		1x	2.8	ND		1x	2.6	ND		1x	2.5	ND		1x	2.9
Heptachlor epoxide	ND		1x	0.33	ND		1x	0.31	ND		1x	0.3	ND		1x	0.34
Malathion	ND		1x	2.2	ND		1x	2.1	ND		1x	2	ND		1x	2.3
Methoxychlor	ND		1x	40	ND		1x	38	ND		1x	36	ND		1x	41
Methyl parathion	ND		1x	2.2	ND		1x	2.1	ND		1x	2	ND		1x	2.3
Mirex	ND		1x	2.2	ND		1x	2.1	ND		1x	2	ND		1x	2.3
Toxaphene	ND		1x	180	ND		1x	170	ND		1x	160	ND		1x	180
Aroclor-1016	ND		1x	13	ND		1x	59	ND		1x	12	ND		1x	66
Aroclor-1221	ND		1x	33	ND		1x	160	ND		1x	30	ND		1x	170
Aroclor-1232	ND		1x	10	ND		1x	47	ND		1x	9.1	ND		1x	52
Aroclor-1242	ND		1x	13	ND		1x	66	ND		1x	12	ND		1x	72
Aroclor-1248	ND		1x	3.3	ND		1x	13	ND		1x	3	ND		1x	15
Aroclor-1254	ND		1x	6.7	ND		1x	41	ND		1x	6.1	ND		1x	45
Aroclor-1260	ND		1x	3.3	ND		1x	15	ND		1x	3	ND		1x	17

ND=Not detected

Table 4-7. Continued.

BLIND SPLITS

Analyte ug/kg	BLINDSPLIT1A(BR1) Result	Qual.	Dil.	Limit	BLINDSPLIT2A(BR3) Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	4.2	ND		1x	3.8
4,4'-DDE	ND		1x	0.88	ND		1x	0.78
4,4'-DDT	ND		1x	4.8	ND		1x	4.3
Aldrin	ND		1x	0.48	ND		1x	0.43
alpha-BHC	ND		1x	3.3	ND		1x	3
Azinphos methyl	ND		1x	20	ND		1x	18
beta-BHC	ND		1x	0.3	ND		1x	0.27
Chlordane, technical	ND		1x	11	ND		1x	10
Chlorobenside	ND		1x	2	ND		1x	1.8
Dacthal	ND		1x	2	ND		1x	1.8
delta-BHC	ND		1x	0.52	ND		1x	0.46
Demeton	ND		1x	20	ND		1x	18
Dieldrin	ND		1x	3.9	ND		1x	3.5
Endosulfan I	ND		1x	0.3	ND		1x	0.27
Endosulfan II	ND		1x	0.7	ND		1x	0.62
Endosulfan sulfate	ND		1x	1.5	ND		1x	1.4
Endrin	ND		1x	4.2	ND		1x	3.8
Endrin aldehyde	ND		1x	0.3	ND		1x	0.27
Ethyl parathion	ND		1x	2	ND		1x	1.8
gamma-BHC	ND		1x	2.2	ND		1x	2
Heptachlor	ND		1x	2.5	ND		1x	2.2
Heptachlor epoxide	ND		1x	0.3	ND		1x	0.27
Malathion	ND		1x	2	ND		1x	1.8
Methoxychlor	ND		1x	36	ND		1x	32
Methyl parathion	ND		1x	2	ND		1x	1.8
Mirex	ND		1x	2	ND		1x	1.8
Toxaphene	ND		1x	160	ND		1x	140
Aroclor-1016	ND		1x	12	ND		1x	11
Aroclor-1221	ND		1x	30	ND		1x	27
Aroclor-1232	ND		1x	9.1	ND		1x	8.1
Aroclor-1242	ND		1x	12	ND		1x	11
Aroclor-1248	ND		1x	3	ND		1x	2.7
Aroclor-1254	ND		1x	6.1	ND		1x	5.4
Aroclor-1260	ND		1x	3	ND		1x	2.7

ND=Not detected

Table 4-7. Continued.

BREWERTON ANGLE REACH

Analyte ug/kg	BRA1 SED Result	BRA1 SED Qual.	BRA1 SED Dil.	BRA1 SED Limit	BRA2 SED Result	BRA2 SED Qual.	BRA2 SED Dil.	BRA2 SED Limit
4,4'-DDD	ND		1x	5.2	ND		1x	5
4,4'-DDE	ND		1x	1.1	ND		1x	1
4,4'-DDT	ND		1x	5.9	ND		1x	5.7
Aldrin	ND		1x	0.59	ND		1x	0.57
alpha-BHC	ND		1x	4.1	ND		1x	3.9
Azinphos methyl	ND		1x	25	ND		1x	24
beta-BHC	ND		1x	0.37	ND		1x	0.36
Chlordane, technical	ND		1x	14	ND		1x	13
Chlorobenside	ND		1x	2.5	ND		1x	2.4
Dacthal	ND		1x	2.5	ND		1x	2.4
delta-BHC	ND		1x	0.63	ND		1x	0.61
Demeton	ND		1x	25	ND		1x	24
Dieldrin	ND		1x	4.8	ND		1x	4.6
Endosulfan I	ND		1x	0.37	ND		1x	0.36
Endosulfan II	ND		1x	0.85	ND		1x	0.82
Endosulfan sulfate	ND		1x	1.9	ND		1x	1.8
Endrin	ND		1x	5.2	ND		1x	5
Endrin aldehyde	ND		1x	0.37	ND		1x	0.36
Ethyl parathion	ND		1x	2.5	ND		1x	2.4
gamma-BHC	ND		1x	2.7	ND		1x	2.6
Heptachlor	ND		1x	3.1	ND		1x	3
Heptachlor epoxide	ND		1x	0.37	ND		1x	0.36
Malathion	ND		1x	2.5	ND		1x	2.4
Methoxychlor	ND		1x	44	ND		1x	43
Methyl parathion	ND		1x	2.5	ND		1x	2.4
Mirex	ND		1x	2.5	ND		1x	2.4
Toxaphene	ND		1x	200	ND		1x	190
Aroclor-1016	ND		1x	70	ND		1x	68
Aroclor-1221	ND		1x	190	ND		1x	180
Aroclor-1232	ND		1x	56	ND		1x	54
Aroclor-1242	ND		1x	78	ND		1x	75
Aroclor-1248	ND		1x	16	ND		1x	15
Aroclor-1254	ND		1x	48	ND		1x	46
Aroclor-1260	ND		1x	18	ND		1x	18

ND=Not detected

Table 4-7. Continued.

FT. McHENRY REACH

Analyte ug/kg	FMH1 SED Result	FMH1 SED Qual.	FMH1 SED Dil.	FMH1 SED Limit	FMH2 SED Result	FMH2 SED Qual.	FMH2 SED Dil.	FMH2 SED Limit	FMH3 SED Result	FMH3 SED Qual.	FMH3 SED Dil.	FMH3 SED Limit	FMH4 SED Result	FMH4 SED Qual.	FMH4 SED Dil.	FMH4 SED Limit
4,4'-DDD	ND		1x	4.7	ND		1x	5.4	ND		1x	4.1	ND		1x	3.5
4,4'-DDE	ND		1x	0.97	ND		1x	1.1	ND		1x	0.85	ND		1x	0.72
4,4'-DDT	ND		1x	5.3	ND		1x	6.2	ND		1x	4.7	ND		1x	4
Aldrin	ND		1x	0.53	ND		1x	0.62	ND		1x	0.47	ND		1x	0.4
alpha-BHC	ND		1x	3.7	ND		1x	4.2	ND		1x	3.2	ND		1x	2.8
Azinphos methyl	ND		1x	22	ND		1x	26	ND		1x	20	ND		1x	17
beta-BHC	ND		1x	0.33	ND		1x	0.38	ND		1x	0.29	ND		1x	0.25
Chlordane, technical	ND		1x	12	ND		1x	14	ND		1x	11	ND		1x	9.2
Chlorobenside	ND		1x	2.2	ND		1x	2.6	ND		1x	2	ND		1x	1.7
Dacthal	ND		1x	2.2	ND		1x	2.6	ND		1x	2	ND		1x	1.7
delta-BHC	ND		1x	0.57	ND		1x	0.65	ND		1x	0.5	ND		1x	0.42
Demeton	ND		1x	22	ND		1x	26	ND		1x	20	ND		1x	17
Dieldrin	ND		1x	4.3	ND		1x	5	ND		1x	3.8	ND		1x	3.2
Endosulfan I	ND		1x	0.33	ND		1x	0.38	ND		1x	0.29	ND		1x	0.25
Endosulfan II	ND		1x	0.77	ND		1x	0.88	ND		1x	0.68	ND		1x	0.57
Endosulfan sulfate	ND		1x	1.7	ND		1x	2	ND		1x	1.5	ND		1x	1.3
Endrin	ND		1x	4.7	ND		1x	5.4	ND		1x	4.1	ND		1x	3.5
Endrin aldehyde	ND		1x	0.33	ND		1x	0.38	ND		1x	0.29	ND		1x	0.25
Ethyl parathion	ND		1x	2.2	ND		1x	2.6	ND		1x	2	ND		1x	1.7
gamma-BHC	ND		1x	2.4	ND		1x	2.8	ND		1x	2.1	ND		1x	1.8
Heptachlor	ND		1x	2.8	ND		1x	3.2	ND		1x	2.4	ND		1x	2.1
Heptachlor epoxide	ND		1x	0.33	ND		1x	0.38	ND		1x	0.29	ND		1x	0.25
Malathion	ND		1x	2.2	ND		1x	2.6	ND		1x	2	ND		1x	1.7
Methoxychlor	ND		1x	40	ND		1x	46	ND		1x	35	ND		1x	30
Methyl parathion	ND		1x	2.2	ND		1x	2.6	ND		1x	2	ND		1x	1.7
Mirex	ND		1x	2.2	ND		1x	2.6	ND		1x	2	ND		1x	1.7
Toxaphene	ND		1x	180	ND		1x	200	ND		1x	160	ND		1x	130
Aroclor-1016	ND		1x	63	ND		1x	73	ND		1x	56	ND		1x	48
Aroclor-1221	ND		1x	170	ND		1x	190	ND		1x	150	ND		1x	120
Aroclor-1232	ND		1x	50	ND		1x	58	ND		1x	44	ND		1x	38
Aroclor-1242	ND		1x	70	ND		1x	81	ND		1x	62	ND		1x	52
Aroclor-1248	ND		1x	14	ND		1x	17	ND		1x	13	ND		1x	11
Aroclor-1254	ND		1x	43	ND		1x	50	ND		1x	38	ND		1x	32
Aroclor-1260	ND		1x	16	ND		1x	19	ND		1x	14	ND		1x	12

ND=Not detected

Table 4-7. Continued.

CURTIS BAY REACH

Analyte	CB1 SED				CB2 SED				CB3 SED				CB4 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	6.1	ND		1x	2.9	ND		1x	5.6	ND		1x	6.1
4,4'-DDE	ND		1x	1.3	ND		1x	0.59	ND		1x	1.2	ND		1x	1.3
4,4'-DDT	ND		1x	7	ND		1x	3.3	ND		1x	6.4	ND		1x	7
Aldrin	ND		1x	0.7	ND		1x	0.33	ND		1x	0.64	ND		1x	0.7
alpha-BHC	ND		1x	4.8	ND		1x	2.2	ND		1x	4.4	ND		1x	4.8
Azinphos methyl	ND		1x	29	ND		1x	14	ND		1x	27	ND		1x	29
beta-BHC	ND		1x	0.43	ND		1x	0.2	ND		1x	0.4	ND		1x	0.44
Chlordane, technical	ND		1x	16	ND		1x	7.6	ND		1x	15	ND		1x	16
Chlorobenside	ND		1x	2.9	ND		1x	1.4	ND		1x	2.7	ND		1x	2.9
Dacthal	ND		1x	2.9	ND		1x	1.4	ND		1x	2.7	ND		1x	2.9
delta-BHC	ND		1x	0.74	ND		1x	0.35	ND		1x	0.68	ND		1x	0.74
Demeton	ND		1x	29	ND		1x	14	ND		1x	27	ND		1x	29
Dieldrin	ND		1x	5.7	ND		1x	2.7	ND		1x	5.2	ND		1x	5.7
Endosulfan I	ND		1x	0.43	ND		1x	0.2	ND		1x	0.4	ND		1x	0.43
Endosulfan II	ND		1x	1	ND		1x	0.47	ND		1x	0.92	4	P	1x	1
Endosulfan sulfate	ND		1x	2.2	ND		1x	1	ND		1x	2	ND		1x	2.2
Endrin	ND		1x	6.1	ND		1x	2.9	ND		1x	5.6	ND		1x	6.1
Endrin aldehyde	ND		1x	0.43	ND		1x	0.2	ND		1x	0.4	ND		1x	0.43
Ethyl parathion	ND		1x	2.9	ND		1x	1.4	ND		1x	2.7	ND		1x	2.9
gamma-BHC	ND		1x	3.2	ND		1x	1.5	ND		1x	2.9	ND		1x	3.2
Heptachlor	ND		1x	3.6	ND		1x	1.7	ND		1x	3.3	ND		1x	3.6
Heptachlor epoxide	ND		1x	0.43	ND		1x	0.2	ND		1x	0.4	ND		1x	0.43
Malathion	ND		1x	2.9	ND		1x	1.4	ND		1x	2.7	ND		1x	2.9
Methoxychlor	ND		1x	52	ND		1x	24	ND		1x	48	ND		1x	52
Methyl parathion	ND		1x	2.9	ND		1x	1.4	ND		1x	2.7	ND		1x	2.9
Mirex	ND		1x	2.9	ND		1x	1.4	ND		1x	2.7	ND		1x	2.9
Toxaphene	ND		1x	230	ND		1x	110	ND		1x	210	ND		1x	230
Aroclor-1016	ND		1x	83	ND		1x	39	ND		1x	76	ND		1x	83
Aroclor-1221	ND		1x	220	ND		1x	100	ND		1x	200	ND		1x	220
Aroclor-1232	ND		1x	65	ND		1x	31	ND		1x	60	ND		1x	65
Aroclor-1242	ND		1x	91	ND		1x	43	ND		1x	84	ND		1x	91
Aroclor-1248	ND		1x	19	ND		1x	8.8	ND		1x	17	ND		1x	19
Aroclor-1254	ND		1x	57	ND		1x	27	ND		1x	52	ND		1x	57
Aroclor-1260	ND		1x	21	ND		1x	10	ND		1x	20	ND		1x	21

ND=Not detected P=Inductively coupled plasma

Table 4-7. Continued.

FERRY BAR REACH

Analyte	FB1 SED				FB2 SED				FB3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	6.4	ND		1x	7	ND		1x	5.6
4,4'-DDE	ND		1x	1.3	ND		1x	1.4	ND		1x	1.2
4,4'-DDT	ND		1x	7.3	ND		1x	8	ND		1x	6.4
Aldrin	ND		1x	0.73	ND		1x	0.8	ND		1x	0.64
alpha-BHC	ND		1x	5	ND		1x	5.5	ND		1x	4.4
Azinphos methyl	ND		1x	30	ND		1x	33	ND		1x	27
beta-BHC	ND		1x	0.45	ND		1x	0.5	ND		1x	0.4
Chlordane, technical	ND		1x	17	ND		1x	18	ND		1x	15
Chlorobenside	ND		1x	3	ND		1x	3.3	ND		1x	2.7
Dacthal	ND		1x	3	ND		1x	3.3	ND		1x	2.7
delta-BHC	ND		1x	0.77	ND		1x	0.85	ND		1x	0.68
Demeton	ND		1x	30	ND		1x	33	ND		1x	27
Dieldrin	ND		1x	5.9	ND		1x	6.5	ND		1x	5.2
Endosulfan I	ND		1x	0.45	ND		1x	0.5	ND		1x	0.4
Endosulfan II	ND		1x	1	ND		1x	1.2	ND		1x	0.92
Endosulfan sulfate	ND		1x	2.3	ND		1x	2.6	ND		1x	2
Endrin	ND		1x	6.4	ND		1x	7	ND		1x	5.6
Endrin aldehyde	ND		1x	0.45	ND		1x	0.5	ND		1x	0.4
Ethyl parathion	ND		1x	3	ND		1x	3.3	ND		1x	2.7
gamma-BHC	ND		1x	3.3	ND		1x	3.6	ND		1x	2.9
Heptachlor	ND		1x	3.8	ND		1x	4.2	ND		1x	3.3
Heptachlor epoxide	ND		1x	0.45	ND		1x	0.5	ND		1x	0.4
Malathion	ND		1x	3	ND		1x	3.3	ND		1x	2.7
Methoxychlor	ND		1x	55	ND		1x	60	ND		1x	48
Methyl parathion	ND		1x	3	ND		1x	3.3	ND		1x	2.7
Mirex	ND		1x	3	ND		1x	3.3	ND		1x	2.7
Toxaphene	ND		1x	240	ND		1x	260	ND		1x	210
Aroclor-1016	ND		1x	86	ND		1x	95	ND		1x	76
Aroclor-1221	ND		1x	230	ND		1x	250	ND		1x	200
Aroclor-1232	ND		1x	68	ND		1x	75	ND		1x	60
Aroclor-1242	ND		1x	95	ND		1x	100	ND		1x	84
Aroclor-1248	ND		1x	20	ND		1x	22	ND		1x	17
Aroclor-1254	ND		1x	59	ND		1x	65	ND		1x	52
Aroclor-1260	ND		1x	22	ND		1x	24	ND		1x	20

ND=Not detected

Table 4-7. Continued.

NORTHWEST BRANCH EAST

Analyte	NBE1 SED				NBE2 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	6.4	ND		1x	7.4
4,4'-DDE	ND		1x	1.3	ND		1x	1.5
4,4'-DDT	ND		1x	7.3	ND		1x	8.4
Aldrin	ND		1x	0.73	ND		1x	0.84
alpha-BHC	ND		1x	5	ND		1x	5.8
Azinphos methyl	ND		1x	30	ND		1x	35
beta-BHC	ND		1x	0.45	ND		1x	0.53
Chlordane, technical	ND		1x	17	ND		1x	19
Chlorobenside	ND		1x	3	ND		1x	3.5
Dacthal	ND		1x	3	ND		1x	3.5
delta-BHC	ND		1x	0.77	ND		1x	0.89
Demeton	ND		1x	30	ND		1x	35
Dieldrin	ND		1x	5.9	ND		1x	6.8
Endosulfan I	ND		1x	0.45	ND		1x	0.53
Endosulfan II	ND		1x	1	ND		1x	1.2
Endosulfan sulfate	ND		1x	2.3	ND		1x	2.7
Endrin	ND		1x	6.4	ND		1x	7.4
Endrin aldehyde	ND		1x	0.45	ND		1x	0.53
Ethyl parathion	ND		1x	3	ND		1x	3.5
gamma-BHC	ND		1x	3.3	ND		1x	3.8
Heptachlor	ND		1x	3.8	ND		1x	4.4
Heptachlor epoxide	ND		1x	0.45	ND		1x	0.53
Malathion	ND		1x	3	ND		1x	3.5
Methoxychlor	ND		1x	55	ND		1x	63
Methyl parathion	ND		1x	3	ND		1x	3.5
Mirex	ND		1x	3	ND		1x	3.5
Toxaphene	ND		1x	240	ND		1x	280
Aroclor-1016	ND		1x	18	ND		1x	21
Aroclor-1221	ND		1x	45	ND		1x	53
Aroclor-1232	ND		1x	14	ND		1x	16
Aroclor-1242	ND		1x	18	ND		1x	21
Aroclor-1248	ND		1x	4.5	ND		1x	5.3
Aroclor-1254	ND		1x	9.1	ND		1x	11
Aroclor-1260	ND		1x	4.5	ND		1x	5.3

ND=Not detected

Table 4-7. Continued.

NORTHWEST BRANCH WEST

Analyte	NBW1 SED				NBW2 SED				NBW3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	4.1	ND		1x	3.2	ND		1x	6.1
4,4'-DDE	ND		1x	0.85	ND		1x	0.66	ND		1x	1.3
4,4'-DDT	ND		1x	4.7	ND		1x	3.6	ND		1x	7
Aldrin	ND		1x	0.47	ND		1x	0.36	ND		1x	0.7
alpha-BHC	ND		1x	3.2	ND		1x	2.5	ND		1x	4.8
Azinphos methyl	ND		1x	20	ND		1x	15	ND		1x	29
beta-BHC	ND		1x	0.29	ND		1x	0.23	ND		1x	0.43
Chlordane, technical	ND		1x	11	ND		1x	8.4	ND		1x	16
Chlorobenside	ND		1x	2	ND		1x	1.5	ND		1x	2.9
Dacthal	ND		1x	2	ND		1x	1.5	ND		1x	2.9
delta-BHC	ND		1x	0.5	ND		1x	0.39	ND		1x	0.74
Demeton	ND		1x	20	ND		1x	15	ND		1x	29
Dieldrin	ND		1x	3.8	ND		1x	3	ND		1x	5.7
Endosulfan I	ND		1x	0.29	ND		1x	0.23	ND		1x	0.43
Endosulfan II	ND		1x	0.68	ND		1x	0.52	ND		1x	1
Endosulfan sulfate	ND		1x	1.5	ND		1x	1.2	ND		1x	2.2
Endrin	ND		1x	4.1	ND		1x	3.2	ND		1x	6.1
Endrin aldehyde	ND		1x	0.29	ND		1x	0.23	ND		1x	0.43
Ethyl parathion	ND		1x	2	ND		1x	1.5	ND		1x	2.9
gamma-BHC	ND		1x	2.1	ND		1x	1.7	ND		1x	3.2
Heptachlor	ND		1x	2.4	ND		1x	1.9	ND		1x	3.6
Heptachlor epoxide	ND		1x	0.29	ND		1x	0.23	ND		1x	0.43
Malathion	ND		1x	2	ND		1x	1.5	ND		1x	2.9
Methoxychlor	ND		1x	35	ND		1x	27	ND		1x	52
Methyl parathion	ND		1x	2	ND		1x	1.5	ND		1x	2.9
Mirex	ND		1x	2	ND		1x	1.5	ND		1x	2.9
Toxaphene	ND		1x	160	ND		1x	120	ND		1x	230
Aroclor-1016	ND		1x	12	ND		1x	9.1	ND		1x	17
Aroclor-1221	ND		1x	29	ND		1x	23	ND		1x	43
Aroclor-1232	ND		1x	8.8	ND		1x	6.8	ND		1x	13
Aroclor-1242	ND		1x	12	ND		1x	9.1	ND		1x	17
Aroclor-1248	ND		1x	2.9	ND		1x	2.3	ND		1x	4.3
Aroclor-1254	ND		1x	5.9	ND		1x	4.5	ND		1x	8.7
Aroclor-1260	ND		1x	2.9	ND		1x	2.3	ND		1x	4.3

ND=Not detected

Table 4-8. Metals results for Chesapeake Bay and Baltimore Harbor sediments presented by sampling reach.

POPLAR ISLAND

Analyte	PI1SED				PI2SED				PI3SED				PI4SED				PI5SED			
mg/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	2080		1x	4	4820		1x	13.2	1100		1x	3.7	1290		1x	3.8	4110		1x	4.4
Antimony	0.32	BN	1x	0.14	ND	N	1x	0.46	0.19	BN	1x	0.13	ND	N	1x	0.13	ND	N	1x	0.15
Arsenic	1.3	B	1x	0.14	3	B	1x	0.46	1.5		1x	0.13	0.94	B	1x	0.13	2		1x	0.15
Beryllium	ND		1x	0.14	ND		1x	0.46	ND		1x	0.13	ND		1x	0.13	0.2	B	1x	0.15
Cadmium	0.17	B	1x	0.14	ND		1x	0.46	ND		1x	0.13	ND		1x	0.13	0.37	B	1x	0.15
Chromium	3.3		1x	0.68	8.3		1x	2.3	3.2		1x	0.63	2.4		1x	0.66	6.8		1x	0.75
Copper	2.1	B	1x	0.55	3.2	B	1x	1.8	ND		1x	0.51	0.86	B	1x	0.53	3	B	1x	0.6
Iron	3620		1x	8.6	7180		1x	28.7	3240		1x	8	2300		1x	8.3	7170		1x	9.5
Lead	2.8		1x	0.14	7.2		1x	0.46	1.5		1x	0.13	2.1		1x	0.13	5		1x	0.15
Manganese	65.8		1x	0.68	126		1x	2.3	33.8		1x	0.63	43.4		1x	0.66	132		1x	0.75
Mercury	0.06	B	1x	0.05	ND		1x	0.22	0.06	B	1x	0.06	0.06	B	1x	0.06	0.1	B	1x	0.06
Nickel	4.2	B	1x	1.2	10.9	B	1x	4.1	2.6	B	1x	1.1	3	B	1x	1.2	8.3		1x	1.4
Selenium	0.48	B	1x	0.27	ND		1x	0.91	ND		1x	0.25	ND		1x	0.26	0.68	B	1x	0.3
Silver	ND	N	1x	0.41	ND	N	1x	1.4	ND	N	1x	0.38	ND	N	1x	0.4	ND	N	1x	0.45
Thallium	ND	N	1x	0.27	ND	N	1x	0.88	ND	N	1x	0.23	ND	N	1x	0.28	ND	N	1x	0.32
Zinc	22.1	E	1x	0.82	57	E	1x	2.7	10.4	E	1x	0.76	15.9	E	1x	0.79	42.2	E	1x	0.91

ND= Not detected N=MS outside of control limits B=Between IDL and CRDL E=Serial dilution outside of control limits

Table 4-8. Continued.

DEEP TROUGH

Analyte	DT1SED				DT2SED				DT3SED			
mg/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	21400		1x	13.1	21100		1x	4.9	19900		1x	12.4
Antimony	0.5	BN	1x	0.45	ND	N	1x	0.17	0.62	BN	1x	0.43
Arsenic	8		1x	0.45	13.3		1x	0.17	10.9		1x	0.43
Beryllium	1.1	B	1x	0.45	1.1		1x	0.17	1.2	B	1x	0.43
Cadmium	1.5	B	1x	0.45	1.3		1x	0.17	1.5	B	1x	0.43
Chromium	42.2		1x	2.[illegible]	35.2		1x	0.85	39.7		1x	2.1
Copper	25		1x	1.8	10.3		1x	0.68	25.4		1x	1.7
Iron	31300		1x	28.5	39900		1x	10.7	32500		1x	26.8
Lead	31.1		1x	0.45	'5.7		1x	0.17	30.5		1x	0.43
Manganese	622		1x	2.3	1550		1x	0.85	789		1x	2.1
Mercury	0.3	B	1x	0.2	0.16	B	1x	0.11	0.35	B	1x	0.23
Nickel	34.7		1x	4.1	28.5		1x	1.5	34.4		1x	3.8
Selenium	0.95	B	1x	0.9	1.5		1x	0.34	1.7	B	1x	0.85
Silver	ND	N	1x	1.4	ND	N	1x	0.51	ND	N	1x	1.3
Thallium	ND	NW	1x	0.99	ND	N	1x	0.41	ND	N	1x	0.92
Zinc	166	E	1x	2.7	87.6	E	1x	1	183	E	1x	2.6

ND=Not detected N=MS out of control limits B=Between IDL and CRDL W=Spike outside of control limits
E=Serial dilution outside of control limits

Table 4-8. Continued.

KENT ISLAND DEEP

Analyte mg/kg	KI1SED Result	KI1SED Qual.	KI1SED Dil.	KI1SED Limit	KI2SED Result	KI2SED Qual.	KI2SED Dil.	KI2SED Limit	KI3SED Result	KI3SED Qual.	KI3SED Dil.	KI3SED Limit
Aluminum	1150		1x	3.6	16400		1x	8.4	3100		1x	3.8
Antimony	0.16	BN	1x	0.13	0.39	BN	1x	0.29	ND	N	1x	0.13
Arsenic	2.1		1x	0.13	9.7		1x	0.29	2.6		1x	0.13
Beryllium	0.13	B	1x	0.13	1.3	B	1x	0.29	0.29	B	1x	0.13
Cadmium	ND		1x	0.13	1.4	B	1x	0.29	0.32	B	1x	0.13
Chromium	4.3		1x	0.63	39		1x	1.5	10.3		1x	0.66
Copper	2.1	B	1x	0.5	29.8		1x	1.2	3.9		1x	0.53
Iron	3700		1x	7.9	33300		1x	18.3	7530		1x	8.3
Lead	3		1x	0.13	39.4		1x	0.29	6.9		1x	0.13
Manganese	221	N	1x	0.63	1060		1x	1.5	446		1x	0.66
Mercury	0.09	B	1x	0.06	0.24	B	1x	0.13	0.07	B	1x	0.06
Nickel	5.8		1x	1.1	37.3		1x	2.6	9.5		1x	1.2
Selenium	ND	N	1x	0.25	1.8		1x	0.58	0.51	B	1x	0.26
Silver	ND		1x	0.5	ND	N	1x	0.87	ND	N	1x	0.4
Thallium	ND		1x	0.23	ND	N	1x	0.48	ND	N	1x	0.27
Zinc	49.8		1x	0.75	219	E	1x	1.7	87.6	E	1x	0.79

ND= Not detected N=MS outside of control limits B=Between IDL and CRDL
E=Serial dilution outside of control limits

Table 4-8. Continued.

POOLES ISLAND

Analyte mg/kg	POLISED			
	Result	Qual.	Dil.	Limit
Aluminum	17800		1x	6.2
Antimony	ND	N	1x	0.21
Arsenic	9.3		1x	0.21
Beryllium	1	B	1x	0.21
Cadmium	1.1		1x	0.21
Chromium	26.5		1x	1.1
Copper	14.6		1x	0.85
Iron	35100		1x	13.4
Lead	16.3		1x	0.21
Manganese	1290		1x	1.1
Mercury	0.12	B	1x	0.12
Nickel	30.6		1x	1.9
Selenium	1	B	1x	0.43
Silver	ND		1x	0.64
Thallium	ND		1x	0.4
Zinc	94.1		1x	1.3

ND= Not detected N=MS outside of control limits
B=Between IDL and CRDL

Table 4-8. Continued.

SWAN POINT CHANNEL

Analyte mg/kg	SWP1SED				SWP2SED				SWP3SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	20400		1x	11.2	27800		1x	9.3	21600		1x	6.6
Antimony	ND	N	1x	0.38	ND	N	1x	0.32	0.36	BN	1x	0.23
Arsenic	14.8		1x	0.38	13.9		1x	0.32	13.6		1x	0.23
Beryllium	1.8	B	1x	0.38	1.7		1x	0.32	1.8		1x	0.23
Cadmium	1.3	B	1x	0.38	1.9		1x	0.32	1.9		1x	0.23
Chromium	47.2		1x	1.9	51.6		1x	1.6	46.9		1x	1.1
Copper	40.1		1x	1.5	39.7		1x	1.3	47.2		1x	0.9
Iron	44300		1x	24.2	44600		1x	20.1	42200		1x	14.3
Lead	45.6		1x	0.38	50.5		1x	0.32	56.3		1x	0.23
Manganese	3730	N	1x	1.9	2840		1x	1.6	2460		1x	1.1
Mercury	0.28	B	1x	0.16	0.36	B	1x	0.21	0.5		1x	0.17
Nickel	51.5		1x	3.5	50.2		1x	2.9	47.5		1x	2
Selenium	1.8	BN	1x	0.77	2.5	*	1x	0.64	1.8	*	1x	0.45
Silver	ND		1x	7.7	ND		1x	0.96	ND		1x	0.68
Thallium	ND		1x	0.81	ND	N	1x	0.88	0.74	BN	1x	0.67
Zinc	281		1x	2.3	272	N	1x	1.9	283	N	1x	1.4

ND= Not detected N=MS outside of control limits B=Between IDL and CRDL
*=Duplicate analysis outside of control limits

Table 4-8. Continued.

CRAIGHILL ENTRANCE

Analyte	CRE1SED				CRE2SED				CRE3SED			
mg/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	5190		1x	6.5	22100		1x	6.4	25200 .		1x	6
Antimony	ND	N	1x	0.22	ND	N	1x	0.22	ND	N	1x	0.21
Arsenic	4.9	EN	1x	0.22	9.8	EN	1x	0.22	9.9	EN	1x	0.21
Beryllium	1	BN	1x	0.24	1.5	N	1x	0.24	1.2	N	1x	0.21
Cadmium	0.66	B	1x	0.22	1.5		1x	0.22	1.7		1x	0.21
Chromium	16.6		1x	1.1	41.9		1x	1.1	44.2		1x	1
Copper	10.6		1x	0.9	8.4		1x	0.88	8.7		1x	0.83
Iron	25600		1x	15	45900		1x	15.1	39800		1x	13.1
Lead	15.3	E	1x	0.22	17.1	E	1x	0.22	17.9	E	1x	0.21
Manganese	1340		1x	1.1	803		1x	1.1	1190		1x	1
Mercury	0.25		1x	0.12	0.14	B	1x	0.11	0.12	B	1x	0.09
Nickel	17.1		1x	2	29.6		1x	2	43.2		1x	1.9
Selenium	ND	N	1x	0.45	1.1	N	1x	0.44	1.7	N	1x	0.41
Silver	ND	N	1x	0.72	ND	N	1x	1.4	ND	N	1x	1.3
Thallium	ND		1x	0.47	ND		1x	0.4	ND		1x	0.46
Zinc	87.3	*	1x	1.3	96.7	*	1x	1.3	104	*	1x	1.2

ND= Not detected N=MS outside of control limits B=Between IDL and CRDL
E=Serial dilution outside of control limits *=Duplicate analysis outside of control limits

Table 4-8. Continued.

CRAIGHILL CHANNEL

Analyte	CR1SED				CR2SED				CR2SEDFD				CR3SED			
mg/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	5880		1x	3.3	8390		1x	5.8	20000		1x	8	16500		1x	4.9
Antimony	ND	N	1x	0.11	ND	N	1x	0.2	ND	N	1x	0.28	ND	N	1x	0.17
Arsenic	4.8	EN	1x	0.11	7.4	EN	1x	0.2	15.4	EN	1x	0.28	12	EN	1x	0.17
Beryllium	0.47	BN	1x	0.14	0.71	BN	1x	0.18	1.5	N	1x	0.29	1.4	N	1x	0.19
Cadmium	0.58		1x	0.11	0.89	B	1x	0.2	1.8		1x	0.28	1.5		1x	0.17
Chromium	13.1		1x	0.57	23.4		1x	1	53		1x	1.4	29.5		1x	0.85
Copper	2.8		1x	0.45	12.9		1x	0.8	30.7		1x	1.1	10.1		1x	0.68
Iron	18000		1x	9	19700		1x	11.5	39400		1x	18	40300		1x	12.2
Lead	5.8	E	1x	0.11	17.5	E	1x	0.2	42.8	E	1x	0.28	17.6	E	1x	0.17
Manganese	412		1x	0.57	2120		1x	1	5700		1x	1.4	809		1x	0.85
Mercury	0.06	B	1x	0.06	0.17	B	1x	0.11	0.35		1x	0.17	0.16	B	1x	0.10
Nickel	8.8		1x	1	17.3		1x	1.8	41.5		1x	2.5	39.4		1x	1.5
Selenium	0.87	N	1x	0.23	1.1	N	1x	0.4	1.4	N	1x	0.55	1.8	N	1x	0.34
Silver	ND	N	1x	0.86	ND	N	1x	0.55	ND	N	1x	0.86	ND	N	1x	1.2
Thallium	ND		1x	0.25	ND		1x	0.37	ND		1x	0.58	ND		1x	0.43
Zinc	37.9	*	1x	0.68	103	*	1x	1.2	246	*	1x	1.7	94.1	*	1x	1

ND= Not detected N=MS outside of control limits B=Between IDL and CRDL
E=Serial dilution outside of control limits *=Duplicate analysis outside of control limits

Table 4-8. Continued.

CRAIGHILL ANGLE

Analyte	CRA1SED				CRA2SED			
mg/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	16100		1x	7.4	18900		1x	8.9
Antimony	ND	N	1x	0.26	0.39	BN	1x	0.31
Arsenic	12.8	EN	1x	0.26	15.1	EN	1x	0.31
Beryllium	1.5	N	1x	0.26	1.7	N	1x	0.26
Cadmium	1.7		1x	0.26	1.9		1x	0.31
Chromium	48.5		1x	1.3	58.6		1x	1.5
Copper	30.6		1x	1	36.6		1x	1.2
Iron	37400		1x	16.5	41600		1x	16.2
Lead	44.3	E	1x	0.26	52.4	E	1x	0.31
Manganese	3450		1x	1.3	3620		1x	1.5
Mercury	0.32		1x	0.12	0.41		1x	0.18
Nickel	38.8		1x	2.3	49.2		1x	2.8
Selenium	1.8	N	1x	0.51	1.2	BN	1x	0.61
Silver	ND	N	1x	0.79	ND	N	1x	0.77
Thallium	ND		1x	0.51	ND		1x	0.68
Zinc	242	*	1x	1.5	286	*	1x	1.8

ND= Not detected N=MS outside of control limits B=Between IDL and CRDL
E=Serial dilution outside of control limits *=Duplicate analysis outside of control limits

Table 4-8. Continued.

CRAIGHILL UPPER RANGE

Analyte mg/kg	CRU1SED				CRU2SED				CRU3SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	12800		1x	7.5	6170		1x	4	17200		1x	5.3
Antimony	ND	N	1x	0.26	0.23	BN	1x	0.14	ND	N	1x	0.18
Arsenic	11.4	EN	1x	0.26	6.3	EN	1x	0.14	9	EN	1x	0.18
Beryllium	1.7	N	1x	0.25	ND	N	1x	0.14	1.3	N	1x	0.22
Cadmium	1.5		1x	0.26	0.64	B	1x	0.14	1.4		1x	0.18
Chromium	49.3		1x	1.3	29.9		1x	0.69	31.6		1x	0.92
Copper	34.3		1x	1	16.8		1x	0.55	7.6		1x	0.74
Iron	41100		1x	15.9	1840		1x	9.1	42600		1x	13.8
Lead	53.5	E	1x	0.26	24.5	E	1x	0.14	16	E	1x	0.18
Manganese	3140		1x	1.3	1430		1x	0.69	1190		1x	0.92
Mercury	0.37		1x	0.14	0.18		1x	0.07	0.12	B	1x	0.11
Nickel	42.3		1x	2.3	18.5		1x	1.2	26.5		1x	1.7
Selenium	1.6	N	1x	0.52	1.2	N	1x	0.28	0.83	BN	1x	0.37
Silver	ND	N	1x	1.5	ND	N	1x	0.43	ND	N	1x	1.3
Thallium	ND		1x	0.58	ND		1x	0.28	ND		1x	0.43
Zinc	273	*	1x	1.5	120	*	1x	0.83	88	*	1x	1.1

ND= Not detected N=MS outside of control limits B=Between IDL and CRDL
E=Serial dilution outside of control limits *=Duplicate analysis outside of control limits

Table 4-8. Continued.

CUTOFF ANGLE

Analyte	CUT1SED				CUT2SED				CUT3SED			
mg/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	18100		1x	8.8	14900		1x	8.6	12000		1x	7.9
Antimony	ND	N	1x	0.3	ND	N	1x	0.3	0.84	BN	1x	0.27
Arsenic	17.9	EN	1x	0.3	15.3	EN	1x	0.3	15.1	EN	1x	0.27
Beryllium	1.8	N	1x	0.24	1.9	BN	1x	0.39	2.1	N	1x	0.29
Cadmium	1.7		1x	0.3	1.7		1x	0.3	1.4		1x	0.27
Chromium	66.8		1x	1.5	66.9		1x	1.5	81.9		1x	1.4
Copper	36		1x	1.2	40.4		1x	1.2	42.6		1x	1.1
Iron	42100		1x	15.3	45200		1x	24.6	52000		1x	18.2
Lead	64.4	E	1x	0.3	60.6	E	1x	0.3	67	E	1x	0.27
Manganese	6780		1x	1.5	2500		1x	1.5	5150		1x	1.4
Mercury	0.44		1x	0.16	0.43		1x	0.16	0.4		1x	0.13
Nickel	46.2		1x	2.7	43.8		1x	2.7	43.1		1x	2.4
Selenium	1.7	N	1x	0.61	ND	N	1x	0.59	1.9	N	1x	0.54
Silver	ND	N	1x	1.5	ND	N	1x	1.2	ND	N	1x	0.87
Thallium	ND		1x	0.6	ND		1x	0.65	ND		1x	0.43
Zinc	317	*	1x	1.8	308	*	1x	1.8	319	*	1x	1.6

ND= Not detected N=MS outside of control limits B=Between IDL and CRDL
E=Serial dilution outside of control limits *=Duplicate analysis outside of control limits

Table 4-8. Continued.

TOLCHESTER CHANNEL-VAN VEEN

Analyte	TLC1SED				TLC2SED				TLC2SEDFD				TLC3SED			
mg/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	23200		10x	4.3	18900		10x	4.1	18800		1x	5.5	21300		1x	7.9
Antimony	ND	N	1x	0.15	ND	N	1x	0.14	ND	N	1x	0.19	ND	N	1x	0.27
Arsenic	11.5		1x	0.15	8.1		1x	0.14	9.9		1x	0.19	13.7		1x	0.27
Beryllium	2.1		1x	0.15	1.4		1x	0.14	1.3		1x	0.19	1.8		1x	0.27
Cadmium	1.1		1x	0.15	1		1x	0.14	0.89	B	1x	0.19	1.5		1x	0.27
Chromium	27.2		1x	0.74	22.5		1x	0.71	24.2		1x	0.94	40.8		1x	1.4
Copper	42.4		1x	0.59	26.1		1x	0.57	22.8		1x	0.75	38.3		1x	1.1
Iron	34500		10x	9.3	32300		10x	9	32000		10x	11.9	38500		10x	17.2
Lead	32		1x	0.15	21.5		1x	0.14	19.8		1x	0.19	43.1		1x	0.27
Manganese	950		10x	0.74	850		10x	0.71	713		1x	0.94	4710		10x	1.4
Mercury	0.24		1x	0.09	0.12	B	1x	0.09	ND		1x	0.1	0.25	B	1x	0.14
Nickel	51.6		1x	1.3	35.7		1x	1.3	32.1		1x	1.7	57.6		1x	2.5
Selenium	1.2		1x	0.3	0.41	B	1x	0.29	ND		1x	0.38	1.9		1x	0.55
Silver	ND		1x	0.44	ND		1x	0.43	ND		1x	0.57	ND		1x	0.82
Thallium	0.39	B	1x	0.23	ND		1x	0.35	ND		1x	0.35	ND		1x	0.58
Zinc	192		1x	0.89	118		1x	0.86	111		1x	1.1	249		1x	1.6

ND= Not detected N=MS outside of control limits B=Between IDL and CRDL

Table 4-8. Continued.

TOLCHESTER CHANNEL-GRAVITY CORE

Analyte	TLV1SED				TLV2SED				TLV3SED				TLV4SED				TLV5SED			
mg/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	18500		1x	5.5	18700		1x	5.5	17700		10x	4.8	21300		1x	5.9	20000		1x	6.1
Antimony	ND	N	1x	0.19	ND	N	1x	0.19	0.19	BN	1x	0.17	0.26	BN	1x	0.21	0.23	BN	1x	0.21
Arsenic	14.3		1x	0.19	15.1		1x	0.19	12.7		1x	0.17	16.5		1x	0.21	13.1		1x	0.21
Beryllium	2.4		1x	0.19	2.2		1x	0.19	2		1x	0.17	2.4		1x	0.21	2		1x	0.21
Cadmium	1.6		1x	0.19	1.5		1x	0.19	1.7		1x	0.17	2		1x	0.21	2		1x	0.21
Chromium	39.1		1x	0.95	35.2		1x	0.94	36.6		1x	0.83	42.1		1x	1	38.4		1x	1
Copper	59		1x	0.76	56.2		1x	0.75	49.6		1x	0.67	60.3		1x	0.82	47.8		1x	0.84
Iron	37500		10x	12	37200		10x	11.9	35400		10x	10.5	41900		1x	12.9	42200		1x	13.2
Lead	58.3		1x	0.19	55.8		1x	0.19	51.5		1x	0.17	66.3		1x	0.21	55.9		1x	0.21
Manganese	2430		10x	0.95	2060		10x	0.94	2130		10x	0.83	2320		1x	1	2660		1x	1
Mercury	0.58		1x	0.10	0.53		1x	0.09	0.42		1x	0.08	0.56		1x	0.1	0.44		1x	0.1
Nickel	72.2		1x	1.7	70.9		1x	1.7	66.5		1x	1.5	75.6		1x	1.8	64.1		1x	1.9
Selenium	2.4		1x	0.38	1.6		1x	0.38	1.2		1x	0.33	3	*	1x	0.41	2.2	*	1x	0.42
Silver	ND		1x	0.57	ND		1x	0.57	ND		1x	0.5	ND		1x	0.62	ND		1x	0.63
Thallium	ND		1x	0.4	ND		1x	0.38	ND		1x	0.33	ND	NW	1x	0.43	ND	N	1x	0.38
Zinc	316		1x	1.1	318		1x	1.1	307		1x	1	365	N	1x	1.2	294	N	1x	1.3

ND=Not detected N=MS out of control limits B=Between IDL and CRDL W=Spike outside of control limits
*=Duplicate analysis outside of control limits

Table 4-8. Continued.

BREWERTON EASTERN EXTENSION-VAN VEEN

Analyte	BE1SED				BE2SED				BE3SED				BE4SED			
mg/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	20700		10x	11.8	24500		10x	7.9	22900		10x	6.5	21800		10x	8.9
Antimony	ND	N	1x	0.41	ND	N	1x	0.27	ND	N	1x	0.22	ND	N	1x	0.31
Arsenic	14.2		1x	0.41	19.6		1x	0.27	15.1		1x	0.22	20.3		1x	0.31
Beryllium	2.1		1x	0.41	2.3		1x	0.27	2.3		1x	0.22	2.4		1x	0.31
Cadmium	2		1x	0.41	2.3		1x	0.27	2.3		1x	0.22	2.5		1x	0.31
Chromium	50.2		1x	2	57.8		1x	1.4	51		1x	1.1	75.7		1x	1.5
Copper	38.2		1x	1.6	45.7		1x	1.1	43.2		1x	0.9	53.4		1x	1.2
Iron	41300		10x	25.5	48000		10x	17.2	46000		10x	14.1	52300		10x	19.2
Lead	54.2		1x	0.41	63.2		1x	0.27	60.5		1x	0.22	78.7		1x	0.31
Manganese	6000		1x	2	3910		1x	1.4	7000		1x	1.1	6610		1x	1.5
Mercury	0.5		1x	0.15	0.47		1x	0.14	0.49		1x	0.15	0.63		1x	0.16
Nickel	62.7		1x	3.6	65.6		1x	2.5	76.4		1x	2	72.1		1x	2.7
Selenium	1.9	B	1x	0.81	0.95	B	1x	0.55	2.4		1x	0.45	1.9		1x	0.61
Silver	ND		1x	1.2	1	B	1x	0.82	1.3	B	1x	0.67	1.3	B	1x	0.92
Thallium	ND		1x	0.61	ND	W	1x	0.57	ND	W	1x	0.43	ND	W	1x	0.59
Zinc	305	E	1x	2.4	354	E	1x	1.6	332	E	1x	1.3	412	E	1x	1.8

ND=Not detected N=MS out of control limits B=Between IDL and CRDL W=Spike outside of control limits
E=Serial dilution outside of control limits

Table 4-8. Continued.

BREWERTON EASTERN EXTENSION-GRAVITY CORE

Analyte mg/kg	BEV1SED				BEV2SED				BEV3SED				BEV4SED				BEV5SED				BEV6SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	23100		10x	4.9	26700		10x	6.2	20000		10x	6.3	22800		10x	5.5	29400		10x	5.2	22400		10x	6
Antimony	ND	N	1x	0.17	ND	N	1x	0.21	ND	N	1x	0.22	ND	N	1x	0.19	ND	N	1x	0.18	ND	N	1x	0.21
Arsenic	17.4		1x	0.17	14		1x	0.22	12.8		1x	0.22	10.4		1x	0.19	13.9		1x	0.18	12.9		1x	0.21
Beryllium	2.4		1x	0.17	2.2		1x	0.22	1.3		1x	0.22	1.6		1x	0.19	2.1		1x	0.18	1.5		1x	0.21
Cadmium	2.7		1x	0.17	2.3		1x	0.22	1.7		1x	0.22	1.9		1x	0.19	2.1		1x	0.18	1.7		1x	0.21
Chromium	52.5		1x	0.84	45.1		1x	1.1	35.6		1x	1.1	34.7		1x	0.95	42.2		1x	0.9	37.9		1x	1
Copper	50.7		1x	0.67	39.1		1x	0.86	16.7		1x	0.87	23.5		1x	0.76	29.8		1x	0.72	11.4		1x	0.83
Iron	45500		10x	10.6	49000		10x	13.5	39900		10x	13.7	25900		10x	11.9	48900		10x	11.3	43300		10x	13
Lead	72.1		1x	0.17	46.3		1x	0.22	42.7		[illegible]	0.22	29		1x	0.19	31.7		1x	0.18	18.4		1x	0.21
Manganese	4780		1x	0.84	1890		1x	1.1	1440		1x	1.1	2030		1x	0.95	2400		1x	0.9	1360		1x	1
Mercury	0.52	(a)	1x	0.11	0.42	(a)	1x	0.11	0.26	(a)	1x	0.1	0.93	(a)	1x	0.11	0.16	B(a)	1x	0.12	ND	(a)	1x	0.11
Nickel	75.5		1x	1.5	60		1x	1.9	29.4		1x	2	38.8		1x	1.7	48.9		1x	1.6	33.3		1x	1.9
Selenium	1.9		1x	0.34	1	B	1x	0.43	1.5		1x	0.43	1		1x	0.38	1.4		1x	0.36	1.7		1x	0.41
Silver	1.4	B	1x	0.5	ND		1x	0.64	ND		1x	0.65	ND		1x	0.57	ND		1x	0.54	ND		1x	0.62
Thallium	ND	W	1x	0.39	ND	W	1x	0.36	ND		1x	0.36	ND		1x	0.31	ND		1x	0.49	ND		1x	0.42
Zinc	362	E	1x	1	242	E	1x	1.3	111	E	1x	1.3	123	E	1x	1.1	154	E	1x	1.1	101	E	1x	1.2

ND=Not detected N=MS out of control limits B=Between IDL and CRDL W=Spike outside of control limits
E=Serial dilution outside of control limits
(a)=Sample digested six days beyond holding time

Table 4-8. Continued.

BREWERTON REACH

Analyte ug/kg	BR1 SED				BR2 SED				BR3 SED				BR4 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	19900		10x	8.6	21800		10x	6.6	27300		10x	7.3	21100		10x	8.8
Antimony	0.34	BN	1x	0.3	0.65	BN	1x	0.23	0.34	BN	1x	0.25	0.33	BN	1x	0.3
Arsenic	19.8		1x	0.3	18.4		1x	0.23	18.4		1x	0.25	18.8		1x	0.3
Beryllium	2		1x	0.3	1.8		1x	0.23	2		1x	0.25	2		1x	0.3
Cadmium	2.4		1x	0.3	2.4		1x	0.23	2.7		1x	0.25	2.5		1x	0.3
Chromium	82.6		1x	1.5	94.7		1x	1.1	97.5		1x	1.3	120		1x	1.5
Copper	50.5		1x	1.2	53.2		1x	0.91	71.3		1x	1	60.8		1x	1.2
Iron	49100		10x	18.7	48400		10x	14.3	28400		10x	15.8	27400		10x	19.1
Lead	77.8		1x	0.3	98.2		1x	0.23	78.6		1x	0.25	88.6		1x	0.3
Manganese	5390		1x	1.5	2430		10x	1.1	2260		1x	1.3	2850		1x	1.5
Mercury	0.4	(a)	1x	0.15	0.48		1x	0.12	0.46		1x	0.13	0.49		1x	0.14
Nickel	56.2		1x	2.7	47.1		1x	2	48.8		1x	2.3	58.4		1x	2.7
Selenium	1.7		1x	0.59	2.7		1x	0.45	1.8		1x	0.5	1.8		1x	0.61
Silver	ND		1x	0.89	ND		1x	0.68	ND		1x	0.75	ND		1x	0.91
Thallium	ND		1x	0.36	ND		1x	0.56	ND		1x	0.54	ND		1x	0.43
Zinc	375	E	1x	1.8	375	E	1x	1.4	366	E	1x	1.5	399	E	1x	1.8

ND= Not detected N=MS outside of control limits B=Between IDL and CRDL
E=Serial dilution outside of control limits
(a)=Samples analyzed six days beyond holding time

Table 4-8. Continued.

BLIND SPLITS

Analyte ug/kg	BLINDSPLIT1A(BR1) Result	Qual.	Dil.	Limit	BLINDSPLIT2A(BR3) Result	Qual.	Dil.	Limit
Aluminum	23100		10x	6.2	22000		10x	6.4
Antimony	0.46	BN	1x	0.21	ND	N	1x	0.22
Arsenic	20.7		1x	0.21	16		1x	0.22
Beryllium	1.9		1x	0.21	1.6		1x	0.22
Cadmium	2.6		1x	0.21	2.3		1x	0.22
Chromium	101		1x	1.1	76.4		1x	1.1
Copper	58.8		1x	0.86	43.9		1x	0.88
Iron	48200		10x	13.5	49200		10x	13.9
Lead	88.1		1x	0.21	63.1		1x	0.22
Manganese	3380		1x	1.1	1970		1x	1.1
Mercury	0.55		1x	0.15	0.33		1x	0.1
Nickel	51.7		1x	1.9	38.6		1x	2
Selenium	2.1		1x	0.43	2.2		1x	0.44
Silver	0.83	B	1x	0.64	ND		1x	0.66
Thallium	ND	W	1x	0.4	ND	W	1x	0.4
Zinc	404	E	1x	1.3	290	E	1x	1.3

ND=Not detected N=MS out of control limits B=Between IDL and CR
W=Spike outside of control limits
E=Serial dilution outside of control limits

Table 4-8. Continued.

BREWERTON ANGLE REACH

Analyte	BRA1 SED				BRA2 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	17100		10x	7.8	21600		10x	8.3
Antimony	0.5	BN	1x	0.27	0.71	BN	1x	0.29
Arsenic	17.3		1x	0.27	19		1x	0.29
Beryllium	1.7		1x	0.27	2.1		1x	0.29
Cadmium	2.1		1x	0.27	2.5		1x	0.29
Chromium	112		1x	1.3	97.9		1x	1.4
Copper	53.8		1x	1.1	57.3		1x	1.1
Iron	44800		10x	17	50400		10x	18.1
Lead	74.4		1x	0.27	77.3		1x	0.29
Manganese	2830		1x	1.3	4870		1x	1.4
Mercury	0.71		1x	0.17	0.63		1x	0.17
Nickel	44.9		1x	2.4	62.8		1x	2.6
Selenium	1.7		1x	0.54	1.9		1x	0.57
Silver	ND		1x	0.81	ND		1x	0.86
Thallium	2.5	B	1x	0.66	ND		1x	0.55
Zinc	337	E	1x	1.6	369	E	1x	1.7

ND= Not detected N=MS outside of control limits B=Between IDL and CRDL
E=Serial dilution outside of control limits

Table 4-8. Continued.

FT. McHENRY REACH

Analyte ug/kg	FMH1 SED Result	Qual.	Dil.	Limit	FMH2 SED Result	Qual.	Dil.	Limit	FMH3 SED Result	Qual.	Dil.	Limit	FMH4 SED Result	Qual.	Dil.	Limit
Aluminum	18200		1x	8.7	18600		1x	10.8	18800		1x	8	13800		1x	5.2
Antimony	1.6	BN	1x	0.3	1.2	BN	1x	0.37	0.93	BN	1x	0.28	2	BN	1x	0.18
Arsenic	17		1x	0.3	17.9		1x	0.37	29.3		1x	0.28	23.7		1x	0.18
Beryllium	1.4	B	1x	0.3	1.3	B	1x	0.37	1.4		1x	0.28	1.1		1x	0.18
Cadmium	2.1		1x	0.3	2.3		1x	0.37	2.3		1x	0.28	2.5		1x	0.18
Chromium	152	E	1x	1.5	134	E	1x	1.9	126	E	1x	1.4	183	E	1x	0.89
Copper	70.5		1x	1.2	72.7		1x	1.5	87.9		1x	1.1	126		1x	0.71
Iron	48600	E	1x	18.8	50000	E	1x	23.6	50800	E	1x	17.4	40400	E	1x	11.2
Lead	85.4		1x	0.3	77.1		1x	0.37	95.4		1x	0.28	87.2		1x	0.18
Manganese	1610		1x	1.5	1820		1x	1.9	1350		1x	1.4	1310		1x	0.89
Mercury	0.46	(a)	1x	0.15	0.51	(a)	1x	0.17	ND	(a)	1x	0.14	0.59	(a)	1x	0.11
Nickel	47.2		1x	2.7	39.4		1x	3.4	33.9		1x	2.5	28.8		1x	1.6
Selenium	4	N	1x	0.6	3.3	N	1x	0.75	5.4	N	1x	0.55	4.1	N	1x	0.36
Silver	1	B	1x	0.9	ND		1x	1.1	ND		1x	0.83	ND		1x	0.53
Thallium	ND		1x	0.67	ND		1x	0.65	ND		1x	0.51	ND		1x	0.39
Zinc	377		1x	1.8	350		1x	2.2	285		1x	1.7	346		1x	1.1

ND= Not detected N=MS outside of control limits B=Between IDL and CRDL

E=Serial dilution outside of control limits

(a)=Sample analyzed six days beyond holding time

Table 4-8. Continued.

CURTIS BAY REACH

Analyte	CB1 SED				CB2 SED				CB3 SED				CB4 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	18700		1x	11.7	5390		1x	5.6	14200		1x	10.5	16600		1x	11.6
Antimony	2.3	BN	1x	0.4	1.2	BN	1x	0.19	2.8	BN	1x	0.36	2.6	BN	1x	0.4
Arsenic	26.1		1x	0.4	10.9		1x	0.19	32.2		1x	0.36	42.2		1x	0.4
Beryllium	1.4	B	1x	0.4	0.55	B	1x	0.19	1.3	B	1x	0.36	1.3	B	1x	0.4
Cadmium	2.8		1x	0.4	1.2		1x	0.19	2.5		1x	0.36	2.9		1x	0.4
Chromium	206	E	1x	2	118	E	1x	0.97	210	E	1x	1.8	175	E	1x	2
Copper	102		1x	1.6	49.5		1x	0.78	133		1x	1.4	172		1x	1.6
Iron	58800	E	1x	25.4	26100	E	1x	12.2	53400	E	1x	22.8	61500	E	1x	25.1
Lead	106		1x	0.4	37.4		1x	0.19	116		1x	0.36	130		1x	0.4
Manganese	3310		1x	2	483		1x	0.97	1120		1x	1.8	858		1x	2
Mercury	0.89	(a)	1x	0.2	0.26	(a)	1x	0.086	0.76	(a)	1x	0.19	1	(a)	1x	0.21
Nickel	48.5		1x	3.6	13		1x	1.7	44.8		1x	3.3	38.8		1x	3.6
Selenium	5.2	N	1x	0.8	2.2	N	1x	0.39	5.2	N	1x	0.72	6.4	N	1x	0.8
Silver	ND		1x	1.2	ND		1x	0.58	ND		1x	1.1	ND		1x	1.2
Thallium	ND		1x	0.74	ND		1x	0.33	ND		1x	0.7	ND		1x	0.74
Zinc	455		1x	2.4	154		1x	1.2	393		1x	2.2	390		1x	2.4

ND= Not detected N=MS outside of control limits B=Between IDL and CRDL
E=Serial dilution outside of control limits
(a)=Sample analyzed six days beyond holding time

Table 4-8. Continued.

FERRY BAR REACH

Analyte	FB1 SED				FB2 SED				FB3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	17300		1x	11.6	18700		1x	14.3	21300		1x	10.3
Antimony	1.8	BN	1x	0.4	2.1	BN	1x	0.49	1.6	BN	1x	0.36
Arsenic	21.8		1x	0.4	21.9		1x	0.49	21.1		1x	0.36
Beryllium	1.3	B	1x	0.4	1.4	B	1x	0.49	1.5	B	1x	0.36
Cadmium	2.6		1x	0.4	2.7		1x	0.49	2.8		1x	0.36
Chromium	176	E	1x	2	189	E	1x	2.5	193	E	1x	1.8
Copper	158		1x	1.6	164		1x	2	166		1x	1.4
Iron	42300	E	1x	25.3	45600	E	1x	31.2	42400	E	1x	22.5
Lead	123		1x	0.4	120		1x	0.49	122		1x	0.36
Manganese	1990		1x	2	4680		1x	2.5	796		1x	1.8
Mercury	0.85	(a)	1x	0.19	0.77	(a)	1x	0.21	0.68	(a)	1x	0.16
Nickel	45.5		1x	3.6	59.8		1x	4.5	48		1x	3.2
Selenium	4.9	N	1x	0.8	5.2	N	1x	0.99	4.9	N	1x	0.71
Silver	ND		1x	1.2	ND		1x	1.5	ND		1x	1.1
Thallium	ND		1x	0.84	ND		1x	0.98	ND		1x	0.77
Zinc	388		1x	2.4	389		1x	3	384		1x	2.1

ND= Not detected N=MS outside of control limits B=Between IDL and CRDL
E=Serial dilution outside of control limits
(a)=Sample analyzed six days beyond holding time

Table 4-8. Continued.

NORTHWEST BRANCH EAST

Analyte	NBE1 SED				NBE2 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	21900		1x	12.4	18000		1x	13.8
Antimony	3	BN	1x	0.43	2.9	BN	1x	0.47
Arsenic	32.7		1x	0.43	23.5		1x	0.47
Beryllium	1.5	B	1x	0.43	1.4	B	1x	0.47
Cadmium	3.9		1x	0.43	3.3		1x	0.47
Chromium	370	E	1x	2.1	263	E	1x	2.4
Copper	322		1x	1.7	289		1x	1.9
Iron	50700	E	1x	26.8	45300	E	1x	29.9
Lead	204		1x	0.43	177		1x	0.47
Manganese	2360		1x	2.1	969		1x	2.4
Mercury	0.77	(a)	1x	0.23	0.74	(a)	1x	0.23
Nickel	53.5		1x	3.8	40.9		1x	4.3
Selenium	12.2	N	1x	0.85	12.7	N	1x	0.95
Silver	1.9	B	1x	1.3	1.9	B	1x	1.4
Thallium	ND		1x	0.79	ND		1x	0.97
Zinc	513		1x	2.6	456		1x	2.8

ND=Not detected N=MS out of control limits B=Between IDL and CRDL W=Spike out of control limit
E=Serial dilution outside of control limits
(a)=Sample analyzed six days beyond holding time

Table 4-8. Continued.

NORTHWEST BRANCH WEST

Analyte	NBW1 SED				NBW2 SED				NBW3 SED			
ug/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	16600		1x	8.5	11200		1x	5	18900		1x	11.8
Antimony	0.54	BN	1x	0.29	1.2	BN	1x	0.17	15.3	BN	1x	0.41
Arsenic	8.9		1x	0.29	12.3		1x	0.17	39.9		1x	0.41
Beryllium	1.3	B	1x	0.29	0.91		1x	0.17	1.4	B	1x	0.41
Cadmium	1.4	B	1x	0.29	1.6		1x	0.17	6.2		1x	0.41
Chromium	62.5	E	1x	1.5	176	E	1x	0.85	2240	E	1x	2
Copper	36		1x	1.2	98		1x	0.68	553		1x	1.6
Iron	37000	E	1x	18.4	25300	E	1x	10.8	47800	E	1x	25.7
Lead	20.5		1x	0.29	52		1x	0.17	486		1x	0.41
Manganese	895		1x	1.5	437		1x	0.85	847		1x	2
Mercury	0.14	B(a)	1x	0.14	0.43	(a)	1x	0.11	6.3	(a)	1x	0.19
Nickel	29.8		1x	2.6	35.7		1x	1.5	56.5		1x	3.7
Selenium	3.3	N	1x	0.58	3.7	N	1x	0.34	14	N	1x	0.81
Silver	ND		1x	0.87	ND		1x	0.51	2.9	B	1x	1.2
Thallium	ND	W	1x	0.55	ND		1x	0.43	ND		1x	0.82
Zinc	98.6		1x	1.7	140		1x	1	874		1x	2.4

ND=Not detected N=MS out of control limits B=Between IDL and CRDL W=Spike out of control limits
E=Serial dilution outside of control limits
(a)=Sample analyzed six days beyond holding time

Table 4-9. Organotin results for selected Chesapeake Bay sediments.

	POPLAR ISLAND						KENT ISLAND			DEEP TROUGH		
ug/kg	PI1SED			PI5SED			KI2SED			DT2SED		
	Result	Dilution	Limit	Result	Dilution	Limit	Result	Dilution	Limit	Result	Dilution	Limit
Tributyltin (TBT)	ND	1x	0.3	23.65	1x	0.3	4.32	1x	0.3	ND	1x	0.3
Dibutyltin (DBT)	ND	1x	0.3	ND	1x	0.3	ND	1x	0.3	ND	1x	0.3
Monobutyltin (MBT)	ND	1x	0.3	ND	1x	0.3	ND	1x	0.3	ND	1x	0.3

ND=Not detected

Table 4-9. Continued.

ug/kg	SWAN POINT SWP2SED			TOLCHESTER TLV3SED			TLC2SED			TLC2SEDFD		
	Result	Dilution	Limit	Result	Dilution	Limit	Result	Dilution	Limit	Result	Dilution	Limit
Tributyltin (TBT)	4.97	1x	0.3	ND	1x	0.3	ND	1x	0.3	ND	1x	0.3
Dibutyltin (DBT)	ND	1x	0.3	ND	1x	0.3	ND	1x	0.3	ND	1x	0.3
Monobutyltin (MBT)	ND	1x	0.3	ND	1x	0.3	ND	1x	0.3	ND	1x	0.3

ND=Not detected

Table 4-9. Continued.

	BREWERTON						BLIND SPLITS					
ug/kg	BR1SED			BR3SED			BLINDSPLIT1A (BR1)			BLINDSPLIT2A (BR3)		
	Result	Dilution	Limit	Result	Dilution	Limit	Result	Dilution	Limit	Result	Dilution	Limit
Tributyltin (TBT)	ND	1x	0.3	2.86	1x	0.3	ND	1x	0.3	41.77	1x	0.3
Dibutyltin (DBT)	ND	1x	0.3	ND	1x	0.3	ND	1x	0.3	8.58	1x	0.3
Monobutyltin (MBT)	ND	1x	0.3	ND	1x	0.3	ND	1x	0.3	2.89	1x	0.3

ND=Not detected

Table 4-9. Continued.

ug/kg	BREWERTON						CRAIGHILL UPPER RANGE/ENTRANCE					
	BE2SED			BEV3SED			CRU2SED			CRE2SED		
	Result	Dilution	Limit	Result	Dilution	Limit	Result	Dilution	Limit	Result	Dilution	Limit
Tributyltin (TBT)	6.27	1x	0.3	ND	1x	0.3	7.02	1x	0.3	ND	1x	0.3
Dibutyltin (DBT)	ND	1x	0.3	ND	1x	0.3	1.96	1x	0.3	ND	1x	0.3
Monobutyltin (MBT)	ND	1x	0.3	ND	1x	0.3	ND	1x	0.3	ND	1x	0.3

ND=Not detected

Table 4-9. Continued.

ug/kg	CRAIGHILL CR2SED			CRAIGHILL CR2FDSED			CUTOFF ANGLE CUT2SED		
	Result	Dilution	Limit	Result	Dilution	Limit	Result	Dilution	Limit
Tributyltin (TBT)	1.22	1x	0.3	3.42	1x	0.3	10.77	1x	0.3
Dibutyltin (DBT)	ND	1x	0.3	ND	1x	0.3	7.90	1x	0.3
Monobutyltin (MBT)	ND	1x	0.3	ND	1x	0.3	ND	1x	0.3

ND=Not detected

Table 4-10. General Chemistry results for Chesapeake Bay and Baltimore Harbor sediments presented by sample reach.

POPLAR ISLAND

Analyte	PI1 SED				PI2 SED				PI3 SED				PI4 SED				PI5 SED			
mg/kg	Result	Qual	Dil	Limit	Result	Qual	Dil	Limit	Result	Qual	Dil	Limit	Result	Qual	Dil	Limit	Result	Qual	Dil	Limit
Carbon, total organic	3280		1x	585	14400		1x	2380	2500		1x	569	3280		1x	585	14400		1x	2380
Cyanide, total	ND		1x	0.28	ND		1x	0.95	ND		1x	0.25	ND		1x	0.28	ND		1x	0.95
Nitrogen, ammonia	7.6		1x	3.6	19.2		1x	11.6	3.4		1x	3.1	7.6		1x	3.6	19.2		1x	11.6
Nitrogen, nitrate and nitrite	146		1x	14	7.6		1x	4.6	2.1		1x	1.2	146		1x	14	7.6		1x	4.6
Nitrogen, total Kjeldahl	106		1x	33.9	515		1x	85	132		1x	32	106		1x	33.9	515		1x	85
Oxygen demand, biochemical	397		1x	176	ND		1x	571	216		1x	154	397		1x	176	ND		1x	571
Oxygen demand, chemical	2680		1x	146	6010		1x	476	1340		1x	128	2680		1x	146	6010		1x	476
Phosphorus, total	61.4		1x	8	147		1x	22.9	61.8		1x	6.2	61.4		1x	8	147		1x	22.9
Sulfide, total	41.4		1x	32.4	ND		1x	102	ND		1x	24.8	41.4		1x	32.4	ND		1x	102

ND =Not detected

Table 4-10. Continued.

DEEP TROUGH

Analyte	DT1 SED				DT2 SED				DT3 SED			
mg/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbon, total organic	47500		1x	3650	14000		1x	1080	50700		1x	2690
Cyanide, total	ND		1x	1	ND		1x	0.44	ND		1x	0.89
Nitrogen, ammonia	131		1x	11.7	8.1		1x	5.1	262		1x	12
Nitrogen, nitrate and nitrite	8.2		1x	4.9	7.7		1x	2	4.8		1x	4.6
Nitrogen, total Kjeldahl	1830		1x	121	1370		1x	67.2	2180		1x	105
Oxygen demand, biochemical	4530		1x	603	376		1x	258	1760		1x	566
Oxygen demand, chemical	36700		1x	1000	18600		1x	430	29000		1x	942
Phosphorus, total	843		1x	[illegible]	614		1x	53.8	632		1x	73.6
Sulfide, total	2600		1x	118	ND		1x	46.2	ND		1x	104

ND=Not detected

Table 4-10. Continued.

KENT ISLAND DEEP

Analyte mg/kg	KI1 SED Result	KI1 SED Qual.	KI1 SED Dil.	KI1 SED Limit	KI2 SED Result	KI2 SED Qual.	KI2 SED Dil.	KI2 SED Limit	KI3SED Result	KI3SED Qual.	KI3SED Dil.	KI3SED Limit
Carbon, total organic	13600		1x	758	7250		1x	1480	10100		1x	640
Cyanide, total	ND		1x	0.27	0.92		1x	0.57	ND		1x	0.3
Nitrogen, ammonia	8.6		1x	3.2	30.6		1x	7.2	69.1		1x	3.4
Nitrogen, nitrate and nitrite	4		1x	1.3	3.6		1x	2.8	4.6		1x	1.2
Nitrogen, total Kjeldahl	236		1x	34.6	131		1x	64	335		1x	29
Oxygen demand, biochemical	346		1x	159	857		1x	356	468		1x	173
Oxygen demand, chemical	22100		1x	682	23900		1x	148	6170		1x	144
Phosphorus, total	68.6		1x	6.9	661		1x	46.4	92.6		1x	7.2
Sulfide, total	ND		1x	28.6	ND		1x	55.4	ND		1x	29.3

ND=Not detected

Table 4-10. Continued.

POOLES ISLAND

Analyte mg/kg	POLISED Result	Qual.	Dil	Limit
Carbon, total organic	36100		1x	1100
Cyanide, total	ND		1x	0.53
Nitrogen, ammonia	39.7		1x	6.6
Nitrogen, nitrate and nitrite	7.5		1x	2.4
Nitrogen, total Kjeldahl	982		1x	322
Oxygen demand, biochemical	1080		1x	296
Oxygen demand, chemical	88200		1x	988
Phosphorus, total	467		1x	30.9
Sulfide, total	ND		1x	47.5

ND=Not detected

Table 4-10. Continued.

SWAN POINT CHANNEL

Analyte	SWP1 SED				SWP2 SED				SWP3 SED			
mg/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbon, total organic	90500		1x	2300	44800		1x	3290	37000		1x	1890
Cyanide, total	ND		1x	0.91	ND		1x	0.94	ND		1x	0.8
Nitrogen, ammonia	279		1x	10.6	24.2		1x	11.4	17.2		1x	9.9
Nitrogen, nitrate and nitrite	6.5		1x	4.1	5.8		1x	4.3	6		1x	3.6
Nitrogen, total Kjeldahl	2260		1x	108	2230		1x	105	2550		1x	92.8
Oxygen demand, biochemical	2830		1x	517	3940		1x	1360	4150		1x	1200
Oxygen demand, chemical	13800		1x	431	91300		1x	1810	58500		1x	1600
Phosphorus, total	1570		1x	108	1930	(a)	1x	188	1290	(a)	1x	71.6
Sulfide, total	1080		1x	94.5	ND		1x	91.1	ND		1x	96.8

ND=Not detected

(a)=Total phosphorus digestates became cloudy upon addition of reagents, interfering with colorimetric analysis
Potential high bias

Table 4-10. Continued.

CRAIGHILL ENTRANCE

Analyte mg/kg	CRE1 SED				CRE2 SED				CRE3 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbon, total organic	29600		1x	1010	21300		1x	1080	17700		1x	937
Cyanide, total	ND		1x	0.53	ND		1x	0.5	ND		1x	0.43
Nitrogen, ammonia	35.5		1x	6	10		1x	5.9	39.9		1x	12.2
Nitrogen, nitrate and nitrite	5.2		1x	2.5	4.6		1x	2.4	13		1x	2.3
Nitrogen, total Kjeldahl	855		1x	283	1190		1x	116	1140		1x	105
Oxygen demand, biochemical	1130		1x	304	554		1x	291	325		1x	281
Oxygen demand, chemical	73400		1x	2020	50900		1x	1940	50500		1x	1880
Phosphorus, total	586		1x	45.2	397		1x	43.2	344		1x	36.6
Sulfide, total	318		1x	48.5	61.4		1x	54.8	95.1		1x	50

ND=Not detected

Table 4-10. Continued.

CRAIGHILL CHANNEL

Analyte mg/kg	CR1 SED				CR2 SED				CR2FD SED				CR3 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbon, total organic	10600		1x	725	13500		1x	1010	46200		1x	2670	29000		1x	1220
Cyanide, total	ND		1x	0.29	ND		1x	0.4	ND		1x	0.69	ND		1x	0.51
Nitrogen, ammonia	6		1x	3.6	16.9		1x	5.3	410		1x	40.7	8.9		1x	6
Nitrogen, nitrate and nitrite	7		1x	1.4	6.5		1x	2.1	10.8		1x	3.3	12.6		1x	2.3
Nitrogen, total Kjeldahl	635		1x	36.2	666		1x	53.8	922		1x	77.2	1150		1x	54.2
Oxygen demand, biochemical	410		1x	174	1010		1x	258	1510		1x	400	585		1x	291
Oxygen demand, chemical	25600		1x	580	76300		1x	1720	104000		1x	2670	81200		1x	1940
Phosphorus, total	130		1x	25.9	359		1x	33.6	1100		1x	52.1	344		1x	43.3
Sulfide, total	ND		1x	29.9	ND		1x	49.3	268		1x	63.1	54		1x	48.2

ND=Not detected

Table 4-10. Continued.

CRAIGHILL ANGLE

Analyte mg/kg	CRA1 SED Result	Qual.	Dil.	Limit	CRA2 SED Result	Qual.	Dil.	Limit
Carbon, total organic	42700		1x	2000	47400		1x	2000
Cyanide, total	ND		1x	0.62	ND		1x	0.72
Nitrogen, ammonia	374		1x	75	309		1x	91.1
Nitrogen, nitrate and nitrite	16.2		1x	2.9	9.7		1x	3.7
Nitrogen, total Kjeldahl	2000		1x	376	1260		1x	435
Oxygen demand, biochemical	976		1x	361	1530		1x	451
Oxygen demand, chemical	52800		1x	1200	133000		1x	3000
Phosphorus, total	1060		1x	93.8	1220		1x	67.1
Sulfide, total	230		1x	54.5	1310		1x	73.6

ND= Not detected

Table 4-10. Continued.

CRAIGHILL UPPER RANGE

Analyte mg/kg	CRU1 SED				CRU2 SED				CRU3 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbon, total organic	46500		1x	1780	8180		1x	745	19900		1x	1170
Cyanide, total	ND		1x	0.75	ND		1x	0.31	ND		1x	0.45
Nitrogen, ammonia	59.7		1x	8.5	17.9		1x	4	31.2		1x	6.1
Nitrogen, nitrate and nitrite	17.5		1x	3.5	8.7		1x	1.5	9.4		1x	2.3
Nitrogen, total Kjeldahl	1490		1x	444	824		1x	41.2	1190		1x	112
Oxygen demand, biochemical	1940		1x	426	703		1x	190	1380		1x	281
Oxygen demand, chemical	69100		1x	1420	40100		1x	1270	32600		1x	935
Phosphorus, total	1120		1x	55.5	451		1x	24.7	437		1x	36.5
Sulfide, total	1670		1x	74.3	211		1x	32.2	104		1x	54.9

ND=Not detected

Table 4-10. Continued.

CUTOFF ANGLE

Analyte mg/kg	CUT1 SED Result	Qual	Dil	Limit	CUT2 SED Result	Qual	Dil	Limit	CUT3 SED Result	Qual	Dil	Limit
Carbon, total organic	41500		1x	2250	38800		1x	1590	33700		1x	1570
Cyanide, total	ND		1x	0.67	ND		1x	0.78	ND		1x	0.63
Nitrogen, ammonia	395		1x	8.4	374		1x	9.8	50.6		1x	7.9
Nitrogen, nitrate and nitrite	12.2		1x	3.3	6.6		1x	3.9	7.3		1x	3.1
Nitrogen, total Kjeldahl	1950		1x	162	2220		1x	192	1950		1x	157
Oxygen demand, biochemical	1710		1x	405	2260		1x	478	1260		1x	378
Oxygen demand, chemical	81300		1x	2700	81200		1x	1590	53700		1x	1260
Phosphorus, total	686		1x	52.7	1460		1x	71.1	1080		1x	49.2
Sulfide, total	358		1x	61.8	1300		1x	86.3	1000		1x	55

ND=Not detected

Table 4-10. Continued.

TOLCHESTER CHANNEL-VAN VEEN

Analyte	TLC1 SED				TLC2 SED				TLC2FD SED				TLC3 SED			
mg/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbon, total organic	56700		1x	968	23600		1x	841	19000		1x	1100	35300		1x	1180
Cyanide, total	ND		1x	0.36	ND		1x	0.41	ND		1x	0.47	ND		1x	0.5
Nitrogen, ammonia	15.8		1x	5	19		1x	5	18.3		1x	5.6	70		1x	7.1
Nitrogen, nitrate and nitrite	12		1x	1.8	4.2		1x	2.1	6.2		1x	2.2	4.9		1x	2.9
Nitrogen, total Kjeldahl	675		1x	224	1080		1x	50.5	1020		1x	59.7	1470		1x	66.1
Oxygen demand, biochemical	2460		1x	581	729		1x	252	710		1x	264	1550		1x	355
Oxygen demand, chemical	91200		1x	3100	28300		1x	841	38100		1x	880	87700		1x	2370
Phosphorus, total	430		1x	40.3	328		1x	43.8	1210		1x	91.6	1310		1x	74
Sulfide, total	460		1x	32.8	268		1x	42.9	751		1x	48.2	237		1x	60.7

ND=Not detected

Table 4-10. Continued.

TOLCHESTER CHANNEL-GRAVITY CORE

Analyte	TLV1 SED				TLV2 SED				TLV3 SED				TLV4 SED				TLV5 SED			
mg/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbon, total organic	54800		1x	951	75300		1x	848	64500		1x	1220	55200		1x	1770	47400		1x	916
Cyanide, total	0.47		1x	0.43	ND		1x	0.41	ND		1x	0.4	ND		1x	0.41	ND		1x	0.4
Nitrogen, ammonia	134		1x	22.3	114		1x	24.2	75.9		1x	24.7	71.6		1x	44.2	205		1x	44.9
Nitrogen, nitrate and nitrite	2.5		1x	1.8	2		1x	1.8	3.8		1x	1.7	3.1		1x	2	3.3		1x	2.2
Nitrogen, total Kjeldahl	444		1x	48.6	1030		1x	259	721		1x	238	854		1x	247	1030		1x	252
Oxygen demand, biochemical	671		1x	242	977		1x	229	1210		1x	238	976		1x	267	914		1x	261
Oxygen demand, chemical	63000		1x	1620	78900		1x	3050	56400		1x	1590	66900		1x	1770	67500		1x	2180
Phosphorus, total	985		1x	84.2	1050		1x	79.5	983		1x	49.6	1370		1x	110	1210		1x	90.6
Sulfide, total	2270		1x	44.1	581		1x	39.3	ND		1x	41	183		1x	43.8	ND		1x	48.8

ND=Not detected

Table 4-10. Continued.

BREWERTON EASTERN EXTENSION-VAN VEEN

Analyte	BE1 SED				BE2 SED				BE3 SED				BE4 SED			
mg/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbon, total organic	66900		1x	2570	61500		1x	2180	53500		1x	1580	49000		1x	1500
Cyanide, total	3.6		1x	0.8	1.9		1x	0.56	0.59		1x	0.56	ND		1x	0.67
Nitrogen, ammonia	47		1x	10.1	162		1x	38.6	20.4		1x	7.2	102		1x	43.8
Nitrogen, nitrate and nitrite	ND		1x	3.6	4.2		1x	2.7	3.1		1x	2.8	6.5		1x	3.4
Nitrogen, total Kjeldahl	1860		1x	100	815		1x	390	1320		1x	386	1570		1x	463
Oxygen demand, biochemical	2800		1x	501	2080		1x	359	1840		1x	356	2020		1x	427
Oxygen demand, chemical	163000		1x	8350	90200		1x	2400	39000		1x	119	58000		1x	1420
Phosphorus, total	1430		1x	74.6	1010		1x	46.8	948		1x	53	1110		1x	55.6
Sulfide, total	321		1x	92.4	59.4		1x	59.4	2220		1x	69.7	734		1x	75.1

ND=Not detected

Table 4-10. Continued.

BREWERTON EASTERN EXTENSION-GRAVITY CORE

Analyte	BEV1 SED				BEV2 SED				BEV3 SED				BEV4 SED				BEV5 SED				BEV6 SED			
mg/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual	Dil	Limit
Carbon, total organic	64200		1x	1890	43900		1x	1520	26200		1x	1360	15400		1x	1120	27500		1x	1580	28400		1x	1430
Cyanide, total	1.7		1x	0.44	0.86		1x	0.48	1.7		1x	0.47	ND		1x	0.45	1.8		1x	0.53	ND		1x	0.48
Nitrogen, ammonia	350		1x	57.3	84.8		1x	28.8	153		1x	30.5	124		1x	27.6	97.8		1x	32.8	104		1x	31.6
Nitrogen, nitrate and nitrite	5.2		1x	2.3	3.2		1x	2	4.9		1x	2.1	3.8		1x	2.1	3.9		1x	2.4	4.2		1x	2.2
Nitrogen, total Kjeldahl	930		1x	295	1330		1x	110	92[illegible]		1x	287	1020		1x	61	1120		1x	364	1460		1x	340
Oxygen demand, biochemical	1330		1x	283	2080		1x	685	911		1x	287	1490		1x	269	1450		1x	307	932		1x	301
Oxygen demand, chemical	43800		1x	944	47600		1x	1830	33300		1x	955	46700		1x	1800	32600		1x	1020	36600		1x	1000
Phosphorus, total	1050		1x	84.3	672		1x	35.7	385		1x	42.6	644		1x	35.1	842		1x	45.7	436		1x	34.8
Sulfide, total	143		1x	53.2	769		1x	38.5	ND		1x	52.1	ND		1x	49.2	50.6		1x	128	ND		1x	47.8

ND=Not detected

Table 4-10. Continued.

BREWERTON REACH

Analyte mg/kg	BR1 SED				BR2 SED				BR3 SED				BR4 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbon, total organic	43100		1x	1890	50100		1x	1560	36500		1x	1590	66800		1x	2150
Cyanide, total	ND		1x	0.61	ND		1x	0.58	4.2		1x	0.57	0.89		1x	0.74
Nitrogen, ammonia	50.4		1x	8.2	71.4		1x	8.1	268		1x	38.7	113		1x	17.9
Nitrogen, nitrate and nitrite	5		1x	3.1	4		1x	2.8	10.4		1x	2.7	ND		1x	3.3
Nitrogen, total Kjeldahl	1030		1x	414	940		1x	391	995		1x	359	1160		1x	497
Oxygen demand, biochemical	2290		1x	397	2210		1x	375	1710		1x	358	4550		1x	1050
Oxygen demand, chemical	135000		1x	6620	151000		1x	6250	96800		1x	5970	97100		1x	7000
Phosphorus, total	866		1x	46	888		1x	55.8	913		1x	46.7	1110		1x	62.5
Sulfide, total	ND		1x	67.9	689		1x	60.8	259		1x	51.3	1240		1x	70.6

ND=Not detected

Table 4-10. Continued.

BLIND SPLITS

Analyte mg/kg	BLINDSPLIT1A(BR1) Result	Qual.	Dil.	Limit	BLINDSPLIT2A(BR3) Result	Qual.	Dil.	Limit
Carbon, total organic	55900		1x	2430	9710		1x	1260
Cyanide, total	2.6		1x	0.63	0.65		1x	0.54
Nitrogen, ammonia	45		1x	7.4	78.8		1x	13.4
Nitrogen, nitrate and nitrite	4.1		1x	3	4.4		1x	2.7
Nitrogen, total Kjeldahl	1380		1x	146	657		1x	310
Oxygen demand, biochemical	3300		1x	910	1580		1x	321
Oxygen demand, chemical	86100		1x	6070	92000		1x	5360
Phosphorus, total	1090		1x	54.2	807		1x	37.2
Sulfide, total	308		1x	52.8	197		1x	46.3

ND=Not detected

Table 4-10. Continued.

BREWERTON ANGLE REACH

Analyte	BRA1 SED				BRA2 SED			
mg/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbon, total organic	49700		1x	1950	32200		1x	1770
Cyanide, total	2.8		1x	0.77	ND		1x	0.75
Nitrogen, ammonia	401		1x	46.9	113		1x	17.8
Nitrogen, nitrate and nitrite	48.3		1x	3.7	5.1		1x	3.4
Nitrogen, total Kjeldahl	1750		1x	199	1080		1x	442
Oxygen demand, biochemical	4060		1x	1100	1980		1x	424
Oxygen demand, chemical	91300		1x	7320	112000		1x	7070
Phosphorus, total	989		1x	45.7	1160		1x	55.2
Sulfide, total	456		1x	78.2	298		1x	69.8

ND=Not detected

Table 4-10. Continued.

FT. McHENRY REACH

Analyte mg/kg	FMH1 SED Result	Qual.	Dil.	Limit	FMH2 SED Result	Qual.	Dil.	Limit	FMH3 SED Result	Qual.	Dil.	Limit	FMH4 SED Result	Qual.	Dil.	Limit
Carbon, total organic	48000		1x	91.3	54900		1x	115	9830		1x	76.6	30900		1x	148
Cyanide, total	ND	(b)	1x	0.66	ND		1x	0.75	ND		1x	0.59	ND		1x	0.48
Nitrogen, ammonia	157		1x	41.6	336		1x	46.5	55.6		1x	7.2	34.9		1x	6.3
Nitrogen, nitrate and nitrite	8.4		1x	3	4.8		1x	3.8	4.2		1x	2.9	ND		1x	2.3
Nitrogen, total Kjeldahl	1910		1x	91.3	2690		1x	115	1390		1x	383	1010		1x	148
Oxygen demand, biochemical	1850		1x	403	1580		1x	465	893		1x	353	1290		1x	298
Oxygen demand, chemical	101000		1x	3740	158000		1x	3870	50200		1x	1220	57900		1x	1080
Phosphorus, total	936		1x	46.7	1220	(a)	1x	60.5	600		1x	46	959		1x	44.3
Sulfide, total	2520		1x	60	1380		1x	78.1	ND		1x	51.8	2410		1x	45.1

ND=Not detected

(a)=MS recivery low-cloudiness in sample may have compromised results.

(b)=Not recovered in MS or MS at 5X dilution-possibility of false negative.

Table 4-10. Continued.

CURTIS BAY REACH

Analyte	CB1 SED				CB2 SED				CB3 SED				CB4 SED			
mg/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbon, total organic	54500		1x	1930	23100		1x	1090	56600		1x	2160	74800		1x	1930
Cyanide, total	ND		1x	0.83	ND		1x	0.38	1.5		1x	0.78	ND		1x	0.91
Nitrogen, ammonia	312		1x	52.4	56		1x	9.8	92		1x	10	181		1x	55.2
Nitrogen, nitrate and nitrite	ND		1x	4.3	2.1		1x	1.8	ND		1x	3.6	ND		1x	4.2
Nitrogen, total Kjeldahl	2350		1x	194	978		1x	94.4	1750		1x	101	2460		1x	109
Oxygen demand, biochemical	5070		1x	1300	724		1x	245	3590		1x	1220	6190		1x	1300
Oxygen demand, chemical	78100		1x	1890	26700		1x	849	76700		1x	1840	124000		1x	4350
Phosphorus, total	1970		1x	136	765		1x	36.4	1450		1x	127	1390		1x	77.6
Sulfide, total	462		1x	79.2	826		1x	43	3340		1x	86	5120		1x	80.5

ND =Not detected

Table 4-10. Continued.

FERRY BAR REACH

Analyte mg/kg	FB1 SED				FB2 SED				FB3 SED			
	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbon, total organic	59600		1x	1950	61500		1x	2080	58800		1x	2250
Cyanide, total	ND		1x	0.9	ND		1x	1	ND		1x	0.81
Nitrogen, ammonia	272		1x	57.9	360		1x	62.4	127		1x	19
Nitrogen, nitrate and nitrite	ND		1x	4.5	ND		1x	4.5	ND		1x	3.9
Nitrogen, total Kjeldahl	2480		1x	132	2110		1x	110	1540		1x	98.4
Oxygen demand, biochemical	7640		1x	1390	7700		1x	1480	7120		1x	1160
Oxygen demand, chemical	90200		1x	2720	91900		1x	2750	77900		1x	2460
Phosphorus, total	1410		1x	72.3	2680		1x	154	1340		1x	123
Sulfide, total	1580		1x	109	6060		1x	112	3130		1x	71.2

ND=Not detected

Table 4-10. Continued.

NORTHWEST BRANCH EAST

Analyte	NBE1 SED				NBE2 SED			
mg/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbon, total organic	60100		1x	1940	77500		1x	2330
Cyanide, total	ND		1x	0.88	ND		1x	1.1
Nitrogen, ammonia	155		1x	23.2	85.4		1x	13
Nitrogen, nitrate and nitrite	ND		1x	4.4	9.2		1x	5.1
Nitrogen, total Kjeldahl	2110		1x	106	1040		1x	149
Oxygen demand, biochemical	8550		1x	1380	9900		1x	1570
Oxygen demand, chemical	75900		1x	1770	93300		1x	2090
Phosphorus, total	1570		1x	144	1090		1x	72.7
Sulfide, total	5220		1x	82.1	4190		1x	108

ND=Not detected

(a)=MS recovery low-cloudiness in sample may have compromised result

Table 4-10. Continued.

NORTHWEST BRANCH WEST

Analyte	NBW1 SED				NBW2 SED				NBW3 SED			
mg/kg	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbon, total organic	44400		1x	1480	47700		1x	1400	154000		1x	3470
Cyanide, total	ND		1x	0.61	ND		1x	0.43	ND		1x	0.91
Nitrogen, ammonia	28.3		1x	7.2	20		1x	5.8	201		1x	55.6
Nitrogen, nitrate and nitrite	2.8		1x	2.7	ND		1x	2.3	ND		1x	4.1
Nitrogen, total Kjeldahl	2000		1x	331	1330		1x	52.7	2170		1x	123
Oxygen demand, biochemical	1090		1x	356	2300		1x	683	7390		1x	1300
Oxygen demand, chemical	43000		1x	1190	73000		1x	2530	151000		1x	4340
Phosphorus, total	493		1x	46.4	448		1x	35.6	1270		1x	67.8
Sulfide, total	ND		1x	62.8	737		1x	48.2	437		1x	86.7

ND=Not detected

Table 4-11. Grain size, Atterberg Limits, and percent moisture for Chesapeake Bay and Baltimore Harbor sediments.

	POPLAR ISLAND				
Physical Analyses	PI1SED	PI2SED	PI3SED	PI4SED	PI5SED
Grain Size					
% gravel	0	0	0	0	0.1
% sand	95.7	97.8	96.3	95.9	60.8
% silt/clay	4.3	2.2	3.7	4.1	39.1
Atterberg Limits					
Liquid Limit (LL)	NP	NP	NP	NP	NP
Plasticity Index (PI)	NP	NP	NP	NP	NP
Percent Moisture (%)	22.6	22.6	21.6	21.2	33.9

NP=Non-plastic

Table 4-11. Continued.

Physical Analyses	DEEP TROUGH DT1SED	DT2SED	DT3SED	KENT ISLAND DEEP KI1SED	KI2SED	KI3SED	POOLES ISLAND POL1SED
Grain Size							
% gravel	0	0	0	1.4	0	0.4	0
% sand	0.9	22.4	0.6	93.1	7.9	90.8	5.1
% silt	14.9	53.9	19.1	3.5	17.9	0.7	23.8
% clay	84.2	23.7	80.3	2	74.2	8.1	71.1
Atterberg Limits							
Liquid Limit (LL)	148	88	112	NP	102	NP	128
Plasticity Index (PI)	94	53	53	NP	57	NP	82
Percent Moisture (%)	78.9	58.1	81.8	24.7	67.8	25.9	61.0

NP=Non-plastic

Table 4-11. Continued.

	SWAN POINT			CRAIGHILL ENTRANCE		
Physical Analyses	SWP1SED	SWP2SED	SWP3SED	CRE1SED	CRE2SED	CRE3SED
Grain Size						
% gravel	0	0	0	9.5	0	0
% sand	0	0.7	0.7	69.4	0.9	2.8
% silt	22.2	21.1	23.2	13	39.7	34.3
% clay	77.8	78.2	76.1	8.1	59.4	62.9
Atterberg Limits						
Liquid Limit (LL)	188	149	151	31	144	115
Plasticity Index (PI)	143	9	98	12	96	76
Percent Moisture (%)	75.8	76.9	72.5	43.2	59.4	59.8

Table 4-11. Continued.

	CRAIGHILL				CRAIGHILL ANGLE	
Physical Analyses	CR1SED	CR2SED	CR2SEDFD	CR3SED	CRA1SED	CRA2SED
Grain Size						
% gravel	0.6	0.1	0	1.6	0	0
% sand	68.4	83.6	5.8	5.8	4.8	1.2
% silt	17.2	9.3	22.5	20.4	17.7	18.9
% clay	13.8	7	71.7	72.2	77.5	79.9
Atterberg Limits						
Liquid Limit (LL)	31	28	150	96	97	102
Plasticity Index (PI)	8	6	106	53	50	67
Percent Moisture (%)	38.1	37.3	72.3	59.9	69.2	75.1

Table 4-11. Continued.

	CRAIGHILL UPPER RANGE			CUTOFF ANGLE		
Physical Analyses	CRU1SED	CRU2SED	CRU3SED	CUT1SED	CUT2SED	CUT3SED
Grain Size						
% gravel	0	0	0.4	0	0	0
% sand	6.1	25.6	21.5	1.9	10.2	1
% silt	44.6	37.8	37.4	18.5	19.8	24.4
% clay	49.3	36.6	40.7	79.6	70	74.6
Atterberg Limits						
Liquid Limit (LL)	96	58	64	155	100	93
Plasticity Index (PI)	58	31	37	106	56	50
Percent Moisture (%)	71.6	55.8	52.5	74.1	77.5	68.0

Table 4-11. Continued.

Physical Analyses	TOLCHESTER (VAN VEEN) TLC1SED	TLC2SED	TLC2SEDFD	TLC3SED	TOLCHESTER (GRAVITY CORE) TLV1SED	TLV2SED	TLV3SED	TLV4SED	TLV5SED
Grain Size									
% gravel	0	0	0	0	0	0	0	0	0
% sand	2.1	0.7	2.2	0.7	1.2	1.3	1.2	1.1	10.5
% silt	60.1	58.3	52.2	21.2	45.8	43.4	39.6	40.5	40.1
% clay	37.8	41	45.6	78.1	53	55.3	59.2	58.4	49.4
Atterberg Limits									
Liquid Limit (LL)	101	98	98	141	81	74	76	94	100
Plasticity Index (PI)	66	59	59	97	42	35	37	48	60
Percent Moisture (%)	53.7	56.0	63.3	68.9	55.3	52.7	53.3	55.8	56.2

Table 4-11. Continued.

Physical Analyses	BREWERTON EASTERN EXTENSION (VAN VEEN) BE1SED	BE2SED	BE3SED	BE4SED	BREWERTON EASTERN EXTENSION (GRAVITY CORE) BEV1SED	BEV2SED	BEV3SED	BEV4SED	BEV5SED	BEV6SED
Grain Size										
% gravel	0	0.5	0	0	0.3	0.2	0	0.5	0.2	0
% sand	0.6	2.6	1.4	0.6	0.5	3.4	11.5	8.1	2.2	1.2
% silt	31.6	23.2	27.9	27.8	30.4	35.3	33.6	49.4	38.1	65.6
% clay	67.8	73.7	70.7	71.6	68.8	61.1	54.9	42	59.5	33.2
Atterberg Limits										
Liquid Limit (LL)	114	104	111	133	100	88	81	74	108	115
Plasticity Index (PI)	73	63	70	89	59	53	46	43	72	80
Percent Moisture (%)	71.0	69.8	72.8	57.6	63.1	56.6	54.6	54.4	61.1	60.8

Table 4-11. Continued.

	BREWERTON						BREWERTON ANGLE	
Physical Analyses	BR1SED	BR2SED	BR3SED	BR4SED	BSPLIT1A	BSPLIT2A	BRA1SED	BRA2SED
Grain Size								
% gravel	0	0	0.2	0	0	0	0	0
% sand	0.9	3.3	1	1.2	1.2	0.9	0.5	0.3
% silt	28.3	27.3	26.6	17.3	23.6	27.6	17	29.3
% clay	70.8	69.4	72.2	81.5	75.2	71.5	82.5	70.4
Atterberg Limits								
Liquid Limit (LL)	128	115	102	128	104	109	126	119
Plasticity Index (PI)	86	76	62	84	60	72	77	73
Percent Moisture (%)	69.3	71.6	65.9	73.5	66.7	64.4	76.7	72.8

4.2 REFERENCE WATER/ELUTRIATE WATER

TABLE 4-12 REFERENCE WATER AND ELUTRIATE WATER SAMPLE IDS, COLLECTION DATES, LABOARTORY ACCESSION NUMBERS, AND LABORATORY REPORT NUMBERS

REACH	STATION/ SAMPLE TYPE	SAMPLE ID	COLLECTION DATE	LABORATORY ACCESSION NUMBER	LABORATORY REPORT NUMBER
Poplar Island	PI1	PI1WAT	10-26-95	9515618	951702
	PI1 Field Duplicate	PI1WATFD	10-26-95	9515617	951702
	PI5	PI5WAT	10-27-95	9515669	951702
Deep Trough	DT1	DT1WAT	10-30-95	9515774	951722
Kent Island Deep	KI3	KI3WAT	10-30-95	951777	951722
	KI3 Field Duplicate	KI3WATFD	10-30-95	9515775	951722
Pooles Island	POL1	POL1WAT	11-13-95	9516357	951790
Swan Point	Elutriate	SWPEL		9516028	951754
Craighill Entrance / Craighill	Elutriate	CRE/C[illegible]EL		9516710	951821
Craighill Angle	Elutriate	CRAEL		9516714	951823
Craighill Upper Range/ Cutoff Angle	Elutriate	CRU/CUTEL		9516740	951828
Tolchester (Van Veen)	Elutriate	TLCEL		9516354	951788
Tolchester (Gravity Core)	Elutriate	TLVEL		9516217	951784
Brewerton, Eastern Ext. (Van Veen)	Elutriate	BEEL		9517154	951887
Brewerton Eastern Ext. (Gravity Core)	Elutriate	BEVEL		9517141	951884
Brewerton / Brewerton Angle	Elutriate	BR/BRAEL		9517155	951888
Ft. McHenry	Elutriate	FMHEL		9517174	951892
Curtis Bay	Elutriate	CBEL		9517186	951895
Ferry Bar	Elutriate	FBEL		9517191	951897
Northwest Branch East / Northwest Branch West	Elutriate	NBE/NBWEL		9517198	951899

Table 4-11. Continued.

	FT. McHENRY				CURTIS BAY			
Physical Analyses	FMH1SED	FMH2SED	FMH3SED	FMH4SED	CB1SED	CB2SED	CB3SED	CB4SED
Grain Size								
% gravel	0	0	0.5	0.6	0	0	0	0
% sand	0.7	1.1	3.2	25.6	0.8	17.9	5.8	8.5
% silt	19.9	25.3	30.6	23.5	16.4	45.5	17.1	23.4
% clay	79.4	73.6	65.7	50.3	82.8	36.6	77.1	68.1
Atterberg Limits								
Liquid Limit (LL)	138	103	97	100	110	48	101	103
Plasticity Index (PI)	94	56	49	67	61	22	48	55
Percent Moisture (%)	71.0	76.2	66.4	62.2	75.4	52.1	78.9	71.5

Table 4-11. Continued.

	FERRY BAR			NORTHWEST BRANCH EAST/WEST				
Physical Analyses	FB1SED	FB2SED	FB3SED	NBE1SED	NBE2SED	NBW1SED	NBW2SED	NBW3SED
Grain Size								
% gravel	0	0	0	0	0	0	0	0
% sand	1.8	1.8	1.6	2.5	1.4	2.1	17.8	3.1
% silt	26.5	20.6	20.9	17.2	16.8	22	10.7	11.6
% clay	71.7	77.6	77.5	80.3	81.8	75.9	71.5	85.3
Atterberg Limits								
Liquid Limit (LL)	110	106	142	97	128	110	79	87
Plasticity Index (PI)	60	51	80	47	80	65	39	34
Percent Moisture (%)	81.4	81.4	71.9	76.8	79.8	66.4	64.1	80.6

Table 4-13. Volatiles results for reference water and Chesapeake Bay and Baltimore Harbor elutriates.

POPLAR ISLAND

Analyte ug/L	PI1 WAT Result	Qual.	Dil.	Limit	PI1 WATFD Result	Qual.	Dil.	Limit	PI5WAT Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	1	ND		1x	1	ND		1x	1
1,1-Dichloroethene	ND		1x	1	ND		1x	1	ND		1x	1
1,1,1-Trichloroethane	ND		1x	1	ND		1x	1	ND		1x	1
1,1,2-Trichloroethane	ND		1x	1	ND		1x	1	ND		1x	1
1,1,2,2-Tetrachloroethane	ND		1x	1	ND		1x	1	ND		1x	1
1,2-Dichloroethane	ND		1x	1	ND		1x	1	ND		1x	1
1,2-Dichloropropane	ND		1x	1	ND		1x	1	ND		1x	1
2-Butanone	ND		1x	1	ND		1x	1	ND		1x	1
2-Chloroethyl vinyl ether	ND	(a)	1x	1	ND	(a)	1x	1	ND	(a)	1x	1
Acrolein	ND		1x	8	ND		1x	8	ND		1x	8
Acrylonitrile	ND		1x	5	ND		1x	5	ND		1x	5
Benzene	ND		1x	1	ND		1x	1	ND		1x	1
Bromodichloromethane	ND		1x	1	ND		1x	1	ND		1x	1
Bromoform	ND		1x	1	ND		1x	1	ND		1x	1
Bromomethane	ND		1x	1	ND		1x	1	ND		1x	1
Carbon tetrachloride	ND		1x	1	ND		1x	1	ND		1x	1
Chlorobenzene	ND		1x	1	ND		1x	1	ND		1x	1
Chloroethane	ND		1x	1	ND		1x	1	ND		1x	1
Chlororform	ND		1x	1	ND		1x	1	ND		1x	1
Chloromethane	ND		1x	2	ND		1x	2	ND		1x	2
cis-1,3-Dichloropropene	ND		1x	1	ND		1x	1	ND		1x	1
Dibromochloromethane	ND		1x	1	ND		1x	1	ND		1x	1
Dichlorodifluoromethane	ND		1x	1	ND		1x	1	ND		1x	1
Ethylbenzene	ND		1x	1	ND		1x	1	ND		1x	1
Methylene chloride	ND		1x	1	ND		1x	1	ND		1x	1
Tetrachlorethene	ND		1x	1	ND		1x	1	ND		1x	1
Toluene	ND		1x	1	ND		1x	1	ND		1x	1
trans-1,2-Dichloroethene	ND		1x	1	ND		1x	1	ND		1x	1
trans-1,3-Dichloropropene	ND		1x	1	ND		1x	1	ND		1x	1
Trichloroethene	ND		1x	1	ND		1x	1	ND		1x	1
Trichlorofluoromethane	ND		1x	1	ND		1x	1	ND		1x	1
Vinyl chloride	ND		1x	1	ND		1x	1	ND		1x	1

ND=Not detected
(a)=Not recovered in MS/MSD

Table 4-13. Continued.

	DEEP TROUGH				KENT ISLAND DEEP								POOLES ISLAND			
Analyte	DT1WAT				KI3WAT				KI3WATFD				POL1WAT			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1-Dichloroethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1,1-Trichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1,2-Trichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1,2,2-Tetrachloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,2-Dichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,2-Dichloropropane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
2-Butanone	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
2-Chloroethyl vinyl ether	ND	(a)	1x	1	ND	(a)	1x	1	ND	(a)	1x	1	ND		1x	1
Acrolein	ND		1x	8	ND		1x	8	ND		1x	8	ND		1x	8
Acrylonitrile	ND		1x	5	ND		1x	5	ND		1x	5	ND		1x	5
Benzene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Bromodichloromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Bromoform	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Bromomethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Carbon tetrachloride	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Chlorobenzene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Chloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Chlororform	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Chloromethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
cis-1,3-Dichloropropene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Dibromochloromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Dichlorodifluoromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Ethylbenzene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Methylene chloride	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Tetrachlorethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Toluene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
trans-1,2-Dichloroethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
trans-1,3-Dichloropropene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Trichloroethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Trichlorofluoromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Vinyl chloride	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1

ND=Not detected
(a)=Not recovered in MS/MSD

Table 4-13. Continued.

Analyte ug/L	SWAN POINT CHANNEL SWPEL Result	Qual.	Dil.	Limit	CRAIGHILL ENTRANCE/CRAIGHILL CRE/CREL Result	Qual.	Dil.	Limit	CRAIGHILL ANGLE CRAEL Result	Qual.	Dil.	Limit	CRAIGHILL UPPER RANGE/CUTOFF ANGLE CRU/CUTEL Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1-Dichloroethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1,1-Trichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1,2-Trichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1,2,2-Tetrachloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,2-Dichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,2-Dichloropropane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
2-Butanone	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
2-Chloroethyl vinyl ether	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Acrolein	ND		1x	8	ND		1x	8	ND		1x	8	ND		1x	8
Acrylonitrile	ND		1x	5	ND		1x	5	ND		1x	5	ND		1x	5
Benzene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Bromodichloromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Bromoform	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Bromomethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Carbon tetrachloride	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Chlorobenzene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Chloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Chlororform	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Chloromethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
cis-1,3-Dichloropropene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Dibromochloromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Dichlorodifluoromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Ethylbenzene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Methylene chloride	120	(b)	1x	1	21	(b)	1x	1	22	(b)	1x	1	15	(b)	1x	1
Tetrachlorethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Toluene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
trans-1,2-Dichloroethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
trans-1,3-Dichloropropene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Trichloroethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Trichlorofluoromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Vinyl chloride	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1

ND=Not detected
(b)=Attributable to laboratory contamination.

Table 4-13. Continued.

	TOLCHESTER								BREWERTON EASTERN EXTENSION							
	Van-Veen				Gravity Core				Van-Veen				Gravity Core			
Analyte	TLCEL				TLVEL				BEEL				BEVEL			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1-Dichloroethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1,1-Trichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1,2-Trichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1,2,2-Tetrachloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,2-Dichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,2-Dichloropropane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
2-Butanone	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
2-Chloroethyl vinyl ether	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Acrolein	ND		1x	8	ND		1x	8	ND		1x	8	ND		1x	8
Acrylonitrile	ND		1x	5	ND		1x	5	ND		1x	5	ND		1x	5
Benzene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Bromodichloromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Bromoform	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Bromomethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Carbon tetrachloride	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Chlorobenzene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Chloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Chlororform	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Chloromethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
cis-1,3-Dichloropropene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Dibromochloromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Dichlorodifluoromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Ethylbenzene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Methylene chloride	2		1x	1	3		1x	1	73	(b)	1x	1	13	(b)	1x	1
Tetrachlorethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Toluene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
trans-1,2-Dichloroethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
trans-1,3-Dichloropropene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Trichloroethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Trichlorofluoromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Vinyl chloride	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1

ND=Not detected
(b)=Attributable to laboratory contamination.

Table 4-13. Continued.

	BREWERTON/BREWERTON ANGLE				CURTIS BAY				FT McHENRY				FERRY BAR			
Analyte	BR/BRAEL				CBEL				FMHEL				FBEL			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,1-Dichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1-Dichloroethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1,1-Trichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1,2-Trichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,1,2,2-Tetrachloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,2-Dichloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
1,2-Dichloropropane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
2-Butanone	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
2-Chloroethyl vinyl ether	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Acrolein	ND		1x	8	ND		1x	8	ND		1x	8	ND		1x	8
Acrylonitrile	ND		1x	5	ND		1x	5	ND		1x	5	ND		1x	5
Benzene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Bromodichloromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Bromoform	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Bromomethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Carbon tetrachloride	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Chlorobenzene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Chloroethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Chlororform	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Chloromethane	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
cis-1,3-Dichloropropene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Dibromochloromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Dichlorodifluoromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Ethylbenzene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Methylene chloride	24	(h)	1x	1	190	(b)	1x	1	7	(h)	1x	1	260	E(b)	1x	1
Tetrachlorethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Toluene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
trans-1,2-Dichloroethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
trans-1,3-Dichloropropene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Trichloroethene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Trichlorofluoromethane	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Vinyl chloride	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1

ND=Not detected E=Estimated
(b)=Attributable to laboratory contamination.

Table 4-13. Continued.

NORTHWEST BRANCH
EAST/WEST

Analyte	NBE/NBWEL			
ug/L	Result	Qual	Dil.	Limit
1,1-Dichloroethane	ND		1x	1
1,1-Dichloroethene	ND		1x	1
1,1,1-Trichloroethane	ND		1x	1
1,1,2-Trichloroethane	ND		1x	1
1,1,2,2-Tetrachloroethane	ND		1x	1
1,2-Dichloroethane	ND		1x	1
1,2-Dichloropropane	ND		1x	1
2-Butanone	ND		1x	1
2-Chloroethyl vinyl ether	ND		1x	1
Acrolein	ND		1x	8
Acrylonitrile	ND		1x	5
Benzene	ND		1x	1
Bromodichloromethane	ND		1x	1
Bromoform	ND		1x	1
Bromomethane	ND		1x	1
Carbon tetrachloride	ND		1x	1
Chlorobenzene	ND		1x	1
Chloroethane	ND		1x	1
Chlororform	ND		1x	1
Chloromethane	ND		1x	2
cis-1,3-Dichloropropene	ND		1x	1
Dibromochloromethane	ND		1x	1
Dichlorodifluoromethane	ND		1x	1
Ethylbenzene	ND		1x	1
Methylene chloride	13	(b)	1x	1
Tetrachlorethene	ND		1x	1
Toluene	ND		1x	1
trans-1,2-Dichloroethene	ND		1x	1
trans-1,3-Dichloropropene	ND		1x	1
Trichloroethene	ND		1x	1
Trichlorofluoromethane	ND		1x	1
Vinyl chloride	ND		1x	1

ND=Not detected
(b)=Attributable to laboratory contamination.

Table 4-14. Semivolatiles results for reference water and Chesapeake Bay and Baltimore Harbor elutriates.

POPLAR ISLAND

Analyte	PI1 WAT				PI1WATFD				PI5WAT			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	4	ND		1x	4	ND		1x	4
1,2-Diphenylhydrazine	ND		1x	2	ND		1x	2	ND		1x	2
1,2,4-Trichlorobenzene	ND		1x	5	ND		1x	5	ND		1x	5
1,3-Dichlorobenzene	ND		1x	4	ND		1x	4	ND		1x	4
1,4-Dichlorobenzene	ND		1x	4	ND		1x	4	ND		1x	4
2-Chloronaphthalene	ND		1x	3	ND		1x	3	ND		1x	3
2-Chlorophenol	ND		1x	4	ND		1x	4	ND		1x	4
2-Methyl-4,6-dinitrophenol	ND		1x	2	ND		1x	2	ND		1x	2
2-Methylphenol	ND		1x	3	ND		1x	3	ND		1x	3
2-Nitroaniline	ND		1x	1	ND		1x	1	ND		1x	1
2-Nitrophenol	ND		1x	4	ND		1x	4	ND		1x	4
2,2'-oxybis(1-Chloropropane)	ND		1x	4	ND		1x	4	ND		1x	4
2,4-Dichlorophenol	ND		1x	3	ND		1x	3	ND		1x	3
2,4-Dimethylphenol	ND		1x	4	ND		1x	4	ND		1x	4
2,4-Dinitrophenol	ND		1x	2	ND		1x	2	ND		1x	2
2,4-Dinitrotoluene	ND		1x	1	ND		1x	1	ND		1x	1
2,4,5-Trichlorophenol	ND		1x	2	ND		1x	2	ND		1x	2
2,4,6-Trichlorophenol	ND		1x	2	ND		1x	2	ND		1x	2
2,6-Dinitrotoluene	ND		1x	1	ND		1x	1	ND		1x	1
3-Nitroaniline	ND		1x	4	ND		1x	4	ND		1x	4
3+4-Methylphenol	ND		1x	3	ND		1x	3	ND		1x	3
3,3'-Dichlorobenzidine	ND		1x	10	ND		1x	10	ND		1x	10
4-Bromophenyl phenyl ether	ND		1x	3	ND		1x	3	ND		1x	3
4-Chloro-3-methylphenol	ND		1x	1	ND		1x	1	ND		1x	1
4-Chloroaniline	ND		1x	6	ND		1x	6	ND		1x	6
4-Chlorophenyl phenyl ether	ND		1x	3	ND		1x	3	ND		1x	3
4-Nitroaniline	ND		1x	3	ND		1x	3	ND		1x	3
4-Nitrophenol	ND		1x	1	ND		1x	1	ND		1x	1
Benzidine	ND		1x	2	ND		1x	2	ND		1x	2
Benzoic acid	ND		1x	2	ND		1x	2	ND		1x	2
Benzyl alcohol	ND		1x	2	ND		1x	2	ND		1x	2
Benzyl butyl phthalate	ND		1x	2	ND		1x	2	ND		1x	2
bis(2-Chloroethoxy)methane	ND		1x	4	ND		1x	4	ND		1x	4
bis(2-Chloroethyl) ether	ND		1x	4	ND		1x	4	ND		1x	4
bis(2-Ethylhexyl) phthalate	ND		1x	7	ND		1x	7	ND		1x	7

analyte list continued on following page

ND=Not detected

Table 4-14. Semivolatiles results for reference water and Chesapeake Bay and Baltimore Harbor elutriates.

POPLAR ISLAND

Analyte	PI1 WAT				PI1 WATED				PI5WAT			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	2	ND		1x	2	ND		1x	2
Cyclohexanone	ND		1x	4	ND		1x	4	ND		1x	4
Dibenzofuran	ND		1x	3	ND		1x	3	ND		1x	3
Diethyl phthalate	ND		1x	3	ND		1x	3	ND		1x	3
Dimethyl phthalate	ND		1x	4	ND		1x	4	ND		1x	4
Di-n-butyl phthalate	ND		1x	2	ND		1x	2	ND		1x	2
Di-n-octyl phthalate	ND		1x	2	ND		1x	2	ND		1x	2
Hexachlorobenzene	ND		1x	3	ND		1x	3	ND		1x	3
Hexachlorobutadiene	ND		1x	5	ND		1x	5	ND		1x	5
Hexachlorocyclopentadiene	ND		1x	3	ND		1x	3	ND		1x	3
Hexachloroethane	ND		1x	4	ND		1x	4	ND		1x	4
Isophorone	ND		1x	2	ND		1x	2	ND		1x	2
Nitrobenzene	ND		1x	4	ND		1x	4	ND		1x	4
N-Nitrosodimethylamine	ND		1x	4	ND		1x	4	ND		1x	4
N-Nitrosodi-n-propylamine	ND		1x	3	ND		1x	3	ND		1x	3
N-Nitrosodiphenylamine	ND		1x	2	ND		1x	2	ND		1x	2
Pentachlorophenol	ND		1x	2	ND		1x	2	ND		1x	2
Phenol	ND		1x	4	ND		1x	4	ND		1x	4
Pyridine	ND		1x	6	ND		1x	6	ND		1x	6

ND=Not detected

Table 4-14. Continued.

Analyte ug/L	DEEP TROUGH DT1WAT Result	Qual.	Dil.	Limit	KENT ISLAND DEEP KI3WAT Result	Qual.	Dil.	Limit	KI3WATFD Result	Qual.	Dil.	Limit	POOLES ISLAND POL1WAT Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
1,2-Diphenylhydrazine	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
1,2,4-Trichlorobenzene	ND		1x	5	ND		1x	5	ND		1x	5	ND		1x	5
1,3-Dichlorobenzene	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
1,4-Dichlorobenzene	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
2-Chloronaphthalene	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
2-Chlorophenol	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
2-Methyl-4,6-dinitrophenol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2-Methylphenol	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
2-Nitroaniline	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
2-Nitrophenol	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
2,2'-oxybis(1-Chloropropane)	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
2,4-Dichlorophenol	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
2,4-Dimethylphenol	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
2,4-Dinitrophenol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2,4-Dinitrotoluene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
2,4,5-Trichlorophenol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2,4,6-Trichlorophenol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2,6-Dinitrotoluene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
3-Nitroaniline	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
3+4-Methylphenol	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
3,3'-Dichlorobenzidine	ND		1x	10	ND		1x	10	ND		1x	10	ND		1x	10
4-Bromophenyl phenyl ether	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
4-Chloro-3-methylphenol	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
4-Chloroaniline	ND		1x	6	ND		1x	6	ND		1x	6	ND		1x	6
4-Chlorophenyl phenyl ether	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
4-Nitroaniline	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
4-Nitrophenol	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Benzidine	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Benzoic acid	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Benzyl alcohol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Benzyl butyl phthalate	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
bis(2-Chloroethoxy)methane	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
bis(2-Chloroethyl) ether	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
bis(2-Ethylhexyl) phthalate	ND		1x	7	ND		1x	7	ND		1x	7	ND		1x	7

analyte list continued on following page

ND=Not detected

Table 4-14. Continued.

Analyte ug/L	DEEP TROUGH DT1WAT Result	Qual.	Dil.	Limit	KENT ISLAND DEEP KI3WAT Result	Qual.	Dil.	Limit	KI3WATFD Result	Qual.	Dil.	Limit	POOLES ISLAND POL1WAT Result	Qual.	Dil.	Limit
Carbazole	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Cyclohexanone	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
Dibenzofuran	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
Diethyl phthalate	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
Dimethyl phthalate	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
Di-n-butyl phthalate	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Di-n-octyl phthalate	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Hexachlorobenzene	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
Hexachlorobutadiene	ND		1x	5	ND		1x	5	ND		1x	5	ND		1x	5
Hexachlorocyclopentadiene	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
Hexachloroethane	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
Isophorone	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Nitrobenzene	ND		1x	5	ND		1x	5	ND		1x	5	ND		1x	5
N-Nitrosodimethylamine	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
N-Nitrosodi-n-propylamine	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
N-Nitrosodiphenylamine	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Pentachlorophenol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Phenol	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
Pyridine	ND		1x	6	ND		1x	6	ND		1x	6	ND		1x	6

ND=Not detected

Table 4-14. Continued.

Analyte	SWAN POINT				CRAIGHILL ENTRANCE/CRAIGHILL				CRAIGHILL ANGLE				CRAIGHILL UPPER RANGE/CUTOFF ANGLE			
	SWPEL				CRE/CREL				CRAEL				CRU/CUTEL			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
1,2-Diphenylhydrazine	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
1,2,4-Trichlorobenzene	ND		1x	5	ND		1x	5	ND		1x	5	ND		1x	5
1,3-Dichlorobenzene	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
1,4-Dichlorobenzene	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
2-Chloronaphthalene	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
2-Chlorophenol	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
2-Methyl-4,6-dinitrophenol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2-Methylphenol	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
2-Nitroaniline	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
2-Nitrophenol	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
2,2'-oxybis(1-Chloropropane)	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
2,4-Dichlorophenol	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
2,4-Dimethylphenol	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
2,4-Dinitrophenol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2,4-Dinitrotoluene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
2,4,5-Trichlorophenol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2,4,6-Trichlorophenol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2,6-Dinitrotoluene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
3-Nitroaniline	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
3+4-Methylphenol	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
3,3'-Dichlorobenzidine	ND		1x	10	ND		1x	10	ND		1x	10	ND		1x	10
4-Bromophenyl phenyl ether	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
4-Chloro-3-methylphenol	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
4-Chloroaniline	ND		1x	6	ND		1x	6	ND		1x	6	ND		1x	6
4-Chlorophenyl phenyl ether	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
4-Nitroaniline	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
4-Nitrophenol	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Benzidine	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Benzoic acid	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Benzyl alcohol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Benzyl butyl phthalate	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
bis(2-Chloroethoxy)methane	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
bis(2-Chloroethyl) ether	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
bis(2-Ethylhexyl) phthalate	3	J	1x	7	4	J	1x	7	4	J	1x	7	ND		1x	7

analyte list continued on following page

ND=Not detected J=Estimated

Table 4-14. Continued.

	SWAN POINT				CRAIGHILL ENTRANCE/CRAIGHILL				CRAIGHILL ANGLE				CRAIGHILL UPPER RANGE/CUTOFF ANGLE			
Analyte	SWPEL				CRE/CREL				CRAEL				CRU/CUTEL			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Cyclohexanone	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
Dibenzofuran	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
Diethyl phthalate	11		1x	3	4		1x	3	15		1x	3	6		1x	3
Dimethyl phthalate	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
Di-n-butyl phthalate	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Di-n-octyl phthalate	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Hexachlorobenzene	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
Hexachlorobutadiene	ND		1x	5	ND		1x	5	ND		1x	5	ND		1x	5
Hexachlorocyclopentadiene	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
Hexachloroethane	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
Isophorone	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Nitrobenzene	ND		1x	5	ND		1x	5	ND		1x	5	ND		1x	5
N-Nitrosodimethylamine	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
N-Nitrosodi-n-propylamine	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
N-Nitrosodiphenylamine	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Pentachlorophenol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Phenol	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
Pyridine	ND		1x	6	ND		1x	6	ND		1x	6	ND		1x	6

ND=Not detected

Table 4-14. Continued.

	TOLCHESTER								BREWERTON EASTERN EXTENSION							
	Van-Veen				Gravity Core				Van-Veen				Gravity Core			
Analyte	TLCEL				TLVEL				BEEL				BEVEL			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
1,2-Diphenylhydrazine	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
1,2,4-Trichlorobenzene	ND		1x	5	ND		1x	5	ND		1x	5	ND		1x	5
1,3-Dichlorobenzene	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
1,4-Dichlorobenzene	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
2-Chloronaphthalene	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
2-Chlorophenol	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
2-Methyl-4,6-dinitrophenol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2-Methylphenol	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
2-Nitroaniline	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
2-Nitrophenol	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
2,2'-oxybis(1-Chloropropane)	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
2,4-Dichlorophenol	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
2,4-Dimethylphenol	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
2,4-Dinitrophenol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2,4-Dinitrotoluene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
2,4,5-Trichlorophenol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2,4,6-Trichlorophenol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2,6-Dinitrotoluene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
3-Nitroaniline	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
3+4-Methylphenol	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
3,3'-Dichlorobenzidine	ND		1x	10	ND		1x	10	ND		1x	10	ND		1x	10
4-Bromophenyl phenyl ether	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
4-Chloro-3-methylphenol	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
4-Chloroaniline	ND		1x	6	ND		1x	6	ND		1x	6	ND		1x	6
4-Chlorophenyl phenyl ether	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
4-Nitroaniline	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
4-Nitrophenol	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Benzidine	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Benzoic acid	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Benzyl alcohol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Benzyl butyl phthalate	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
bis(2-Chloroethoxy)methane	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
bis(2-Chloroethyl) ether	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
bis(2-Ethylhexyl) phthalate	ND		1x	7	ND		1x	7	ND		1x	7	ND		1x	7

analyte list continued on following page

ND-Not detected

Table 4-14. Continued.

Analyte	TOLCHESTER								BREWERTON EASTERN EXTENSION							
	Van-Veen				Gravity Core				Van-Veen				Gravity Core			
	TLCEL				TLVEL				BEEL				BEVEL			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Cyclohexanone	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
Dibenzofuran	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
Diethyl phthalate	ND		1x	3	ND		1x	3	ND		1x	3	4		1x	3
Dimethyl phthalate	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
Di-n-butyl phthalate	6		1x	2	9		1x	2	ND		1x	2	ND		1x	2
Di-n-octyl phthalate	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Hexachlorobenzene	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
Hexachlorobutadiene	ND		1x	5	ND		1x	5	ND		1x	5	ND		1x	5
Hexachlorocyclopentadiene	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
Hexachloroethane	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
Isophorone	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Nitrobenzene	ND		1x	5	ND		1x	5	ND		1x	5	ND		1x	5
N-Nitrosodimethylamine	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
N-Nitrosodi-n-propylamine	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
N-Nitrosodiphenylamine	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Pentachlorophenol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Phenol	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
Pyridine	ND		1x	6	ND		1x	6	ND		1x	6	ND		1x	6

ND=Not detected

Table 4-14. Continued.

Analyte	BREWERTON/BREWERTON ANGLE				CURTIS BAY				FT McHENRY				FERRY BAR			
	BR/BRAEL				CBEL				FMHEL				FBEL			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
1,2-Diphenylhydrazine	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
1,2,4-Trichlorobenzene	ND		1x	5	ND		1x	5	ND		1x	5	ND		1x	5
1,3-Dichlorobenzene	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
1,4-Dichlorobenzene	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
2-Chloronaphthalene	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
2-Chlorophenol	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
2-Methyl-4,6-dinitrophenol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2-Methylphenol	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
2-Nitroaniline	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
2-Nitrophenol	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
2,2'-oxybis(1-Chloropropane)	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
2,4-Dichlorophenol	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
2,4-Dimethylphenol	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
2,4-Dinitrophenol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2,4-Dinitrotoluene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
2,4,5-Trichlorophenol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2,4,6-Trichlorophenol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
2,6-Dinitrotoluene	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
3-Nitroaniline	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
3+4-Methylphenol	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
3,3'-Dichlorobenzidine	ND		1x	10	ND		1x	10	ND		1x	10	ND		1x	10
4-Bromophenyl phenyl ether	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
4-Chloro-3-methylphenol	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
4-Chloroaniline	ND		1x	6	ND		1x	6	ND		1x	6	ND		1x	6
4-Chlorophenyl phenyl ether	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
4-Nitroaniline	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
4-Nitrophenol	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Benzidine	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Benzoic acid	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Benzyl alcohol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Benzyl butyl phthalate	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
bis(2-Chloroethoxy)methane	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
bis(2-Chloroethyl) ether	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
bis(2-Ethylhexyl) phthalate	ND		1x	7	ND		1x	7	ND		1x	7	ND		1x	7

analyte list continued on following page

ND=Not detected

Table 4-14. Continued.

Analyte	BREWERTON/BREWERTON ANGLE				CURTIS BAY				FT McHENRY				FERRY BAR			
	BR/BRAEL				CBEL				FMHEL				FBEL			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbazole	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Cyclohexanone	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
Dibenzofuran	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
Diethyl phthalate	ND		1x	3	6		1x	3	9		1x	3	6		1x	3
Dimethyl phthalate	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
Di-n-butyl phthalate	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Di-n-octyl phthalate	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Hexachlorobenzene	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
Hexachlorobutadiene	ND		1x	5	ND		1x	5	ND		1x	5	ND		1x	5
Hexachlorocyclopentadiene	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
Hexachloroethane	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
Isophorone	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Nitrobenzene	ND		1x	5	ND		1x	5	ND		1x	5	ND		1x	5
N-Nitrosodimethylamine	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
N-Nitrosodi-n-propylamine	ND		1x	3	ND		1x	3	ND		1x	3	ND		1x	3
N-Nitrosodiphenylamine	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Pentachlorophenol	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Phenol	ND		1x	4	ND		1x	4	ND		1x	4	ND		1x	4
Pyridine	ND		1x	6	ND		1x	6	ND		1x	6	ND		1x	6

ND=Not detected

Table 4-14. Continued.

NORTHWEST BRANCH
EAST/WEST

Analyte ug/L	NBE/NBWEL Result	Qual.	Dil.	Limit
1,2-Dichlorobenzene	ND		1x	4
1,2-Diphenylhydrazine	ND		1x	2
1,2,4-Trichlorobenzene	ND		1x	5
1,3-Dichlorobenzene	ND		1x	4
1,4-Dichlorobenzene	ND		1x	4
2-Chloronaphthalene	ND		1x	3
2-Chlorophenol	ND		1x	4
2-Methyl-4,6-dinitrophenol	ND		1x	2
2-Methylphenol	ND		1x	3
2-Nitroaniline	ND		1x	1
2-Nitrophenol	ND		1x	4
2,2'-oxybis(1-Chloropropane)	ND		1x	4
2,4-Dichlorophenol	ND		1x	3
2,4-Dimethylphenol	ND		1x	4
2,4-Dinitrophenol	ND		1x	2
2,4-Dinitrotoluene	ND		1x	1
2,4,5-Trichlorophenol	ND		1x	2
2,4,6-Trichlorophenol	ND		1x	2
2,6-Dinitrotoluene	ND		1x	1
3-Nitroaniline	ND		1x	4
3+4-Methylphenol	ND		1x	3
3,3'-Dichlorobenzidine	ND		1x	10
4-Bromophenyl phenyl ether	ND		1x	3
4-Chloro-3-methylphenol	ND		1x	1
4-Chloroaniline	ND		1x	6
4-Chlorophenyl phenyl ether	ND		1x	3
4-Nitroaniline	ND		1x	3
4-Nitrophenol	ND		1x	1
Benzidine	ND		1x	2
Benzoic acid	ND		1x	2
Benzyl alcohol	ND		1x	2
Benzyl butyl phthalate	ND		1x	2
bis(2-Chloroethoxy)methane	ND		1x	4
bis(2-Chloroethyl) ether	ND		1x	4
bis(2-Ethylhexyl) phthalate	ND		1x	7

analyte list continued on following

ND=Not detected

Table 4-14. Continued.

NORTHWEST BRANCH
EAST/WEST

Analyte ug/L	NBE/NBWEL Result	Qual.	Dil.	Limit
Carbazole	ND		1x	2
Cyclohexanone	ND		1x	4
Dibenzofuran	ND		1x	3
Diethyl phthalate	ND		1x	3
Dimethyl phthalate	ND		1x	4
Di-n-butyl phthalate	ND		1x	2
Di-n-octyl phthalate	ND		1x	2
Hexachlorobenzene	ND		1x	3
Hexachlorobutadiene	ND		1x	5
Hexachlorocyclopentadiene	ND		1x	3
Hexachloroethane	ND		1x	4
Isophorone	ND		1x	2
Nitrobenzene	ND		1x	5
N-Nitrosodimethylamine	ND		1x	4
N-Nitrosodi-n-propylamine	ND		1x	3
N-Nitrosodiphenylamine	ND		1x	2
Pentachlorophenol	ND		1x	2
Phenol	ND		1x	4
Pyridine	ND		1x	6

ND=Not detected

Table 4-15. Pesticide and PCB results for reference water and Chesapeake Bay and Baltimore Harbor elutriates.

POPLAR ISLAND

Analyte	PI1 WAT				PI1WATFD				PI5WAT			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	0.03	ND		1x	0.03	ND		1x	0.03
4,4'-DDE	ND		1x	0.014	ND		1x	0.014	ND		1x	0.014
4,4'-DDT	ND		1x	0.022	ND		1x	0.022	ND		1x	0.022
Aldrin	ND		1x	0.007	ND		1x	0.007	ND		1x	0.007
alpha-BHC	ND		1x	0.006	ND		1x	0.006	ND		1x	0.006
Azinphos methyl	ND		1x	1	ND		1x	1	ND		1x	1
beta-BHC	ND		1x	0.003	ND		1x	0.003	ND		1x	0.003
Chlordane, technical	ND		1x	0.11	ND		1x	0.11	ND		1x	0.11
Chlorobenside	ND		1x	0.1	ND		1x	0.1	ND		1x	0.1
Dacthal	ND		1x	0.1	ND		1x	0.1	ND		1x	0.1
delta-BHC	ND		1x	0.003	ND		1x	0.003	ND		1x	0.003
Demeton	ND		1x	1	ND		1x	1	ND		1x	1
Dieldrin	ND		1x	0.034	ND		1x	0.034	ND		1x	0.034
Endosulfan I	ND		1x	0.009	ND		1x	0.009	ND		1x	0.009
Endosulfan II	ND		1x	0.007	ND		1x	0.007	ND		1x	0.007
Endosulfan sulfate	ND		1x	0.018	ND		1x	0.018	ND		1x	0.018
Endrin	ND		1x	0.031	ND		1x	0.031	ND		1x	0.031
Endrin aldehyde	ND		1x	0.011	ND		1x	0.011	ND		1x	0.011
Ethyl parathion	ND		1x	0.1	ND		1x	0.1	ND		1x	0.1
gamma-BHC	ND		1x	0.01	ND		1x	0.01	ND		1x	0.01
Heptachlor	ND		1x	0.017	ND		1x	0.017	ND		1x	0.017
Heptachlor epoxide	ND		1x	0.004	ND		1x	0.004	ND		1x	0.004
Malathion	ND		1x	0.1	ND		1x	0.1	ND		1x	0.1
Methoxychlor	ND		1x	0.24	ND		1x	0.24	ND		1x	0.24
Methyl parathion	ND		1x	0.1	ND		1x	0.1	ND		1x	0.1
Mirex	ND		1x	0.1	ND		1x	0.1	ND		1x	0.1
Toxaphene	ND		1x	0.62	ND		1x	0.62	ND		1x	0.62
Aroclor-1016	ND		1x	0.073	ND		1x	0.073	ND		1x	0.073
Aroclor-1221	ND		1x	1.1	ND		1x	1.1	ND		1x	1.1
Aroclor-1232	ND		1x	0.3	ND		1x	0.3	ND		1x	0.3
Aroclor-1242	ND		1x	0.4	ND		1x	0.4	ND		1x	0.4
Aroclor-1248	ND		1x	0.24	ND		1x	0.24	ND		1x	0.24
Aroclor-1254	ND		1x	0.46	ND		1x	0.46	ND		1x	0.46
Aroclor-1260	ND		1x	0.06	ND		1x	0.06	ND		1x	0.06

ND=Not detected

Table 4-15. Continued

Analyte	DEEP TROUGH				KENT ISLAND DEEP								POOLES ISLAND			
	DT1WAT				KI3WAT				KI3WATFD				POL1WAT			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	0.03	ND		1x	0.03	ND		1x	0.03	ND		1x	0.03
4,4'-DDE	ND		1x	0.014	ND		1x	0.014	ND		1x	0.014	ND		1x	0.014
4,4'-DDT	ND		1x	0.022	ND		1x	0.022	ND		1x	0.022	ND		1x	0.022
Aldrin	ND		1x	0.007	ND		1x	0.007	ND		1x	0.007	ND		1x	0.007
alpha-BHC	ND		1x	0.006	ND		1x	0.006	ND		1x	0.006	ND		1x	0.006
Azinphos methyl	ND		1x	0.1	ND		1x	0.1	ND		1x	0.1	ND		1x	2
beta-BHC	ND		1x	0.003	ND		1x	0.003	ND		1x	0.003	ND		1x	0.003
Chlordane, technical	ND		1x	0.11	ND		1x	0.11	ND		1x	0.11	ND		1x	0.11
Chlorobenside	ND		1x	0.1	ND		1x	0.1	ND		1x	0.1	ND		1x	0.2
Dacthal	ND		1x	0.1	ND		1x	0.1	ND		1x	0.1	ND		1x	0.2
delta-BHC	ND		1x	0.003	ND		1x	0.003	ND		1x	0.003	ND		1x	0.003
Demeton	ND		1x	0.1	ND		1x	0.1	ND		1x	0.1	ND		1x	2
Dieldrin	ND		1x	0.034	ND		1x	0.034	ND		1x	0.034	ND		1x	0.034
Endosulfan I	ND		1x	0.009	ND		1x	0.009	ND		1x	0.009	ND		1x	0.009
Endosulfan II	ND		1x	0.007	ND		1x	0.007	ND		1x	0.007	ND		1x	0.007
Endosulfan sulfate	ND		1x	0.018	ND		1x	0.018	ND		1x	0.018	ND		1x	0.018
Endrin	ND		1x	0.031	ND		1x	0.031	ND		1x	0.031	ND		1x	0.031
Endrin aldehyde	ND		1x	0.011	ND		1x	0.011	ND		1x	0.011	ND		1x	0.011
Ethyl parathion	ND		1x	0.1	ND		1x	0.1	ND		1x	0.1	ND		1x	0.2
gamma-BHC	ND		1x	0.01	ND		1x	0.01	ND		1x	0.01	ND		1x	0.01
Heptachlor	ND		1x	0.017	ND		1x	0.017	ND		1x	0.017	ND		1x	0.017
Heptachlor epoxide	ND		1x	0.004	ND		1x	0.004	ND		1x	0.004	ND		1x	0.004
Malathion	ND		1x	0.1	ND		1x	0.1	ND		1x	0.1	ND		1x	0.2
Methoxychlor	ND		1x	0.24	ND		1x	0.24	ND		1x	0.24	ND		1x	0.24
Methyl parathion	ND		1x	0.1	ND		1x	0.1	ND		1x	0.1	ND		1x	0.2
Mirex	ND		1x	0.1	ND		1x	0.1	ND		1x	0.1	ND		1x	0.2
Toxaphene	ND		1x	0.62	ND		1x	0.62	ND		1x	0.62	ND		1x	0.62
Aroclor-1016	ND		1x	0.073	ND		1x	0.073	ND		1x	0.073	ND		1x	0.073
Aroclor-1221	ND		1x	1.1	ND		1x	1.1	ND		1x	1.1	ND		1x	1.1
Aroclor-1232	ND		1x	0.3	ND		1x	0.3	ND		1x	0.3	ND		1x	0.3
Aroclor-1242	ND		1x	0.4	ND		1x	0.4	ND		1x	0.4	ND		1x	0.4
Aroclor-1248	ND		1x	0.24	ND		1x	0.24	ND		1x	0.24	ND		1x	0.24
Aroclor-1254	ND		1x	0.46	ND		1x	0.46	ND		1x	0.46	ND		1x	0.46
Aroclor-1260	ND		1x	0.06	ND		1x	0.06	ND		1x	0.06	ND		1x	0.06

ND=Not detected

Table 4-15. Continued

Analyte	SWAN POINT CHANNEL				CRAIGHILL ENTRANCE/CRAIGHILL				CRAIGHILL ANGLE				CRAIGHILL UPPER RANGE/CUTOFF ANGLE			
	SWPEL				CRE/CREL				CRAEL				CRU/CUTEL			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	0.03	ND		1x	0.03	ND		1x	0.03	ND		1x	0.03
4,4'-DDE	ND		1x	0.014	ND		1x	0.014	ND		1x	0.014	ND		1x	0.014
4,4'-DDT	ND		1x	0.022	ND		1x	0.022	ND		1x	0.022	ND		1x	0.022
Aldrin	ND		1x	0.007	ND		1x	0.007	ND		1x	0.007	ND		1x	0.007
alpha-BHC	ND		1x	0.006	ND		1x	0.006	ND		1x	0.006	ND		1x	0.006
Azinphos methyl	ND		1x	0.2	ND	(a)	1x	0.5	ND	(a)	1x	1	ND	(a)	1x	1
beta-BHC	ND		1x	0.003	ND		1x	0.003	ND		1x	0.003	ND		1x	0.003
Chlordane, technical	ND		1x	0.11	ND		1x	0.11	ND		1x	0.11	ND		1x	0.11
Chlorobenside	ND		1x	0.02	ND	(a)	1x	0.1	ND	(a)	1x	0.1	ND	(a)	1x	0.1
Dacthal	ND		1x	0.02	ND	(a)	1x	0.1	ND	(a)	1x	0.1	ND	(a)	1x	0.1
delta-BHC	ND		1x	0.003	ND		1x	0.003	ND		1x	0.003	ND		1x	0.003
Demeton	ND		1x	0.2	ND	(a)	1x	0.5	ND	(a)	1x	1	ND	(a)	1x	1
Dieldrin	ND		1x	0.034	ND		1x	0.034	ND		1x	0.034	ND		1x	0.034
Endosulfan I	ND		1x	0.009	ND		1x	0.009	ND*		1x	0.009	ND		1x	0.009
Endosulfan II	ND		1x	0.007	ND		1x	0.007	ND		1x	0.007	ND		1x	0.007
Endosulfan sulfate	ND		1x	0.018	ND		1x	0.018	ND		1x	0.018	ND		1x	0.018
Endrin	ND		1x	0.031	ND		1x	0.031	ND		1x	0.031	ND		1x	0.031
Endrin aldehyde	ND		1x	0.011	ND		1x	0.011	ND		1x	0.011	ND		1x	0.011
Ethyl parathion	ND		1x	0.02	ND	(a)	1x	0.1	ND	(a)	1x	0.1	ND	(a)	1x	0.1
gamma-BHC	ND		1x	0.01	ND		1x	0.01	ND		1x	0.01	ND		1x	0.01
Heptachlor	ND		1x	0.017	ND		1x	0.017	ND		1x	0.017	ND		1x	0.017
Heptachlor epoxide	ND		1x	0.004	ND		1x	0.004	ND		1x	0.004	ND		1x	0.004
Malathion	ND		1x	0.02	ND	(a)	1x	0.1	ND	(a)	1x	0.1	ND	(a)	1x	0.1
Methoxychlor	ND		1x	0.24	ND		1x	0.24	ND		1x	0.24	ND		1x	0.24
Methyl parathion	ND		1x	0.02	ND	(a)	1x	0.1	ND	(a)	1x	0.1	ND	(a)	1x	0.1
Mirex	ND		1x	0.02	ND	(a)	1x	0.1	ND	(a)	1x	0.1	ND	(a)	1x	0.1
Toxaphene	ND		1x	0.62	ND		1x	0.62	ND		1x	0.62	ND		1x	0.62
Aroclor-1016	ND		1x	0.073	ND		1x	0.073	ND		1x	0.073	ND		1x	0.073
Aroclor-1221	ND		1x	1.1	ND		1x	1.1	ND		1x	1.1	ND		1x	1.1
Aroclor-1232	ND		1x	0.3	ND		1x	0.3	ND		1x	0.3	ND		1x	0.3
Aroclor-1242	ND		1x	0.4	ND		1x	0.4	ND		1x	0.4	ND		1x	0.4
Aroclor-1248	ND		1x	0.24	ND		1x	0.24	ND		1x	0.24	ND		1x	0.24
Aroclor-1254	ND		1x	0.46	ND		1x	0.46	ND		1x	0.46	ND		1x	0.46
Aroclor-1260	ND		1x	0.06	ND		1x	0.06	ND		1x	0.06	ND		1x	0.06

ND=Not detected

(a)=Extracted within extraction holding time, but analyzed beyond analysis holding time of 40 days after extraction.

Table 4-15. Continued

Analyte	TOLCHESTER								BREWERTON EASTERN EXTENSION							
	Van-Veen				Gravity Core				Van-Veen				Gravity Core			
	TLCEL				TLVEL				BEEL				BEVEL			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	0.03	ND		1x	0.03	ND		1x	0.03	ND		1x	0.03
4,4'-DDE	ND		1x	0.014	ND		1x	0.014	ND		1x	0.014	ND		1x	0.014
4,4'-DDT	ND		1x	0.022	ND		1x	0.022	ND		1x	0.022	ND		1x	0.022
Aldrin	ND		1x	0.007	ND		1x	0.007	ND		1x	0.007	ND		1x	0.007
alpha-BHC	ND		1x	0.006	ND		1x	0.006	ND		1x	0.006	ND		1x	0.006
Azinphos methyl	ND		1x	2	ND		1x	2	ND		1x	0.2	ND		1x	0.2
beta-BHC	ND		1x	0.003	ND		1x	0.003	ND		1x	0.003	ND		1x	0.003
Chlordane, technical	ND		1x	0.11	ND		1x	0.11	ND		1x	0.11	ND		1x	0.11
Chlorobenside	ND		1x	0.2	ND		1x	0.2	ND		1x	0.02	ND		1x	0.02
Dacthal	ND		1x	0.2	ND		1x	0.2	ND		1x	0.02	ND		1x	0.02
delta-BHC	ND		1x	0.003	ND		1x	0.003	ND		1x	0.003	ND		1x	0.003
Demeton	ND		1x	.2	ND		1x	2	ND		1x	0.2	ND		1x	0.2
Dieldrin	ND		1x	0.034	ND		1x	0.034	ND		1x	0.034	ND		1x	0.034
Endosulfan I	ND		1x	0.009	ND		1x	0.009	ND		1x	0.009	ND		1x	0.009
Endosulfan II	ND		1x	0.007	ND		1x	0.007	ND		1x	0.007	ND		1x	0.007
Endosulfan sulfate	ND		1x	0.018	ND		1x	0.018	ND		1x	0.018	ND		1x	0.018
Endrin	ND		1x	0.031	ND		1x	0.031	ND		1x	0.031	ND		1x	0.031
Endrin aldehyde	ND		1x	0.011	ND		1x	0.011	ND		1x	0.011	ND		1x	0.011
Ethyl parathion	ND		1x	0.2	ND		1x	0.2	ND		1x	0.2	ND		1x	0.02
gamma-BHC	ND		1x	0.01	ND		1x	0.01	ND		1x	0.01	ND		1x	0.01
Heptachlor	ND		1x	0.017	ND		1x	0.017	ND		1x	0.017	ND		1x	0.017
Heptachlor epoxide	ND		1x	0.004	ND		1x	0.004	ND		1x	0.004	ND		1x	0.004
Malathion	ND		1x	0.2	ND		1x	0.2	ND		1x	0.2	ND		1x	0.02
Methoxychlor	ND		1x	0.24	ND		1x	0.24	ND		1x	0.24	ND		1x	0.24
Methyl parathion	ND		1x	0.2	ND		1x	0.2	ND		1x	0.2	ND		1x	0.02
Mirex	ND		1x	0.2	ND		1x	0.2	ND		1x	0.2	ND		1x	0.02
Toxaphene	ND		1x	0.62	ND		1x	0.62	ND		1x	0.62	ND		1x	0.62
Aroclor-1016	ND		1x	0.073	ND		1x	0.073	ND		1x	0.073	ND		1x	0.073
Aroclor-1221	ND		1x	1.1	ND		1x	1.1	ND		1x	1.1	ND		1x	1.1
Aroclor-1232	ND		1x	0.3	ND		1x	0.3	ND		1x	0.3	ND		1x	0.3
Aroclor-1242	ND		1x	0.4	ND		1x	0.4	ND		1x	0.4	ND		1x	0.4
Aroclor-1248	ND		1x	0.24	ND		1x	0.24	ND		1x	0.24	ND		1x	0.24
Aroclor-1254	ND		1x	0.46	ND		1x	0.46	ND		1x	0.46	ND		1x	0.46
Aroclor-1260	ND		1x	0.06	ND		1x	0.06	ND		1x	0.06	ND		1x	0.06

ND=Not detected

Table 4-15. Continued

Analyte	BREWERTON/BREWERTON ANGLE BR/BRAEL				CURTIS BAY CBEL				FT McHENRY FMHEL				FERRY BAR FBEL			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	0.03	ND		1x	0.03	ND		1x	0.03	ND		1x	0.03
4,4'-DDE	ND		1x	0.014	ND		1x	0.014	ND		1x	0.014	ND		1x	0.014
4,4'-DDT	ND		1x	0.022	ND		1x	0.022	ND		1x	0.022	ND		1x	0.022
Aldrin	ND		1x	0.007	ND		1x	0.007	ND		1x	0.007	ND		1x	0.007
alpha-BHC	ND		1x	0.006	ND		1x	0.006	ND		1x	0.006	ND		1x	0.006
Azinphos methyl	ND		1x	0.2	ND		1x	0.2	ND		1x	0.2	ND		1x	0.2
beta-BHC	ND		1x	0.003	ND		1x	0.003	ND		1x	0.003	ND		1x	0.003
Chlordane, technical	ND		1x	0.11	ND		1x	0.11	ND		1x	0.11	ND		1x	0.11
Chlorobenside	ND		1x	0.02	ND		1x	0.02	ND		1x	0.02	ND		1x	0.02
Dacthal	ND		1x	0.02	ND		1x	0.02	ND		1x	0.02	ND		1x	0.02
delta-BHC	ND		1x	0.003	ND		1x	0.003	ND		1x	0.003	ND		1x	0.003
Demeton	ND		1x	0.2	ND		1x	0.2	ND		1x	0.2	ND		1x	0.2
Dieldrin	ND		1x	0.034	ND		1x	0.034	ND		1x	0.034	ND		1x	0.034
Endosulfan I	ND		1x	0.009	ND		1x	0.009	ND		1x	0.009	ND		1x	0.009
Endosulfan II	ND		1x	0.007	ND		1x	0.007	ND		1x	0.007	ND		1x	0.007
Endosulfan sulfate	ND		1x	0.018	ND		1x	0.018	ND		1x	0.018	ND		1x	0.018
Endrin	ND		1x	0.031	ND		1x	0.031	ND		1x	0.031	ND		1x	0.031
Endrin aldehyde	ND		1x	0.011	ND		1x	0.011	ND		1x	0.011	ND		1x	0.011
Ethyl parathion	ND		1x	0.2	ND		1x	0.02	ND		1x	0.02	ND		1x	0.02
gamma-BHC	ND		1x	0.01	ND		1x	0.01	ND		1x	0.01	ND		1x	0.01
Heptachlor	ND		1x	0.017	ND		1x	0.017	ND		1x	0.017	ND		1x	0.017
Heptachlor epoxide	ND		1x	0.004	ND		1x	0.004	ND		1x	0.004	ND		1x	0.004
Malathion	ND		1x	0.2	ND		1x	0.02	ND		1x	0.02	ND		1x	0.02
Methoxychlor	ND		1x	0.24	ND		1x	0.24	ND		1x	0.24	ND		1x	0.24
Methyl parathion	ND		1x	0.2	ND.		1x	0.02	ND		1x	0.02	ND		1x	0.02
Mirex	ND		1x	0.2	ND		1x	0.02	ND		1x	0.02	ND		1x	0.02
Toxaphene	ND		1x	0.62	ND		1x	0.62	ND		1x	0.62	ND		1x	0.62
Aroclor-1016	ND		1x	0.073	ND		1x	0.073	ND		1x	0.073	ND		1x	0.073
Aroclor-1221	ND		1x	1.1	ND		1x	1.1	ND		1x	1.1	ND		1x	1.1
Aroclor-1232	ND		1x	0.3	ND		1x	0.3	ND		1x	0.3	ND		1x	0.3
Aroclor-1242	ND		1x	0.4	ND		1x	0.4	ND		1x	0.4	ND		1x	0.4
Aroclor-1248	ND		1x	0.24	ND		1x	0.24	ND		1x	0.24	ND		1x	0.24
Aroclor-1254	ND		1x	0.46	ND		1x	0.46	ND		1x	0.46	ND		1x	0.46
Aroclor-1260	ND		1x	0.06	ND		1x	0.06	ND		1x	0.06	ND		1x	0.06

ND=Not detected

Table 4-15. Continued

NORTHWEST BRANCH
EAST/WEST

Analyte	NBE/NBWEL			
ug/L	Result	Qual.	Dil.	Limit
4,4'-DDD	ND		1x	0.03
4,4'-DDE	ND		1x	0.014
4,4'-DDT	ND		1x	0.022
Aldrin	ND		1x	0.007
alpha-BHC	ND		1x	0.006
Azinphos methyl	ND		1x	0.2
beta-BHC	ND		1x	0.003
Chlordane, technical	ND		1x	0.11
Chlorobenside	ND		1x	0.02
Dacthal	ND		1x	0.02
delta-BHC	ND		1x	0.003
Demeton	ND		1x	0.2
Dieldrin	ND		1x	0.034
Endosulfan I	ND		1x	0.009
Endosulfan II	ND		1x	0.007
Endosulfan sulfate	ND		1x	0.018
Endrin	ND		1x	0.031
Endrin aldehyde	ND		1x	0.011
Ethyl parathion	ND		1x	0.2
gamma-BHC	ND		1x	0.01
Heptachlor	ND		1x	0.017
Heptachlor epoxide	ND		1x	0.004
Malathion	ND		1x	0.2
Methoxychlor	ND		1x	0.24
Methyl parathion	ND		1x	0.2
Mirex	ND		1x	0.2
Toxaphene	ND		1x	0.62
Aroclor-1016	ND		1x	0.073
Aroclor-1221	ND		1x	1.1
Aroclor-1232	ND		1x	0.3
Aroclor-1242	ND		1x	0.4
Aroclor-1248	ND		1x	0.24
Aroclor-1254	ND		1x	0.46
Aroclor-1260	ND		1x	0.06

ND=Not detected

Table 4-16. Metals results for reference water and Chesapeake Bay and Baltimore Harbor elutriates.

POPLAR ISLAND

Analyte	PI1 WAT				PI1WATFD				PI5WAT			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	221		1x	29	214		1x	29	293		1x	29
Antimony	4.4	B	1x	1	4.3	B	1x	1	4.6	B	1x	1
Arsenic	2.4	B	1x	1	1.8	B	1x	1	ND		1x	1
Beryllium	ND		1x	1	ND		1x	1	ND		1x	1
Cadmium	ND	N	1x	1	ND	N	1x	1	ND	N	1x	1
Chromium	2.2	BW	1x	1	2.7	BW	1x	1	3.2	B	1x	1
Copper	ND		1x	1	ND		1x	1	ND		1x	1
Iron	ND		1x	20	ND		1x	20	ND		1x	20
Lead	ND		1x	24	ND		1x	24	ND		1x	24
Manganese	6.8	B	1x	6	8	B	1x	6	7.4	B	1x	6
Mercury	0.11	B	1x	0.1	0.15	B	1x	0.1	ND		1x	0.1
Nickel	ND	W	1x	3	3.6	BW	1x	3	ND	W	1x	3
Selenium	ND		1x	2	ND		1x	2	ND		1x	2
Silver	4.9	B	1x	4	4.6	B	1x	4	ND		1x	4
Thallium	ND	W	1x	2	ND	W	1x	2	ND	W	1x	2
Zinc	ND		1x	6	ND		1x	6	ND		1x	6

ND=Not detected N=MS outside of control limits B=Between IDL and CRDL
W=Spike outside of control limits

Table 4-16. Continued.

	DEEP TROUGH				KENT ISLAND DEEP								POOLES ISLAND			
Analyte	DT1WAT				KI3WAT				KI3WATFD				POL1WAT			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	222		1x	29	179	B	1x	29	149	B	1x	29	272		1x	29
Antimony	4.8	B	1x	1	4.3	B	1x	1	4.9	B	1x	1	2	B	1x	1
Arsenic	3.1	B	1x	1	1.2	B	1x	1	2	B	1x	1	1.7	B	1x	1
Beryllium	ND		1x	1	ND		1x	1	ND		1x	1	ND	N	1x	1
Cadmium	ND	N	1x	1	ND	N	1x	1	ND	N	1x	1	ND	N	1x	1
Chromium	1.8	BW	1x	1	ND	W	1x	1	ND	W	1x	1	1.1	BW	1x	1
Copper	ND		1x	1	ND		1x	1	ND		1x	1	ND	W	1x	1
Iron	ND		1x	20	ND		1x	20	ND		1x	20	349	N	1x	20
Lead	ND		1x	1	ND		1x	1	ND		1x	1	ND	N	1x	1
Manganese	10.3	B	1x	6	34.4		1x	6	30.6		1x	6	43.4	N	1x	5
Mercury	0.1	B	1x	0.1	0.13	B	1x	0.1	ND		1x	0.1	ND		1x	0.1
Nickel	4.1	BW	1x	3	ND		1x	3	ND	W	1x	3	15.9	BN	1x	3
Selenium	ND		1x	2	ND		1x	2	3.1	B	1x	2	2.3	B	1x	2
Silver	4.5	B	1x	4	ND		1x	4	ND		1x	4	ND		1x	4
Thallium	ND	W	1x	2	ND	W	1x	2	ND	W	1x	2	ND	NW	1x	2
Zinc	6	B	1x	6	6.8	B	1x	6	9.4	B	1x	6	ND	N	1x	6

ND=Not detected N=MS outside of control limits B=Between IDL and CRDL W=Spike outside of control limits

Table 4-16. Continued.

	SWAN POINT CHANNEL				**CRAIGHILL ENTRANCE/CRAIGHILL**				**CRAIGHILL ANGLE**				**CRAIGHILL UPPER RANGE/CUTOFF ANGLE**			
Analyte	SWPEL				CRE/CREL				CRAEL				CRU/CUTEL			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	135	B	1x	29	143	B	1x	29	175	B	1x	29	149	B	1x	29
Antimony	3.6	B	1x	1	5.5	B	1x	1	3.2	B	1x	1	5	B	1x	1
Arsenic	4.9	B	1x	1	2	B	1x	1	13.5		1x	1	4.5	B	1x	1
Beryllium	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Cadmium	ND		1x	1	ND	N	1x	1	ND	N	1x	1	ND	N	1x	1
Chromium	9.2	B	1x	1	ND	W	1x	1	3.7	BW	1x	1	1.7	B	1x	1
Copper	2.9	B	1x	1	3.5	B	1x	1	1.9	B	1x	1	3.5	B	1x	1
Iron	287	N	1x	20	ND		1x	20	1830		1x	20	108		1x	20
Lead	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Manganese	6770	E	1x	5	589		1x	5	5930		1x	5	4400		1x	5
Mercury	1.8	N	1x	0.1	0.16	B	1x	0.1	0.18	B	1x	0.1	0.12	B	1x	0.1
Nickel	3.3	BW	1x	3	17.1	BNS	1x	3	14.3	BNS	1x	3	5.7	BNW	1x	3
Selenium	ND		1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Silver	ND		1x	4	ND	N	1x	4	ND	N	1x	4	4	BN	1x	4
Thallium	ND	NW(a)	1x	2	ND	NW	1x	2	ND	NW	1x	2	ND	NW	1x	2
Zinc	ND		1x	6	13.2	B	1x	6	9.3	B	1x	6	7.7	B	1x	6

ND=Not detected N=MS outside of control limits B=Between IDL and CRDL W=Spike outside of control limits S=Determined by MSA E=Serial dilution outside of control limits (a)=Not recovered in MS, even after dilution. Potential for false negative.

Table 4-16. Continued.

	TOLCHESTER								BREWERTON EASTERN EXTENSION							
	Van-Veen				Gravity Core				Van-Veen				Gravity Core			
Analyte	TLCEL				TLVEL				BEEL				BEVEL			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	290		1x	29	165	B	1x	29	190	B	1x	29	80.9	B	1x	29
Antimony	6.2	B	1x	1	5.4	B	1x	1	5.5	B	1x	1	2.6	B	1x	1
Arsenic	8.7	B	1x	1	5.7	B	1x	1	10.8		1x	1	3.6	B	1x	1
Beryllium	ND	N	1x	1	ND	N	1x	1	ND		1x	1	ND		1x	1
Cadmium	ND	N	1x	1	ND	N	1x	1	ND		1x	1	ND		1x	1
Chromium	5.4	B	1x	1	1.3	BW	1x	1	6.5	BN	1x	1	1.9	BNW	1x	1
Copper	3.4	BW	1x	1	2.9	BW	1x	1	2.6	B	1x	1	1.7	B	1x	1
Iron	397	N	1x	20	390	N	1x	20	335		1x	20	22.8	B	1x	20
Lead	ND	N	1x	1	ND	N	1x	1	ND		1x	1	ND		1x	1
Manganese	3820	N	1x	5	1270	N	1x	5	9960	E	1x	5	644	E	1x	5
Mercury	0.1	B	1x	0.1	ND		1x	0.1	ND		1x	0.1	ND		1x	0.1
Nickel	41.3	NS	1x	3	18.6	BNS	1x	3	10.1	BS	1x	3	5.6	B	1x	3
Selenium	2.1	B	1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Silver	ND		1x	4	ND		1x	4	5	B	1x	4	ND		1x	4
Thallium	ND	NW	1x	2	ND	NW	1x	2	ND	NW	1x	2	ND	NW	1x	2
Zinc	54	N	1x	6	64	N	1x	6	12.9	B	1x	6	18.1	B	1x	6

ND=Not detected N=MS outside of control limits B=Between IDL and CRDL W=Spike outside of control limits S=Determined by MSA E=Serial dilution outside of control limits

Table 4-16. Continued.

	BREWERTON/BREWERTON ANGLE				CURTIS BAY				FT McHENRY				FERRY BAR			
Analyte	BR/BRAEL				CBEL				FMHEL				FBEL			
ug/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Aluminum	233		1x	29	184	B	1x	29	477		1x	29	228		1x	29
Antimony	5.1	B	1x	1	5.3	B	1x	1	5.4	B	1x	1	5	B	1x	1
Arsenic	8	B	1x	1	14		1x	1	11.6		1x	1	17.2		1x	1
Beryllium	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Cadmium	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Chromium	2.2	BN	1x	1	1.4	BN	1x	1	2.7	BN	1x	1	6.1	BN	1x	1
Copper	1.2	B	1x	1	1.2	B	1x	1	4.1	B	1x	1	6.9	B	1x	1
Iron	208		1x	20	972		1x	20	338		1x	20	353		1x	20
Lead	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1
Manganese	1910	E	1x	5	1880	E	1x	5	1720	E	1x	5	3570	E	1x	5
Mercury	ND		1x	0.1	ND		1x	0.1	0.36		1x	0.1	ND		1x	0.1
Nickel	3.2	BW	1x	3	ND	W	1x	3	4.2	BW	1x	3	6.2	BW	1x	3
Selenium	2	B	1x	2	ND		1x	2	ND		1x	2	ND		1x	2
Silver	5.3	B	1x	4	6.4	B	1x	4	4.7	B	1x	4	4.8	B	1x	4
Thallium	ND	NW	1x	2	ND	NW	1x	2	ND	NW	1x	2	ND	NW	1x	2
Zinc	21.2		1x	6	7.3	B	1x	6	19.5	B	1x	6	11.6	B	1x	6

ND=Not detected N=MS outside of control limits B=Between IDL and CRDL W=Spike outside of control limits
E=Serial dilution outside of control limits

Table 4-16. Continued.

NORTHWEST BRANCH
EAST/WEST

Analyte	NBE/NBWEL			
ug/L	Result	Qual.	Dil.	Limit
Aluminum	202		1x	29
Antimony	6.7	B	1x	1
Arsenic	22.9		1x	1
Beryllium	ND		1x	1
Cadmium	ND		1x	1
Chromium	1.9	BN	1x	1
Copper	1.6	B	1x	1
Iron	71.6	B	1x	20
Lead	ND		1x	1
Manganese	1460	E	1x	5
Mercury	0.51		1x	0.1
Nickel	ND	W	1x	3
Selenium	ND		1x	2
Silver	5	B	1x	4
Thallium	ND	NW	1x	2
Zinc	13.5	B	1x	6

ND=Not detected N=MS outside of control limits B=Between IDL and C
E=Serial dilution outside of control limits W=Spike ouside of control limits

Table 4-17. General chemistry results for reference water and Chesapeake Bay and Baltimore Harbor elutriates.

POPLAR ISLAND

Analyte	PI1 WAT				PI1WATFD				PI5WAT			
mg/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbon, total organic	ND		1x	5	4.2		1x	2	3.5		1x	2
Cyanide, total	ND		1x	0.01	ND		1x	0.01	ND		1x	0.01
Nitrogen, ammonia	ND		1x	0.1	ND		1x	0.1	ND		1x	0.1
Nitrogen, nitrate and nitrite	ND		1x	0.05	ND		1x	0.05	ND		1x	0.05
Nitrogen, total Kjeldahl	ND		1x	0.25	0.3		1x	0.25	ND		1x	0.25
Oxygen demand, biochemical	ND		1x	1	ND		1x	1	ND		1x	1
Oxygen demand, chemical	770		1x	10	ND		1x	200	ND		1x	200
Phosphorus, total	ND		1x	0.05	ND		1x	0.05	ND		1x	0.05
Sulfide, total	ND		1x	1	ND		1x	1	ND		1x	1

ND=Not detected

Table 4-17. Continued.

	DEEP TROUGH				**KENT ISLAND DEEP**								**POOLES ISLAND**			
Analyte	DT1WAT				KI3WAT				KI3WATFD				POL1WAT			
mg/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbon, total organic	ND		1x	5	2.7		1x	2	2.9		1x	2	4		1x	1
Cyanide, total	ND		1x	0.01	ND		1x	0.01	ND		1x	0.01	ND		1x	0.01
Nitrogen, ammonia	0.15		1x	0.1	0.17		1x	0.1	0.17		1x	0.1	0.33		1x	0.1
Nitrogen, nitrate and nitrite	ND		1x	0.05	0.11		1x	0.05	0.087		1x	0.05	0.79		1x	0.05
Nitrogen, total Kjeldahl	ND		1x	0.25	ND		1x	0.25	0.33		1x	0.25	ND		1x	0.25
Oxygen demand, biochemical	ND		1x	1	1.9		1x	1	ND		1x	1	ND		1x	1
Oxygen demand, chemical	841		1x	40	788		1x	20	731		1x	20	32		1x	10
Phosphorus, total	ND		1x	0.05	ND		1x	0.05	ND		1x	0.05	ND		1x	0.05
Sulfide, total	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1

ND=Not detected

Table 4-17. Continued.

	SWAN POINT CHANNEL				CRAIGHILL ENTRANCE/CRAIGHILL				CRAIGHILL ANGLE				CRAIGHILL UPPER RANGE/CUTOFF ANGLE			
Analyte	SWPEL				CRE/CREL				CRAEL				CRU/CUTEL			
mg/L	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit	Result	Qual.	Dil.	Limit
Carbon, total organic	76.7		1x	1	19.2		1x	1	44.8		1x	1	37.2		1x	1
Cyanide, total	ND		1x	0.01	ND		1x	0.01	ND		1x	0.01	ND		1x	0.01
Nitrogen, ammonia	10.8		1x	1	2.2		1x	0.1	10.3		1x	5	6.4		1x	2.5
Nitrogen, nitrate and nitrite	0.06		1x	0.05	0.1		1x	0.05	ND		1x	0.05	0.1		1x	0.05
Nitrogen, total Kjeldahl	8.4		1x	0.25	2.8		1x	0.25	10.2		1x	2.5	6.3		1x	1.2
Oxygen demand, biochemical	ND		1x	1	4.6		1x	1	6.4		1x	1	1.2		1x	1
Oxygen demand, chemical	114		1x	10	30.3		1x	10	24		1x	10	27.7		1x	10
Phosphorus, total	0.26		1x	0.05	ND		1x	0.05	0.063		1x	0.05	ND		1x	0.05
Sulfide, total	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1

ND=Not detected

Table 4-17. Continued.

Analyte mg/L	TOLCHESTER Van-Veen TLCEL Result	Qual.	Dil.	Limit	TOLCHESTER Gravity Core TLVEL Result	Qual.	Dil.	Limit	BREWERTON EASTERN EXTENSION Van-Veen BEEL Result	Qual.	Dil.	Limit	BREWERTON EASTERN EXTENSION Gravity Core BEVEL Result	Qual.	Dil.	Limit
Carbon, total organic	26.8		1x	1	22.5		1x	1	42.2		1x	1	17.7		1x	1
Cyanide, total	ND		1x	0.01	ND		1x	0.01	ND		1x	0.01	ND		1x	0.01
Nitrogen, ammonia	2.4		1x	0.5	3.7		1x	0.5	5.3		1x	0.5	1.4		1x	0.5
Nitrogen, nitrate and nitrite	0.31		1x	0.05	0.35		1x	0.05	0.24		1x	0.05	1.1		1x	0.1
Nitrogen, total Kjeldahl	2.9		1x	0.25	3.9		1x	0.25	6		1x	0.5	2.1		1x	0.25
Oxygen demand, biochemical	ND		1x	1	2.6		1x	1	1.2		1x	1	1		1x	1
Oxygen demand, chemical	128		1x	10	238		1x	10	74.1		1x	10	ND		1x	10
Phosphorus, total	0.12		1x	0.05	ND		1x	0.05	0.06		1x	0.05	ND		1x	0.05
Sulfide, total	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1

ND=Not detected

Table 4-17. Continued.

Analyte mg/L	BREWERTON/BREWERTON ANGLE BR/BRAEL Result	Qual.	Dil.	Limit	CURTIS BAY CBEL Result	Qual.	Dil.	Limit	FT McHENRY FMHEL Result	Qual.	Dil.	Limit	FERRY BAR FBEL Result	Qual.	Dil.	Limit
Carbon, total organic	46.3		1x	1	40.8		1x	1	39		1x	1	50.7		1x	1
Cyanide, total	ND		1x	0.01	ND		1x	0.01	ND		1x	0.01	ND		1x	0.01
Nitrogen, ammonia	7.1		1x	1	5		1x	1	5.1		1x	1	7.8		1x	1
Nitrogen, nitrate and nitrite	0.17		1x	0.05	0.13		1x	0.05	0.15		1x	0.1	0.12		1x	0.05
Nitrogen, total Kjeldahl	4.4		1x	0.25	5.3		1x	0.5	5.4		1x	0.25	6		1x	1.2
Oxygen demand, biochemical	ND		1x	1	ND		1x	1	2.3		1x	1	ND		1x	1
Oxygen demand, chemical	103		1x	10	57		1x	10	77.7		1x	10	80.3		1x	10
Phosphorus, total	0.1		1x	0.05	0.078		1x	0.05	0.36		1x	0.05	0.74		1x	0.05
Sulfide, total	ND		1x	1	ND		1x	1	ND		1x	1	ND		1x	1

ND=Not detected

Table 4-17. Continued.

**NORTHWEST BRANCH
EAST/WEST**

Analyte	NBE/NBWEL			
mg/L	Result	Qual.	Dil.	Limit
Carbon, total organic	30.2		1x	1
Cyanide, total	ND		1x	0.01
Nitrogen, ammonia	3.2		1x	0.1
Nitrogen, nitrate and nitrite	0.2		1x	0.05
Nitrogen, total Kjeldahl	3.3		1x	0.25
Oxygen demand, biochemical	1.7		1x	1
Oxygen demand, chemical	60.1		1x	10
Phosphorus, total	0.24		1x	0.05
Sulfide, total	ND		1x	1

ND=Not detected

5. QA/QC RESULTS

This chapter will be submitted as an addendum.

5.1 MATRIX SPIKE / MATRIX SPIKE DUPLICATES (MS/MSD)

5.2 TRIP BLANKS (VOLATILES)

Trip blank results for volatiles are presented in Appendix C.

5.3 STANDARD ANALYTICAL REFERENCE MATERIAL (SARM)

6. REFERENCES

EA Engineering, Science, and Technology (EA). 1995a. Final Sampling Plan. FY 1995 Sediment Sampling and Chemical Analysis for Baltimore Harbor and Chesapeake Bay, Maryland. Prepared for U.S. Army Corps of Engineers, Baltimore District. November.

EA Engineering, Science, and Technology (EA). 1995b. Final Quality Assurance Management Plan for Testing of Dredged Material Proposed for Bay Disposal. Prepared for U.S. Army Corps of Engineers, Baltimore District. November.

U.S. EPA. 1994. Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual. EPA 823-B-94-002. U.S. EPA and U.S. Army Corps of Engineers, Washington, D.C.

U.S. EPA. 1995. QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations. EPA 823-B-95-001. U.S. EPA and U.S. Army Corps of Engineers, Washington, D.C.

Appendix A
Final Sampling Plan

Appendix B
Final Quality Assurance Project Plan
(QAPP)

FINAL SAMPLING PLAN

FY 1995 SEDIMENT SAMPLING AND CHEMICAL ANALYSIS FOR BALTIMORE HARBOR AND CHESAPEAKE BAY, MARYLAND

Prepared for

Department of the Army
Baltimore District
U.S. Army Corps of Engineers
10 South Howard Street
10th Floor HTRW Branch
Baltimore, Maryland 21201

Prepared by

EA Engineering, Science, and Technology
11019 McCormick Road
Hunt Valley, Maryland 21031

November 1995

60787.26

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1. INTRODUCTION

1.1 BACKGROUND

Section 404 of the Federal Water Pollution Control Act of 1972, Public Law 92-500, as amended by the Clean Water Act of 1977, Public Law 95-217, requires the Environmental Protection Agency (EPA), in conjunction with the U.S. Army Corps of Engineers (USACE), to promulgate guidelines for the discharge of dredged or fill material to ensure that the proposed discharge will not result in unacceptable adverse impacts to U.S. waters. The Draft Evaluation of Dredged Material Proposed for Discharge in Inland and Near Coastal Waters - Test Manual (EPA 1994), commonly referred to as the Inland Testing Manual (ITM), establishes procedures applicable to the potential contaminant-related environmental impacts associated with the discharge of dredged material in inland waters, near coastal waters, and surrounding environs. The technical guidance in the ITM is consistent with the Guidelines. Results obtained are used within the context of regulatory requirements to facilitate decision-making with regard to management of the dredged material.

1.2 SCOPE OF THIS PROJECT

The Baltimore District of the USACE intends to define chemical concentrations in sediment proposed for dredging in FY96 and FY97 consistent with the Guidelines and technical guidance of the ITM. Approach channels considered for maintenance and/or widening or realignment include the Craighill Entrance Channel, the Craighill Channel, the Craighill Angle, the Craighill Upper Range, the Cutoff Angle, the Brewerton Channel Eastern Extension, the Swan Point Channel, and the Tolchester Channel. Within Baltimore Harbor, the channels proposed for maintenance dredging include the Brewerton Channel, the Brewerton Angle, the Ft. McHenry Channel, the Curtis Bay Channel, the Northwest Branch East Channel, the Northwest Branch West Channel, and the Ferry Bar Channel. Reference sediments and waters will be collected from near Poplar Island, the Kent Island Deep Site, the proposed Deep Trough Placement Site, and the Pooles Island area.

This Sampling Plan (SP) addresses sampling tasks necessary to obtain chemical constituent data for sediment in these channels. The purpose of this SP is to provide a blueprint for all field work by defining the sampling approach. Sampling locations, sampling procedures and associated QA/QC, analytical parameters for each sample type, and data presentation are addressed in this document. QA/QC guidelines and procedures are addressed more specifically in the Quality Assurance Project Plan (QAPP) for this project (EA 1995).

2. SAMPLE COLLECTION

2.1 SAMPLING APPROACH

The overall sampling strategy is intended to minimize potential cross-contamination and maximize data comparability. Data quality will be controlled and maintained by:

- appropriate sampling program design
- collection of representative samples
- use of appropriate sampling techniques
- adherence to chain-of-custody, preservation, and holding time requirements
- sample analysis and analytical quality control based on approved, standard methods and procedures

2.2 SAMPLING LOCATIONS

Chemical concentration gradients are expected in the Chesapeake Bay sediments targeted for sample collection. In accordance with the Inland Testing Manual (ITM), sampling will begin with the stations anticipated to contain the lowest concentrations.

Sixty-nine stations will be sampled: 47 stations outside of Baltimore Harbor and 22 stations inside Baltimore Harbor. Samples will be collected first from the most southerly stations (Mid-Chesapeake Bay) and easterly stations. Sampling will proceed sequentially to the north and west from reference stations: Poplar Island, Kent Island Deep Site, the proposed Deep Trough Placement Site, and the Pooles Island area with the final samples recovered in the Inner Harbor area of Baltimore City. Station locations for each sampling reach are illustrated in Figures 2-1 through 2-13. Latitude/longitude of each station, and collection technique are presented in Tables 2-1 and 2-2. Sampling locations will be determined in the field using a Magellan® GPS with differential.

2.3 SAMPLING EQUIPMENT AND PROCEDURES

2.3.1 Sediment/Elutriate Sediment

Surface sediments will be collected at reference sites and channel reaches (58 stations) using a Kahlsico® stainless steel Van Veen sampler (40 liter capacity). One grab sample will be collected from each station. In order to avoid disturbance and associated loss of volatile chemicals, volatiles samples will be transferred directly from the grab sampler to sample containers. In addition, headspace will be eliminated from volatiles sample containers by filling the container to the top. After volatiles samples have been removed, an approximate one gallon volume of sediment will be homogenized with a stainless steel spoon in a stainless steel mixing bowl. The homogenized sample will be transferred to appropriate sample containers using a stainless steel spoon.

Gravity coring will take place at 11 stations within the two reaches where undisturbed sediments are to be dredged (Brewerton Eastern Extension and Tolchester). A Benthos® Model 2171, 8ft. Gravity Corer with polycarbonate core liners (2 ⅞ inch diameter) will be deployed to collect cores of consolidated material. Two core samples will be collected at each station in order to obtain the volume of sediment required for chemical and elutriate analyses. For both cores, the unconsolidated surface layer will be measured and discarded (approximately the top 3-7 inches of sediment), and the remaining consolidated material from each core will be measured, combined, and homogenized in a stainless steel bowl. All samples will be transferred to holding containers using a stainless steel spoon.

To avoid disturbance and associated loss of volatile chemicals, volatiles samples will be collected from the middle of the first gravity core and transferred directly to the volatiles sample containers before homogenizing. Headspace will be eliminated from volatiles sample containers by filling the container to the top. Sample container types, preservation techniques and holding times are presented in Table 2-3. A synopsis of analyses required at each station with the associated sample code is presented in Table 2-4.

Sediment samples to be used by the analytical laboratory in the preparation of elutriate samples will consist of composites of multiple samples collected from one or two reaches, as indicated in Table 2-1. Instructions for elutriate composites and sample IDs are presented in Table 2-5. These samples will be composited in the laboratory in stainless steel bowls and approximately 3 L of the homogenized sediment will be removed and placed in the appropriate sample container using a stainless steel spoon.

All sediment collection equipment will be decontaminated between samples, according to the procedures described in Section 2.4 of this plan. Sampling inside of Rock Point/North Point will be conducted under level D conditions. Gloves, coveralls and goggles will be required of anyone handling samples.

2.3.2 Water/Elutriate Water

Reference water samples will be collected from the placement sites: Poplar Island, Deep Trough, Kent Island, and Pooles Island (Table 2-2). These samples will be analyzed for chemical constituents and will be collected using dedicated (1.5 inch diameter) Teflon bailers. Because water depth exceeds 100ft at the the Deep Trough site, a 1 liter, teflon-coated General Oceanics® niskin bottle will be deployed to collect water using a hydraulic winch. The niskin bottle will be deployed approximately 6-8 times to obtain the required sample volume. All samples will be poured directly into holding containers with appropriate preservatives supplied by EA

Laboratories. To avoid loss of volatile chemicals, volatiles sample containers will be the first containers filled.

Elutriate water samples will be collected from each reach using a peristaltic pump with polyethylene tubing. At each reach, four gallons of site water will be collected from approximately 5 ft. above the bottom. If water depth is less than 5 ft, a mid-depth sample will be collected. At each station the tubing will be flushed with the equivalent of 10 times the collection tubing volume prior to sample collection. Water samples will then be dispensed directly into appropriate sample containers. Sample container types, preservation techniques and holding times for water samples are presented in Table 2-6. A synopsis of analyses required at each station with the assocaited sample code number is presented in Table 2-7.

2.4 EQUIPMENT DECONTAMINATION

To minimize potential cross-contamination, all non-dedicated sediment sampling equipment (stainless steel Van Veen, mixing bowls, and spoons) will be rinsed with site water, scrubbed with a bristle brush, rinsed a second time with site water and then rinsed with deionized water between samples. For gravity coring, a dedicated polycarbonate liner will be used at each station, and the exterior of the corer will be scrubbed with a bristle brush and rinsed with site water to remove excess sediment. All dedicated sampling equipment will be protected from contamination with covering (e.g. plastic wrapped, boxed) until employed for sampling.

2.5 FIELD QC SAMPLES

2.5.1 Trip Blanks

Trip blanks (also called transport blanks) will be analyzed to evaluate the effect of ambient site conditions and sample shipment on sample integrity and to ensure proper sample container preparation and handling techniques. For this program, trip blanks will be analyzed for volatile organi compounds only. Trip blanks are samples that originate as analyte-free water placed in volatile organic vials (preserved with HCl) in the laboratory and analyzed for volatile organic compounds. One trip blank will be analyzed per group of samples per day. All volatile samples collected on each sampling day will be stored in the same cooler as the trip blank.

2.5.2 Field Duplicates

Field duplicates are samples collected simultaneously from the same sampling location, which are used as measures of matrix homogeneity and sampling precision. Duplicate samples will be collected as individual, co-located samples. They will be homogenized separately, or placed directly into sample containers in the case of volatiles samples. Two field duplicate samples will be collected for each matrix (sediment and water). Stations where field duplicates will be collected are listed in Table 2-4 (sediment) and Table 2-7 (water).

2.5.3 Field Blind Split Samples

A split sample is a single, field-collected, homogenized sample that is divided into two portions in the field, with each portion being carried through the analytical process as a separate sample. Two split samples will be provided for analysis, each from a different sampling location.

At each of five locations, EA will collect a second set of samples. The second sample will be divided into two ½ gallon portions and placed into separate containers. Two of the five sets of samples will be blind selected, and relabeled to obscure their identity. One sample from each blind selected set will be shipped to EA Laboratories, the second to an outside laboratory. These results will be tracked as separate samples and provided to the Corps. Stations where sediment split samples will be collected are listed in Table 2-4.

2.5.4 Matrix Spike/Matrix Spike Duplicate

A matrix spike (MS) is a field sample to which a known amount of analyte is added before sample preparation and analysis to evaluate the potential effects of matrix interference. Analyte concentrations in the spiked and unspiked sample are used to calculate percent recovery as a measure of the extent of matrix interference. Five percent of the samples collected within each matrix (sediment and water) will be designated for MS analysis (U.S. EPA 1995).

For organic methods, the MS is duplicated, providing a matrix spike duplicate (MSD). For inorganic analytes, a method duplicate is analyzed in addition to the MS. Five percent of the samples collected for each matrix (sediment and water) will be designated for MSD or duplicate analysis (U.S. EPA 1995). For this sampling program, EA Laboratories will analyze four MS/MSD sediment samples and one MS/MSD water sample. Samples designated for MS/MSD analysis (organic analyses) or MS and duplicate analysis (inorganic analyses) will be collected in duplicate. Sampling locations where MS/MSD samples will be collected are indicated toTable 2-4 (sediment) and Table 2-7 (water).

2.5.5 Standard Reference Material (SRM)

One sample obtained by EA Laboratories from the National Bureau of Standards (NBS) will be analyzed for the full suite of sediment analyses.

2.6 SAMPLE CONTAINERS, PRESERVATION AND HANDLING

Containers, quantities required for analysis, preservation techniques, and holding times for sediment and water samples are presented in Tables 2-3 and 2-6, respectively. Sediment and water samples will be stored in coolers at 4°C while awaiting delivery to the appropriate analytical laboratory. Samples will be delivered by sample collection personnel directly to EA Laboratories' facility in Hunt Valley, MD. Samples will be delivered to EA Laboratories on the day of collection. Samples requiring shipment to subcontractor laboratories will be shipped by EA Laboratories via overnight express.

2.7 CHAIN-OF-CUSTODY

2.7.1 Sample Labeling

The following information, at a minimum, is required on each sample label:

Client	Collection date
Project number	Collection time
Sample location	Sampler's initials
Sample identification number	Preservative(s)

After the label has been completed in the field using indelible ink and has been affixed to the sample container, the label is covered with clear tape to provide protection from moisture. Pre-printed pressure-sensitive labels will be supplied by EA Laboratories.

2.7.2 Custody Seals

To ensure that samples have not been disturbed during shipment, any shipping containers that leave the immediate possession of the sample collection personnel (i.e., samples to be shipped by courier to subcontractors) will be taped with a custody seal. The seal will include the signature of the person shipping the container and will be placed on the lid of the shipping container after the container has been secured closed with strapping tape. Clear adhesive tape will be placed over the cooler custody seals to ensure that seals are not accidently broken during shipment.

2.7.3 Field Logbook

All information pertinent to the field activities will be recorded in a bound logbook. Entries in the field logbook will include date and time of sample collection, tidal cycle, weather conditions, field observations, sampling station, sample identification number, sampling location (including latitude and longitude), sampling depth, and sample collection method.

2.7.4 Chain-of-Custody Record

A chain-of-custody record will accompany each shipment of samples to the laboratory for analysis. Chain-of-custody documentation will include the following: sample ID number, data and time of collection, number of containers, analyses requested, and sampler's name and signature. Chain-of-custody forms submitted with sediment and water samples are depicted in Figures 2-14 and 2-15, respectively.

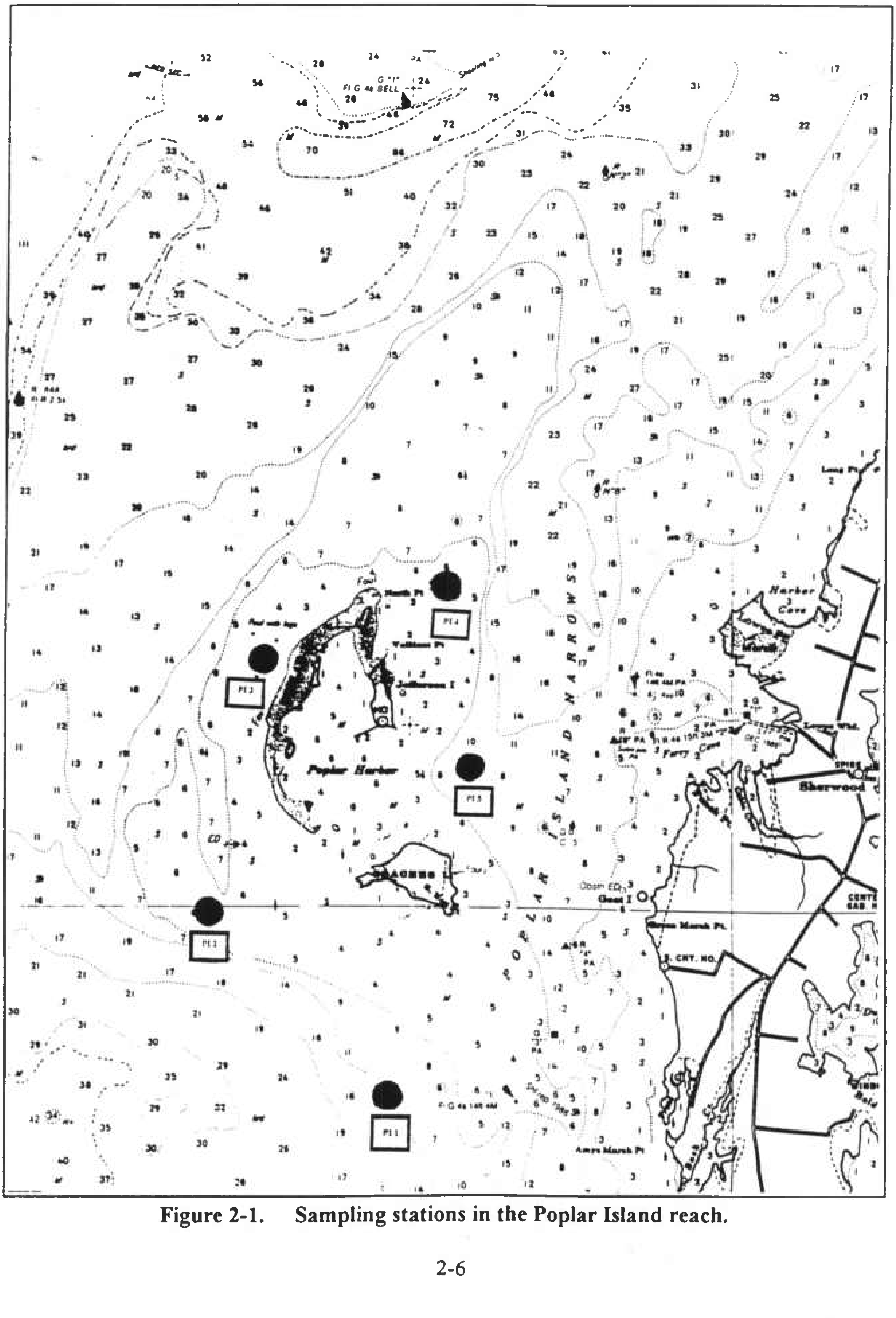

Figure 2-1. Sampling stations in the Poplar Island reach.

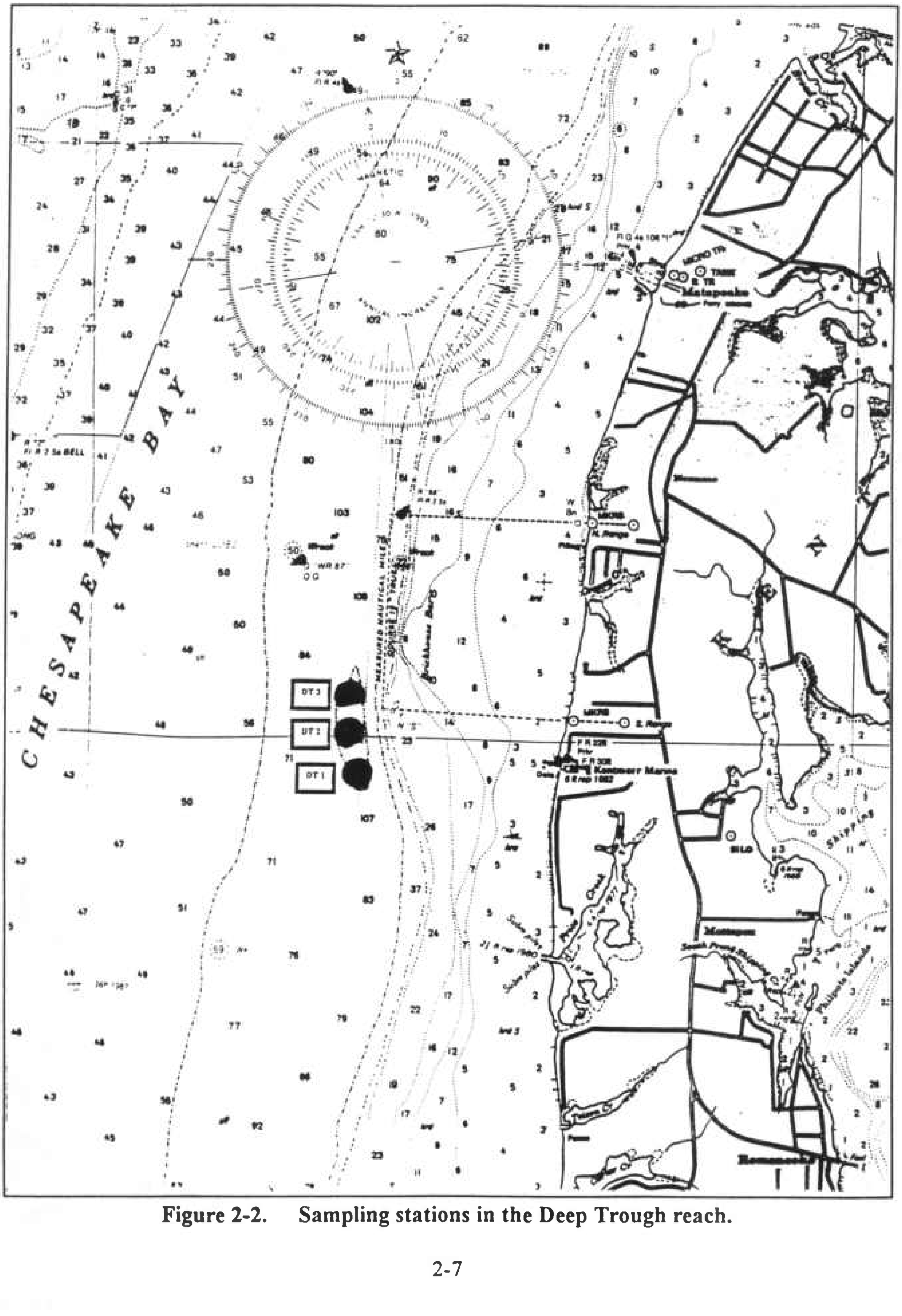

Figure 2-2. Sampling stations in the Deep Trough reach.

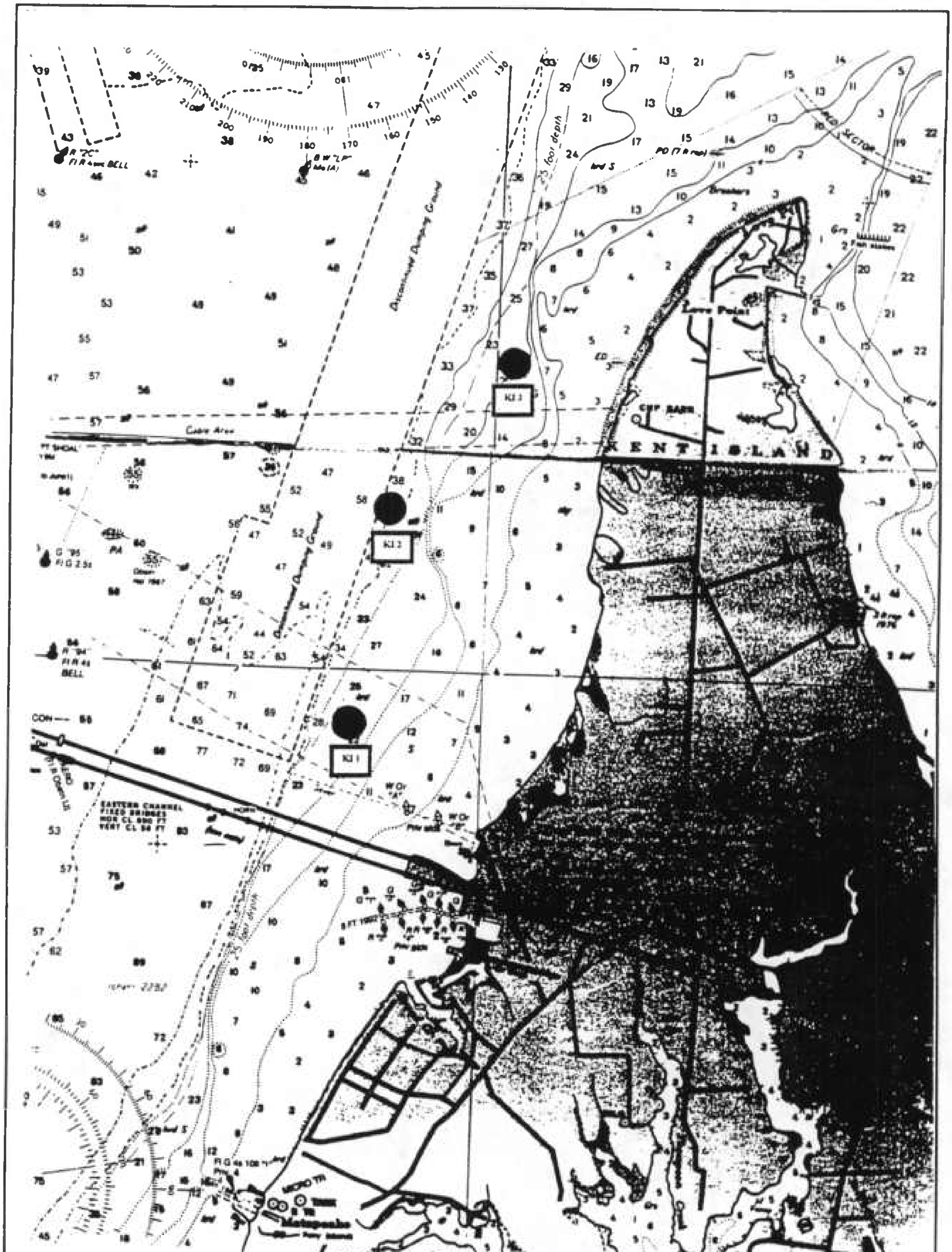

Figure 2-3. Sampling stations in the Kent Island reach.

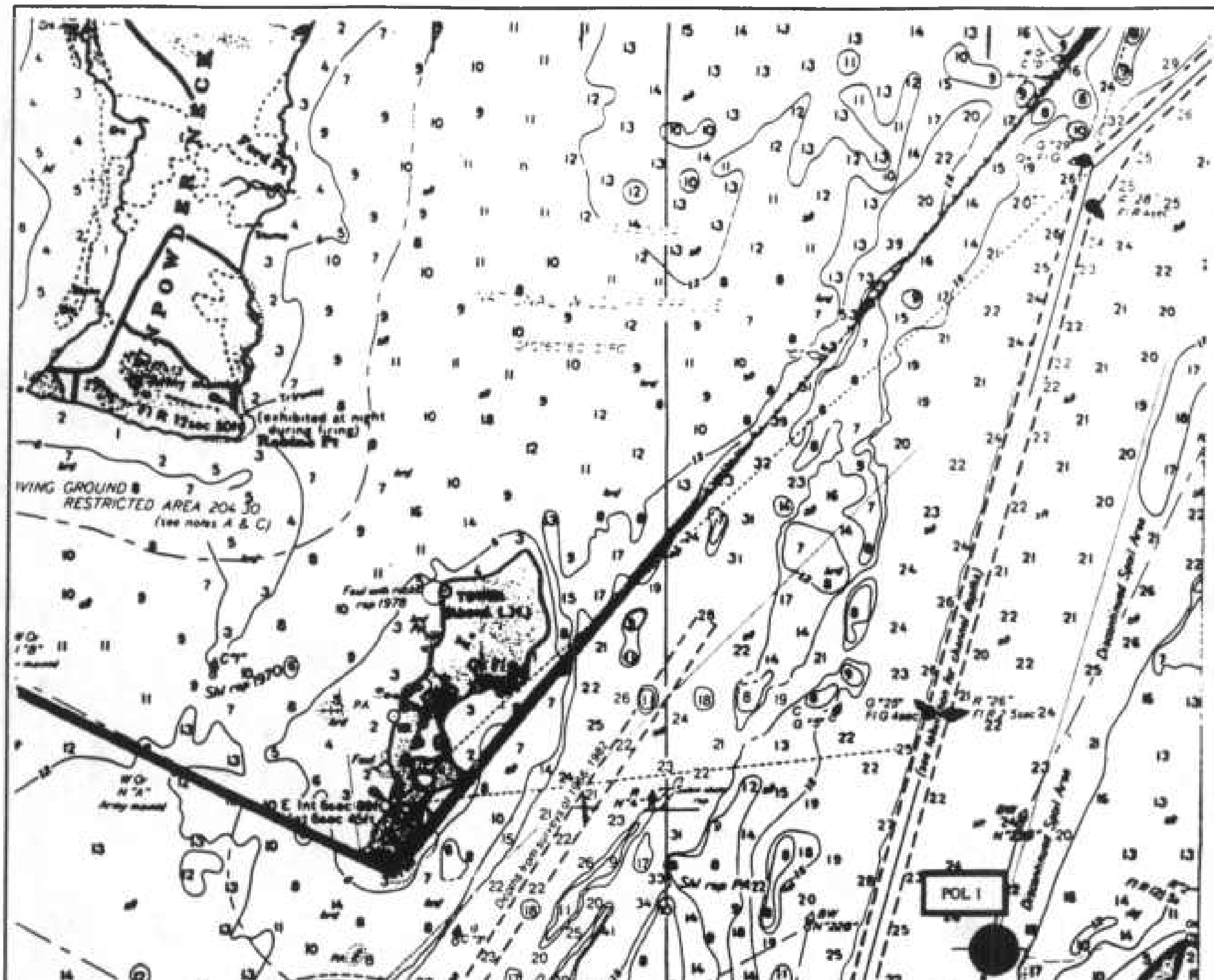

Figure 2-4. Sampling stations near Pooles Island.

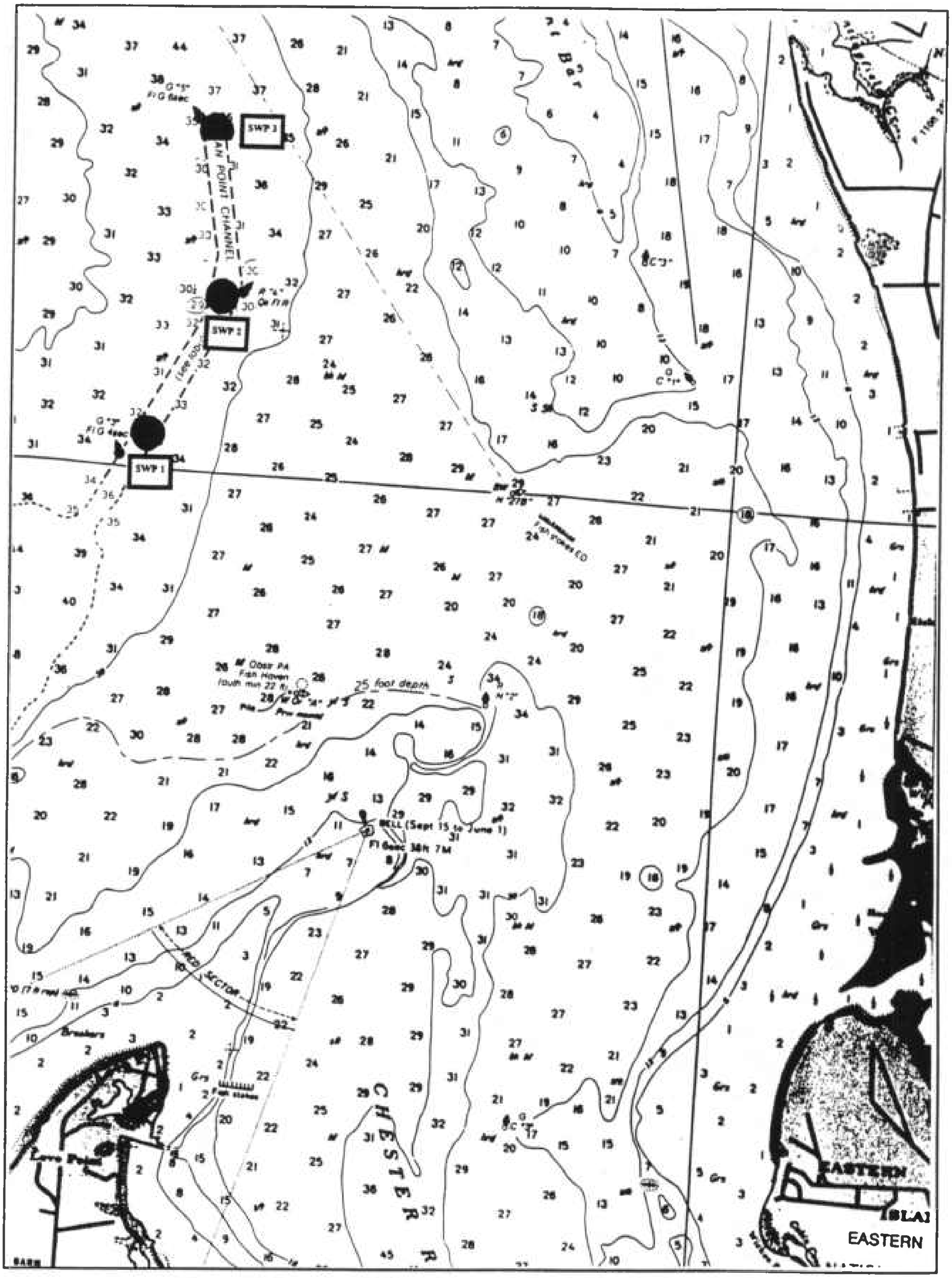

Figure 2-5. Sampling stations in the Swan Point reach.

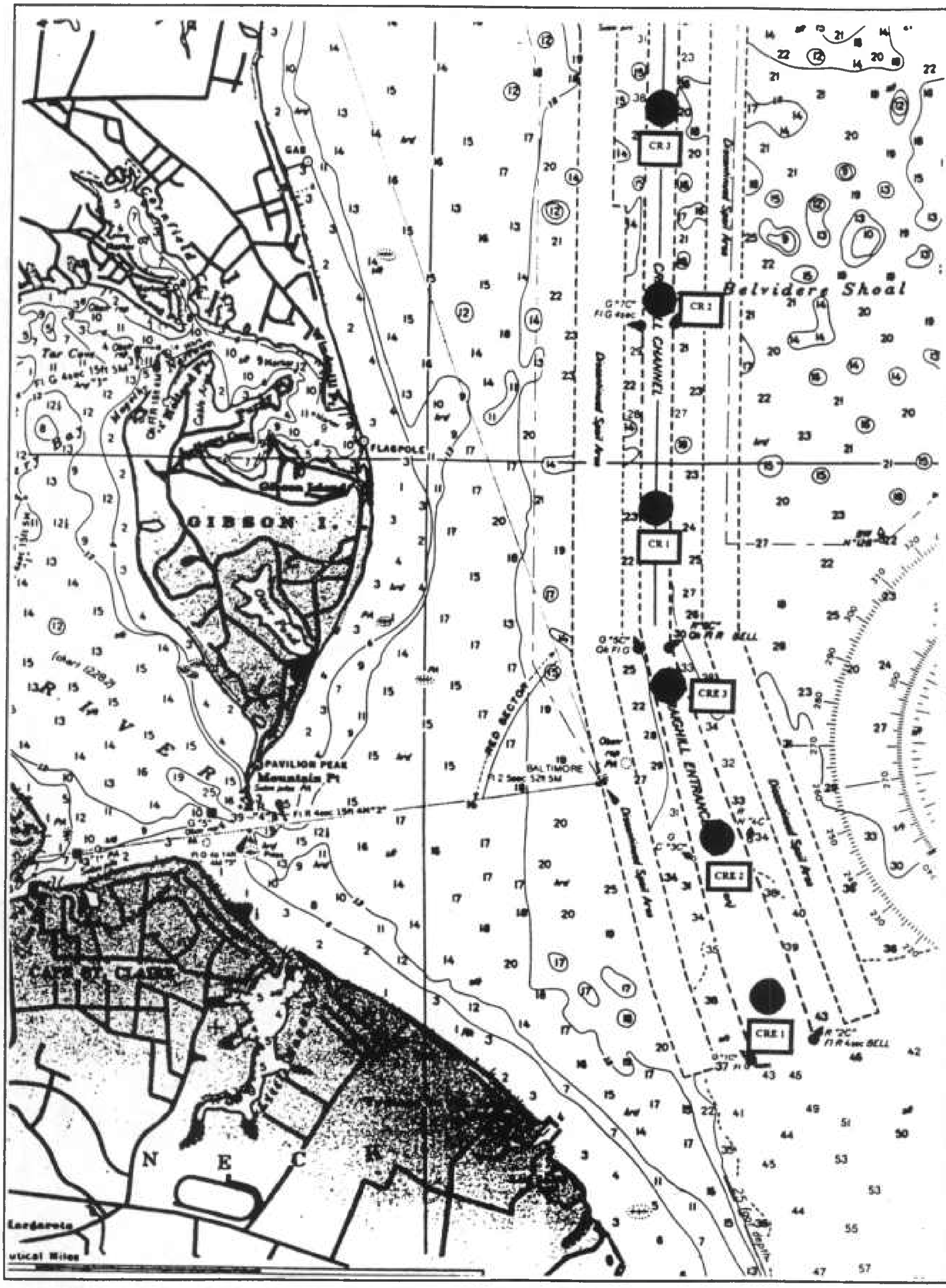

Figure 2-6. Sampling stations in the Craighill Entrance and Craighill reaches.

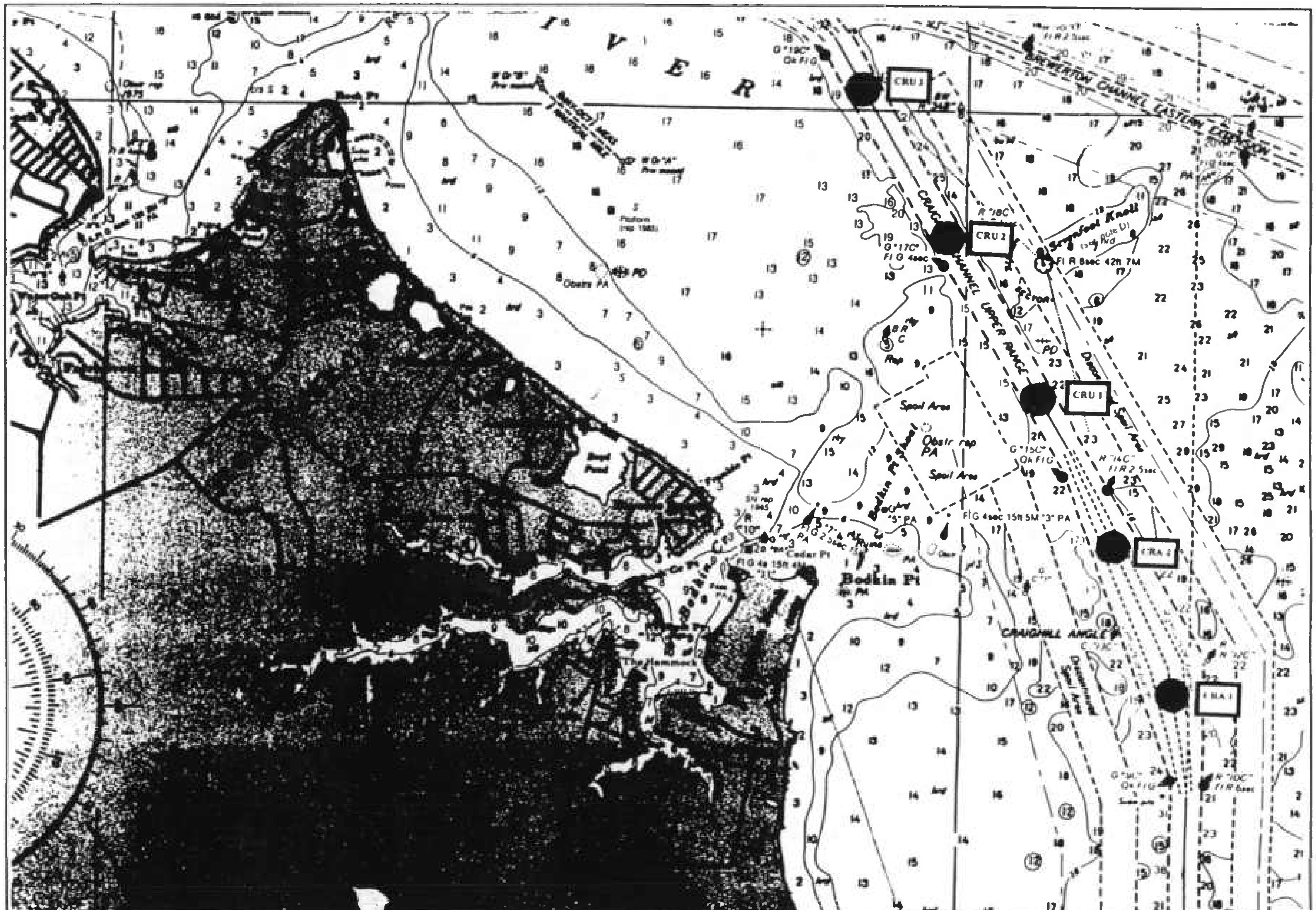

Figure 2-7. Sampling stations in the Craighill Angle and Craighill Upper Range reaches.

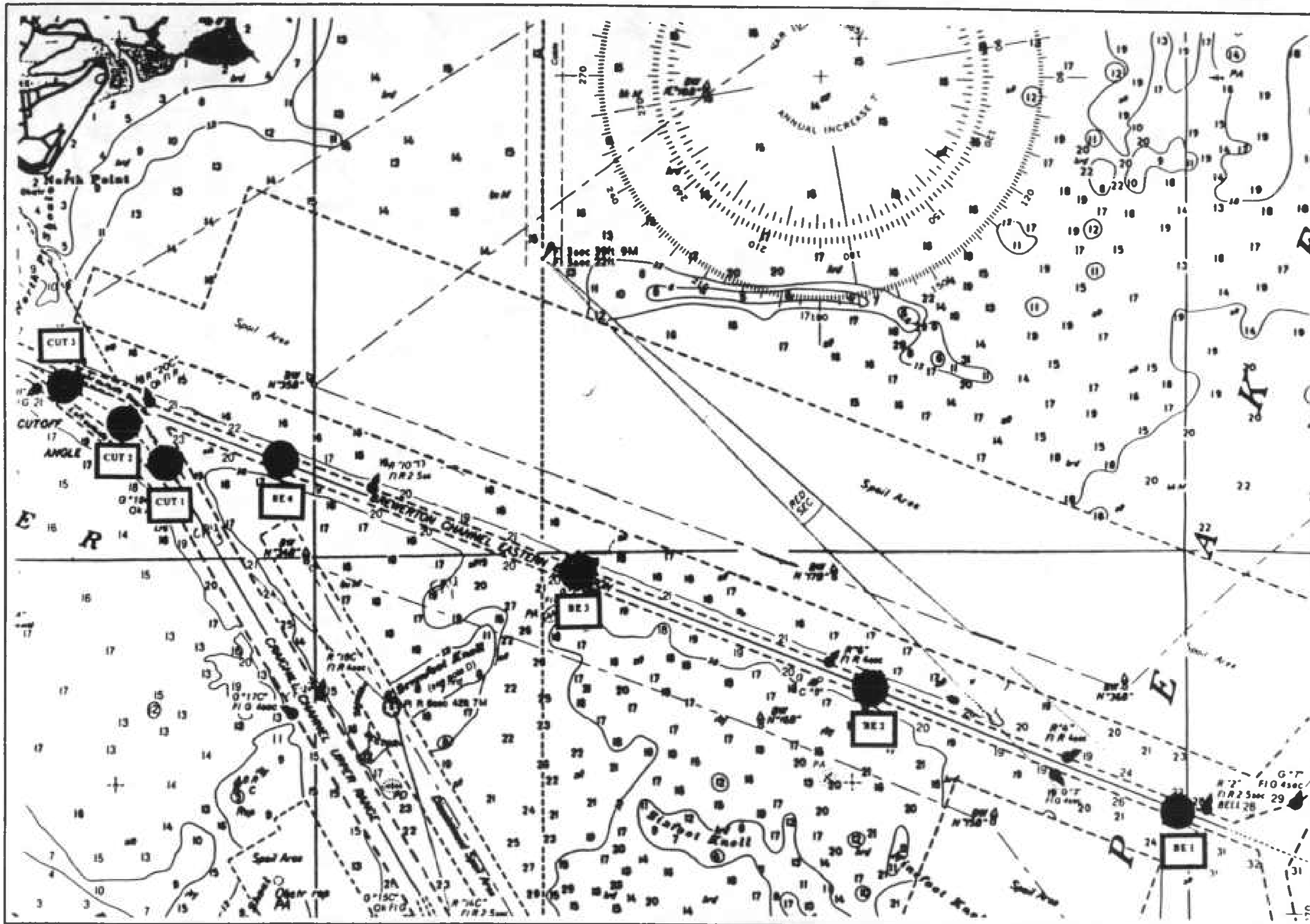

Figure 2-8. Van Veen sampling stations in the Cutoff Angle and Brewerton Eastern Extension reaches.

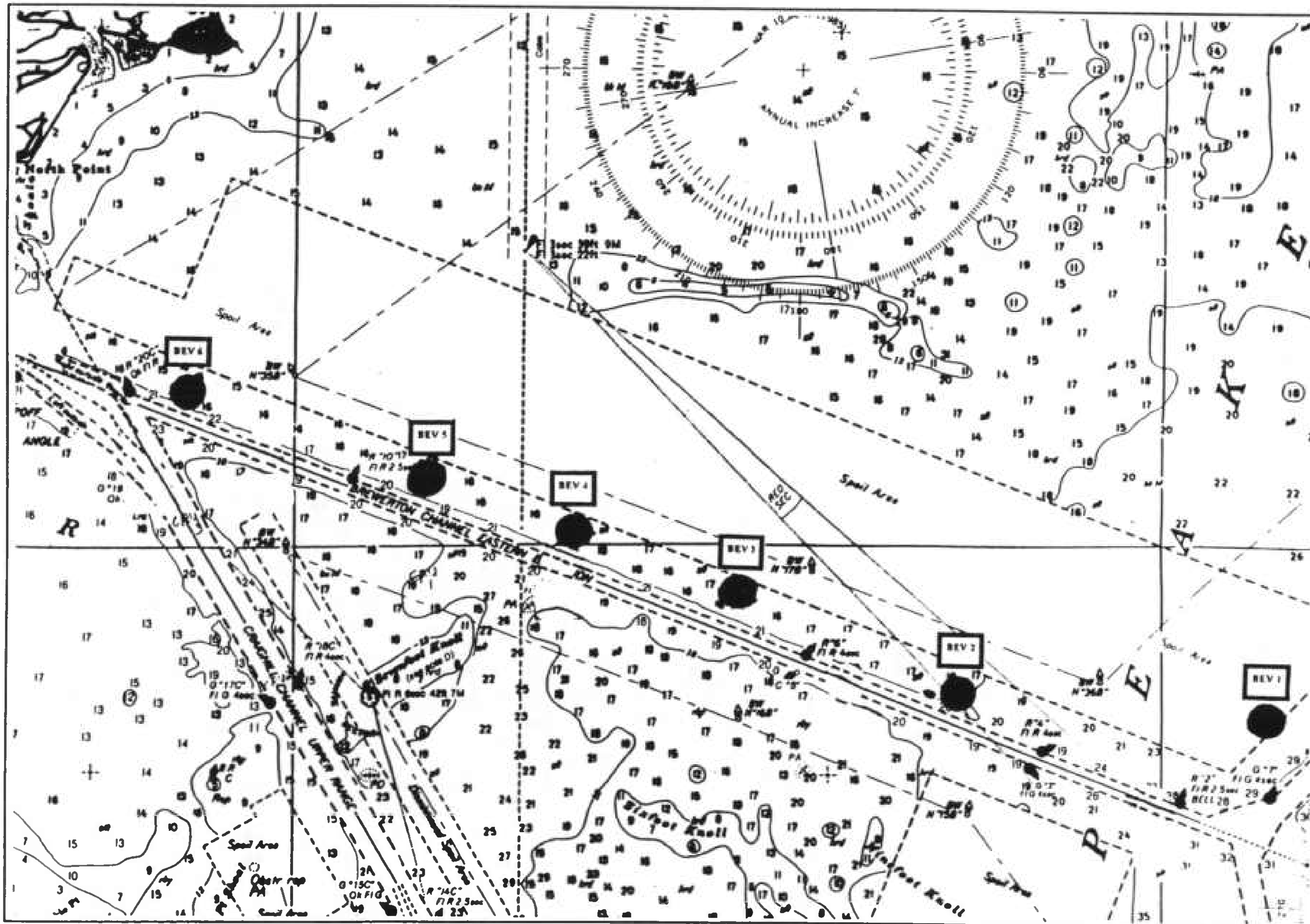

Figure 2-9. Gravity core sampling stations in the Brewerton Eastern Extension.

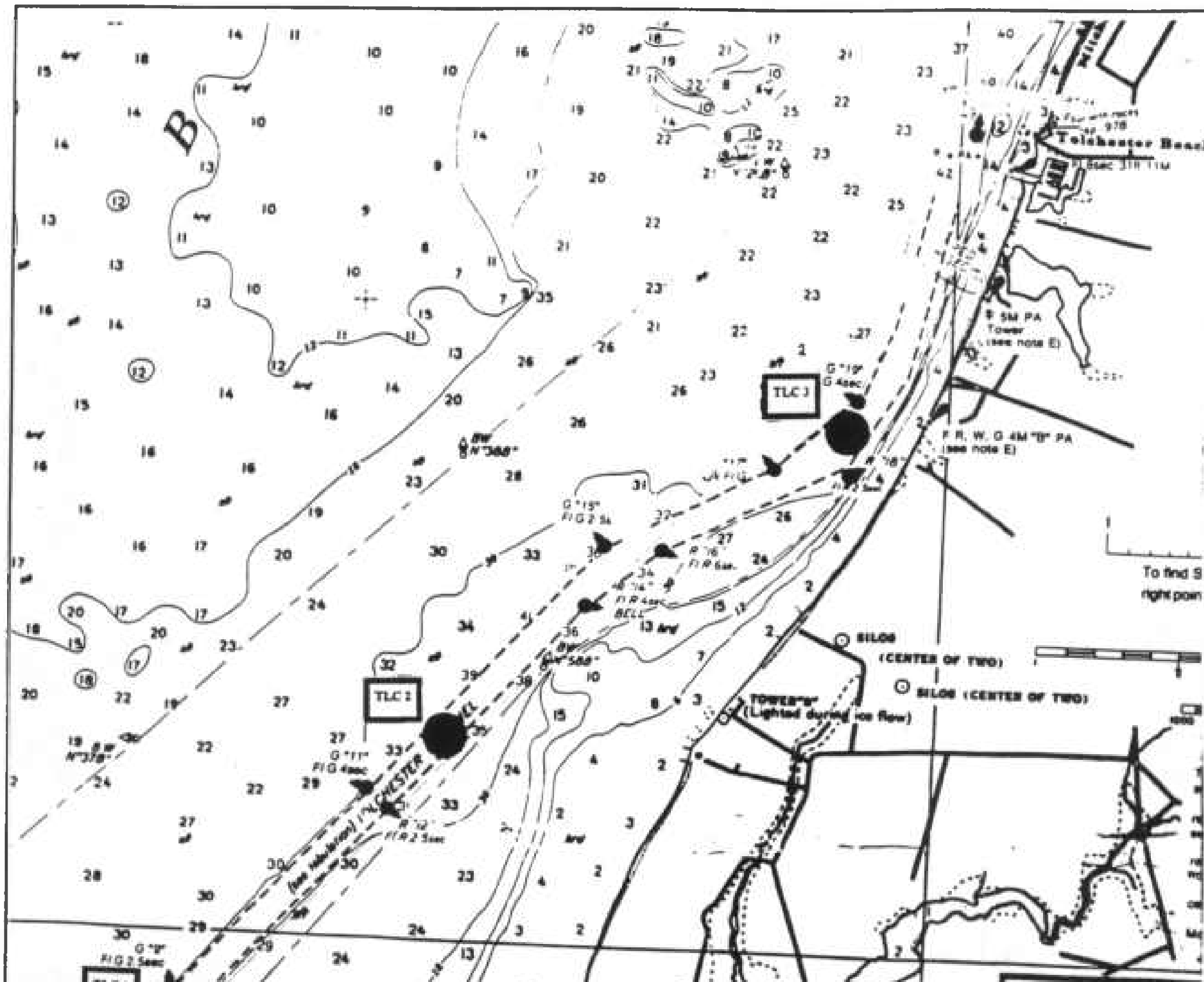

Figure 2-10. Van Veen sampling stations in the Tolchester reach.

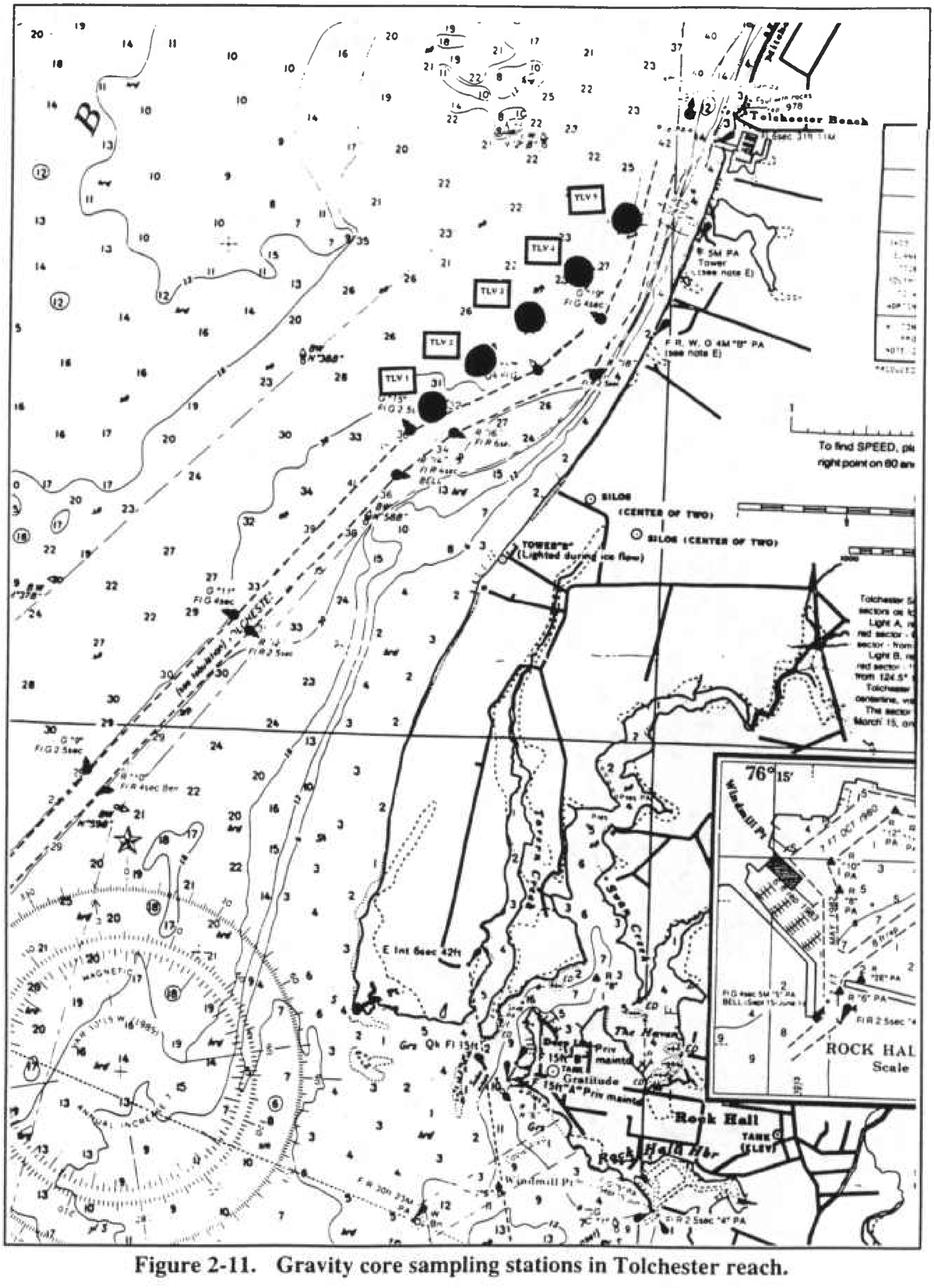

Figure 2-11. Gravity core sampling stations in Tolchester reach.

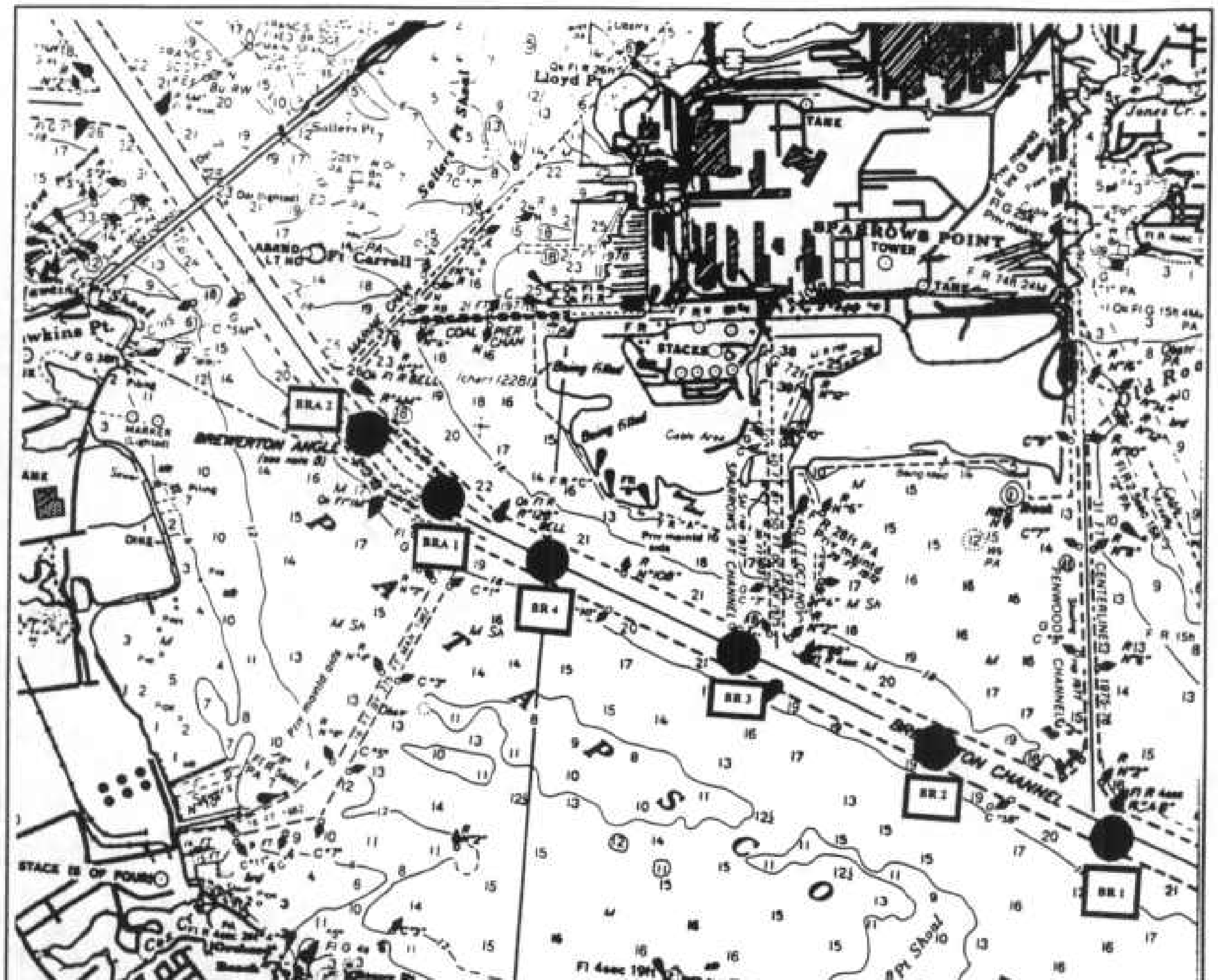

Figure 2-12. Sampling stations in the Brewerton and Brewerton Angle reaches.

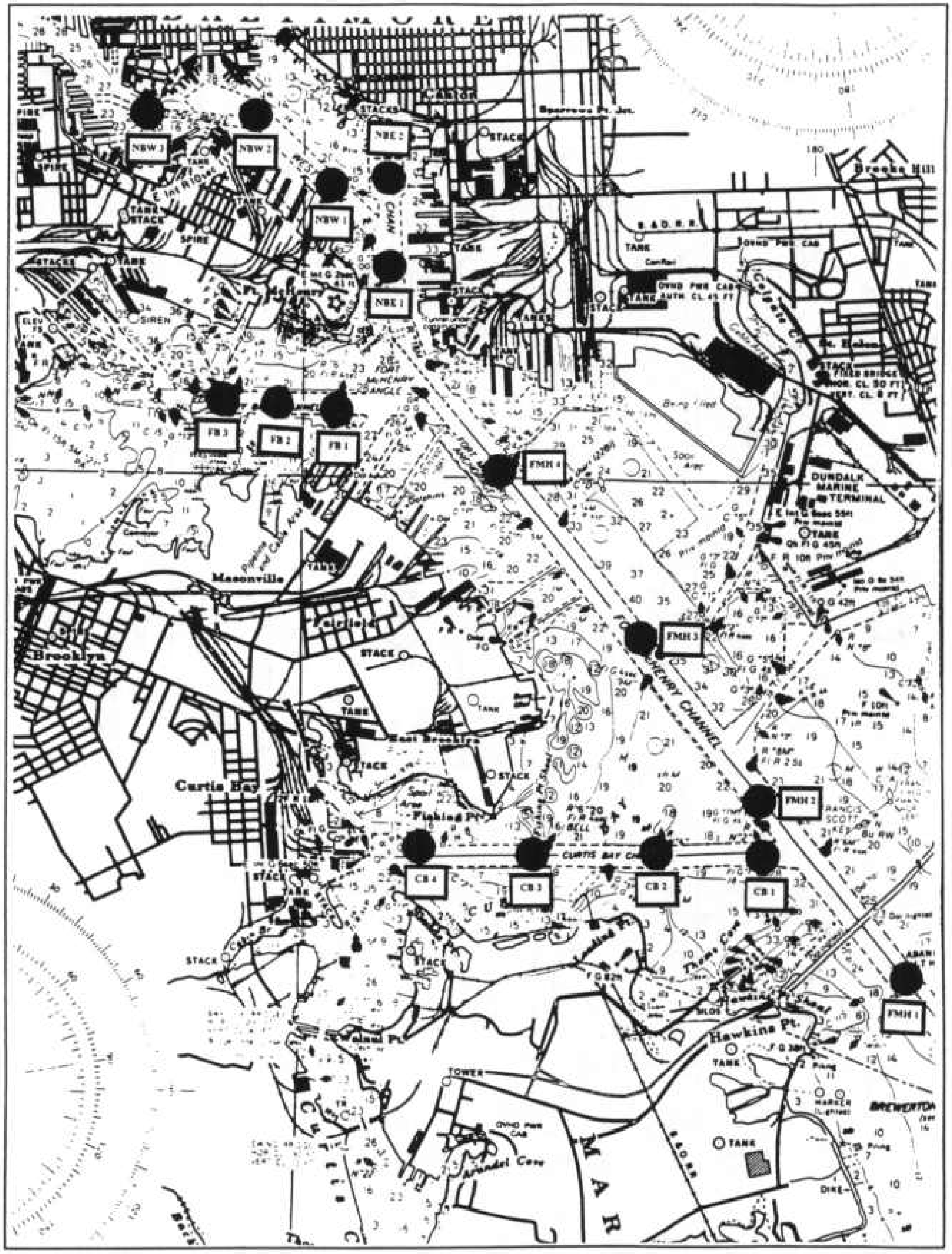

Figure 2-13. Sampling stations in the Curtis Bay, Ft. McHenry, Ferry Bar, Northwest Branch East and Northwest Branch West reaches.

Company Name: EA	Project Manager or Contact: Frank Pine Phone: x2207
Project No. 60787.26 Dept.: 3153 Task: 0003	Project Name: USACE Bay Sediment Sampling
Sample Storage Location:	ATO Number: 2908
Page 1 of 2	Report #:

Chain of Custody Record

EA® EA Laboratories
19 Loveton Circle
Sparks, MD 21152
Telephone: (410) 771-4920
Fax: (410) 771-4407

Report Deliverables: 1 2 3 4 D E
EDD: Yes/No summary tables
DUE TO CLIENT: ______

Parameters/Method Numbers for Analysis

Date	Time	Water	Soil	Sample Identification 19 Characters	No. of Containers *	PPL Organics/8240/8270/8080	Pesticides only/8080*	PCBs only/8080**	PPL Metals 6010/7000	Total Sulfide/SW9030	Tot. Phosphorus/EPA 365.3 Mod	TKN/EPA 351.2 Mod	Nitrate+Nitrite/EPA 353.2 Mod	Nitrogen Ammonia/EPA 350.1 Mod	TOC/SW9060	BOD/EPA 405.1 Mod	COD/EPA 410.4 Mod	EA Labs Accession Number	Remarks
			X																LPM: Mary Aspen/Natasha Sullivan
																			*if PCB concentration
																			exceeds 11.5 ug/kg(wet)
																			PCB Congeners are
																			determined using
																			pesticide extract
																			SW-846 3540 from
																			pesticide only analysis
																			surrogate for
																			pesticide only - TCX
																			**PCB only: 2mL
																			final extract,
																			acid cleanup.

Samples by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time	Airbill Number:	Sample Shipped by: (Circle) Fed Ex. Puro. UPS Hand Carried Other:

Cooler Temp.____C pH: ☐ Yes ☐ No Comments: Custody Seals Intact ☐ Yes ☐ No

NOTE: Please indicate method number for analyses requested. This will help clarify any questions with laboratory techniques.

WHITE—EA Laboratories YELLOW—EA Laboratories PINK—Project Manager *Shaded Areas for Lab Use Only*

Figure 2-14. Sample chain-of-custody record for Bay Sediments .

Chain of Custody Record

EA Laboratories
19 Loveton Circle
Sparks, MD 21152
Telephone: (410) 771-4920
Fax: (410) 771-4407

Company Name: EA

Project Manager or Contact: Frank Pine

Phone: X2207

Project No. 60787.26

Project Name: USACE Bay Sediment Sampling

Dept.: 3153 Task: 0003

Sample Storage Location:

ATO Number: 2908

Page 2 of 2

Report #:

Report Deliverables: 1 2 3 4 D E

EDD Yes/No Summary tables

DUE TO CLIENT:

Parameters/Method Numbers for Analysis

Date	Time	Water	Soil	Sample Identification 19 Characters	No. of Containers	Cyanide/SW9012	Tributyl Tin/SW-846	Aluminum, Iron, Manganese Standard ICP SW-846	Atterburg Limits, Moisture, & Grain Size/ASTM	PAH's by HPLC/SW-846 8310 **	PPL Volatiles/SW-846 8240 ***						EA Labs Accession Number	Remarks
			X															LPM: Mary Aspen/Natasha Sullivan
																		* BNA's 8270 plus Bay Sediment List
																		** PAH's by HPLC plus Bay Sediment List
																		*** PPL Volatiles plus Bay Sediment List

Samples by: (Signature) Date/Time | Relinquished by: (Signature) Date/Time | Received by: (Signature) Date/Time

Relinquished by: (Signature) Date/Time | Received by Laboratory: (Signature) Date/Time | Airbill Number:

Sample Shipped by: (Circle) Fed Ex. Puro. UPS Hand Carried Other:

Cooler Temp.____C pH: Yes No Comments: Custody Seals Intact Yes No

NOTE: Please indicate method number for analyses requested. This will help clarify any questions with laboratory techniques.

WHITE—EA Laboratories YELLOW—EA Laboratories PINK—Project Manager *Shaded Areas for Lab Use Only*

Figure 2-14. (Cont.)

Company Name: EA

Project Manager or Contact: Frank Pine

Phone: X8807

Project No. 60787.26

Project Name: USACE Bay Sediment Sampling

Dept.: 3153 Task 0003

Sample Storage Location:

ATO Number: 8908

Page 1 of 2 Report #:

Parameters/Method Numbers for Analysis

Date	Time	Water	Soil	* Sample Identification 19 Characters	No. of Containers	PPL Organics/8270/8080 **	PPL Metals/6010/7000	Total Sulfide/SW 9030	Tot. Phos/EPA 365.3 Mod	TKN/EPA 351.2 Mod	Nitrate+Nitrite/EPA 353.3 Mod	Nitrogen Ammonia/EPA 350.1 Mod	TOC/SW 9060	BOD/EPA 405.1 Mod	COD/EPA 410.4 Mod	Cyanide/SW 9012	PPL Volatiles/SW-846 8240 ***	EA Labs Accession Number	Remarks
		X																	LPM: Mary Asper / Natasha Sullivan

Chain of Custody Record

EA Laboratories
19 Loveton Circle
Sparks, MD 21152
Telephone: (410) 771-4920
Fax: (410) 771-4407

Report Deliverables: 1 2 3 4 D E

EDD: Yes/No Summary tables

DUE TO CLIENT: ________

Remarks:

* Use for elutriate Sediment composite and (elutriate water)

** BNAs 8270 plus Bay Sediment List

*** PPL Volatiles plus Bay Sediment List

Samples by: (Signature) Date/Time | Relinquished by: (Signature) Date/Time | Received by: (Signature) Date/Time

Relinquished by: (Signature) Date/Time | Received by Laboratory: (Signature) Date/Time | Airbill Number:

Sample Shipped by: (Circle) Fed Ex. Puro. UPS Hand Carried Other:

Cooler Temp.____C pH: Yes No Comments: Custody Seals Intact Yes No

NOTE: Please indicate method number for analyses requested. This will help clarify any questions with laboratory techniques.

WHITE—EA Laboratories YELLOW—EA Laboratories PINK—Project Manager *Shaded Areas for Lab Use Only*

Figure 2-15. Sample chain-of-custody record for reference water and elutriates.

Company Name: EA	Project Manager or Contact: Frank Pine Phone: X2207
Project No. 60787.26 Dept.: 3153 Task: 0003	Project Name: USACE Bay Sediment Sampling
Sample Storage Location:	ATO Number: 2908
Page 2 of 2	Report #:

Parameters/Method Numbers for Analysis

Chain of Custody Record

EA Laboratories
19 Loveton Circle
Sparks, MD 21152
Telephone: (410) 771-4920
Fax: (410) 771-4407

Report Deliverables: 1 2 3 4 D E

EDD: Yes/No Summary tables

DUE TO CLIENT: ____________

Date	Time	Water	Soil	Sample Identification 19 Characters	No. of Containers	Aluminum, Iron, Manganese Standard ICP SW-846										EA Labs Accession Number	Remarks
		X															LPM: Mary Asper/ Natasha Sullivan

Samples by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Date/Time	Received by Laboratory: (Signature)	Date/Time	Airbill Number:	Sample Shipped by: (Circle) Fed Ex. Puro. UPS Hand Carried Other:

Cooler Temp.____C pH: Yes No Comments: Custody Seals Intact Yes No

NOTE: Please indicate method number for analyses requested. This will help clarify any questions with laboratory techniques.

WHITE—EA Laboratories YELLOW—EA Laboratories PINK—Project Manager *Shaded Areas for Lab Use Only*

Figur2-15. (Cont.).

TABLE 2-1 SEDIMENT SAMPLING LOCATIONS

Sampling Reach	Station	Latitude	Longitude	Sampling Method	No. Sediment Samples	No. Elutriate Sediments
Poplar Island	PI 1	38° 44' 03" N	76° 22' 16" W	Van Veen	1 TBT	2 (composite) 5:1 x 2 400 ml each
	PI 2	38° 44' 59" N	76° 23' 29" W	Van Veen	1	
	PI 3	38° 46' 14" N	76° 23' 07" W	Van Veen	1	
	PI 4	38° 46' 39" N	76° 21' 54" W	Van Veen	1	
	PI 5	38° 45' 43" N	76° 21' 40" W	Van Veen	1 TBT	
Deep Trough	DT 1	38° 54' 48" N	76° 23' 14" W	Van Veen	1	1 (composite) 3:1 666 ml each
	DT 2	38° 55' 00" N	76° 23' 18" W	Van Veen	1 TBT	
	DT 3	38° 55' 12" N	76° 23' 18" W	Van Veen	1	
Kent Island Deep	KI 1	38° 59' 42" N	76° 20' 48" W	Van Veen	1	1 (composite) 3:1 666 ml each
	KI 2	39° 00' 51" N	76° 20' 25" W	Van Veen	1 TBT	
	KI 3	39° 01' 31" N	76° 19' 54" W	Van Veen	1	
Swan Point	SWP 1	39° 05' 10" N	76° 18' 28" W	Van Veen	1	1 (composite) 3:1 333 ml each
	SWP 2	39° 05' 48" N	76° 18' 05" W	Van Veen	1 TBT	
	SWP 3	39° 06' 32" N	76° 18' 11" W	Van Veen	1	
Craighill Entrance	CRE 1	39° 02' 34" N	76° 23' 03" W	Van Veen	1	1 (composite) 6:1 333 ml each
	CRE 2	39° 03' 18" N	76° 23' 20" W	Van Veen	1 TBT	
	CRE 3	39° 03' 60" N	76° 23' 36" W	Van Veen	1	
Craighill	CR 1	39° 04' 48" N	76° 23' 41" W	Van Veen	1	
	CR 2	39° 05' 44" N	76° 23' 41" W	Van Veen	1 TBT	
	CR 3	39° 06' 34" N	76° 23' 41" W	Van Veen	1	
Craighill Angle	CRA 1	39° 07' 23" N	76° 23' 47" W	Van Veen	1	1 (composite) 2:1 1000 ml each
	CRA 2	39° 08' 04" N	76° 24' 08" W	Van Veen	1	

Note: TBT (Tributyl Tin) analysis performed <u>only</u> on samples outside of Baltiomore Harbor.

Table 2-1 (continued)

Sampling Reach	Station	Latitude	Longitude	Sampling Method	No. Sediment Samples	No. Elutriate Sediments
Craighill Upper Range	CRU 1	39° 08' 42" N	76° 24' 36" W	Van Veen	1	1 (composite) 6:1 333 ml each
	CRU 2	39° 09' 23" N	76° 25' 03" W	Van Veen	1 TBT	
	CRU 3	39° 10' 06" N	76° 25' 36" W	Van Veen	1	
Cutoff Angle	CUT 1	39° 10' 25" N	76° 25' 52" W	Van Veen	1	
	CUT 2	39° 10' 36" N	76° 26' 07" W	Van Veen	1 TBT	
	CUT 3	39° 10' 45" N	76° 26' 28" W	Van Veen	1	
Tolchester (Van Veen)	TLC 1	39° 09' 39" N	76° 18' 24" W	Van Veen	1	1 (composite) 3:1 666 ml each
	TLC 2	39° 10' 44" N	76° 17' 12" W	Van Veen	1 TBT	
	TLC 3	39° 11' 51" N	76° 15' 28" W	Van Veen	1	
Tolchester (Gravity Core)	TLV 1	39° 11' 32" N	76° 16' 24" W	Gravity Core	1	1 (composite) 5:1 400 ml each
	TLV 3	39° 11' 45" N	76° 16' 07" W	Gravity Core	1	
	TLV 5	39° 11' 57" N	76° 15' 50" W	Gravity Core	1 TBT	
	TLV 7	39° 12' 12" N	76° 15' 34" W	Gravity Core	1	
	TLV 9	39° 12' 26" N	76° 15' 16" W	Gravity Core	1	
Brewerton, Eastern Ext. (Van Veen)	BE 1	39° 08' 51" N	76° 20' 03" W	Van Veen	1	1 (composite) 4:1 500 ml each
	BE 2	39° 09' 23" N	76° 21' 48" W	Van Veen	1 TBT	
	BE 3	39° 09' 54" N	76° 23' 29" W	Van Veen	1	
	BE 4	39° 10' 25" N	76° 25' 12" W	Van Veen	1	
Brewerton, Eastern Ext. (Gravity Core)	BEV 1	39° 08' 56" N	76° 19' 46" W	Gravity Core	1	1 (composite) 6:1 333 ml each
	BEV 2	39° 09' 21" N	76° 21' 10" W	Gravity Core	1	
	BEV 3	39° 09' 44" N	76° 22' 24" W	Gravity Core	1 TBT	
	BEV 4	39° 10' 03" N	76° 23' 23" W	Gravity Core	1	
	BEV 5	39° 10' 18" N	76° 24' 15" W	Gravity Core	1	
	BEV 6	39° 10' 41" N	76° 25' 38" W	Gravity Core	1	

Table 2-1 (continued)

Sampling Reach	Station	Latitude	Longitude	Sampling Method	No. Sediment Samples	No. Elutriate Sediments
Brewerton	BR 1	39° 11' 02" N	76° 27' 23" W	Van Veen	1	1 (composite) 6:1 333 ml each
	BR 2	39° 11' 18" N	76° 28' 12" W	Van Veen	1	
	BR 3	39° 11' 34" N	76° 29' 07" W	Van Veen	1 TBT	
	BR 4	39° 11' 51" N	76° 30' 01" W	Van Veen	1	
Brewerton Angle	BRA 1	39° 12' 03" N	76° 30' 31" W	Van Veen	1	
	BRA 2	39° 12' 15" N	76° 30' 53" W	Van Veen	1	
Curtis Bay	CB 1	39° 13' 18" N	76° 32' 18" W	Van Veen	1	1 (composite) 4:1 500 ml each
	CB 2	39° 13' 19" N	76° 32' 55" W	Van Veen	1	
	CB 3	39° 13' 17" N	76° 33' 38" W	Van Veen	1	
	CB 4	39° 13' 18" N	76° 34' 18" W	Van Veen	1	
Ft. McHenry	FMH 1	39° 12' 46" N	76° 31' 28" W	Van Veen	1	1 (composite) 4:1 500 ml each
	FMH 2	39° 13' 33" N	76° 32' 19" W	Van Veen	1	
	FMH 3	39° 14' 17" N	76° 33' 01" W	Van Veen	1	
	FMH 4	39° 15' 01" N	76° 33' 52" W	Van Veen	1	
Ferry Bar	FB 1	39° 15' 17" N	76° 34' 49" W	Van Veen	1	1 (composite) 3:1 666 ml each
	FB 2	39° 15' 20" N	76° 35' 06" W	Van Veen	1	
	FB 3	39° 15' 20" N	76° 35' 28" W	Van Veen	1	
Northwest Branch East	NBE 1	39° 15' 57" N	76° 34' 30" W	Van Veen	1	1 (composite) 5:1 400 ml each
	NBE 2	39° 16' 21" N	76° 34' 31" W	Van Veen	1	
Northwest Branch West	NBW 1	39° 16' 19" N	76° 34' 51" W	Van Veen	1	
	NBW 2	39° 16' 38" N	76° 35' 17" W	Van Veen	1	
	NBW 3	39° 16' 38" N	76° 35' 55" W	Van Veen	1	
Total No. Samples					69	13
Field Duplicates Blind Splits SRM					2 TBT 2 TBT 1 TBT	
Total No. Samples to be analyzed					74	13

TABLE 2-2 WATER SAMPLING LOCATIONS

Sampling Reach	Station	Latitude	Longitude	Sampling Method	No. Water Samples
Poplar Island	PI 1	38° 44' 03" N	76° 22' 16" W	Teflon bailer	1
	PI 5	38° 45' 43" N	76° 31' 40" W	Teflon bailer	1
Deep Trough	DT 1	38° 54' 48" N	76° 23' 14" W	Niskin	1
Kent Island Deep	KI 3	39° 01' 31" N	76° 23' 18" W	Teflon bailer	1
Pooles Island	POL 1	39° 16' 09" N	76° 13' 34" W	Teflon bailer	1
Total No. Samples					5
Field Duplicates					2
Total No. Samples to be analyzed					7

(a) 12 liters of water will be required for laboratory preparation of each elutriate sample; actual numbers of samples to be collected from each placement site will be determined by the number of dredge sites from which sediment is proposed for disposal at each placement site.

TABLE 2-3 REQUIRED CONTAINERS, PRESERVATION TECHNIQUE, AND HOLDING TIMES[a] FOR SEDIMENT SAMPLES

Parameter	Mass Required (g)[b]	Container[c]	Preservative	Holding Time
Inorganics				
Mercury	5	P	≤20C	30 days
Other Metals	5	P	≤20C	6 months
Cyanide	50	P,G	4C	14 days
Sulfide	10	P,G	4C	7 days
Biochemical Oxygen Demand	10	G	4C	48 hours
Chemical Oxygen Demand	50	P,G	≤20C	28 days
Nitrogen (Ammonia, Total Kjeldahl, Nitrate + Nitrite) Phosphorus	150	P,G	4C	28 days
Physical Parameters				
Total Moisture, Atterburg Limits, Grain Size	1000	P,G	≤20C	6 months
Organics				
Tributyltin	50	Solvent rinsed glass jar with Teflon-lined lid	≤20C	6 months
Total Organic Carbon	5	Heat treated glass vial with Teflon-lined lid	4C	14 days
Pesticides PCB Congeners Semivolatile Organics	400	Solvent rinsed glass jar with Teflon-lined lid	≤20C	10 days until extraction 40 days after extraction
Volatile Organics	50	Heat treated glass vial with Teflon-lined lid	≤20C	10 days

(a) From time of sample collection per *USACE/EPA. 1991. Evaluation of Dredged Material Proposed for Ocean Disposal.*
(b) 3 liters of sediment will be collected for laboratory preparation of each elutriate sample.
(c) P = plastic; G = glass. *National Oceanographic and Atmospheric Administration. July, 1993. Sampling and Analytical Methods of the National Status and Trends Program. National Benthic Surveillance and Mussel Watch Projects. 1984-1992. NOS ORCA 71. NOAA, Silver Spring, Maryland.*

TABLE 2-4. CHEMICAL ANALYSES FOR CHESAPEAKE BAY AND BALTIMORE HARBOR SEDIMENT SAMPLES

SAMPLING LOCATION	SAMPLE ID	PPL Org(a)	PAHs(b)	PCB Congeners(b)	TBT(b)	PPL Metals & Al, Fe, Mn(b)	Total Sulfide(b)	Total Phos. (b)	TKN(b)	NO2 & NO3(b)	Ammonia(b)	TOC(b)	BOD(b)	COD(b)	Cyanide(b)	Atterberg, Moist., Grain size(b)	Elutriate Prep(d)
Poplar Island																	
PI1	PI1SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	
PI2	PI2SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	
PI3	PI3SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	
PI4	PI4SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	
PI5	PI5SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	
Deep Trough																	
DT1	DT1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	
DT2	DT2SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	
DT3	DT3SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	
Kent Island Deep																	
KI1	KI1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	
KI2	KI2SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	
KI3	KI3SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	
Pooles Island																	
POL1	POL1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	
POL1 Matrix spike/Matrix spike dup.	POL1SEDMS/MSD	X	X			X	X	X	X	X	X	X	X	X	X	X	
Swan Point																	
SWP1	SWP1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	SWPEL
SWP2	SWP2SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	SWPEL
SWP3	SWP3SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	SWPEL
Craighill Entrance																	
CRE1	CRE1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	CRE/CREL
CRE2	CRE2SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	CRE/CREL
CRE3	CRE3SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	CRE/CREL
Craighill																	
CR1	CR1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	CRE/CREL
CR2	CR2SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	CRE/CREL
CR2 Field Duplicate	CR2SEDFD	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	
CR3	CR3SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	CRE/CREL
Craighill Angle																	
CRA1	CRA1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	CRAEL
CRA2	CRA2SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	CRAEL
Craighill Upper Range																	
CRU1	CRU1SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	CRU/CUTEL
CRU2	CRU2SED	X	X	X (e)	X	X	X	X	X	X	X	X	X	X	X	X	CRU/CUTEL
CRU2 Matrix spike/Matrix spike dup	CRU2SEDMS/MSD	X	X		X	X	X	X	X	X	X	X	X	X	X	X	CRU/CUTEL
CRU3	CRU3SED	X	X	X (e)		X	X	X	X	X	X	X	X	X	X	X	CRU/CUTEL

TABLE 2-4. CHEMICAL ANALYSES FOR CHESAPEAKE BAY AND BALTIMORE HARBOR SEDIMENT SAMPLES

SAMPLING LOCATION	SAMPLE ID	PPL Org(a)	PAHs(b)	PCB Congeners(b)	TBT(b)	PPL Metals & Al, Fe, Mn(b)	Total Sulfide(b)	Total Phos. (b)	TKN(b)	NO2 & NO3(b)	Ammonia(b)	TOC(b)	BOD(b)	COD(b)	Cyanide(b)	Atterberg, Moist, Grain size(b)	Elutriate Prep(d)
Cutoff Angle																	
CUT1	CUT1SED	X	X	X (c)		X	X	X	X	X	X	X	X	X	X	X	CBU/CUTEL
CUT2	CUT2SED	X	X	X (c)	X	X	X	X	X	X	X	X	X	X	X	X	CBU/CUTEL
CUT3	CUT3SED	X	X	X (c)		X	X	X	X	X	X	X	X	X	X	X	CBU/CUTEL
Tolchester																	
TLC1	TLC1SED	X	X	X (c)		X	X	X	X	X	X	X	X	X	X	X	TLCEL
TLC2	TLC2SED	X	X	X (c)	X	X	X	X	X	X	X	X	X	X	X	X	TLCEL
TLC2 Field Duplicate	TLC2SEDFD	X	X	X (c)	X	X	X	X	X	X	X	X	X	X	X	X	TLCEL
TLC3	TLC3SED	X	X	X (c)		X	X	X	X	X	X	X	X	X	X	X	TLCEL
TLV1	TLV1SED	X	X	X (c)		X	X	X	X	X	X	X	X	X	X	X	TLVEL
TLV2	TLV2SED	X	X	X (c)		X	X	X	X	X	X	X	X	X	X	X	TLVEL
TLV3	TLV3SED	X	X	X (c)	X	X	X	X	X	X	X	X	X	X	X	X	TLVEL
TLV3 Matrix spike/Matrix spike dup	TLV3SEDMS/MSD	X	X		X	X	X	X	X	X	X	X	X	X	X	X	TLVEL
TLV4	TLV4SED	X	X	X (c)		X	X	X	X	X	X	X	X	X	X	X	TLVEL
TLV5	TLV5SED	X	X	X (c)		X	X	X	X	X	X	X	X	X	X	X	TLVEL
Brewerton, Eastern Ext.																	
BE1	BE1SED	X	X	X (c)		X	X	X	X	X	X	X	X	X	X	X	BEEL
BE2	BE2SED	X	X	X (c)	X	X	X	X	X	X	X	X	X	X	X	X	BEEL
BE3	BE3SED	X	X	X (c)		X	X	X	X	X	X	X	X	X	X	X	BEEL
BE4	BE4SED	X	X	X (c)		X	X	X	X	X	X	X	X	X	X	X	BEEL
BEV1	BEV1SED	X	X	X (c)		X	X	X	X	X	X	X	X	X	X	X	BEVEL
BEV2	BEV2SED	X	X	X (c)		X	X	X	X	X	X	X	X	X	X	X	BEVEL
BEV3	BEV3SED	X	X	X (c)	X	X	X	X	X	X	X	X	X	X	X	X	BEVEL
BEV4	BEV4SED	X	X	X (c)		X	X	X	X	X	X	X	X	X	X	X	BEVEL
BEV5	BEV5SED	X	X	X (c)		X	X	X	X	X	X	X	X	X	X	X	BEVEL
BEV6	BEV6SED	X	X	X (c)		X	X	X	X	X	X	X	X	X	X	X	BEVEL
Brewerton																	
BR1	BR1SED	X	X			X	X	X	X	X	X	X	X	X	X	X	BR/BRAEL
BR1 Blind split	BR1SEDBS	(c)	(c)	X (c)		(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	
BR2	BR2SED	X	X			X	X	X	X	X	X	X	X	X	X	X	BR/BRAEL
BR2 Blind split	BR2SEDBS	(c)	(c)	X (c)		(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	
BR3	BR3SED	X	X		X	X	X	X	X	X	X	X	X	X	X	X	BR/BRAEL
BR3 Blind split	BR3SEDBS	(c)	(c)	X (c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	
BR4	BR4SED	X	X			X	X	X	X	X	X	X	X	X	X	X	BR/BRAEL
BR4 Blind split	BR4SEDBS	(c)	(c)	X (c)		(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	
Brewerton Angle																	
BRA1	BRA1SED	X	X			X	X	X	X	X	X	X	X	X	X	X	BR/BRAEL
BRA1 Blind split	BRA1SEDBS	X	X	X (c)		X	X	X	X	X	X	X	X	X	X	X	

TABLE 2-4. CHEMICAL ANALYSES FOR CHESAPEAKE BAY AND BALTIMORE HARBOR SEDIMENT SAMPLES

SAMPLING LOCATION	SAMPLE ID	PPL Org(a)	PAHs(h)	PCB Congeners(h)	TBT(h)	PPL Metals & Al, Fe, Mn(h)	Total Sulfide(h)	Total Phos. (h)	TKN(h)	NO2 & NO3(h)	Ammonia(h)	TOC(h)	BOD(h)	COD(h)	Cyanide(b)	Atterberg, Moist., Grain size(h)	Elutriate Prep(d)
BRA2	BRA2SED	X	X			X	X	X	X	X	X	X	X	X	X	X	BR/BRAEL
Curtis Bay																	
CB1	CB1SED	X	X			X	X	X	X	X	X	X	X	X	X	X	CBEL
CB2	CB2SED	X	X			X	X	X	X	X	X	X	X	X	X	X	CBEL
CB3	CB3SED	X	X			X	X	X	X	X	X	X	X	X	X	X	CBEL
CB4	CB4SED	X	X			X	X	X	X	X	X	X	X	X	X	X	CBEL
Ft. McHenry																	
FMH1	FMH1SED	X	X			X	X	X	X	X	X	X	X	X	X	X	FMHEL
FMH2	FMH2SED	X	X			X	X	X	X	X	X	X	X	X	X	X	FMHEL
FMH3	FMH3SED	X	X			X	X	X	X	X	X	X	X	X	X	X	FMHEL
FMH4	FMH4SED	X	X			X	X	X	X	X	X	X	X	X	X	X	FMHEL
Ferry Bar																	
FB1	FB1SED	X	X			X	X	X	X	X	X	X	X	X	X	X	FBEL
FB1 Matrix spike/Matrix spike dup	FB1SEDMS/MSD	X	X			X	X	X	X	X	X	X	X	X	X	X	FBEL
FB2	FB2SED	X	X			X	X	X	X	X	X	X	X	X	X	X	FBEL
FB3	FB3SED	X	X			X	X	X	X	X	X	X	X	X	X	X	FBEL
Northwest Branch East																	
NBE1	NBE1SED	X	X			X	X	X	X	X	X	X	X	X	X	X	NBE/NBWEL
NBE2	NBE2SED	X	X			X	X	X	X	X	X	X	X	X	X	X	NBE/NBWEL
Northwest Branch West																	
NBW1	NBW1SED	X	X			X	X	X	X	X	X	X	X	X	X	X	NBE/NBWEL
NBW2	NBW2SED	X	X			X	X	X	X	X	X	X	X	X	X	X	NBE/NBWEL
NBW3	NBW3SED	X	X			X	X	X	X	X	X	X	X	X	X	X	NBE/NBWEL

(a) Sample aliquots will be placed in 2 (60 ml) glass VOC containers (for volatiles) and 1 (1 gal) clear wide-mouth glass containers (pest/pcbs, semivolatiles)

(b) Sample aliquots will be placed in 2 (1/2 gal) clear widemouth glass containers.

(c) Two blind splits (of 5) will be selected randomly in the field and submitted to an outside lab; the other half of each split will go to EA for blind split analysis.

(d) Samples will be placed in 1 gal clear wide-mouth glass containers. Samples with the same elutriate designation (e.g., CRE/CR) will be composited by the lab to provide one sediment sample to be used in elutriate prep

(e) Samples will be analyzed if the total PCB concentration is > 11.6 micrograms /kilogram.

TABLE 2-5 SAMPLES TO BE USED FOR PREPARATION OF ELUTRIATE SAMPLES FOR CHESAPEAKE BAY/BALTIMORE HARBOR SEDIMENT QUALITY ANALYSES

Sampling Reach	Station	Sediment Samples	Sediment Aliquot to be Used for Elutriate	Elutriate Water Samples	Water Vol. to be Used for Elutriate	Sample ID for Resulting Composited Elutriate Sample
Swan Point	SWP 1	SWP1SED	666 ml	SWPEW (1 composite)	8 liters	SWPEL
	SWP 2	SWP2SED	666 ml			
	SWP 3	SWP3SED	666 ml			
Craighill Entrance	CRE 1	CRE1SED	333 ml	CRE/CREW (1 composite)	8 liters	CRE/CREL
	CRE 2	CRE2SED	333 ml			
	CRE 3	CRE3SED	333 ml			
Craighill	CR 1	CR1SED	333 ml			
	CR 2	CR2SED	333 ml			
	CR 3	CR3SED	333 ml			
Craighill Angle	CRA 1	CRA1SED	1000 ml	CRAEW (1 composite)	8 liters	CRAEL
	CRA 2	CRA2SED	1000 ml			
Craighill Upper Range	CRU 1	CRU1SED	333 ml	CRU/CUTEW (1 composite)	8 liters	CRU/CUTEL
	CRU 2	CRU2SED	333 ml			
	CRU 3	CRU3SED	333 ml			
Cutoff Angle	CUT 1	CUT1SED	333 ml			
	CUT 2	CUT2SED	333 ml			
	CUT 3	CUT3SED	333 ml			
Tolchester	TLC 1	TLC1SED	666 ml	TLCEW (1 composite)	8 liters	TLCEL
	TLC 2	TLC2SED	666 ml			
	TLC 3	TLC3SED	666 ml			
	TLV 1	TLV1SED	400 ml	TLVEW (1 composite)	8 liters	TLVEL
	TLV 2	TLV2SED	400 ml			
	TLV 3	TLV3SED	400 ml			
	TLV 4	TLV4SED	400 ml			
	TLV 5	TLV5SED	400 ml			

TABLE 2-5 (Continued)

Sampling Reach	Station	Sediment Samples	Sediment Aliquot to be Used for Elutriate	Elutriate Water Samples	Water Vol. to be Used for Elutriate	Sample ID for Resulting Composited Elutriate Sample
Brewerton, Eastern Ext.	BE 1	BE1SED	500 ml	BEEW (1 composite)	8 liters	BEEL
	BE 2	BE2SED	500 ml			
	BE 3	BE3SED	500 ml			
	BE 4	BE4SED	500 ml			
	BEV 1	BEV1SED	333 ml	BEVEW (1 composite)	8 liters	BEVEL
	BEV 2	BEV2SED	333 ml			
	BEV 3	BEV3SED	333 ml			
	BEV 4	BEV4SED	333 ml			
	BEV 5	BEV5SED	333 ml			
	BEV 6	BEV6SED	333 ml			
Brewerton	BR 1	BR1SED	333 ml	BR/BRAEW (1 composite)	8 liters	BR/BRAEL
	BR 2	BR2SED	333 ml			
	BR 3	BR3SED	333 ml			
	BR 4	BR4SED	333 ml			
Brewerton Angle	BRA 1	BRA1SED	333 ml			
	BRA 2	BRA2SED	333 ml			
Curtis Bay	CB 1	CB1SED	500 ml	CBEW (1 composite)	8 liters	CBEL
	CB 2	CB2SED	500 ml			
	CB 3	CB3SED	500 ml			
	CB 4	CB4SED	500 ml			
Ft. McHenry	FMH 1	FMH1SED	500 ml	FMHEW (1 composite)	8 liters	FMHEL
	FMH 2	FMH2SED	500 ml			
	FMH 3	FMH3SED	500 ml			
	FMH 4	FMH4SED	500 ml			

TABLE 2-5 (Continued)

Sampling Reach	Station	Sediment Samples	Sediment Aliquot to be Used for Elutriate	Elutriate Water Samples	Water Vol. to be Used for Elutriate	Sample ID for Resulting Composited Elutriate Sample
Ferry Bar	FB 1	FB1SED	666 ml	FBEW (1 composite)	8 liters	FBEL
	FB 2	FB2SED	666 ml			
	FB 3	FB3SED	666 ml			
Northwest Branch East	NBE 1	NBE1SED	400 ml	NBE/NBWEW (1 composite)	8 liters	NBE/NBWEL
	NBE 2	NBE2SED	400 ml			
Northwest Branch West	NBW 1	NBW1SED	400 ml			
	NBW 2	NBW2SED	400 ml			
	NBW 3	NBW3SED	400 ml			
Total No. Samples		57		13		13

TABLE 2-6 REQUIRED CONTAINERS, PRESERVATION TECHNIQUE, AND HOLDING TIMES [a] FOR SITE WATER AND ELUTRIATE WATER SAMPLES

Parameter	Volume Required (mL)[b]	Container[c]	Preservative	Holding Time
Inorganics				
Mercury	100	P	pH <2 with HNO_3 Cool, 4 C	14 days
Other Metals	100	P	pH <2 with HNO_3 Cool, 4 C	6 months
Cyanide	500	P,G	NaOH to pH >12 Ascorbic Acid Cool, 4 C	14 days 24 hours in presence of S^{2-}
Sulfide	500	P,G	NaOH to pH >9 Zinc Acetate Cool, 4 C	7 days
Biochemical Oxygen Demand	1000	P,G	Cool, 4 C	48 hours
Chemical Oxygen Demand	50	P,G	H_2SO_4 to pH <2	28 days
Nitrogen (Ammonia, Total Kjeldahl, Nitrate + Nitrite) Total Phosphorus	1050	P,G	H_2SO_4 to pH <2 Cool, 4 C	28 days
Organics				
Tributyltin	2000	G	Cool, 4 C	6 months
Total Organic Carbon	50	P,G	H_2SO_4 or HCl to pH <2 Cool, 4 C	28 days
Pesticides PCB Congeners Semivolatile Organics	2000	G, teflon-lined cap	Cool, 4 C	7 days until extraction 40 days after extraction
Volatile Organics	80	G, teflon-lined septum	Cool, 4 C	14 days

(a) From time of sample collection per *USACE/EPA. 1991. Evaluation of Dredged Material Proposed for Ocean Disposal.*
(b) 12 liters (3 gal) of water will be collected for preparation of each elutriate sample.
(c) P = plastic; G = glass. *National Oceanographic and Atmospheric Administration. July, 1993. Sampling and Analytical Methods of the National Status and Trends Program. National Benthic Surveillance and Mussel Watch Projects. 1984-1992. NOS ORCA 71. NOAA, Silver Spring, Maryland.*

TABLE 2-7. CHEMICAL ANALYSES FOR CHESAPEAKE BAY AND BALTIMORE HARBOR REFERENCE WATER AND ELUTRIATE WATER SAMPLES

SAMPLING LOCATION	SAMPLE ID	PPL Org(a)	PPL VOAs (b)	PPL Metals & Al, Fe, Mn(c)	Total Sulfide(d)	Total Phosphorus(e)	TKN(e)	NO2 & NO3(e)	Ammonia(e)	TOC(e)	BOD(f)	COD(e)	Cyanide(g)
WATER CHEMISTRY													
Poplar Island													
PI1	PI1WAT	X		X	X	X	X	X	X	X	X	X	X
PI1 Field Duplicate	PI1WATFD	X		X	X	X	X	X	X	X	X	X	X
PI1 Matrix spike	PI1WATMS	X		X	X	X	X	X	X	X	X	X	X
PI1 Matrix spike duplicate	PI1WATMSD	X		X	X	X	X	X	X	X	X	X	X
PI5	PI5WAT	X		X	X	X	X	X	X	X	X	X	X
Deep Trough													
DT1	DT1WAT	X		X	X	X	X	X	X	X	X	X	X
Kent Island Deep													
KI3	KI3WAT	X		X	X	X	X	X	X	X	X	X	X
KI3 Field Duplicate	KI3WATFD	X		X	X	X	X	X	X	X	X	X	X
Pooles Island													
POL1	POL1WAT	X		X	X	X	X	X	X	X	X	X	X
TRIP BLANKS													
Day1	TBMMDDYY		X										
Day 2	TBMMDDYY		X										
Day 3	TBMMDDYY		X										
Day 4	TBMMDDYY		X										
Day 5	TBMMDDYY		X										
Day 6	TBMMDDYY		X										
Day 7	TBMMDDYY		X										
Day 8	TBMMDDYY		X										
Day 9	TBMMDDYY		X										
Day 10	TBMMDDYY		X										
ELUTRIATES													
Swan Point	SWPEL	X		X	X	X	X	X	X	X	X	X	X
Craighill Entrance/Craighill	CRE/CREL	X		X	X	X	X	X	X	X	X	X	X
Craighill Angle	CRAEL	X		X	X	X	X	X	X	X	X	X	X
Craighill Upper Range/Cutoff Angle	CRU/CUTEL	X		X	X	X	X	X	X	X	X	X	X
Tolchester (Van Veen)	TLCEL	X		X	X	X	X	X	X	X	X	X	X
Tolchester (Core)	TLVEL	X		X	X	X	X	X	X	X	X	X	X
Brewerton, Eastern Ext. (Van Veen)	BEEL	X		X	X	X	X	X	X	X	X	X	X
Brewerton Eastern Ext. (Core)	BEVEL	X		X	X	X	X	X	X	X	X	X	X
Brewerton/Brewerton Angle	BR/BRAEL	X		X	X	X	X	X	X	X	X	X	X
Curtis Bay	CBEL	X		X	X	X	X	X	X	X	X	X	X
Ft. McHenry	FMHEL	X		X	X	X	X	X	X	X	X	X	X
Ferry Bar	FBEL	X		X	X	X	X	X	X	X	X	X	X
Northwest Branch East/NW Branch West	NBE/NBWEL	X		X	X	X	X	X	X	X	X	X	X

(a) Samples will be placed in 2 (40 ml) glass VOC containers (for volatiles) and 4 (1 liter) clear glass containers (pest/pcbs, semivolatiles).

(b) Samples will be placed in 2 (40 ml) glass containers.

(c) Samples will be placed in a "C" bottle preserved with HNO3.

(d) Samples will be placed in an "I" bottle preserved with zinc acetate

(e) Samples will be placed in a 500 ml "B" bottle preserved with H2SO4

(f) Samples will be placed in a 500 ml "A" bottle (no preservative)

(g) Samples will be placed in a "G" bottle preserved with NAOH

(h) Sample IDs and volumes used in elutriate preparation are listed in Table 2-5

3. SAMPLE ANALYSIS

Table 3-1 includes the analytical parameters and methods for both sediment and water samples to be collected for this project.

TABLE 3-1 ANALYTICAL PARAMETERS AND ANALYTICAL METHODS FOR SEDIMENTS AND WATER

Analytes	Analytical Method	Matrix	Quantity
PPL organics (volatiles, semivolatiles, pesticides/PCBs) by GC and GCMS	SW 8240/SW 8270/SW 8080/SW8310 (1)	Sediment	74
	SW 8240/SW 8270/SW 8080 (1)	Water/Elutriate	20
Organotins	SW 846 (1)	Sediment	19
PPL metals and aluminum, iron, and manganese	SW 6010/SW 7000 (1)	Sediment Water/Elutriate	74 20
Cyanide	SW 9012 (1)	Sediment Water/Elutriate	74 20
Total sulfide	SW 9030 (1)	Sediment Water/Elutriate	74 20
Total phosphorus	EPA 365.3 (modified) (2)	Sediment Water/Elutriate	74 20
Total Kjeldahl nitrogen (TKN)	EPA 351.2 (modified) (2)	Sediment Water/Elutriate	74 20
Nitrate plus nitrite	EPA 353.2 (modified) (2)	Sediment Water/Elutriate	74 20
Ammonia nitrogen	EPA 350.1 (modified) (2)	Sediment Water/Elutriate	74 20
Total organic carbon (TOC)	SW 9060 (1)	Sediment Water/Elutriate	74 20
Biochemical oxygen demand (BOD)	EPA 405.1 (modified) (2)	Sediment Water/Elutriate	74 20
Chemical oxygen demand (COD)	EPA 410.4 (modified) (2)	Sediment Water/Elutriate	74 20
Atterberg limits, grain size distribution, percent moisture	ASTM D4318, D422, D4959 (3)	Sediment	74

(1) U.S. EPA. August 1993. Test Methods for Evaluating Solid Waste. Physical/Chemical Methods. EPA SW-846, 3rd edition. U.S. EPA, Washington, D.C.

(2) U.S. EPA. 1979. Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020. U.S. EPA, Cincinnati, OH.

(3) American Society for Testing and Materials. 1994. Annual Book of ASTM Standards. Volume 4.08. ASTM, Philadelphia, PA.

4. DATA PRESENTATION

Analytical results will be incorporated into a data report. Chemical data will be presented on analytical report forms. Associated QA/QC results will be reported along with the analytical data.

5. STATISTICAL ANALYSIS

All statistical analyses for the chemical data provided by EA will be performed by USACE. Analytical data will be provided by EA in an electronic copy to facilitate statistical analysis.

6. REPORT PRODUCTION

Analytical results will be incorporated into a data report. This report will include a description of sample collection, analytical methods used, and locations of sampling stations, as well as tabulated results for all sediment analyses and associated QA/QC results. An electronic copy of all reports will be provided in Word Perfect 6.0 format. In addition, analytical data will be provided electronically in a Lotus .WK4 compatible format.

7. PROJECT SCHEDULE

It is anticipated that the pre-sampling meeting will be held during the week of 22 September, during which the SP and QAPP will be presented and discussed. Sampling will be initiated following USACE approval of the SP and the QAPP. It is anticipated that sampling will begin 16 October. It is anticipated that sampling will occur over a two to four week period. EA will provide an overview of activities to date during the post-sampling meeting, which will be held within two weeks after the completion of sample collection.

Analytical results will be incorporated into a data report. The draft data report will be completed six weeks after the last field sample is submitted for analysis. The final report will be submitted four weeks after submittal of the draft report.

8. REFERENCES

EA Engineering, Science, and Technology (EA). 1995. Draft Quality Assurance Management Plan for FY 1995 Sediment Sampling and Chemical Analysis for Baltimore Harbor and Chesapeake Bay, Maryland. Prepared by EA for U.S. Army Corps of Engineers. EA, Hunt Valley, MD.

U.S. EPA. 1994. Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual. EPA 823-B-94-002. U.S. EPA and U.S. Army Corps of Engineers, Washington, D.C.

U.S. EPA. 1995. QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations. EPA 823-B-95-001. U.S. EPA and U.S. Army Corps of Engineers, Washington, D.C.

Appendix B
Final Quality Assurance Project Plan
(QAPP)

FINAL

QUALITY ASSURANCE PROJECT PLAN FOR TESTING OF DREDGED MATERIAL PROPOSED FOR BAY DISPOSAL

Prepared for:

Corps of U.S. Army Engineers
Baltimore Disirict
Baltimore

Prepared by:

EA Laboratories
19 Loveton Circle
Sparks, Maryland 21152

November 1995

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Quality Assurance Plan For
Testing of Dredged Material
Proposed for Bay Disposal

REVIEW AND APPROVAL

Prepared by:

Minnie M. Uhlfelder 13 November 1995

M. M. Uhlfelder Date
Quality Services Manager, EA Laboratories

Reviewed by:

D. S. Santoro 15 November 1995

D. S. Santoro Date
Director, Corporate Quality Assurance
EA Engineering, Science, and Technology, Inc.

Approved by:

22 November 1995

F. Pine Date
Project Manager
EA Engineering, Science, and Technology, Inc.

November 1995

1. INTRODUCTION

1.1 PROGRAM DESCRIPTION

Under Section 404 of the Federal Water Pollution Control Act of 1972 (FWPCA), Public Law 92-500, as amended by the Clean Water Act of 1977 (CWA), Public Law 95-217, all proposed operations involving the transportation and discharge of dredged material into inland and near coastal waters are to be evaluated to determine the potential impacts of such activities. In accordance with this regulation, the Environmental Protection Agency (EPA), in conjunction with the U.S. Army Corps of Engineers (USACE), has developed a testing manual to define procedures for the evaluation of the suitability of sites to receive dredged material. This manual, *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. - Testing Manual (Draft)* (EPA-823-B-94-002, June 1994), is commonly referred to as the Inland Testing Manual (ITM).

The technical guidance in the ITM is consistent with Federal Guidelines (CWA Section 404(b)(1) Guidelines) and is intended for use by USACE and EPA personnel in order to obtain results which will be utilized within the context of regulatory requirements to facilitate decision-making with regard to management of the dredged material.

Both EA Engineering, Science and Technology, Inc. (EA) and EA Laboratories (a division of EA) are under contract to the USACE to collect samples and to perform specified constituent analyses of sediments proposed for dredging in FY96 and FY97 in order to assist in determining the suitability of selected sites for disposal of these materials consistent with the Guidelines and the ITM.

1.2 QUALITY ASSURANCE PLAN

EA Laboratories has prepared this Quality Assurance Project Plan (QAPjP), with guidance from the USACE, Baltimore District, to identify the policies, organization, objectives, functional activities, and specific activities designed to achieve the desired quality goals for analytical chemistry support operations set forth in the ITM.

This QAP includes the following:

- Descriptions of all technical procedures for sample custody control and traceability from sample delivery to results reported to clients, laboratory analyses, data reduction, data validation and data reporting.

- Standard Operating Procedures (SOPs) and EA Laboratories Analytical Methods used in support of this program.
- QA objectives which are consistent with the ITM.
- Policy and procedures for the conduct of performance and systems audits.
- Corrective Action procedures.

2. PROGRAM ORGANIZATION AND CONTACTS

2.1 PROGRAM ORGANIZATION AND RESPONSIBILITIES

EA Laboratories organizational positions of management and technical staff are shown in Figure 2-1. EA Laboratories also maintains a list of sub-contractor laboratories which can serve the needs of the client. Some analytical procedures identified in the scope of work have been subcontracted to validated USACE-certified laboratories identified in Figure 2-2. All subcontracted data will conform to the criteria outlined within this QAPjP; contact and monitoring will be effected through the Laboratory Project Manager as indicated below.

The following lists the specific responsibilities of each position.

Director, EA Laboratories

- Ensures laboratory data quality.
- Maintains laboratory staffing.
- Develops laboratory budget.
- Ensures laboratory safety.
- Approves laboratory equipment acquisition.
- Promotes laboratory marketing and client interface.
- Sets analytical priorities.

Quality Services Manager (QSM)

- Develops EA Laboratories QA program.
- Manages state and federal laboratory certifications.
- Maintains EA Laboratories QA, SOP and methods manuals.
- Maintains an independent Quality Assurance staff.
- Responsible for review and approval of nonconformance reports (NCRs).
- Exercises authority to shut down any instrument, method or operational group if an out-of-control situation exists.
- Conducts performance, systems and data audits.
- Provides escort for all inspections, provides written response to findings, and maintains audit records.
- Oversees personnel training on QC requirements and procedures, distributes quality related information, procedural changes, and guidance to departmental personnel.

Laboratory Project Manager (LPM)

- Serves as client-laboratory contact through project duration.
- Responsible for identifying project specific QA/QC requirements.
- Coordinates projects for the duration of their life cycle within the laboratory.
- Ensures coordination of production efforts, on-time delivery of data packages which meet all client specifications for parameters, methods, quality control, and report format.
- Serves as sub-contractor laboratory liaison throughout the project duration.

Information Systems Manager (ISM)

- Responsible for the site preparation, and onsite configuration of hardware and software for EA Laboratories' Laboratory Management Information System (LIMS).
- Identifies custom programming needs, and prepares protocols for system operation.
- Responsible for user training, and routine system maintenance.
- Assists the Director, EA Laboratories by providing specialized technical knowledge in overall computerization of laboratory functions, including data management, scheduling, management reports, and financial reports.

Division Manager (DM)

- Responsible for the implementation of their respective analytical programs operating in the inorganics and organics laboratories.
- Provides technical knowledge of methodologies and instrumentation for group, company, and clients.
- Responsible for data review against project requirements and internal quality control criteria.
- Plans for expansions or purchases in order to increase the efficiency of the operation.
- Provides information on capacity, pricing, and scheduling of work.
- Performs personnel functions such as hiring, performance reviews, time sheet approval, time-off approval, and salary adjustment recommendations.
- Troubleshoots instruments and keeps up-to-date with instrument and software developments.

Laboratory Supervisor (LS)

- Participates in planning laboratory programs on the basis of specialized knowledge of problems and methods and probable value of results.
- Assist the Division Managers in one or more areas of overall management of the analytical laboratory, including personnel, physical plant, and financial budgeting and planning.
- Troubleshoots problems regarding analytical procedures and equipment performance.

- Performs quantitative and qualitative analyses using manual or specialized and complex instrumental methods.
- Fully competent and proficient in the operation of sophisticated scientific equipment.
- Interprets results, prepares reports, and provides technical advice in specialized area.
- Supervises and trains staff in methods of analyses, standard operating procedures, and QA/QC requirements.
- Provides advice to Division Managers in budgetary and personnel matters.

Sample Management Officer (SMO)

- Receives, logs, and assigns control numbers to incoming samples.
- Inspects sample shipping containers for presence/absence and condition of:
  - Custody seals, locks, "evidence tape," etc.
  - Container breakage and/or container integrity
- Records condition of both shipping containers and sample containers (bottles, jars, cans, etc.).
- Signs documents shipped with samples (i.e., air bills, chain-of-custody records, etc.).
- Verifies and records agreement or nonagreement of information on sample documents (i.e., sample tags, chain-of-custody records, traffic reports, air bills, etc.) in appropriate logbooks or on appropriate forms. If there is nonagreement, recording the problems, and notifying appropriate laboratory personnel for contacting the Laboratory Project Manager for direction.
- Labels samples with laboratory accession numbers, cross-referencing laboratory numbers to client numbers and/or sample tag numbers.
- Controls access to samples in storage and assuring that laboratory standard operating procedures are followed when samples are removed from and returned to storage.
- Monitors storage conditions for proper sample preservation such as refrigeration temperature and prevention of cross-contamination.
- Returns shipping containers to the proper sampling teams.
- Follows standard operating procedures applicable to sample management.
- Responsible for sample storage facilities. Maintains a log record on these facilities, including temperature of storage rooms, and procedures for sample storage area.
- Follows all laboratory safety rules.

2.2 PROGRAM CONTACTS

The following persons are identified as contacts for this program:

Contact	Function	Company	Phone Number	Ext	Fax Number
Frank Pine	Project Manager	EA Engineering, Science & Technology, Inc.	410-584-7000	2207	410-527-1840
A. Reza Karimi	Vice President &Laboratory Director	EA Laboratories	410-771-4920	310	410-771-4407
Mimi M. Uhlfelder	Quality Services Manager	EA Laboratories	410-771-4920	308	410-771-4407
Mary E. Asper	Sample Management Officer	EA Laboratories	410-771-4920	315	410-771-4407
Natasha K. Sullivan	Laboratory Project Manager	EA Laboratories	410-771-4920	335	410-771-4407
Paul D'Amato	Project Contact	E_2SI	410-466-1400		410-466-7371
Allen Uhler	Project Contact	Battelle	617-934-0571		617-934-2124

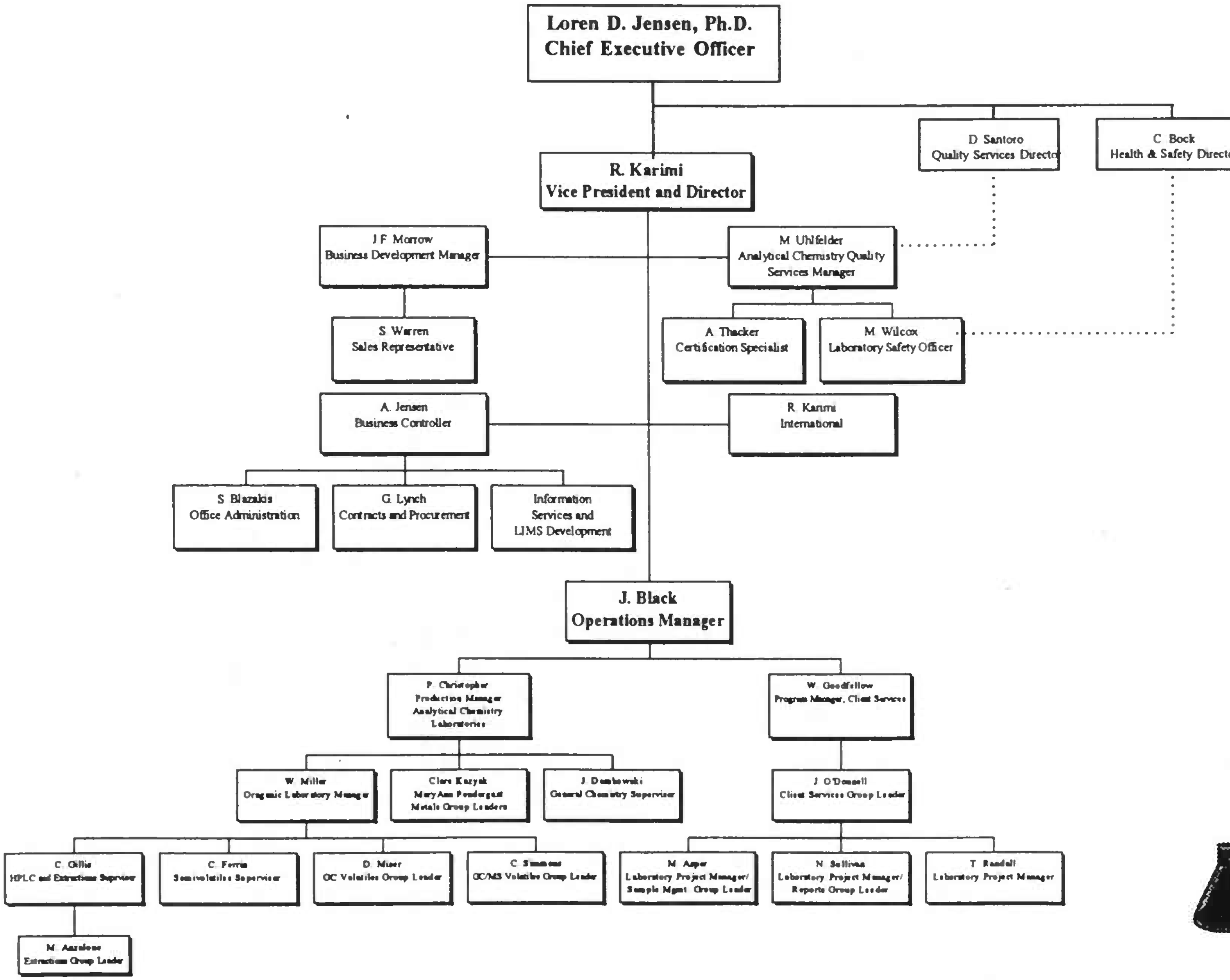
Figure 2-2. Program Contacts

2.3 SUBCONTRACTED ANALYSIS

There are two subcontracted laboratories that will be responsible for specific analyses. All physical analyses will be conducted by E_2SI, located in Baltimore, MD. They will provide analyses for: grain size, Atterberg limits, and moisture content. Battelle Laboratories, located in Boston, MA, will provide analysis for organotin compounds.

Figure 2-1. EA Laboratories Program Organization

Laboratories' Organization



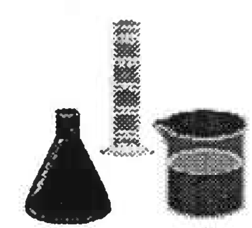


Figure 6-1

SOQ02/95

3. QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA

3.1 DATA USES

The purpose of this QAPjP is to provide a standard for control and review of measurement data to ensure they are scientifically sound, defensible, and of known acceptable quality. The data will be used to determine the appropriate methods and locations for placement of mid-Chesapeake Bay bottom sediments proposed to be dredged. Program objectives for analytical testing are:

- Test and characterize site water and elutriate.
- Test and characterize sediments representative of proposed dredge sites with regard to physical characteristics and chemical contamination.

3.2 DATA QUALITY OBJECTIVES

3.2.1 Characteristics of Data Quality

The PARCC (precision, accuracy, representativeness, completeness and comparability) parameters are the characteristics of data quality. Table 3-1 lists the formulas used to calculate precision, accuracy, and completeness.

- *Precision* is the mutual agreement among individual measurements of the same property and is a measure of the random error component of the data collection process. The overall precision of the data is the sum of that due to sampling and analysis. To determine the analytical precision of the method and/or laboratory analyst, a routine program of replicate analyses is performed. The results of the replicate analyses are used to calculate the relative percent difference (RPD), which is the governing quality control parameter for precision. For triplicate analyses, the relative standard deviation is reported.

- *Accuracy* is the agreement between a measurement and the true value. It is a measure of the bias or systematic error of the entire data collection process. Sampling accuracy is assessed by evaluating the results of field and trip blanks. To determine the accuracy of an analytical method a periodic program of laboratory control sample spiking is conducted. The results of sample spiking are used to calculate the quality control parameter for accuracy evaluation, the percent recovery (%R).

- *Representativeness* is the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is a quantitative parameter that is most concerned with the proper design and implementation of the sampling program. The sampling program has been designed so that the samples collected are as representative as possible of the medium being sampled and that a sufficient number of samples will be collected. Representativeness is addressed by the description of the sampling techniques and the rationale used to select the sampling locations.

- *Completeness* is the adequacy in quantity of valid measurements to prevent misinterpretation and to answer important questions. For this program, the data completeness objective is 90 percent.

- *Interbatch Comparability* is the extent to which comparisons among different measurements of the same quantity or quality will yield valid conclusion. For this program, comparability among measurements will be achieved through the use of control charts for Laboratory Control Samples (LCS). Establishment of control limits, and generation and evaluation of control charts are discussed in Section 9 of this QAPjP.

In addition to the PARCC parameters, program objectives have been established for method detection limits (MDLs) which are discussed in Section 7.2 of this QAPjP.

3.2.2 Quantitative Objectives for Precision and Accuracy

The objectives for precision and accuracy for each chemical are based on the capabilities of the approved EPA analytical method with respect to laboratory performance. Appendix A presents the quantitative objectives for accuracy and precision for the various parameter groups for laboratory performance and evaluation of sample measurement bias.

TABLE 3-1 DATA QUALITY CHARACTERISTICS FORMULAS

CHARACTERISTIC	FORMULA	SYMBOLS
Precision (as relative percent difference, %RPD)	$RPD = \frac{\lvert x_1 - x_2 \rvert}{(x_1 + x_2)/2} 100 = \frac{\lvert x_1 - x_2 \rvert}{(x_1 + x_2)} \times 200$	x_1, x_2 = duplicate values.
Precision (as relative standard deviation, %RSD)	$RSD(\%) = \frac{s}{\overline{X}} \times 100$	s = standard deviation $\overline{X}$ = mean of the measurements.
Accuracy (as percent recovery (%R) for samples without a background level of the analyte, such as reference materials, laboratory control samples, and performance evaluation samples)	$\%R = \frac{X}{T} \times 100$	X = found concentration T = true or assumed concentration
Accuracy (as percent recovery (%R) for measurements in which a known amount of analyte (a spike) is added to an environmental sample)	$\%R = \frac{X - B}{T} \times 100$	X = found concentration B = background concentration T = true or assumed concentration
Completeness	$C = \frac{N}{S} \times 100$	C = completeness (%) N = number of valid data S = number of samples collected

4. SAMPLING

Sampling procedures are addressed separately in the Sampling Plan.

5. SAMPLE CUSTODY

5.1 CHAIN-OF-CUSTODY OPERATIONS

Samples are physical evidence and should be handled according to certain procedural safeguards. For the purposes of legal proceedings, a showing to the court that the laboratory is a secure area may be all that is required for the analyzed evidence to be admitted. However, it is anticipated that in some cases, the court may require a showing of the hand-to-hand custody of the samples from sampling through disposal.

Although EA Laboratories is not involved in sampling activities, in the event that the court requires such a comprehensive chain-of-custody demonstration, the laboratory is prepared to produce documentation that traces the in-house custody of the samples from the time of receipt to the completion of the analysis.

The National Enforcement Investigations Center (NEIC) of U.S. EPA defines custody of evidence in the following ways:

- It is in your actual possession; or
- It is in your view, after being in your physical possession; or
- It was in your possession and then you locked or sealed it up to prevent tampering; or
- It is in a secure area.

5.1.1 Sample Bottle Preparation

The chain-of-custody procedure actually begins with the preparation of the sample containers and preservatives to be used in sample collection. For this program, EA Laboratories purchases and distributes pre-cleaned sample containers. Vendors are required to provide documentation of analysis for each lot of containers, and the documentation is kept on file in the Sample Management Office. Contaminant levels are also evaluated annually by the laboratory through analysis of randomly selected containers in each vendor lot (EAL-SOP-202).

In the event that certified pre-cleaned containers are not available, sample containers are cleaned in the laboratory according to the procedures given in Table 5-1, which are specific for the parameters to be determined. These procedures are documented in laboratory standard operating procedures (EAL-SOP-033, EAL-SOP-043, and EAL-SOP-062).

Tables 5-2 and 5-3 define the type of container required for specific analyses and matrix, preservation techniques and holding times for sediment and water samples. Preservatives are added to the sample containers at the time sample kits are prepared.

Sample kits, which are coolers containing chain-of-custody forms, custody seals, sample containers, preservatives, ice and packing material, are prepared by the Sample Management Office in response to receipt of the Analytical Task Order (Fig. 5-1).

5.1.2 Sampling

For this program, samples are collected by EA following procedures specified in the program Sampling Plan. After the samples are collected, each is distributed as necessary among preserved containers appropriate to the parameters to be determined. Each container is provided with a sample label that is filled out at the time of collection. At this time, a chain-of-custody form (Figure 5-2) is initiated. The collected samples are cooled, if necessary, and returned to the laboratory by the most expedient means to ensure that holding times will be met. The chain-of-custody form is signed and dated as necessary as the samples pass from the collectors to those persons responsible for their transportation.

5.1.3 Sample Labeling

The importance of sample labeling is critical to the success of this program. Improperly labeled samples lead to questions with regard to location, project, sampling station, date sampled, and sampler. All of this information is essential for proper sample handling. The following information, at a minimum, is required on each sample label:

Client	Date collected
Project number	Time collected
Location	Collected by
Station	Preservative(s)

After the label has been completed in the field and has been affixed to the sample container, the label is covered with clear tape. Pre-printed pressure-sensitive labels are supplied by EA Laboratories with the sample kits.

5.2 EA LABORATORIES SAMPLE MANAGEMENT OPERATIONS

The laboratory has a designated Sample Management Officer. This individual is responsible for receiving samples in the laboratory, opening the coolers and checking the sample integrity and the custody seal, logging samples into the laboratory system, and controlling the handling and storage of samples while in the laboratory.

5.2.1 Sample Receipt and Logging

After samples have been collected, labeled and the chain-of-custody forms initiated, the project manager completes the right side of the chain-of-custody form. This form provides sample-specific information and a listing of the parameters required on each sample, along with the required analytical sensitivity. The chain-of-custody and appropriate field data sheets are sealed in a water-tight plastic envelope and shipped with the samples to the laboratory.

Upon receipt at the laboratory, the Sample Management Officer or designate custodian inspects the samples for integrity and checks the shipment against the chain-of-custody/analytical task order form. Cooler temperatures are checked and documented on the chain-of-custody. The pH of preserved samples (except volatile organics) is measured and documented in the Sample pH Logbook which is maintained in the Sample Management Office (EAL-SOP-257). The pH of sample vials submitted for volatile organics determinations are checked by the analyst during analysis, and the pH is recorded in the instrument run logbook.

Discrepancies are addressed at this point, and documented on the chain-of-custody form and must be resolved before samples are released to the laboratory for analysis. When the shipment and the chain-of-custody are in agreement, the custodian enters the samples into the Analytical Custody and Preservation Log and assigns each sample a unique laboratory number.

This number is affixed to each sample bottle. The custodian then enters the sample and analysis information into the laboratory computer system (LIMS). The original of the chain-of-custody form is given to the data management group, with a copy to the laboratory operations manager. These log-in procedures are documented in EAL-SOP-035 and EAL-SOP-036.

5.2.2 Sample Storage and Security

While in the laboratory, the samples and aliquots that require storage at approximately 4 C are maintained in a locked refrigerator unless they are being used for analysis. Samples for purgeable organics determinations are stored in a separate locked refrigerator from other samples, sample extracts, and standards. All the refrigerators in the laboratory used for storage of samples are locked, numbered, and dedicated to specific types of samples, e.g. organic extractables, volatiles, inorganics. Similarly, there are refrigerators designated for extracts and standards. Samples (e.g. tissue) that are required to be frozen are stored in a freezer. The sample storage areas are within the laboratory to which access is limited to laboratory chemists and controlled by assigned passkeys. Specific requirements for sample storage are the following:

- Samples and extracts are stored in a secure area designed to comply with the storage method(s) defined in the contract.
- Samples are removed from the shipping container and stored in their original containers unless damaged.
- Damaged samples are disposed in an appropriate manner and this disposal is documented.
- The storage area is kept secure at all times. The sample custodian controls access to the storage area.
- Whenever samples are removed from storage, these removals are documented. All transfers of samples are documented on internal chain-of-custody records.
- Samples and extracts are stored after completion of analysis in accordance with the contract or until instructed otherwise by the Project Manager.
- The location of stored extracts is recorded.
- Samples for Volatile Organic Analysis are stored separately from other samples.
- Standards are not stored with samples or sample extracts.

So that the laboratory may satisfy sample chain-of-custody requirements, the following standard operating procedures for laboratory/sample security are implemented:

- Samples are stored in a secure area.
- Access to the laboratory is through a monitored area. Other outside-access doors to the laboratory are kept locked.
- Visitors sign a visitor's log and are escorted while in the laboratory.
- Refrigerators, freezers, and other sample storage areas are securely maintained or locked.
- Only the designated sample custodian and supervisory personnel have keys to locked sample storage area(s).
- Samples remain in secure sample storage until removed for sample preparation or analysis.
- All transfers of samples into and out of storage are documented on an internal chain-of-custody record by designated sample custodian within operational groups and Sample Management, and these internal custody records are maintained in the project files.

5.2.3 Sample Archives

Following completion of analysis, sediment samples are archived at ≤20C for one year from sample collection.

TABLE 5-1 CLEANING PROCEDURES FOR SAMPLE CONTAINERS

Parameter Group	Material	Cleaning
Total Organic Carbon Sulfide	Plastic	Detergent & hot water wash Deionized water rinse
Volatile Organics	Glass	Detergent & hot water wash Deionized water rinse Methanol rinse
Pesticides, PCBs	Glass	Detergent & hot water wash Acetone and deionized water rinse Dry at 400 C
Semivolatile Organics	Amber Glass	Detergent & hot water wash Acetone and deionized water rinse Dry at 400 C Methanol Rinse
Cyanide Chemical Oxygen Demand Phosphorus Nitrogen, Ammonia Nitrogen, Total Kjeldahl Nitrate & Nitrite	Plastic	Detergent & hot water wash HCl soak Deionized water rinse
Metals	Plastic	Detergent & hot water wash HNO_3 soak Deionized water rinse

TABLE 5-2 REQUIRED CONTAINERS, PRESERVATION TECHNIQUE, AND HOLDING TIMES FOR SEDIMENT SAMPLES [(a)]

Parameter	Mass Required (g)	Container[(b)]	Preservative	Holding Time
Inorganics				
Mercury	5	P	≤20C	30 days
Other Metals	5	P	≤20C	6 months
Cyanide	50	P,G	4C	14 days
Sulfide	10	P,G	4C	7 days
Biochemical Oxygen Demand	10	G	4C	48 hours
Chemical Oxygen Demand	50	P,G	≤20C	28 days
Nitrogen (Ammonia, Total Kjeldahl, Nitrate + Nitrite) Phosphorus	150	P,G	4C	28 days
Physical Parameters				
Total Moisture, Atterburg Limits, Grain Size	1000	P,G	≤20C	6 months
Organics				
Tributyltin	50	Solvent rinsed glass jar with Teflon-lined lid [(b)]	≤20C	6 months
Total Organic Carbon	5	Heat treated glass vial with Teflon-lined lid [(b)]	4C	14 days
Pesticides PCB Congeners Semivolatile Organics	400	Solvent rinsed glass jar with Teflon-lined lid [(b)]	≤20C	10 days until extraction 40 days after extraction
Volatile Organics	50	Heat treated glass vial with Teflon-lined lid [(b)]	≤20C	10 days

(a) From time of sample collection per *USACE/EPA. February, 1991. Evaluation of Dredged Material Proposed for Ocean Disposal. EPA-503/8-91/001.*

(b) P = plastic; G = glass. *National Oceanographic and Atmospheric Administration. July, 1993. Sampling and Analytical Methods of the National Status and Trends Program. National Benthic Surveillance and Mussel Watch Projects. 1984-1992. NOS ORCA 71. NOAA, Silver Spring, Maryland.*

TABLE 5-3 REQUIRED CONTAINERS, PRESERVATION TECHNIQUE, AND HOLDING TIMES FOR SITE WATER AND ELUTRIATE SAMPLES [a]

Parameter	Volume Required (mL)	Container[b]	Preservative	Holding Time
Inorganics				
Mercury	100	P	pH <2 with HNO_3 Cool, 4 C	14 days
Other Metals	100	P	pH <2 with HNO_3 Cool, 4 C	6 months
Cyanide	500	P,G	NaOH to pH >12 Ascorbic Acid Cool, 4 C	14 days 24 hours in presence of S^{2-}
Sulfide	500	P,G	NaOH to pH >9 Zinc Acetate Cool, 4 C	7 days
Biochemical Oxygen Demand	1000	P,G	Cool, 4 C	48 hours
Chemical Oxygen Demand	50	P,G	H_2SO_4 to pH <2	28 days
Nitrogen (Ammonia, Total Kjeldahl, Nitrate + Nitrite) Total Phosphorus	1050	P,G	H_2SO_4 to pH <2 Cool, 4 C	28 days
Organics				
Total Organic Carbon	50	P,G	H_2SO_4 or HCl to pH <2 Cool, 4 C	28 days
Pesticides Semivolatile Organics	2000	G, teflon-lined cap	Cool, 4 C	7 days until extraction 40 days after extraction
Volatile Organics	80	G, teflon-lined septum	Cool, 4 C	14 days

(a) From time of sample collection per *USACE/EPA. February, 1991. Evaluation of Dredged Material Proposed for Ocean Disposal. EPA 503/8-91/001.*

(b) P = plastic; G = glass. *National Oceanographic and Atmospheric Administration. July, 1993. Sampling and Analytical Methods of the National Status and Trends Program. National Benthic Surveillance and Mussel Watch Projects. 1984-1992. NOS ORCA 71. NOAA, Silver Spring, Maryland.*

Figure 5-1. Analytical Task Order

EA®

ANALYTICAL TASK ORDER

No:
EA LABORATORIES
19 Loveton Circle
Sparks, MD 21152
Phone: (410) 771-4920
FAX (410) 771-4407

1. Turnaround requirement:(See Reverse Side)
   - ☐ Regular Status
   - ☐ Accelerated Status (additional charge)*
   - ☐ Rush Status (additional charge)*

* RESULTS REQUIRED BY: ________________
(Date)

CONTACT EA LABS PRIOR TO SENDING SAMPLES

2. ☐ Original Order
   ☐ Amendment Order
   (Original ATO Document No _____)

3. QUOTATION NUMBER : ________________

4. PROJECT NUMBER: ________________
   Dept. No.: _______ Task No.: ________
   Project Name: ________________
   Project Contact: ________________

5. SHIPPING ADDRESS:
   Company Name: ________________
   Address: ________________
   ____
   Contact: ________________
   Telephone: ( ) ________________
   fax tELEPHONE: ( ) ________________

6. Sample collection:
   Date for Bottles Due to Site: : __________
   Delivery Date Due to Lab: ____________

7. REPORTING REQUIREMENTS:
   ☐ Report: ☐ EA Standard
   ☐ Other (specify) ____________

   ☐ Electronic: Specify Format ________________
   (Additional charge)

8. QC REQUIREMENTS MUST BE COMPLETED: See Terms and Conditions: QC samples billed at regular sample rate.
   - ☐ MATRIX DUPLICATE No. ________
   - ☐ MATRIX SPIKE No. ________
   - ☐ MATRIX SPIKE DUPLICATE No. ________
   - ☐ FIELD BLANKS No. ________
   - ☐ TRIP BLANKS No. ________
   - ☐ OTHER (as speciofied below)

   ____

9. PROGRAM REQUIREMENTS:
   ☐ NPDES ☐ RCRA
   ☐ SWDA ☐ Other: ____________

10. PARAMETERS FOR ANALYSIS:

CATALOG NUMBER	ANALYSIS	NUMBER of SAMPLES	MATRIX**

** Specify: Air, Tissue, Sludge, Soil, Water, etc.

11. SUPPLIES:
    ☐ Deionized Water ☐ Chain-of-Custody Formsd

12. COMMENTS/SPECIAL INSTRUCTIONS: __________
    ____
    ____

13. REQUESTED BY: ____________ Date: __/__/__
    Task Order must be completed, signed and dated prior to start of work.

14. ACCEPTED BY: ____________ Date: __/__/__
    EA Laboratories

White - EA Laboratories Report   Yellow - EA Laboratories File   Pink - Return to Originator   Gold - Originator

Figure 5-2. Chain-of-Custody Form.

Chain of Custody Re

EA Laboratories
19 Loveton Circle
Sparks, MD 21152
Telephone: (410) 771-4920
Fax: (410) 771-4407

Company Na

Project Manager or Contact:

Phone:

Project No.

Project Name:

Dept.: Task:

Sample Storage Location:

ATO Number:

Page of

Report #:

Parameters Numbers for Analysis

Report Deliverables:

1 2 3 4 D E

EDD: Yes/No

DUE TO CLIENT: ___________

Date	Time	Water	Soil	Sample Identification 19 Characters	No. of Containers													EA Labs Accession Number	Remarks
																			LPM:

Sampled by: (Signature) | Date/Time | Relinquished by: (Signature) | Date/Time | Received by: (Signature) | Date/Time

Relinquished by: (Signature) | Date/Time | Received by Laboratory: (Signature) | Date/Time | Airbill Number:

Sample Shipped by: (Circle)
Fed Ex. Puro. UPS
Hand Carried
Other:

Cooler Temp.____C pH: ☐ Yes ☐ No Comments: Custody Seals Intact ☐ Yes ☐ No

NOTE: Please indicate method number for analyses requested. This will help clarify any questions with laboratory techniques.

WHITE—EA Laboratories YELLOW—EA Laboratories PINK—Project Manager *Shaded Areas for Lab Use Only*

6. CALIBRATION PROCEDURES

Instruments and equipment used in EA Laboratories are controlled by a formal calibration program. The program verifies that equipment is of the proper type, range, accuracy, and precision to provide data compatible with specified requirements. All instruments and equipment that measure a quantity, or whose performance is expected at a stated level, are subject to calibration. Calibration is performed by EA Laboratories personnel using reference standards or externally by calibration agencies or equipment manufacturers.

This section prescribes the practices use by EA Laboratories to implement a calibration program. Development and documentation of the laboratory calibration program is the responsibility of the laboratory managers. Implementation is the responsibility of the supervisors and chemists. The Quality Services Manager (QSM) monitors the procedures. Specifics are not provided because the requirements for the calibration of instruments and equipment are dependent upon the type and expected performance of individual instruments and equipment. Therefore, EA Laboratories uses the guidelines provided herein to develop a calibration program.

Two types of calibration are discussed in this section:

- *Operational calibration*, which is routinely performed as part of an analytical procedure or test method, such as the development of a standard curve for use with an atomic absorption spectrophotometer. Operation calibration is generally performed for instrument systems.

- *Periodic calibration*, which is performed at prescribed intervals for equipment, such as balances and thermometers. In general, equipment which can be calibrated periodically is a distinct, singular purpose unit and is relatively stable in performance.

6.1 CALIBRATION SYSTEM

The following sections contain a discussion of the elements comprising the calibration system.

6.1.1 Calibration Procedures

Written procedures are used by EA Laboratories for all instruments and equipment subject to calibration. Whenever possible, recognized procedures, such as those published by ASTM or the U.S. EPA or procedures provided by manufacturers, are adopted. If established procedures are not available, a procedure is developed considering the type of equipment, stability characteristics of the equipment, required accuracy, and the effect of operational error on the quantities measured. As a minimum, the procedures include:

- Equipment to be calibrated
- Reference standards used for calibration
- Calibration technique and sequential actions
- Acceptable performance tolerances
- Frequency of calibration
- Calibration documentation format

6.1.2 Equipment Identification

Equipment that is subject to calibration is identified by a unique number assigned by EA Laboratories, and calibration records reference the specific instrument identification.

6.1.3 Calibration Frequency

Instruments and equipment are calibrated at prescribed intervals and/or as part of the operational use of the equipment. Calibration frequency is based on the type of equipment, inherent stability, manufacturer's recommendations, values provided in recognized standards, intended data use, specified analytical methods, effect of error upon the measurement process, and prior experience.

6.1.4 Calibration Reference Standards

Two types of reference standards are used within EA Laboratories for calibration:

- Physical standards, such as weights for calibrating balances and certified thermometers for calibrating working thermometers, refrigerators and ovens, are generally used for periodic calibration. Whenever possible, physical reference standards have known relationships to nationally recognized standards (e.g., NIST) or accepted values of natural physical constants. If national standards do not exist, the basis for the reference is documented. Physical reference standards are used only for calibration and are stored separately from equipment used in analyses. In general, physical reference standards are at least four to ten times as accurate as the requirements for the equipment which they are used to calibrate. In general, physical standards are recalibrated annually by a certified external agency, and documentation is maintained by the Quality Assurance staff.

- Chemical standards, such as Standard Reference Materials (SRMs) provided by the National Institute of Standards and Technology (NIST) or vendor certified stock solutions and neat compounds, are generally used for operational calibration. EA Laboratories documents all standard preparation activities in order to provide traceability for all standards used for calibration and QC samples.

6.1.5 Calibration Failure

Equipment that cannot be calibrated or becomes inoperable is removed from service. Such equipment must be repaired and satisfactorily recalibrated before reuse. For equipment that fails calibration, analysis cannot proceed until appropriate corrective action is taken and the analyst achieves an acceptable calibration. This is documented in a Nonconformance Record (NCR) which is discussed in Section 13 of this QAPjP.

Scheduled calibration of equipment does not relieve the laboratory staff of the responsibility for using properly functioning equipment. If an equipment malfunction is suspected, the equipment is tagged and removed from service and recalibrated. If it fails recalibration, the above process shall apply. The Division Managers are responsible for the development and implementation of a contingency plan for major equipment failure. The plan includes guidelines on waiting for repairs, use of other instrumentation, subcontracting analyses, and evaluating scheduled priorities.

6.1.6 Calibration Records

Records are prepared and maintained for each piece of equipment subject to calibration. Records demonstrating accuracy of preparation, stability, and proof of continuity of reference standards is also maintained.

Records for periodically calibrated equipment are maintained in the instrument log books, or in the equipment file maintained by the Laboratory Supervisor. Records for periodically calibrated equipment shall include, as appropriate:

- A unique identification number of equipment and type of equipment
- Calibration frequency and acceptable tolerances
- Identification of calibration procedure used
- The date calibration was performed
- The identity of EA Laboratories personnel and/or external agencies performing calibration
- Identification of the reference standards used for calibration
- The calibration date

- Certificates or statements of analysis provided by manufacturers and external agencies and traceability to national standards
- Information regarding calibration acceptance or failure and any repair of failed equipment

For instruments and equipment that are calibrated on an operational basis, calibration generally consists of determining instrumental response against compounds of known composition and concentration or the preparation of a standard response curve of the same compound at different concentrations. Records of these calibrations are maintained in the following documents:

- Standard preparations logbooks contain sufficient information to trace the standards to the original source solution of neat compound.
- The instrument logbook provides an ongoing record of the calibration undertaken for a specific instrument. The logbook should be indexed in the laboratory operations records but should be maintained at the instrument by the chemist. All entries should be signed and dated by the chemist, and reviewed periodically by the Laboratory Supervisor/Manager.
- Copies of the raw calibration data are kept with the analytical sample data. In this way results can be readily processed and verified because the raw data package is complete as a unit. If samples from several projects are processed together, the calibration data is copied and included with each group of data.

6.2 OPERATIONAL CALIBRATION

Operational calibration is generally performed as part of the analytical procedure and refers to those operations in which instrument response (in its broadest interpretation) is related to analyte concentration. Included is the preparation of a standard response (calibration) curve and often the analysis of blanks. Formulas used for calibration are listed in Table 6-1.

6.2.1 Preparation of Calibration Curve

Preparation of a standard calibration curve is accomplished by using calibration standards. The process is summarized as:

- Preparation of a standard calibration curve is accomplished by the analysis of calibration standards that are prepared by adding the analyte(s) of interest to the solvent that is introduced into the instrument.
- The concentrations of the calibration standards are chosen to cover the working range of the instrument or method.
- All sample measurements are made within this working range.

- The calibration curve is prepared by plotting or regressing the instrument responses versus the analyte concentrations.
- The concentrations of the analyzed samples are back-calculated from the calibration curve.

6.2.2 Blanks

The analyst determines through the use of reagent and/or solvent blanks if materials used to prepare the standards are free from interfering substances that could affect the analysis. After determining the individual reagent or solvent blanks, the analyst analyzes a method blank, if applicable, to determine if the cumulative blank interferes with the analysis. A method blank is prepared whenever samples are processed through steps that are not applied to the calibration standards. The method blank is prepared by following the procedure step by step, including the addition of all the reagents and solvents in the quantity added to the sample. If this cumulative blank interferes with the determination, steps are taken to eliminate or reduce the interference to a level that will permit the combination of solvents and reagents to be used. If the blank interference cannot be eliminated, the magnitude of the interference must be considered when calculating the concentration of specific constituents in the samples analyzed.

6.2.3 Instrument Calibration Procedures

Appendix B contains the operational calibration procedures and criteria used by the various instrument groups to meet requirements for the analysis of soil/sediment and water samples for this program.

6.3 PERIODIC CALIBRATION

Periodic calibrations are performed for equipment (e.g. balances, thermometers) that is required in the analytical method, but that is not routinely calibrated as part of the analytical procedure. Table 6-2 lists the periodic calibration requirements used by EA Laboratories.

TABLE 6-1 SUMMARY OF OPERATIONAL CALIBRATION FORMULAS

Application	Formula	Symbols
Linear calibration curves	$C = (R - a_0)/a_1$	C = analytical concentration R = instrument response a_0 = intercept of regression curve (instrument response when concentration is zero) a_1 = slope of regression curve (change in response per change in concentration)
Calibration factors[1]	$CF = \frac{A_x}{C}$	C = concentration (ug/L) CF = calibration factor A_x = peak size of target compound in sample extract
Response factors[1]	$RF = \frac{C_{is} A_x}{C A_{is}}$	C = concentration (ug/L) RF = internal standard response factor C_{is} = concentration of the internal standard (ug/L) A_x = area of the characteristic ion for the target compound A_{is} = area of the characteristic ion for the internal standard

1. Used for quantitation by the external standard technique.

TABLE 6-2 SUMMARY OF PERIODIC CALIBRATION REQUIREMENTS

Instrument	Calibration Frequency		Acceptance Limits	Corrective Actions
Analytical Balances	Daily:	Sensitivity (with a Class P weight)	0.001g	Adjust sensitivity
	Monthly:	Checked with Class S weights	Std. dev. less than 0.1 mg	Service balance
	Annually:	Calibrated by outside vendor against certified Class S weights		Service balance
Thermometers	Annually:	Calibrated against certified NIST thermometers	$\pm$0.5 C	Tag and remove from service
Automatic Pipettors	Quarterly:	Gravimetric check	High volume (> 100 mL): $\leq$1.0% relative error as RSD Low volume (< 100 mL): $\leq$2.0% relative error as RSD	Service or replacement

7. LABORATORY PROCEDURES

This section details the types of documentation used by EA Laboratories to ensure the integrity of the data produced.

7.1 ANALYTICAL METHODS

All inorganic and organic compounds for this project are determined using the methods listed in Table 7-1. Copies of the laboratory SOPs are in Appendix C. To meet program specific regulatory requirements for chemicals of concern, all methods are followed as stated with exceptions noted below:

7.1.1 PCB Congeners

For all sediment samples taken outside of Baltimore Harbor and all split samples, PCB concentrations will be determined separately from pesticides and the PCB extract will be acidified to remove interfering compounds. This procedure is expected to lower the MDL to approximately 10 μg/kg for all Aroclors that would otherwise have MDL's greater than 10 μg/kg.

The Baltimore District USACE has determined that if total PCB concentration is greater than 11.6 ug/kg, congeners will be determined. Samples from outside of Baltimore Harbor will be subject to the 11.6 ug/kg test. Samples taken inside the Harbor (22 samples) will not be subject to congener analysis.

In order to achieve the required detection limits for PCB arochlors in the sediment samples taken outside the harbor, pesticides and PCBs will be extracted separately using two aliquots of sample. The pesticide fraction, extracted with only one surrogate, tetrachloro-m-xylene, will be analyzed in the usual manner and the extract saved for PCB Congener analysis, if required. The PCB extract will be concentrated to 2 ml (five times less than the volume specified in the standard method), subjected to acid cleanup according to SW846 Method 3665 to eliminate possible interferences, and analyzed by dual-column gas chromatography. If the total arochlor concentration in the PCB extract exceeds 11.6 ug/kg, the pesticide extract will be subject to congener identification and quantitation.

7.1.2 Water Quality Parameters

Water quality parameter methods will be modified for sediment analyses based on methods outlined in Table 7-1.

7.1.3 Elutriate Test

The Elutriate is prepared by subsampling approximately 1 L of the dredged material from the well-mixed original sample. The dredged material and unfiltered site water are then combined in a sediment-to-water ratio of 1:4 on a volume basis at room temperature (22° ± 2°C). This is best accomplished by volumetric displacement. After the correct ratio is achieved, the mixture is also stirred vigorously for 30 min with a magnetic stirrer. At 10-min intervals, the mixture is also stirred manually to ensure complete mixing. After the 30-min mixing period, the mixture is allowed to settle for 1 hour. The supernatant is then siphoned off and centrifuged or filtered through a 0.45-μm-mesh filter to remove particulates prior to chemical analysis.

It has been determined that 10 L of site water and 2.5 L of sediment sample will be required for each elutriate test in order to provide the necessary volume of elutriate for the analytical methods indicated.

7.1.4 Semivolatile Organics - PAHs

In order to achieve the target detection limits (TDLs) referenced in *QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations - Chemical Evaluations* (EPA 823-B-95-001, April 1995) for sediment samples, PAHs will be analyzed utilizing the alternative SW846 Method 8310 (HPLC).

7.1.5 Pesticides

For sediment samples only, a surrogate sample will be prepared for pesticides analysis using TCX, a spiking compound used in QA/QC for pesticide/PCB analyses. This is being done to allow for a separate PCB analysis.

7.2 DETECTION LIMITS

The detection limit is a statistical concept that corresponds to the minimum concentration of an analyte above which the net analyte signal can be distinguished with a specified probability from the signal due to the noise inherent in the analytical system. The method detection limit (MDL) was developed by the EPA Environmental Monitoring and Support Laboratory for NPDES monitoring under the Clean Water Act and has found wide acceptance in other EPA programs. The MDL is "the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero" (40 CFR 136, Appendix B).

The actual quantitation limit for a given analysis will vary depending on instrument sensitivity and matrix effects.

Detection limits applicable to this project are listed in Tables 7-2 and 7-3 for sediment and water samples. The tables include the TDLs referenced in the ITM, and the laboratory MDL determined using a reference sediment.

Laboratory MDL studies are performed according to the procedure identified in 40 CFR 136 Appendix B. Organics analyses will use 30 g of sediment (dry-weight basis). The amounts used for the inorganic analyses are given in the applicable analytical method.

Sediment MDLs are determined and reported on a dry weight basis.

Method detection limit (MDL) studies will be used as the basis for any method modifications which will allow the laboratory to effectively achieve the TDLs.

Project reporting level: For this project, data will be reported following the guidance in "Chemical Concentration Data Near The Detection Limit" (EPA/903/8-91/001) using the laboratory determined MDLs (Tables 7-2 and 7-3). The MDL procedure (40 CFR 136) will be modified from the specified 7 aliquots to use 5 discrete receiving site samples. Sample data will be reported as a sample quantitation limit (SQL) per the same guidance with dilution, cleanup and method modifications taken into account.

7.3 STANDARD OPERATING PROCEDURES

A standard operating procedure (SOP) is a written step-by-step description of laboratory operating procedures exclusive of analytical methods. EA Laboratories documents all procedures in formal, approved SOPs, which are issued in a document-controlled manual (EA Manual EAL-002). All SOPs are submitted in draft to the Quality Services Manager (QSM) who is responsible for initiating the review and approval process and for distributing and controlling the final SOPs (EAL-SOP-088).

The SOPs address the following areas:

- Storage containers and sample preservatives
- Sample receipt and logging
- Sample custody
- Sample handling procedures

- Sample transportation
- Glassware cleaning
- Laboratory security
- Quality control procedures and criteria
- Equipment calibration and maintenance
- Documentation
- Safety
- Data handling procedures
- Document control
- Personnel training and documentation
- Sample and extract storage
- Preventing sample contamination
- Traceability of standards
- Data reduction and validation
- Maintaining instrument records and logbooks
- Nonconformance
- Corrective actions
- Records management

The table of contents of the EA Laboratories SOP Manual is given in Appendix C. The QSM is responsible for maintaining the original copies of all SOPs, as well as an historical file of all versions.

7.4 RECORDKEEPING

7.4.1 General Requirements

EA Laboratories maintains extensive records to ensure that all aspects of the analytical process are adequately documented because the keeping of laboratory records is a legal requirement. These records convey:

- What was done.
- When it was done.
- Who did it.
- What was found.

The requirements for laboratory recordkeeping are given in EAL-SOP-065. All data entries are made in indelible, water-resistant ink. The date of the entry and the observer is clear on each entry. The observer uses his/her full name or initials. An initial and signature log is maintained so that the recorder of every entry can be identified. All information is recorded in a notebook or on other records at the time the observations are made. Recording information on loose pieces of paper is not allowed.

When a mistake is made, the wrong entry is crossed out with a single line, initialed and dated by the person making the entry, and the correct information recorded. Obliteration of an incorrect entry or writing over it is not allowed; neither is the use of correction tape or fluid on any laboratory records.

7.4.2 Laboratory Records

The following records are used to document analytical activities in the laboratory. These are in addition to those discussed elsewhere in this manual, such as chain-of-custody (COC) forms, log-in sheets, maintenance records (Section 11), and nonconformance forms (Section 13).

Reagent and Titrant Preparation Records: The procedure for each analysis includes the procedures for reagent/ titrant preparation; this includes concentration, storage, and discard information. After a reagent/titrant is prepared, the following information is entered on a label affixed to the storage bottle: (1) its identity, (2) intended use, (3) titer/concentration, (4) preparation date, (5) storage requirement, (6) discard date, and (7) preparer. For titrimetric analyses, the procedure includes directions for standardizing the titrant; the laboratory data sheets include space for titrant standardization data.

Standards Preparation Logs: The preparation of stock, intermediate, and working standard solutions is recorded in standards preparation logbooks which are specific to the requirements of each operational group. Each standard is assigned a number that is used to trace the preparation from stock to working standards and to reference the analysis of the standards. The logbooks are completed by the appropriate analysts as they prepare the standards and are reviewed by the supervisor.

Sample Preparation Logs: Sample preparation operations, such as digestions and extractions, are documented in sample preparation logs which are specific to the operations involved. The information in these logs can include: the date, the analyst, sample identification, weight or volume of sample used, reagents used, and final volume. It can also include the volume of spiking, surrogate, or internal standard solution.

Bench Data Sheets: Laboratory bench data sheets are used for those analyses in which instrument responses are manually transcribed from instrument readout or from recorder tracings. The data sheets are preprinted to reflect the requirements of the analysis and are used to ensure that the information is recorded in a complete and organized manner.

Instrument Run Logs: The run log is used for recording data generation, instrument malfunctions, repairs, and maintenance activities. Data generation from an instrument requires that the sequence of the introduction of standards, field samples, and QC samples be recorded in the instrument run log. The following information is recorded when applicable: instrument identification, date, time, analyst, sample identifications, dilutions, and filenames for disk storage.

Strip Chart Recordings/Chromatograms/Computer Output: All strip chart recordings, chromatograms, computer output, and other instrument-generated records are clearly labeled with the following information: instrument identification, date, analyst, and sample identifications. The operational conditions are also recorded if applicable.

TABLE 7-1 ANALYTICAL METHODS

Parameter	Method	Method Number	Matrix	Reference
SAMPLE PREPARATION				
Metals Digestion	Nitric Acid - Hydrogen Peroxide	3050	SO	(1)
Semivolatile Organics, Pesticides Extraction	Continuous Extraction	3520	W	(1)
Semivolatile Organics, Pesticides/PCBs Extraction	Soxhlet Extraction	3540	SO	(1)
Organotins Extractions	Solvent Extraction	NS&T	SO	(2)
Soluble Salts Extraction	Aqueous Extraction	10-2	SO	(3)
Total Metals Digestion (FAA/ICP)	Nitric Acid - Hydrochloric Acid	3010	W	(1)
Total Metals Digestion (GFAA)	Nitric Acid	3020	W	(1)
Volatile Organics Preparation	Purge and trap	5030	W,SO	(1)
ORGANICS - EXTRACTION CLEANUP				
Acid-base Partition Cleanup	Liquid-liquid Partitioning	3650	W,SO	(1)
Alumina Column Cleanup	Adsorption Column Chromatography	3610	W,SO	(1)
Florisil Column Cleanup	Adsorption Column Chromatography	3620	W,SO	(1)
Gel Permeation Cleanup (GPC)	Size Exclusion Procedure	3640	W,SO	(1)
Silica Gel Cleanup	Adsorption Column Chromatography	3630	W,SO	(1)
Sulfur Cleanup	Treatment with Cu, Hg, or TBA-sulfite	3660	W,SO	(1)
ORGANICS				
Acid Extractable Organic Compounds	Gas Chromatography/Mass Spectrometry	8270	W,SO	(1)
Base-Neutral Extractable Organic Compounds	Gas Chromatography/Mass Spectrometry	8270	W,SO	(1)
Polynuclear aromatic hydrocarbons (PAH)	HPLC - UV, fluorescence	8310	W,SO	(1)
Halogenated Hydrocarbon Pesticides	Gas Chromatography - ECD	8080	W,SO	(1)
Polychlorinated Biphenyls	Gas Chromatography - ECD	8080	W,SO	(1)
Organotins	Capillary GC/FPD	NS&T	SO	(2)

TABLE 7-1 ANALYTICAL METHODS

Parameter	Method	Method Number	Matrix	Reference
Volatile Organic Compounds	Gas Chromatography/Mass Spectrometry	8240	W,SO	(1)
METALS				
Aluminum	Atomic Emission - ICP	6010	W,SO	(1)
Antimony	Atomic Emission - Trace ICP	6010	W,SO	(1)
Arsenic	Atomic Emission - Trace ICP	6010	W,SO	(1)
Arsenic	Atomic Absorption - Furnace	7060	W,SO	(1)
Beryllium	Atomic Emission - ICP	6010	W,SO	(1)
Cadmium	Atomic Emission - ICP	6010	W,SO	(1)
Chromium, Total	Atomic Emission - ICP	6010	W,SO	(1)
Copper	Atomic Emission - ICP	6010	W,SO	(1)
Iron	Atomic Emission - ICP	6010	W,SO	(1)
Lead	Atomic Absorption - Furnace	7421	W,SO	(1)
Lead	Atomic Emission - Trace ICP	6010	W,SO	(1)
Manganese	Atomic Emission - ICP	6010	W,SO	(1)
Mercury	Atomic Absorption - Cold Vapor	7470	W	(1)
Mercury	Atomic Absorption - Cold Vapor	7471	SO	(1)
Nickel	Atomic Emission - ICP	6010	W,SO	(1)
Selenium	Atomic Absorption - Furnace	7740	W,SO	(1)
Selenium	Atomic Emission - Trace ICP	6010	W,SO	(1)
Thallium	Atomic Absorption - Furnace	7841	W,SO	(1)
Thallium	Atomic Emission - Trace ICP	6010	W,SO	(1)
Zinc	Atomic Emission - ICP	6010	W,SO	(1)
INORGANIC NONMETALS				

TABLE 7-1 ANALYTICAL METHODS

Parameter	Method	Method Number	Matrix	Reference
Cyanide, Total	Colorimetric - Automated UV	9012	W,SO	(1)
Sulfide, total	Titrimetric	9030	W,SO	(1)
Total Organic Carbon	Oxidation - Infrared	9060	W	(1)
Total Organic Carbon	Induction Furnace	Plumb	SO	(4)
Biochemical Oxygen Demand	BOD (5 day, 20C)	405.1 Mod	W,SO	(5)
Chemical Oxygen Demand	Colorimetric - Manual	410.4 Mod	W,SO	(5)
Nitrogen, Ammonia	Colorimetric - Automated Phenate	350.1 Mod	W,SO	(5)
Nitrogen, Total Kjeldahl	Colorimetric - Autoanalyzer II	351.2 Mod	W,SO	(5)
Nitrogen, Nitrate+Nitrite	Colorimetric - Cadmium Reduction	353.2 Mod	W,SO	(5)
Phosphorus, Total	Persulfate Digestion	365.3 Mod	W,SO	(5)
PHYSICAL PARAMETERS				
Grain Size	Seive Analysis	D422	SO	(6)
Atterberg Limits	Physical Measurement	D4318	SO	(6)
Moisture Content	Gravimetric	D4959	SO	(6)

Matrix codes:

W - Estuarine water, elutriates

SO - Sediments

TABLE 7-1 ANALYTICAL METHODS

Parameter	Method	Method Number	Matrix	Reference

References:

1. United States Environmental Protection Agency. January 1995. Test Methods for Evaluating Solid Waste. Physical/Chemical Methods. EPA SW-846, 3rd edition, including Final Update II. U.S. EPA, Washington, D.C.
2. National Oceanographic and Atmospheric Administration. July, 1993. Sampling and Analytical Methods of the National Status and Trends Program, National Benthic Surveillance and Mussel Watch Projects. 1984-1992. Volume 4. NOS ORCA 71. NOAA, Silver Spring, Maryland.
3. Page, A.L., R.H. Miller, and D.R. Keeney, eds. 1982. Methods of Soil Analysis, Part 2: Chemical and Microbiological Properties, 2nd edition. American Society of Agronomy, Madison, Wis.
4. Plumb, R.H., Jr., 1981. "Procedure for Handling and Chemical Analysis of Sediment and Water Samples", Technical Report EPA/CE-81-1, prepared by Great Lakes Laboratory, State University College at Buffalo, Buffalo, New York.
5. United States Environmental Protection Agency. 1979. Methods for Chemical Analysis of Water and Wastes. EPA-600/4-79-020. U.S. EPA, Cincinnati, Ohio.
6. American Society for Testing and Materials. Annual Book of ASTM Standards. Volume 4.08. ASTM, Philadelphia, PA.

TABLE 7-2 METHOD DETECTION LIMITS (MDLS) FOR SEDIMENT SAMPLES

Parameter	Units	Laboratory MDL[a]	Recommended TDL[b]
Pesticides and PCBs GC/ECD - organochlorine compounds (SW846 8080)			
Aldrin	ug/kg	0.20	10
α-BHC	ug/kg	1.1	-
β-BHC	ug/kg	0.17	-
δ-BHC	ug/kg	0.20	-
γ-BHC (Lindane)	ug/kg	0.73	10
α-Chlordane	ug/kg	0.10	10
γ-Chlordane	ug/kg	0.10	10
Chlordane (Technical)	ug/kg	3.7	10
4,4'-DDD	ug/kg	1.4	10
4,4'-DDE	ug/kg	0.20	10
4,4'-DDT	ug/kg	1.6	10
Dieldrin	ug/kg	1.3	10
Endosulfan I	ug/kg	0.10	10
Endosulfan II	ug/kg	0.20	10
Endosulfan sulfate	ug/kg	0.51	10
Endrin	ug/kg	1.4	10
Endrin aldehyde	ug/kg	0.20	10
Endrin ketone	ug/kg	0.30	10
Heptachlor	ug/kg	0.83	10
Heptachlor epoxide	ug/kg	0.10	10
Methoxychlor	ug/kg	12	10
Toxaphene	ug/kg	53	50
Aroclor 1016	ug/kg	10	-
Aroclor 1221	ug/kg	10	-
Aroclor 1232	ug/kg	10	-
Aroclor 1242	ug/kg	10	-
Aroclor 1248	ug/kg	4.3	-
Aroclor 1254	ug/kg	9.3	-
Aroclor 1260	ug/kg	1.3	-
PCBs GC/ECD - (SW846 8080)[d]			
Aroclor 1016	ug/kg	4	11.6
Aroclor 1221	ug/kg	10	11.6
Aroclor 1232	ug/kg	3	11.6
Aroclor 1242	ug/kg	4	11.6
Aroclor 1248	ug/kg	1	11.6

(a) MDL determined according to the procedure specified in 40 CFR 136, Appendix B.
(b) TDL recommendations are derived from *EPA QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations - Chemical Evaluations*. EPA 823-B-95-001, April 1995. Levels not provided for all analytes.
(c) TDL refers to total (not speciated).
(d) Final extract volume 2.0 ml; MDLs estimated based on 10 ml final extract determinations.

TABLE 7-2 METHOD DETECTION LIMITS (MDLS) FOR SEDIMENT SAMPLES

Parameter	Units	Laboratory MDL[a]	Recommended TDL[b]
Aroclor 1254	ug/kg	2	11.6
Aroclor 1260	ug/kg	0.3	11.6
PCB Congeners - GC/ECD - (SW846 8080)			
2,4'-Dichlorobiphenyl (BZ # 8)	ug/kg	0.97	1
2,2',5-Trichlorobiphenyl (BZ # 18)	ug/kg	0.72	1
2,4,4'-Trichlorobiphenyl (BZ # 28)	ug/kg	0.84	1
2,2',3,5'-Tetrachlorobiphenyl (BZ # 44)	ug/kg	0.72	1
2,2',4,5'-Tetrachlorobiphenyl (BZ # 49)	ug/kg	0.97	1
2,2',5,5'-Tetrachlorobiphenyl (BZ # 52)	ug/kg	1.3	1
2,3',4,4'-Tetrachlorobiphenyl (BZ # 66)	ug/kg	0.89	1
3,3',4,4'-Tetrachlorobiphenyl (BZ # 77)	ug/kg	1.8	1
2,2',3,4,5'-Pentachlorobiphenyl (BZ # 87)	ug/kg	0.82	1
2,2',4,5,5'-Pentachlorobiphenyl (BZ # 101)	ug/kg	0.83	1
2,3,3',4,4'-Pentachlorobiphenyl (BZ # 105)	ug/kg	0.86	1
2,3',4,4',5-Pentachlorobiphenyl (BZ # 118)	ug/kg	1.0	1
3,3',4,4',5-Pentahlorobiphenyl (BZ # 126)	ug/kg	1.3	1
2,2',3,3',4,4'-Hexachlorobiphenyl (BZ # 128)	ug/kg	1.0	1
2,2',3,4,4',5'-Hexachlorobiphenyl (BZ # 138)	ug/kg	1.0	1
2,2',4,4',5,5'-Hexachlorobiphenyl (BZ # 153)	ug/kg	0.99	1
2,3,3',4,4',5-Hexachlorobiphenyl (BZ # 156)	ug/kg	1.2	1
3,3',4,4',5,5'-Hexachlorobiphenyl (BZ # 169)	ug/kg	1.6	1
2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ # 170)	ug/kg	0.98	1
2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ # 180)	ug/kg	1.1	1
2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ # 183)	ug/kg	0.63	1
2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ # 184)	ug/kg	0.79	1
2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ # 187)	ug/kg	0.78	1
2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ # 195)	ug/kg	1.2	1
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ # 206)	ug/kg	1.2	1
2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl (BZ # 209)	ug/kg	1.0	1
Semivolatile organics GC/MS - (SW846 3540/ 8270)			
Benzidine	ug/kg	280	-
Benzoic acid	ug/kg	380	100
Benzyl alcohol	ug/kg	90	50
Bis(2-chloroethyl) ether	ug/kg	140	-

(a) MDL determined according to the procedure specified in 40 CFR 136, Appendix B.
(b) TDL recommendations are derived from *EPA QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations - Chemical Evaluations*. EPA 823-B-95-001, April 1995. Levels not provided for all analytes.
(c) TDL refers to total (not speciated).
(d) Final extract volume 2.0 ml; MDLs estimated based on 10 ml final extract determinations.

TABLE 7-2 METHOD DETECTION LIMITS (MDLS) FOR SEDIMENT SAMPLES

Parameter	Units	Laboratory MDL[a]	Recommended TDL[b]
Bis(2-chloroethoxy)methane	ug/kg	81	-
Bis(2-ethylhexyl) phthalate	ug/kg	130	50
4-Bromophenyl phenyl ether	ug/kg	31	-
Butylbenzylphthalate	ug/kg	86	50
Carbazole	ug/kg	49	-
4-Chloroaniline	ug/kg	270	-
4-Chloro-3-methylphenol	ug/kg	48	-
2-Chloronaphthalene	ug/kg	59	-
2-Chlorophenol	ug/kg	124	-
2-Chlorophenol-d4	ug/kg	120	-
4-Chlorophenyl phenyl ether	ug/kg	65	-
Cyclohexanone	ug/kg	200	-
Dibenzofuran	ug/kg	44	50
Di-n-butyl phthalate	ug/kg	49	50
1,2-Dichlorobenzene	ug/kg	190	20
1,2-Dichlorobenzene-d4	ug/kg	200	-
1,3-Dichlorobenzene	ug/kg	190	20
1,4-Dichlorobenzene	ug/kg	180	20
3,3'-Dichlorobenzidine	ug/kg	290	-
2,4-Dichlorophenol	ug/kg	61	-
Diethyl phthalate	ug/kg	48	50
4,6-Dinitro-2-Methylphenol	ug/kg	62	-
2,4-Dimethylphenol	ug/kg	160	20
Dimethyl phthalate	ug/kg	41	50
2,4-Dinitrophenol	ug/kg	110	-
2,4-Dinitrotoluene	ug/kg	52	-
2,6-Dinitrotoluene	ug/kg	70	-
1,2-Diphenylhydrazine	ug/kg	36	-
Di-n-octyl phthalate	ug/kg	34	50
2-Fluorobiphenyl	ug/kg	56	-
2-Fluorophenol	ug/kg	150	-
Hexachlorobenzene	ug/kg	60	10
Hexachlorobutadiene	ug/kg	150	20
Hexachloroethane	ug/kg	180	100
Hexachlorocyclopentadiene	ug/kg	74	-
Isophorone	ug/kg	76	-
1-Methylnaphthalene	ug/kg	-	20
2-Methylnaphthalene	ug/kg	76	20

(a) MDL determined according to the procedure specified in 40 CFR 136, Appendix B.
(b) TDL recommendations are derived from *EPA QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations - Chemical Evaluations*. EPA 823-B-95-001, April 1995. Levels not provided for all analytes.
(c) TDL refers to total (not speciated).
(d) Final extract volume 2.0 ml; MDLs estimated based on 10 ml final extract determinations.

TABLE 7-2 METHOD DETECTION LIMITS (MDLS) FOR SEDIMENT SAMPLES

Parameter	Units	Laboratory MDL[a]	Recommended TDL[b]
2-Methylphenol	ug/kg	84	50
3+4-Methylphenol	ug/kg	80	-
4-Methylphenol	ug/kg	80	100
2-Nitroaniline	ug/kg	58	-
3-Nitroaniline	ug/kg	210	-
4-Nitroaniline	ug/kg	88	-
Nitrobenzene	ug/kg	120	-
Nitrobenzene-d_5	ug/kg	120	-
2-Nitrophenol	ug/kg	110	-
4-Nitrophenol	ug/kg	62	-
N-Nitrosodiphenylamine	ug/kg	61	20
N-Nitrosodimethylamine	ug/kg	160	-
N-Nitroso-di-n-propylamine	ug/kg	79	-
2,2'-Oxybis(1-chloropropane)	ug/kg	120	-
Pentachlorophenol	ug/kg	69	100
Phenol	ug/kg	91	100
Phenol-d4	ug/kg	86	-
Pyridine	ug/kg	120	-
Terphenyl-d_4	ug/kg	52	-
2,4,6-Tribromophenol	ug/kg	63	-
1,2,4-Trichlorobenzene	ug/kg	140	10
2,4,5-Trichlorophenol	ug/kg	32	-
2,4,6-Trichlorophenol	ug/kg	60	-
Semivolatile organics HPLC - PAHs (SW846 8310)-30 grams - Soil			
Acenaphthene	ug/kg	16	20
Acenaphthylene	ug/kg	36	20
Anthracene	ug/kg	0.88	20
Benzo[a]anthracene	ug/kg	0.81	20
Benzo[b]fluoranthene	ug/kg	1.7	20
Benzo[k]fluoranthene	ug/kg	0.83	20
Benzo[a]pyrene	ug/kg	0.78	20
Benzo[ghi]perylene	ug/kg	1.9	20
Chrysene	ug/kg	1.1	20
Dibenzo[a,h]anthracene	ug/kg	1.9	20
Fluoranthene	ug/kg	2.9	20
Fluorene	ug/kg	3.6	20
Indeno[1,2,3-cd]pyrene	ug/kg	1.7	20

(a) MDL determined according to the procedure specified in 40 CFR 136, Appendix B.
(b) TDL recommendations are derived from *EPA QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations - Chemical Evaluations*. EPA 823-B-95-001, April 1995. Levels not provided for all analytes.
(c) TDL refers to total (not speciated).
(d) Final extract volume 2.0 ml; MDLs estimated based on 10 ml final extract determinations.

TABLE 7-2 METHOD DETECTION LIMITS (MDLS) FOR SEDIMENT SAMPLES

Parameter	Units	Laboratory MDL[a]	Recommended TDL[b]
Naphthalene	ug/kg	17	20
Phenanthrene	ug/kg	0.71	20
Pyrene	ug/kg	0.85	20
1-Methylnaphthalene	ug/kg	-	20
2-Methylnaphthalene	ug/kg	-	20
Organotins (NS&T)			
Tributyltin	mg/kg	0.8	10[c]
Dibutlytin	mg/kg	0.8	10[c]
Monobutyltin	mg/kg	0.8	10[c]
Volatile organics - 5g GC/MS (SW846 8240)			
Acetone	ug/kg	3.5	-
Acrolein	ug/kg	4.7	-
Acrylonitrile	ug/kg	3.1	-
Benzene	ug/kg	0.43	10
Bromodichloromethane	ug/kg	0.51	-
Bromoform	ug/kg	0.40	-
Bromofluorobenzene	ug/kg	0.41	-
Bromomethane	ug/kg	0.46	-
2-Butanone	ug/kg	0.81	-
methyl tert-Butyl ether (MTBE)	ug/kg	0.62	-
Carbon disulfide	ug/kg	0.64	-
Carbon tetrachloride	ug/kg	0.25	-
Chlorobenzene	ug/kg	0.30	-
Chloroethane	ug/kg	0.94	-
2-Chloroethyl vinyl ether	ug/kg	0.45	-
Chloroform	ug/kg	0.38	10
Chloromethane	ug/kg	0.86	-
3-Chloro-1-propene	ug/kg	0.36	-
Dibromochloromethane	ug/kg	0.56	-
1,2-Dibromoethane	ug/kg	0.57	-
1,2 Dichlorobenzene	ug/kg	0.32	-
1,2-Dichloroethene (total)	ug/kg	0.56	-
1,3-Dichlorobenzene	ug/kg	0.33	-
1,4-Dichlorobenzene	ug/kg	0.48	-
Dichlorodifluoromethane	ug/kg	0.59	-
Dichlorofluoromethane	ug/kg	0.24	-

(a) MDL determined according to the procedure specified in 40 CFR 136, Appendix B.
(b) TDL recommendations are derived from *EPA QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations - Chemical Evaluations*. EPA 823-B-95-001, April 1995. Levels not provided for all analytes.
(c) TDL refers to total (not speciated).
(d) Final extract volume 2.0 ml; MDLs estimated based on 10 ml final extract determinations.

TABLE 7-2 METHOD DETECTION LIMITS (MDLS) FOR SEDIMENT SAMPLES

Parameter	Units	Laboratory MDL[a]	Recommended TDL[b]
1,1-Dichloroethane	ug/kg	0.39	-
1,2-Dichloroethane	ug/kg	0.59	-
1,2-Dichloroethane-d4	ug/kg	0.55	-
1,1-Dichloroethene	ug/kg	0.43	-
1,2-Dichloropropane	ug/kg	0.69	-
cis-1,3-Dichloropropene	ug/kg	0.30	-
trans-1,3-Dichloropropene	ug/kg	0.47	-
Diisopropyl ether	ug/kg	0.58	-
Ethylbenzene	ug/kg	0.48	10
2-Hexanone	ug/kg	0.96	-
4-Methyl-2-pentanone (MIBK)	ug/kg	0.73	-
Methylene chloride	ug/kg	0.65	-
Styrene	ug/kg	0.39	-
1,1,2,2-Tetrachloroethane	ug/kg	0.44	-
Tetrachloroethene	ug/kg	0.53	10
Toluene-d_8	ug/kg	0.31	-
Toluene	ug/kg	0.27	10
1,1,1-Trichloroethane	ug/kg	0.31	-
1,1,2-Trichloroethane	ug/kg	0.63	-
Trichloroethene	ug/kg	0.31	10
Trichlorofluoromethane	ug/kg	0.50	-
1,2,3-Trichloropropane	ug/kg	0.41	-
Vinyl acetate	ug/kg	0.68	-
Vinyl chloride	ug/kg	0.44	-
m&P-Xylenes	ug/kg	0.55	10[c]
o-Xylene	ug/kg	0.39	10[c]
Inorganic nonmetals			
Cyanide (SW846 9012)	mg/kg	0.083	2.0
Nitrogen,			
ammonia (EPA 350.1)	mg/kg	0.50	0.1
nitrate + nitrite (EPA 353.2)	mg/kg	0.16	-
total Kjeldahl (EPA 351.2)	mg/kg	10.0	-
Phosphorus, total (EPA 365.3)	mg/kg	1.7	-
Sulfide (SW846 9030)	mg/kg	21.0	0.1
TOC (Plumb, 1981)	mg/kg	--	0.1%
BOD (EPA 405.1 Mod)	mg/kg	--	-
COD (EPA 410.4 Mod)	mg/kg	--	-

(a) MDL determined according to the procedure specified in 40 CFR 136, Appendix B.
(b) TDL recommendations are derived from *EPA QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations - Chemical Evaluations*. EPA 823-B-95-001, April 1995. Levels not provided for all analytes.
(c) TDL refers to total (not speciated).
(d) Final extract volume 2.0 ml; MDLs estimated based on 10 ml final extract determinations.

TABLE 7-2 METHOD DETECTION LIMITS (MDLS) FOR SEDIMENT SAMPLES

Parameter	Units	Laboratory MDL[a]	Recommended TDL[b]
Metals - Cold Vapor (SW846 7471)			
Mercury	mg/kg	0.05	0.2
Metals - Furnace (SW846)			
Antimony	mg/kg	0.3	2.5
Arsenic	mg/kg	0.1	5.0
Beryllium	mg/kg	0.1	2.5
Cadmium	mg/kg	0.1	0.3
Chromium	mg/kg	0.1	5.0
Copper	mg/kg	0.1	5.0
Lead	mg/kg	0.1	5.0
Nickel	mg/kg	0.3	5.0
Selenium	mg/kg	0.1	1.0
Thallium	mg/kg	0.2	0.2
Metals - ICP (SW846)			
Aluminum	mg/kg	15.5	50
Beryllium	mg/kg	0.1	2.5
Chromium	mg/kg	0.5	5
Copper	mg/kg	0.4	5
Iron	mg/kg	6.3	50
Lead	mg/kg	2.4	5
Manganese	mg/kg	0.6	5
Nickel	mg/kg	0.9	5
Silver	mg/kg	0.4	0.2
Zinc	mg/kg	1.1	15
Metals-Trace ICP (SW846 6010)			
Antimony	mg/kg	0.1	2.5
Arsenic	mg/kg	0.1	5.0
Cadmium	mg/kg	0.1	0.3
Lead	mg/kg	0.1	5.0
Selenium	mg/kg	0.2	1.0
Thallium	mg/kg	0.2	0.2

(a) MDL determined according to the procedure specified in 40 CFR 136, Appendix B.
(b) TDL recommendations are derived from *EPA QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations - Chemical Evaluations*. EPA 823-B-95-001, April 1995. Levels not provided for all analytes.
(c) TDL refers to total (not speciated).
(d) Final extract volume 2.0 ml; MDLs estimated based on 10 ml final extract determinations.

TABLE 7-3 METHOD DETECTION LIMITS (MDLS) FOR SITE WATER AND ELUTRIATE SAMPLES

Parameter	Units	Laboratory MDL[a]	Recommended TDL[b]
Pesticides and PCBs GC/ECD - organochlorine compounds (SW846 8080)			
Aldrin	ug/L	0.007	0.04
α-BHC	ug/L	0.006	-
β-BHC	ug/L	0.003	-
δ-BHC	ug/L	0.003	-
γ-BHC (Lindane)	ug/L	0.010	0.1
α-Chlordane	ug/L	0.005	0.14
γ-Chlordane	ug/L	0.005	0.14
Chlordane (Technical)	ug/L	0.11	0.14
4,4'-DDD	ug/L	0.030	0.1
4,4'-DDE	ug/L	0.014	0.1
4,4'-DDT	ug/L	0.022	0.1
Dieldrin	ug/L	0.034	0.02
Endosulfan I	ug/L	0.009	0.1
Endosulfan II	ug/L	0.007	0.1
Endosulfan sulfate	ug/L	0.018	0.1
Endrin	ug/L	0.031	0.1
Endrin aldehyde	ug/L	0.011	0.1
Endrin ketone	ug/L	0.025	0.1
Heptachlor	ug/L	0.017	0.1
Heptachlor epoxide	ug/L	0.004	0.1
Methoxychlor	ug/L	0.24	0.5
Toxaphene	ug/L	0.62	0.5
Aroclor 1016	ug/L	0.073	-
Aroclor 1221	ug/L	1.1	-
Aroclor 1232	ug/L	0.30	-
Aroclor 1242	ug/L	0.40	-
Aroclor 1248	ug/L	0.24	-
Aroclor 1254	ug/L	0.28	-
Aroclor 1260	ug/L	0.04	-
Semivolatile organics GC/MS - (SW846 8270)			
Acenaphthene	ug/L	3	10
Acenaphthylene	ug/L	3	10
Anthracene	ug/L	2	10

(a) MDL determined according to the procedure specified in 40 CFR 136, Appendix B.
(b) TDL recommendations are derived from *EPA QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations - Chemical Evaluations*. EPA 823-B-95-001, April 1995. Levels not provided for all analytes.
(c) TDL refers to total (not speciated).
(d) Final extract volume 2.0 ml; MDLs estimated based on 10 ml final extract determinations.

TABLE 7-3 METHOD DETECTION LIMITS (MDLS) FOR SITE WATER AND ELUTRIATE SAMPLES

Parameter	Units	Laboratory MDL[a]	Recommended TDL[b]
Benzidine	ug/L	2	-
Benzo[a]anthracene	ug/L	1	10
Benzo[b]fluoranthene	ug/L	1	10
Benzo[k]fluoranthene	ug/L	2	10
Benzo[a]pyrene	ug/L	1	10
Benzo[ghi]perylene	ug/L	1	10
Benzoic acid	ug/L	2	50
Benzyl alcohol	ug/L	2	50
Bis(2-chloroethyl) ether	ug/L	4	-
Bis(2-chloroethoxy)methane	ug/L	4	-
Bis(2-ethylhexyl) phthalate	ug/L	7	10
4-Bromophenyl phenyl ether	ug/L	3	-
Butylbenzylphthalate	ug/L	2	10
Carbazole	ug/L	2	-
4-Chloroaniline	ug/L	6	-
4-Chloro-3-methylphenol	ug/L	1	-
2-Chloronaphthalene	ug/L	3	-
2-Chlorophenol	ug/L	4	-
2-Chlorophenol-d[4]	ug/L	4	-
4-Chlorophenyl phenyl ether	ug/L	3	-
Chrysene	ug/L	2	10
Cyclohexanone	ug/L	4	-
Dibenzo[a,h]anthracene	ug/L	2	10
Dibenzofuran	ug/L	3	10
Di-n-butyl phthalate	ug/L	2	10
1,2-Dichlorobenzene	ug/L	4	10
1,2-Dichlorobenzene-d[4]	ug/L	4	-
1,3-Dichlorobenzene	ug/L	4	10
1,4-Dichlorobenzene	ug/L	4	10
3,3'-Dichlorobenzidine	ug/L	10	-
2,4-Dichlorophenol	ug/L	3	-
Diethyl phthalate	ug/L	3	10
4,6-Dinitro-2-Methylphenol	ug/L	2	-
2,4-Dimethylphenol	ug/L	4	10
Dimethyl phthalate	ug/L	4	10

(a) MDL determined according to the procedure specified in 40 CFR 136, Appendix B.
(b) TDL recommendations are derived from *EPA QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations - Chemical Evaluations*. EPA 823-B-95-001, April 1995. Levels not provided for all analytes.
(c) TDL refers to total (not speciated).
(d) Final extract volume 2.0 ml; MDLs estimated based on 10 ml final extract determinations.

TABLE 7-3 METHOD DETECTION LIMITS (MDLS) FOR SITE WATER AND ELUTRIATE SAMPLES

Parameter	Units	Laboratory MDL[a]	Recommended TDL[b]
2,4-Dinitrophenol	ug/L	2	-
2,4-Dinitrotoluene	ug/L	1	-
2,6-Dinitrotoluene	ug/L	1	-
1,2-Diphenylhydrazine	ug/L	2	-
Di-n-octyl phthalate	ug/L	2	10
Fluoranthene	ug/L	2	10
2-Fluorobiphenyl	ug/L	4	-
Fluorene	ug/L	2	10
2-Fluorophenol	ug/L	4	-
Hexachlorobenzene	ug/L	3	10
Hexachlorobutadiene	ug/L	5	50
Hexachloroethane	ug/L	4	50
Hexachlorocyclopentadiene	ug/L	3	-
Indeno[1,2,3-cd]pyrene	ug/L	1	10
Isophorone	ug/L	2	-
1-Methylnaphthalene	ug/L	-	10
2-Methylnaphthalene	ug/L	4	10
2-Methylphenol	ug/L	3	10
4-Methylphenol	ug/L	3	10
3+4-Methylphenol	ug/L	3	-
Naphthalene	ug/L	5	10
2-Nitroaniline	ug/L	1	-
3-Nitroaniline	ug/L	4	-
4-Nitroaniline	ug/L	3	-
Nitrobenzene	ug/L	5	-
Nitrobenzene-d_5	ug/L	4	-
2-Nitrophenol	ug/L	4	-
4-Nitrophenol	ug/L	1	-
N-Nitrosodiphenylamine	ug/L	2	50
N-Nitrosodimethylamine	ug/L	4	-
N-Nitroso-di-n-propylamine	ug/L	3	-
2,2'-Oxybis(1-chloropropane)	ug/L	4	-
Pentachlorophenol	ug/L	2	50
Phenanthrene	ug/L	2	10
Phenol	ug/L	4	10

(a) MDL determined according to the procedure specified in 40 CFR 136, Appendix B.
(b) TDL recommendations are derived from *EPA QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations - Chemical Evaluations*. EPA 823-B-95-001, April 1995. Levels not provided for all analytes.
(c) TDL refers to total (not speciated).
(d) Final extract volume 2.0 ml; MDLs estimated based on 10 ml final extract determinations.

TABLE 7-3 METHOD DETECTION LIMITS (MDLS) FOR SITE WATER AND ELUTRIATE SAMPLES

Parameter	Units	Laboratory MDL[a]	Recommended TDL[b]
Pyrene	ug/L	1	10
Pyridine	ug/L	6	-
Terphenyl-d_{14}	ug/L	2	-
2,4,6-Tribromophenol	ug/L	3	-
1,2,4-Trichlorobenzene	ug/L	5	10
2,4,5-Trichlorophenol	ug/L	2	-
2,4,6-Trichlorophenol	ug/L	2	-
Volatile organics GC/MS - 5 mL purge (SW846 8240)			
Acetone	ug/L	5	-
Acrolein	ug/L	8	-
Acrylonitrile	ug/L	5	-
Benzene	ug/L	1	5
Bromodichloromethane	ug/L	1	-
Bromofluorobenzene	ug/L	1	-
Bromoform	ug/L	1	-
Bromomethane	ug/L	1	-
2-Butanone	ug/L	1	-
methyl tert-Butyl ether (MTBE)	ug/L	1	-
Carbon disulfide	ug/L	1	-
Carbon tetrachloride	ug/L	1	-
Chlorobenzene	ug/L	1	-
Chloroethane	ug/L	1	-
2-Chloroethyl vinyl ether	ug/L	1	-
Chloroform	ug/L	1	5
Chloromethane	ug/L	2	-
3-Chloro-1-propene	ug/L	1	-
1, 2-Dibromoethane (EDB)	ug/L	1	-
Dibromochloromethane	ug/L	1	-
1,2 Dichlorobenzene	ug/L	0.8	-
cis-1,2-Dichloroethene	ug/L	1	-
trans-1, 2-Dichloroethene	ug/L	1	-
1,3-Dichlorobenzene	ug/L	1	-
1,4-Dichlorobenzene	ug/L	1	-
Dichlorodifluoromethane	ug/L	1	-

(a) MDL determined according to the procedure specified in 40 CFR 136, Appendix B.
(b) TDL recommendations are derived from *EPA QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations - Chemical Evaluations*. EPA 823-B-95-001, April 1995. Levels not provided for all analytes.
(c) TDL refers to total (not speciated).
(d) Final extract volume 2.0 ml; MDLs estimated based on 10 ml final extract determinations.

TABLE 7-3 METHOD DETECTION LIMITS (MDLS) FOR SITE WATER AND ELUTRIATE SAMPLES

Parameter	Units	Laboratory MDL[a]	Recommended TDL[b]
1,1-Dichloroethane	ug/L	1	-
1,2-Dichloroethane	ug/L	1	-
1,2-Dichloroethane-d4	ug/L	1	-
1,1-Dichloroethene	ug/L	1	-
Dichlorofluoromethane	ug/L	1	-
1,2-Dichloropropane	ug/L	1	-
cis-1,3-Dichloropropene	ug/L	1	-
trans-1,3-Dichloropropene	ug/L	0.8	-
Diisopropyl ether	ug/L	0.9	-
Ethylbenzene	ug/L	1	5
2-Hexanone	ug/L	1	-
4-Methyl-2-pentanone (MIBK)	ug/L	1	-
Methylene chloride	ug/L	1	-
Styrene	ug/L	0.9	-
1,1,2,2-Tetrachloroethane	ug/L	1	-
Tetrachloroethene	ug/L	1	5
Toluene-d_8	ug/L	1	-
Toluene	ug/L	1	5
1,1,1-Trichloroethane	ug/L	1	-
1,1,2-Trichloroethane	ug/L	1	-
Trichloroethene	ug/L	1	5
Trichlorofluoromethane	ug/L	1	-
1, 2, 3-Trichloropropane	ug/L	1	-
Vinyl acetate	ug/L	3	-
Vinyl chloride	ug/L	1	-
m&p-Xylene	ug/L	2	5[c]
o-Xylene	ug/L	1	5[c]
Inorganic nonmetals/general organics			
Cyanide (EPA 335.3)	mg/L	5.0	-
BOD (EPA 405.1)	mg/L	0.67	-
COD (EPA 410.4)	mg/L	0.44	-
Nitrogen, ammonia (EPA 350.1)	mg/L	0.063	0.03

(a) MDL determined according to the procedure specified in 40 CFR 136, Appendix B.
(b) TDL recommendations are derived from *EPA QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations - Chemical Evaluations*. EPA 823-B-95-001, April 1995. Levels not provided for all analytes.
(c) TDL refers to total (not speciated).
(d) Final extract volume 2.0 ml; MDLs estimated based on 10 ml final extract determinations.

TABLE 7-3 METHOD DETECTION LIMITS (MDLS) FOR SITE WATER AND ELUTRIATE SAMPLES

Parameter	Units	Laboratory MDL[a]	Recommended TDL[b]
nitrate+nitrite (EPA 353.2)	mg/L	0.011	-
total Kjeldahl (EPA 351.2)	mg/L	0.14	-
Phosphorus, total (EPA 365.3)	mg/L	0.015	-
Sulfide (EPA 376.1)	mg/L	0.84	0.1
TOC (EPA 415.2)	mg/L	0.069	0.1%
Metals - Cold Vapor (SW846 7470)			
Mercury	ug/L	0.1	0.2
Metals - Furnace (SW846 7000 series)			
Chromium	ug/L	1.0	1
Copper	ug/L	1.0	1
Nickel	ug/L	3.0	1
Metals - ICP (SW846 6010)			
Aluminum	ug/L	29.0	40
Beryllium	ug/L	1.0	0.2
Iron	ug/L	20.0	10
Manganese	ug/L	5.0	1
Zinc	ug/L	6.0	1
Metals-Trace ICP (SW846 6010)			
Antimony	ug/L	1.0	3
Arsenic	ug/L	1.0	1
Cadmium	ug/L	1.0	1
Lead	ug/L	1.0	1
Selenium	ug/L	2.0	2
Thallium	ug/L	2.0	1

(a) MDL determined according to the procedure specified in 40 CFR 136, Appendix B.
(b) TDL recommendations are derived from *EPA QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations - Chemical Evaluations*. EPA 823-B-95-001, April 1995. Levels not provided for all analytes.
(c) TDL refers to total (not speciated).
(d) Final extract volume 2.0 ml; MDLs estimated based on 10 ml final extract determinations.

8.0 DATA REDUCTION, VALIDATION, AND REPORTING

8.1 DATA REDUCTION

8.1.1 Field Data Reduction

Field data reduction will vary depending on the type of data being collected and the operating unit from which the data is being collected. Data reduction will generally consist of particular procedures that are applied to the data and of the consolidation of data from various sources. All equations used to calculate concentrations or other values will be presented. All calculated results will be verified by someone other than the originator of the calculations.

8.1.2 Laboratory Data Collection and Reduction

Data Collection: For inorganic and general organic analyses where the instruments are not directly coupled to computerized data systems, the raw data are instrument responses in the form of meter, recorder, or printer output. The chemist performing the analysis enters the bench-generated data into a bound laboratory workbook specific for each parameter. All entries are made in ink. These data consist of instrumental responses (absorbances, percent transmittances, etc.), standard and spike concentrations, sample numbers, and any other pertinent information. The workbooks are under the control of the group supervisor who is responsible for their security. For computerized instruments the output is in the form of printer output and files on magnetic disks, which are filed by sample batch.

For chromatographic organic analyses, the raw data are instrument responses in the form of chromatograms, integrator outputs, or computer-generated data files. The chromatograms and printer output are stored in project-specific files. The data files are archived on magnetic tape or disks.

Data Reduction: Data reduction includes the processes that define or compute either the values or numbers of data items. The data reduction processes used in the laboratory include establishment of calibration curves, calculation of sample concentrations from instrument responses, and computation of quality control parameters (Table 3-1). Calibration is discussed in Section 6 of this QAPjP. Table 8-1 lists the formulas used to calculate sample concentrations.

Sample Calculations: The reduction of instrument responses to sample concentrations takes different forms for different types of methods. The discussion below deals with nonchromatographic and chromatographic methods and solid sample calculations.

For most spectrophotometric analyses, the sample concentrations are calculated from the measured instrument responses using a calibration curve. The sample concentrations can be back-calculated from a regression equation fitted to calibration data. For gravimetric and titrimetric analyses, the calculations are performed according to equations given in the method.

For chromatographic analyses, the unknown concentrations are determined using response factors with external standardization. Quantitation by the external standard technique for GC analyses involves calculation of the concentrations of the target compound from the sample response and the response of a standard solution of the compound. These calculations are generally performed by the associated computerized data systems. The data are transferred to summary tables, which are given to the reports group.

Final concentrations will be reported on a dry-weight basis for sediments. Prior to analysis, the percent solids of a sediment sample will be determined and the appropriate correction applied to determine the "corrected" weight needed to achieve the required dry weight for the sediment sample analysis. The dry-weight concentration is then calculated from the analytical concentration of the "corrected" sediment sample.

Reporting Conventions and Units: The number of conventions set forth in the figures for reported data will be consistent with the EAL-SOP-172. Reporting units used are those commonly used for the analyses performed. Concentrations in sediment samples are expressed in terms of weight per unit dry weight (e.g., mg/kg (dry), ug/kg (dry)).

8.2 DATA VALIDATION

8.2.1 Field Data Validation

Field data validation will consist of both quantitative measures (QA/QC samples) and qualitative evaluation. Qualitative evaluation will generally consist of reviewing documentation of field activities, how well collection procedures were followed, and field instrument performance. Project field data will also be compared to historical data, when available.

Validation is the prime responsibility of the project manager who addresses the following areas:

- Proper chain-of-custody, sample handling, and decontamination procedures followed.
- Samples collected according to specified methods.
- Field instrumentation calibrated according to specified methods.
- Quality control samples (e.g., blanks, replicates) collected as required.

- Field data sheets and logbooks completed and in agreement with sample container labels and chain-of-custody forms.

8.2.2 Laboratory Data Validation

Laboratory quality control criteria for method performance and sample measurement bias are listed in Appendix A, and include the following:

- holding times
- initial and continuing calibration
- laboratory blanks
- surrogate recoveries
- matrix spikes and matrix spike duplicates

In addition to the quality control parameters, data are assessed against the stated requirements on the chain-of-custody and sample handling procedures (Section 5). The reviewers also check that transcriptions of raw or final data are correct and that calculations are performed correctly and verified.

The data review process includes initial review by the analyst during sample analysis and data generation, followed by QC Chemist review and Manager/Supervisor review. Data review checklists are used to document the performance and review of the quality control and analytical data. No data can be released without compliant method performance criteria except with the approval of the appropriate Division Manager and the LPM.

8.3 LABORATORY REPORTS

The laboratory Reports group receives the data package after the Division Manager has released it. Reports assembles the draft report by collecting and incorporating:

- all the data packages for each analysis associated with the reported samples.
- the QC chemist narratives.
- other report-related information, such as copies of chain-of-custody, communication records, and nonconformance forms.

The Laboratories' draft report contains all the information specified in Appendix D. It is prepared and reviewed by the Reports staff, and released by the Reports Supervisor. The draft data report is then reviewed by the appropriate Division Managers who sign the report narrative to certify that the report meets the Data Quality Objectives for precision, accuracy, and completeness specified for the project. The report is forwarded to the LPM who releases the report to the client. A copy of the report is filed in the Central Project File.

TABLE 8-1 SAMPLE CONCENTRATION CALCULATION FORMULAS

Application	Formula	Symbols
Linear regression calibration curves	$C = (R - a_0)/a_1$	C = analytical concentration R = instrument response a_0 = intercept of regression curve (instrument response when concentration is zero) a_1 = slope of regression curve (change in response per change in concentration)
Calibration factors [1]	$C = \dfrac{A_x V_f}{CF\ V_i}$	C = concentration (ug/L) CF = calibration factor A_x = peak size of target compound in sample extract V_f = final volume of extracted sample (mL) V_i = initial volume of sample extracted (mL)
Response factors [2]	$C = \dfrac{C_{is} A_x V_f}{RF\ A_{is} V_i}$	C = concentration (ug/L) RF = internal standard response factor C_{is} = concentration of the internal standard (ug/L) A_x = area of the characteristic ion for the target compound V_f = final volume of extracted sample (mL) A_{is} = area of the characteristic ion for the internal standard V_i = initial volume of sample extracted (mL)
Residues [3]	$R = \dfrac{W - T}{V} \times 1{,}000{,}000$	R[6] = residue concentration (mg/L) W = weight of dried residue + container (g) T = tare weight of container (g) V = volume of sample used (mL)
Solid samples [5]	$K = \dfrac{C\ V\ D}{W\ (\%S/100)}$	K = dry-weight concentration (mg/kg) C = analytical concentration (mg/L) V = final volume (mL) of processed sample solution D = dilution factor W = wet weight (g) of as-received sample taken for analysis %S = percent solids of as-received sample

1 Used for quantitation by the external standard technique
2. Used for quantitation by the internal standard technique
3. Used for total, filterable, nonfilterable, and volatile residues as well as gravimetric oil and grease
4. Some values for the conversion factor include. 50,000 for alkalinity, acidity, and hardness; 8,000 for Winkler; 16,000 for iodometric sulfide, and 35,500 for residual chlorine
5. Used to calculate the dry-weight concentration of a solid sample from the analytical concentration of the processed sample.
6. Conversion factor to convert g/mL to mg/L:

$$\frac{mg}{L} = \frac{g}{mL} \cdot \frac{10^3 mL}{L} \cdot \frac{10^3 mg}{g}$$

9. INTERNAL QUALITY CONTROL CHECKS

A quality control program is a systematic process that controls the validity of analytical results by measuring the accuracy and precision of method and matrix, developing expected control limits, using these to detect anomalous events and requiring corrective action techniques to prevent or minimize the recurrence of these events. Quality control measurements for analytical protocols are designed to evaluate laboratory performance, and measurement biases resulting from the sample matrix and field performance.

- *Laboratory method performance:* All quality control criteria for method performance must be met for all target analytes for data to be reported. These criteria generally apply to instrument tune, calibration, method blanks, laboratory control samples (LCS), MDL verification sample, and Standard Reference Materials (SRM). In some instances where method criteria fail, useable data can be obtained and are reported with client approval. The narrative will then include a thorough discussion of the impact on data quality.

- *Sample performance:* The accuracy and precision of sample analyses are influenced by both internal and external factors. Internal factors are those associated with sample preparation and analysis. Internal factors are monitored by the use of internal quality control samples. Quality control field samples are analyzed to determine any measurement bias due to the sample matrix based on evaluation of matrix spikes (MS) and matrix spike duplicates (MSD). If acceptance criteria are not met, matrix interferences are confirmed either by reanalysis or by inspection of the LCS results to verify that laboratory method performance is in control. Data are reported with appropriate qualifiers or discussion.

- *Field performance:* Quality control samples are used to evaluate the effectiveness of the sampling program to obtain representative samples, eliminating any cross contamination. These include trip blanks (for volatile organics), field replicates and field blanks.

9.1 LABORATORY QUALITY CONTROL SAMPLES

Quality control samples specified in the ITM will be analyzed at the frequency stated below for each matrix. Standard Reference Materials (SRMs) will be obtained from National Institute of Standards and Technology (NIST) or a comparable source, if available. Acceptance criteria are listed in Appendix A. With concurrence of the U.S. Army Corps of Engineers, Baltimore District, only one sediment SRM sample will be run, and no water SRM.

Sediment Samples	
Standard Reference Material	1 for this project
Method Blanks	1 per analytical batch of 1-20 samples
Laboratory Control Sample	1 per analytical batch of 1-20 samples
Surrogates	Spiked into all field and QC samples
Matrix Spike/Matrix Spike Duplicate	1 per analytical batch of 1-20 samples
Water Samples	
Standard Reference Material	1 per analytical batch of 1-20 samples (not applicable)
Method Blanks	1 per analytical batch of 1-20 samples
Laboratory Control Sample	1 per analytical batch of 1-20 samples
Surrogates	Spiked into all field and QC samples
Matrix Spike/Matrix Spike Duplicate	1 per analytical batch of 1-20 samples

9.1.1 Standard Reference Material

Standard Reference Materials (SRM) represent performance-based QA/QC. A standard reference material is a soil/solution with a certified concentration that is analyzed as a sample and is used to monitor analytical accuracy. SRMs, if available, will be performed for every batch of twenty (20) or fewer samples.

9.1.2 Method Blanks

The method (reagent) blank is used to monitor laboratory contamination. This is usually a sample of laboratory reagent water processed through the same analytical procedure as the sample (i.e., digested, extracted, distilled). One method blank is prepared and analyzed every day that samples are prepared.

The method blank must contain less than or equal to three times the method detection limit (MDL) limit for the compounds of interest. If this criteria is not met, then all sample processing will be halted until corrective measures are taken and documented. All samples processed with the out-of-control method blank will be reprocessed and reanalyzed. If analytes are detected at <3

9.1.3 Laboratory Control Sample

The Laboratory Control Sample is a fortified method blank analyzed with each analytical batch of twenty (20) or fewer samples. These samples generally consist of reagent water or solid fortified with the analytes of interest for single-analyte methods and selected analytes for multi-analyte methods according to the appropriate analytical method. They are prepared and analyzed with the associated sample batch. The analyte recovery from each is used to monitor analytical accuracy.

The percent recovery is calculated and plotted onto control charts with warning limits at two (2) standard deviations (95% confidence limit), and control limits at three standard deviations (99% confidence limit). Control charts are used to alert the laboratory of the need to check method procedure through trend analysis of the charts (EAL-SOP-247).

9.1.4 Matrix Spike/Matrix Spike Duplicate

A fortified sample (matrix spike) is an aliquot of a field sample which is fortified with the analyte(s) of interest and analyzed to monitor matrix effects associated with a particular sample. Samples to be spiked are chosen at random. The final spiked concentration of each analyte in the sample should be at least ten times the calculated MDL. A duplicate fortified sample (matrix spike duplicate) will be performed for every batch of twenty (20) or fewer samples.

9.1.5 Surrogates

Surrogates are organic compounds that are similar to analytes of interest in chemical composition, extraction, and chromatography, but are not normally found in environmental samples. These compounds are spiked into all blank, standards, samples, and spiked samples prior to analysis for organic parameters. Generally, surrogates are not used for inorganic analyses. Percent recoveries are calculated for each surrogate. Surrogates shall be spiked into samples according to the appropriate analytical method (Section 7 of this QAP). Surrogate spike recoveries shall fall within the control limits set in accordance with procedures specified in the method. Surrogate recoveries will not be calculated if sample dilution causes the surrogate concentration to fall below the quantitation limit.

9.2 CONTROL CHARTS

Quality control charts are graphical plots that are used to determine whether a process is in a state of statistical control. The vertical axis of the control chart is the value of the parameter being measured, and the horizontal axis is the time or sequence of the measurements. A control chart is characterized by a central line, warning limits, and control limits. The central line is the mean, theoretical, or most probable value for the measured parameter. The limits are values on either side of the central line with which are associated probabilities that an observed value will be within the limits. The warning limits are the 2σ or 95% limits; that is, if the process is operating correctly and only random scatter is being observed, nineteen out of twenty points should fall inside the warning limits. The control limits are the 3σ or 99% limits; only one point in a hundred should fall outside these limits by chance alone.

9.2.1 Accuracy and Precision Charts

The control charts used in the laboratory are generated from the analysis of laboratory control samples (LCS), which are used to demonstrate that a method is in control, apart from sample matrix effects (NEESA 1988). The data from the LCS measurements are plotted on two Shewhart control charts; one for accuracy, and the other for precision. The parameter that is plotted on the accuracy chart is the percent recovery of the LCS measurement, calculated from:

$$\text{percent recovery } (\%R) = \frac{\text{found concentration}}{\text{expected concentration}} \times 100$$

The moving ranges between each successive pair of percent recoveries are calculated and plotted on the precision chart:

$$\text{moving range } (R_i) = |\%R_{i+1} - \%R_i| \quad \text{for } i = 1,2,3\ldots(n-1)$$

9.2.2 Calculation of Chart Limits

To calculate the warning and control limits for the charts, 20-30 values of the percent recoveries are collected. From these data the mean percent recovery, $\overline{\%R}$, and the mean moving range, $\overline{R}$, are calculated. The central line of the accuracy chart is the mean percent recovery, $\overline{\%R}$. For control charts based on the moving range of two measurements, the upper and lower warning and control limits of the accuracy chart are given by:

Upper control limit (UCL) $= \overline{\%R} + 2.660\overline{R}$

Upper warning limit (UWL) $= \overline{\%R} + 1.773\overline{R}$

Lower warning limit (LWL) $= \overline{\%R} - 1.773\overline{R}$

Lower control limit (LCL) $= \overline{\%R} - 2.660\overline{R}$

The central line of the precision chart is the mean moving range, $\overline{R}$. The warning and control limits for the precision chart are given by:

UCL $= 3.267\overline{R}$
UWL $= 2.511\overline{R}$
LWL $= 0$
LCL $= 0$

The limits are updated at least quarterly or when the method is changed significantly.

9.2.3 How the Charts are Used

As the value for the control sample is calculated it is compared against the established limits. If the value is within the limits, the analysis is in control and data generated can be used. The percent recovery and the associated run information are entered into the LIMS data base from which they can be retrieved to plot control charts and to update the limits.

9.2.4 Out-of-Control Situations

The following three conditions are used with the control charts to indicate that a possible out-of-control situation exists:

1) any point outside the control limits;
2) any two consecutive points between the warning and control limits; or
3) seven successive points on the same side of the central line.

When one of these conditions exists, the method and the calculations must be investigated to determine if a cause for the condition can be found. When an analyst observes that an out-of-control situation has occurred, the analyst's supervisor is notified, and the appropriate corrective action procedures are initiated. No further analyses are performed until the situation is remedied. If the problem cannot be identified or corrected, the Laboratory Manager and Quality Assurance Manager are notified.

An out-of-control event and the corrective action taken are documented on a nonconformance record form which is discussed in Section 13 of this QAP.

9.2.5 References

American Society for Testing and Materials. 1976. *ASTM Manual on Presentation of Data and Control Chart Analysis.* STP 15D. ASTM, Philadelphia.

Duncan, A.J. 1974. *Quality Control and Industrial Statistics, 4th edition.* Irwin, Homewood, Ill.

Naval Energy and Environmental Support Activity. 1988. *Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Restoration Program, 2nd rev.* NEESA 20.2-047B. NEESA, Port Hueneme, Calif.

United States Environmental Protection Agency. 1979. *Handbook for Analytical Quality Control in Water and Wastewater Laboratory.* EPA-600/4-79-019. U.S. EPA, Cincinnati, Ohio.

9.3 APPLICATION OF CONTROLS

Analytical quality control results are calculated using the formulas in Table 9-1, and are compared with the control limits in Appendix A to determine if the data can be reported. If the limits are exceeded, appropriate corrective action must be taken as specified in Appendix B.

TABLE 9-1 ANALYTICAL QUALITY CONTROL FORMULAS

SAMPLE	FORMULA	SYMBOLS
Spikes (as %R from the concentrations of the analyte in the spiked and unspiked samples)	$\text{Percent recovery} = \frac{A - B}{C} \times 100$	A = sample concentration of the spiked sample (ppm) B = sample concentration of the unspiked sample (ppm) C = concentration of the spike (ppm)
Duplicates (as the mean and relative percent difference (RPD) of the duplicates)	$\text{Mean} = \frac{X_1 + X_2}{2}$ $\text{RPD} = \frac{\lvert X_1 - X_2 \rvert}{\text{Mean}} \times 100$	X_1 = concentration of first replicate X_2 = concentration of second replicate

10. PERFORMANCE AND SYSTEMS AUDITS

An individual audit plan will be developed to provide a basis for each audit. This plan will identify the audit scope, activities to be audited, audit personnel, any applicable documents, and the schedule. Checklists will be prepared by the auditors and used to conduct all audits. They will be developed to accomplish the necessary reviews and to document the results of the audit.

Audits may involve on-site visits by the auditor. Items to be examined may include the availability and implementation of approved work procedures; implementation and documentation of health and safety procedures; calibration and operation of equipment; packaging, storage, and shipping of samples obtained; performance documentation; and nonconformance (variance) documentation.

The records of operations will be reviewed to verify that laboratory and field-related activities were performed in accordance with the appropriate approved procedures. Items reviewed will include, but will not be limited to, the calibration records of equipment, daily field activity logs, chain-of-custody documentation, and data resulting from field and laboratory operations.

10.1 LABORATORY PERFORMANCE AND SYSTEM AUDITS

Audits are performed routinely to review and evaluate the adequacy and effectiveness of laboratory performance and quality assurance program; to ascertain if the QAPjP is being completely and uniformly implemented, to assess the effectiveness of the laboratory quality assurance program, to identify nonconformances, and verify that identified deficiencies are corrected. The Laboratory Quality Services Manager (QSM) is responsible for such audits and will perform them according to a schedule planned to coincide with appropriate activities on the project schedule and sampling plans. Such scheduled audits may be supplemented by additional audits for one or more of the following reasons:

- when significant changes are made in the QAPjP
- when it is necessary to verify that corrective action has been taken on a nonconformance reported in a previous audit
- when requested by the EA Project Manager or Laboratory QSM.

10.1.1 Performance Audits are independent sample checks made by a supervisor or auditor to arrive at a quantitative measure of the quality of the data produced by one section or the entire measurement process. Performance audits are conducted by introducing control samples, in addition to those used routinely, into the data production process. These control samples will include performance evaluation samples of known concentrations. Where a SRM of similar matrix is available, it will be used.

The results of performance audits are evaluated against the criteria in Appendices B and C in this QAPjP and summarized in the analytical report narrative summarized and maintained by the QSM and distributed to the supervisors who must investigate and respond to any results that are outside the control limits.

10.1.2 Systems Audits are on-site qualitative inspections and reviews of the quality assurance system used by some part of or the entire measurement system. System audits are conducted by the corporate QA group with the assistance and involvement of field, laboratory, and project personnel. The audits are performed against the requirements, specified in the QAPjP. A checklist is generally generated from the requirements and becomes the basis for the audit. The results of any deficiencies noted during the audit are summarized in an audit report. Examples of an audit checklist and report form are given in Figures 10-1 and 10-2, respectively.

10.2 AUDIT PROCEDURES

Prior to an audit, the designated lead auditor prepares an audit checklist (Figure 10-1). During an audit and upon its completion, the auditor(s) will discuss the findings with the individuals audited and discuss and agree on corrective actions to be initiated. Within 7 days of completion of an audit, the auditor will prepare and submit an audit report (Figure 10-2) to the Manager of the audited group, the Project Manager, and the Quality Services Manager. Minor administrative findings that can be resolved to the satisfaction of the auditor during an audit are not required to be cited as items requiring corrective action. Findings that are not resolved during the course of the audit and findings affecting the overall quality of the project will be included in the audit report.

Within 7 days, the Manager of the audited group will prepare and submit to the QSM and EA Project Manager a reply to the audit. This reply will include, at a minimum, a plan for implementing the corrective action to be taken on nonconformances indicated in the Audit Report, the date by which such corrective action will be completed, and actions taken to prevent reoccurrence. If the corrective action has been completed, supporting documentation should be attached to the reply. The Auditor will ascertain (by reaudit or other means) if appropriate and timely corrective action has been implemented.

Records of audits will be maintained in the project files. Audit files will include, as a minimum, the Audit Report, the reply to the audit, and any supporting documents. It is the responsibility of the Project Manager to conform to the established procedures, particularly as to development and implementation of such corrective action(s).

10.3 DOCUMENTATION

To ensure that the previously defined scope of the individual audits is accomplished and that the audits follow established procedures, a checklist will be completed during each audit. The checklist will detail the activities to be executed and ensure that the auditing plan is accurate. Audit checklists will be prepared in advance and will be available for review. At a minimum, the checklist will allow space for the following information:

- date and type of audit
- name and title of auditor
- description of group, task or facility being audited
- names of lead technical personnel present at audit
- checklist of audit items according to scope of audit
- deficiencies or nonconformances

Following each system, performance, and data audit, the QSM will prepare a report to document the findings of the specific audit. The report is submitted to the Director, EA Laboratories; Director, Corporate Quality Assurance; and the Laboratory Manager of the audited group to ensure that objectives of the QA program are met. In general, the format of the audit quality assurance reports will consist, at a minimum, of the following:

- description and date of audit
- name of auditor
- copies of completed, signed, and dated audit form and/or checklist
- summary of findings of the audit including any nonconformance or deficiencies
- date of report and appropriate signatures
- description of corrective actions

A copy of the signed and dated report for each audit will be maintained by the QSM, and will also be placed in project files as necessary.

EA LABORATORIES INSPECTION CHECKLIST

DIVISION/AREA:______________________ PROJECT/PROGRAM:____________

AUDIT NUMBER:______________________ AUDIT FINDING REPORT: ________

Q.A. AUDITOR:______________________ DATE:______________

INSPECTION PARAMETERS	YES	NO	N/A
1. Standard Operating Procedures			
a. Date/Revision No. of applicable SOPs			
b. Copy of SOP(s) present in work area			
c. SOP(s) have proper signatures and are current			
d. Personnel awareness of SOP(s) requirements			
2. Protocol			
a. Personnel awareness of protocol requirements			
b. Are specific protocol requirements being followed?			
3. Equipment Records			
a. Are equipment/instrument SOP(s) available for inspection?			
b. Is user aware of SOP(s)?			
c. Is the equipment/instrument manual in the work area?			
d. Is there an instrument Use Log in the area?			
e. Where are maintenance/service records with part(s) replacement numbers kept? Are they current?			
f. Where are calibration, standardization, inspection and cleaning records kept? Are they current?			
4. Protective Clothing			
a. Is the protective clothing required for the observed procedure being properly worn?			
5. Data Records			
a. Are supervisor's signatures present where required?			
b. Are data properly recorded in ink? On the computer?			
c. Are error corrections made by a single line in ink with date, initials and explanation?			
d. Are all blanks filled in?			

* COMMENTS

* Attach a separate sheet for comments.

Figure 10-1. Audit Checklist.

EA Laboratories

19 Loveton Circle
Sparksd, Maryland 21152

(410) 771-4920

Audit Finding Report

AUDITOR SIGNATURE DATE	AUDIT NUMBER	AFR NUMBER	AUDIT DATE

INDIVIDUAL CONTACTED	AREA	PROJECT/PROGRAM NUMBER

COMPLETED BY AUDITOR

REQUIREMENTS

FINDING

RECOMMENDED CORRECTIVE ACTION

SCHEDULED RESPONSE DATE	RESPONSIBLE FOR CORRECTIVE ACTION

COMPLETED BY AUDITED ORGANIZATION

CORRECTIVE ACTION

DATE	SUBMITTED BY	MANAGEMENT APPROVAL

COMPLETED BY AUDITOR

DATE RESPONSE RECEIVED	AUDITOR	RESPONSE ACCEPTABLE YES NO

REASON FOR REJECTION

AFR VERIFICATION

DATE VERIFIED	AUDITOR SIGNATURE	DOCUMENT USED FOR CLOSE OUT	CLOSED DATE

Figure 10-2. Audit Report Form.

11. PREVENTIVE MAINTENANCE

Periodic preventive maintenance is required for all sensitive equipment. Instrument manuals will be kept on file for reference if equipment needs repair. The troubleshooting section of factory manuals may be used in assisting personnel in performing maintenance tasks.

Major instruments in the laboratory are covered by annual service contracts with manufacturers. Under these agreements, regular preventive maintenance visits are made by trained service personnel. Maintenance is documented and maintained in permanent records by the individual responsible for each instrument.

Division Managers are responsible for preparation and documentation of the program. Supervisors implement the program, and the Quality Services Manager reviews implementation to verify compliance during scheduled internal audits. For each operational group, the preventive maintenance program includes the following:

- Listing of the instruments and equipment that are included in the program.
- Frequency of maintenance considering manufacturer's recommendations and/or previous experience with equipment.
- For each instrument in the program a file is maintained for the following information:
    - List of spare parts maintained by the laboratory
    - External service contracts
    - Items to be checked and/or serviced during maintenance and directions for performing maintenance (if external service is not provided or if not stated in manufacturer's instrument manuals)

Specific preventive maintenance practices, their frequency of performance, and available spare parts forlaboratory equipment are described in Table 11-1.

TABLE 11-1. PREVENTIVE MAINTENANCE REQUIREMENTS

Instrument	Item Checked/Serviced	Frequency
Gas Chromatograph	EC (Ni-63) wipe test	Semiannually
	Clean detectors: ECD/FID/NPD	As needed
	Change column	As needed
	Change gas wool plug	As needed
	Clean insert	As needed
	Replace septum	As needed
	Change fuses	As needed
	Reactivate external carrier gas filler	As needed
	dryers	As needed
	Clean and silanize or replace glass liners or injectors	As needed
GC/MS	GC/MS maintenance is the same as GC with the following additions:	
	Diffusion pump oil	Biweekly
	Mechanical pump oil	Quarterly
	Power con. air filter	Biweekly
	Water bay filter	Biweekly
	Interface box	Biweekly
	Vacuum chaff filter	Semiannually
	Turbo pump oil	Annually
	Water filter (if applicable)	Semiannualy
	Computer air filter	Monthly
	Card cage air filter	Monthly
	Source-clean ceramics, polish lenses	As needed
	Clean poles and ceramics on the poles	As needed
	Clean contacts on the component boards	As needed
	Vacuum the component boards	As needed
	Clean grob and replace quartz insert	As needed
	Replace septum	Daily
	Injection port liner checked	Daily
	Column maintenance	As needed
	Disk drive	Semiannually (service engineer) or as needed
	Printer	Quarterly
Technicon Autoanalyzer	Lamp	As needed
	Change Cd column	As needed
	Replace filters	As needed
	Pump	Each Run
	Replace tubing	As needed/daily
	Optics	Quarterly
	Sampler	Quarterly
	Replace oil in CN distillation bath	As needed

TABLE 11-1. PREVENTIVE MAINTENANCE REQUIREMENTS

Instrument	Item Checked/Serviced	Frequency
Atomic Absorption-Furnace Spectrophotometer	Lamps Optics Clean furnace windows Replace graphite tube Replace contact rings Replace quartz windows Clean optics Align background lamp Check wave length	Each run Quarterly by service technician Daily As needed, or 8-100 samples Quarterly or as needed Semiannually or as needed Daily Quarterly by service representative Quarterly by service representative
Inductively Coupled Plasma Spectrophotometer	Sample introduction system Check pumps Clean, realign torch Replace nebulizer Clean mixing chamber Replace pump tubing	Daily Daily Monthly or as needed Monthly or as needed Monthly or as needed Daily, or as needed
Total Organic Carbon Analyzer	Check oxygen purity Check Heater Add acid	Each new cylinder As needed Monthly
Refrigerators/Freezers	Temperature checked and logged Compartment cleaned	Daily on each work day Quarterly
Walk-In Coolers	Temperature checked and logged Unit cleaned	Daily on each work day Quarterly
Balances	Service representative calibration Internal weight train, gears, electronics	Annually Annual service
Thermometers	Calibrated	Annually
Class S Weights	Calibrated	Annually
Deionized/Organopure Water	Conductivity check Ion-exchange bed changed Replace filters	Weekly Weekly As needed
Vacuum Pumps and Air Compressor	Check performance Lubrication, belts, etc.	Weekly As needed

TABLE 11-1. PREVENTIVE MAINTENANCE REQUIREMENTS

Instrument	Item Checked/Serviced	Frequency
Water Baths	Water Level Bath cleaned	Added as needed Six Months

12. DATA QUALITY ASSESSMENT

Data assessment is a systematic process of reviewing data against a set of criteria to identify outliers or errors. Laboratory data review is discussed in Section 8 of this QAP. Each report narrative includes a discussion of the quality control samples and evaluates data usability based on the data.

13. CORRECTIVE ACTIONS

13.1 OBJECTIVES

The objectives of the corrective action procedures presented below are to ensure that recognized errors in performance of sample and data acquisition leads to effective remedial measures and that those steps required to correct an existing condition are documented to provide assurance that any data quality deficiencies are recognized in later interpretation and are not recurrent in the course of the project.

13.2 RATIONALE

Many times corrective measures are undertaken by project staff in a timely and effective fashion but go undocumented. Such incidents may be of a recurrent type that might not be recognized by other staff performing the same activity. In other cases, corrective actions are of a complex nature and may require scheduled interactions between departmental groups. In either case, documentation in a formal or informal sense can reinforce the effectiveness and duration of the corrective measures taken.

13.3 CORRECTIVE ACTION METHODS

13.3.1 Immediate Corrective Actions

Immediate corrective actions are of a minor or routine nature such as correcting malfunctioning equipment, correction of data transcription errors, and other such activities routinely made in the field, laboratory or office by technicians, analysts and other project staff. These should be documented as prescribed in the project quality control procedures, as required. Specific documentation should be limited to notations in logbooks, notebook or on data sheets or other such forms. Such notations should be initiated and dated by the person performing the corrective action.

13.3.2 Long-Term Corrective Actions

Long-term corrective action shall be used to identify and eliminate causes of nonconformances which are of a complex nature and that are formally reported between management groups. A formal system for reporting and recording these corrective actions shall use the following procedure.

13.3.3 Corrective Action Steps

For either immediate or long-term corrective actions, steps comprising closed-loop corrective action system are as follows:

- Define the problem
- Assign responsibility for investigating the problem
- Investigate and determine the cause of the problem
- Determine a corrective action to eliminate the problem
- Assign and accept responsibility for implementing the corrective action
- Establish effectiveness of the corrective action and implement the correction and
- Verify that the corrective action has eliminated the problem.

Nonconformance events associated with analytical work are documented using EA Laboratories Nonconformance Records (NCRs) which are reviewed and acknowledged by the Quality Services Manager (EAL-SOP-072).

13.3.4 Audit Based Nonconformances

Following audits, corrective action is initiated by documenting the audit finding and recommended corrective action on an Audit Finding Report discussed in Section 10. The corrective action undertaken by the designated responsible party is documented with an implementation schedule and management approval. The implementation is verified by the auditor on the same form which is then made part of the project audit report record. Other means of documenting long-term corrective action are equally acceptable if the seven (7) elements listed above are addressed.

13.4 CORRECTIVE ACTION REPORT REVIEW AND FILING

Immediate and long-term corrective actions require review to assure that, during the time of non-conformance, erroneous data were not generated or that, if possible, correct data were acquired instead. Such confirmation and review is the responsibility of the supervisor of the staff implementing the corrective action.

13.5 CORRECTIVE ACTIONS REPORTS TO MANAGEMENT

The Project Manager is informed verbally of analytical non-conformance events as soon as possible and decisions made after evaluation are documented in the NCR. Copies of each NCR are maintained in the report file, and addressed in the final data report.

Figure 13-1 Laboratory Nonconformance Record Form

EA LABORATORIES

LABORATORY NONCONFORMANCE RECORD

NONCONFORMANCE

Client		Sample(s) and Report Number	
Test	Method	Instrument	Date of Occurrence

___ Failed Tuning
___ Failed Calibration
___ Instrument Instability
___ Instrument Malfunction

___ Power Failure
___ Broken or Lost Aliquot
___ Insufficient Volume of Aliquot
___ Poor Aliquot Preservation

___ Exceeded Holding Time
___ Matrix Interference
___ Out-of Control QC Parameter
___ Missing QC Parameter
___ Other

Detailed Description	
Signature of Originator	Date

CORRECTIVE ACTION: MUST DEMONSTRATE CONTROL REESTABLISHED

___ Instrument Retuned
___ Instrument Recalibrated
___ Instrument Serviced

___ Sample(s) Re-Prepared
___ Sample(s) Reanalyzed
___ Laboratory Management Notified
___ Other

Detailed Des ription	
	Date of Completion
Signature of Responsible Perwon	Date

VERIFICATION OF NONCONFORMANCE AND CORRECTIVE ACTION

Signature of Division Manager	Date

NOTIFICATION

Client Contact Required? ___ Yes ___ No	Date of Contact
Detailed Description	
Signature of Laboratory Project Manager	Date

ACKNOWLEDGEMENT

Signature of Laboratory Quality Assurance Manager	Date

14. QUALITY ASSURANCE REPORTS

Fundamental to the success of this program is the active participation of management through awareness of project activities, and during development, review, and operation of the project. Management will be informed of quality central activities through the receipt, review, and/or approval of:

- the QAP
- audit reports
- corrective action reports
- analytical report narratives.

15. REFERENCES

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APPENDIX A

LABORATORY QUALITY CONTROL CRITERIA FOR PRECISION & ACCURACY

APPENDIX A QUALITY CONTROL CRITERIA FOR PRECISION & ACCURACY FOR MATRIX SPIKES, MATRIX SPIKE DUPLICATES, SURROGATES, LABORATORY CONTROL SAMPLES, AND STANDARD REFERENCE MATERIALS (a)

QC Parameter	Spiking Compounds	Spike Concentration		Accuracy (%R)		Precision (b)	
		Water(ug/L)	Soil(mg/kg)	Water	Soil	Water	Soil
SW6010 Metals by Inductively Coupled Plasma Atomic Emission Spectroscopy							
Matrix Spike	Aluminum	2000	--	75-125	--	<20	--
	Antimony	500	50	75-125	75-125	<20	<20
	Arsenic	2000	(d)	75-125	75-125	<20	<20
	Beryllium	50	5	75-125	75-125	<20	<20
	Cadmium	50	5	75-125	75-125	<20	<20
	Chromium	200	20	75-125	75-125	<20	<20
	Copper	250	25	75-125	75-125	<20	<20
	Iron	1000	--	75-125	--	<20	--
	Lead	500	50	75-125	75-125	<20	<20
	Manganese	500	50	75-125	75-125	<20	<20
	Nickel	500	50	75-125	75-125	<20	<20
	Selenium	2000	(d)	75-125	75-125	<20	<20
	Zinc	500	50	75-125	75-125	<20	<20
LCS	Aluminum	4000	(d)	85-102	45-155	<15	<15
	Antimony	2000	(d)	80-110	31-245	<15	<15
	Arsenic	2000	(d)	80-120	49-149	<15	<15
	Beryllium	100	(d)	91-104	64-140	<15	<15
	Cadmium	1000	(d)	80-109	52-144	<15	<15
	Chromium	400	(d)	85-107	54-142	<15	<15

(a) Laboratory Control Sample (LCS) limits are based on historical performance data and are updated annually.
(b) Precision for matrix spikes is listed for relative % difference (%RPD): for the LCS the value is the precision calculated as the moving range for successive LCS recoveries.
(c) RL - Reporting Limit.
(d) LCS is commercially prepared reference standard; therefore, concentrations will vary.
(e) Approximate value: actual value determined through standardization of stock.
(f) SRM and LCS are the same reference solid matrix standard.

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APPENDIX A QUALITY CONTROL CRITERIA FOR PRECISION & ACCURACY FOR MATRIX SPIKES, MATRIX SPIKE DUPLICATES, SURROGATES, LABORATORY CONTROL SAMPLES, AND STANDARD REFERENCE MATERIALS (a)

QC Parameter	Spiking Compounds	Spike Concentration		Accuracy (%R)		Precision (b)	
		Water(ug/L)	Soil(mg/kg)	Water	Soil	Water	Soil
	Copper	500	(d)	90-103	57-145	< 15	< 15
	Iron	2000	(d)	91-105	51-148	< 15	< 15
	Lead	2000	(d)	87-105	53-142	< 15	< 15
	Manganese	1000	(d)	88-105	67-135	< 15	< 15
	Nickel	1000	(d)	91-103	55-146	< 15	< 15
	Selenium	2000	(d)	80-120	52-147	< 15	< 15
	Zinc	1000	(d)	85-105	52-149	< 15	< 15
SRM	Aluminum	(d)	(d)	80-120	(f)	--	
	Antimony	(d)	(d)	80-120	(f)	--	
	Arsenic	(d)	(d)	80-120	(f)	--	
	Beryllium	(d)	(d)	80-120	(f)	--	
	Cadmium	(d)	(d)	80-120	(f)	--	
	Chromium	(d)	(d)	80-120	(f)	--	
	Copper	(d)	(d)	80-120	(f)	--	
	Iron	(d)	(d)	80-120	(f)	--	
	Lead	(d)	(d)	80-120	(f)	--	
	Manganese	(d)	(d)	80-120	(f)	--	
	Nickel	(d)	(d)	80-120	(f)	--	
	Selenium	(d)	(d)	80-120	(f)	--	
	Zinc	(d)	(d)	80-120	(f)	--	

(a) Laboratory Control Sample (LCS) limits are based on historical performance data and are updated annually.
(b) Precision for matrix spikes is listed for relative % difference (%RPD): for the LCS the value is the precision calculated as the moving range for successive LCS recoveries.
(c) RL - Reporting Limit.
(d) LCS is commercially prepared reference standard: therefore, concentrations will vary.
(e) Approximate value: actual value determined through standardization of stock.
(f) SRM and LCS are the same reference solid matrix standard.

APPENDIX A QUALITY CONTROL CRITERIA FOR PRECISION & ACCURACY FOR MATRIX SPIKES, MATRIX SPIKE DUPLICATES, SURROGATES, LABORATORY CONTROL SAMPLES, AND STANDARD REFERENCE MATERIALS (a)

QC Parameter	Spiking Compounds	Spike Concentration		Accuracy (%R)		Precision (b)	
		Water(ug/L)	Soil(mg/kg)	Water	Soil	Water	Soil
SW7060 Arsenic by Graphite Furnace Atomic Absorption							
Matrix Spike	Arsenic	40	40	75-125	75-125	<20	<20
LCS	Arsenic	25	(d)	74-115	49-149	<15	<15
SRM	Arsenic	--	(d)	80-120	(f)	--	<15
SW7421 Lead by Graphite Furnace Atomic Absorption							
Matrix Spike	Lead	20	20	75-125	75-125	<20	<20
LCS (b)	Lead	25	(d)	75-117	53-142	<15	<15
SRM	Lead	--	(d)	80-120	(f)	--	<15
SW7470/7471 Mercury by Cold Vapor Atomic Absorption							
Matrix Spike:	Mercury	1	1	75-125	75-125	<20	<20
LCS (b)	Mercury	4	(d)	83-114	48-156	<15	<15
SRM	Mercury	--	(d)	80-120	(f)	--	<15
SW7740 Selenium by Graphite Furnace Atomic Absorption							
Matrix Spike:	Selenium	10	10	75-125	75-125	<20	<20
LCS (b)	Selenium	50	(d)	77-104	52-149	<15	<15
SRM	Selenium	--	(d)	80-120	(f)	--	<15
SW7841 Thallium by Graphite Furnace Atomic Absorption							
Matrix Spike	Thallium	50	50	75-125	75-125	<20	<20
LCS (b)	Thallium	25	(d)	70-111	50-150	<15	<15
SRM	Thallium	--	(d)	--	(f)	--	<15

(a) Laboratory Control Sample (LCS) limits are based on historical performance data and are updated annually.
(b) Precision for matrix spikes is listed for relative % difference (%RPD): for the LCS the value is the precision calculated as the moving range for successive LCS recoveries.
(c) RL - Reporting Limit.
(d) LCS is commercially prepared reference standard: therefore, concentrations will vary.
(e) Approximate value: actual value determined through standardization of stock.
(f) SRM and LCS are the same reference solid matrix standard.

APPENDIX A QUALITY CONTROL CRITERIA FOR PRECISION & ACCURACY FOR MATRIX SPIKES, MATRIX SPIKE DUPLICATES, SURROGATES, LABORATORY CONTROL SAMPLES, AND STANDARD REFERENCE MATERIALS (a)

QC Parameter	Spiking Compounds	Spike Concentration		Accuracy (%R)		Precision (b)	
		Water(ug/L)	Soil(mg/kg)	Water	Soil	Water	Soil
SW8080 Organochlorine Pesticides and PCBs by GC/ECD							
Matrix Spike	gamma-BHC (Lindane)	0.5	0.017	56-123	46-127	<15	<50
	Heptachlor	0.5	0.017	40-131	35-130	<20	<31
	Aldrin	0.5	0.017	40-120	34-132	<22	<43
	Dieldrin	1.0	0.033	52-126	31-134	<18	<38
	Endrin	1.0	0.033	56-121	42-139	<21	<45
	4,4'-DDT	1.0	0.033	38-127	23-134	<27	<50
Surrogate Spike	DCB	0.2	0.007	30-150	30-150	--	--
	TCX	0.2	0.007	30-150	30-150	--	--
LCS	gamma-BHC (Lindane)	0.5	0.017	32-168	0-177	<20	<25
	Heptachlor	0.5	0.017	36-118	16-150	<20	<25
	Aldrin	0.5	0.017	18-129	21-142	<20	<25
	Dieldrin	1.0	0.033	55-120	31-143	<20	<25
	Endrin	1.0	0.033	56-126	26-160	<20	<25
	4,4'-DDT	1.0	0.033	20-146	0-189	<20	<25
SW8080 PCB Congeners							
Matrix Spike	2,4'-Dichlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',5-Trichlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,4,4'-Trichlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',3,5'-Tetrachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30

(a) Laboratory Control Sample (LCS) limits are based on historical performance data and are updated annually.
(b) Precision for matrix spikes is listed for relative % difference (%RPD); for the LCS the value is the precision calculated as the moving range for successive LCS recoveries.
(c) RL - Reporting Limit.
(d) LCS is commercially prepared reference standard; therefore, concentrations will vary.
(e) Approximate value; actual value determined through standardization of stock.
(f) SRM and LCS are the same reference solid matrix standard.

APPENDIX A QUALITY CONTROL CRITERIA FOR PRECISION & ACCURACY FOR MATRIX SPIKES, MATRIX SPIKE DUPLICATES, SURROGATES, LABORATORY CONTROL SAMPLES, AND STANDARD REFERENCE MATERIALS (a)

QC Parameter	Spiking Compounds	Spike Concentration		Accuracy (%R)		Precision (b)	
		Water(ug/L)	Soil(mg/kg)	Water	Soil	Water	Soil
	2,2',5,5'-Tetrachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,3',4,4'-Tetrachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	3,3',4,4'-Tetrachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',4,5'-Tetrachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',4,5,5'-Pentachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,3,3',4,4'-Pentachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,3',4,4',5-Pentachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',3,4,5'-Pentachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	3,3',4,4',5-Pentachlorobiphenyl	0.05	0.017	50-120	50-120	<30	<30
	2,2',3,4,4',5',6-Heptachlorobiphenyl	0.05	0.017	50-120	50-120	<30	<30
	2,2',3,4,4',6,6'-Heptachlorobiphenyl	0.05	0.017	50-120	50-120	<30	<30
	2,2',3,3',4,4'-Hexachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',3,4,4',5'-Hexachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,3,3',4,4',5-Hexachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	3,3',4,4',5,5'-Hexachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',4,4',5,5'-Hexachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',3,3',4,4',5-Heptachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',3,4,4',5,5'-Heptachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',3,4,5,5',6-Heptachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',3,3',4,4',5,6-Octachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30

(a) Laboratory Control Sample (LCS) limits are based on historical performance data and are updated annually.
(b) Precision for matrix spikes is listed for relative % difference (%RPD); for the LCS the value is the precision calculated as the moving range for successive LCS recoveries.
(c) RL - Reporting Limit.
(d) LCS is commercially prepared reference standard; therefore, concentrations will vary.
(e) Approximate value; actual value determined through standardization of stock.
(f) SRM and LCS are the same reference solid matrix standard.

APPENDIX A QUALITY CONTROL CRITERIA FOR PRECISION & ACCURACY FOR MATRIX SPIKES, MATRIX SPIKE DUPLICATES, SURROGATES, LABORATORY CONTROL SAMPLES, AND STANDARD REFERENCE MATERIALS (a)

QC Parameter	Spiking Compounds	Spike Concentration		Accuracy (%R)		Precision (b)	
		Water(ug/L)	Soil(mg/kg)	Water	Soil	Water	Soil
	2,2',3,3',4,4',5,5',6-Nonachlorbiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',3,3',4,4',5,5',6,6'-Decachlorbiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
SURROGATE	TCX	0.02	0.007	30-150	30-150	--	--
LCS	2,4'-Dichlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',5-Trichlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,4,4'-Trichlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',3,5'-Tetrachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',5,5'-Tetrachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,3',4,4'-Tetrachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',4,5'-Tetrachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	3,3',4,4'-Tetrachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',4,5,5'-Pentachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,3,3',4,4'-Pentachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,3',4,4',5-Pentachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',3,4,5'-Pentachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	3,3',4,4',5-Pentachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',3,3',4,4'-Hexachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',3,4,4',5'-Hexachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,3,3',4,4',5-Hexachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	3,3',4,4',5,5'-Hexachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30

(a) Laboratory Control Sample (LCS) limits are based on historical performance data and are updated annually.
(b) Precision for matrix spikes is listed for relative % difference (%RPD): for the LCS the value is the precision calculated as the moving range for successive LCS recoveries.
(c) RL - Reporting Limit.
(d) LCS is commercially prepared reference standard: therefore, concentrations will vary.
(e) Approximate value: actual value determined through standardization of stock.
(f) SRM and LCS are the same reference solid matrix standard.

APPENDIX A QUALITY CONTROL CRITERIA FOR PRECISION & ACCURACY FOR MATRIX SPIKES, MATRIX SPIKE DUPLICATES, SURROGATES, LABORATORY CONTROL SAMPLES, AND STANDARD REFERENCE MATERIALS (a)

QC Parameter	Spiking Compounds	Spike Concentration		Accuracy (%R)		Precision (b)	
		Water(ug/L)	Soil(mg/kg)	Water	Soil	Water	Soil
	2,2',4,4',5,5'-Hexachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',3,3',4,4',5-Heptachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',3,4,4',5,5'-Heptachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',3,4,5,5',6-Heptachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',3,4,4',5',6-Heptachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',3,4,4',6,6'-Heptachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',3,3',4,4',5,6-Octachlorobiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',3,3',4,4',5,5',6-Nonachlorbiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
	2,2',3,3',4,4',5,5',6,6'-Decachlorbiphenyl	0.05	0.017	50-120	50-120	≤30	≤30
SW8240 Volatile Organic Compounds by GC/MS							
Matrix spike	Benzene	50	50	76-127	66-142	<11	<21
	Toluene	50	50	76-125	59-139	<13	<21
	Chlorobenzene	50	50	75-130	60-133	<13	<21
	1,1-Dichloroethene	50	50	61-145	59-172	<14	<22
	Trichloroethene	50	50	71-120	62-137	<14	<24
Surrogate Spike	1,2-Dichloroethane-d4	50	50	76-114	70-121	--	--
	4-Bromofluorobenzene (BFB)	50	50	86-115	74-121	--	--
	Toluene-d8	50	50	88-110	81-117	--	--
LCS	Benzene	50	50	75-122	81-118	<11	<15
	Toluene	50	50	77-127	75-127	<13	<15

(a) Laboratory Control Sample (LCS) limits are based on historical performance data and are updated annually.
(b) Precision for matrix spikes is listed for relative % difference (%RPD): for the LCS the value is the precision calculated as the moving range for successive LCS recoveries.
(c) RL - Reporting Limit.
(d) LCS is commercially prepared reference standard: therefore, concentrations will vary.
(e) Approximate value: actual value determined through standardization of stock.
(f) SRM and LCS are the same reference solid matrix standard.

APPENDIX A QUALITY CONTROL CRITERIA FOR PRECISION & ACCURACY FOR MATRIX SPIKES, MATRIX SPIKE DUPLICATES, SURROGATES, LABORATORY CONTROL SAMPLES, AND STANDARD REFERENCE MATERIALS (a)

QC Parameter	Spiking Compounds	Spike Concentration		Accuracy (%R)		Precision (b)	
		Water(ug/L)	Soil(mg/kg)	Water	Soil	Water	Soil
	Chlorobenzene	50	50	76-128	73-128	<13	<15
	1,1-Dichloroethene	50	50	75-123	74-124	<14	<15
	Trichloroethene	50	50	72-126	76-117	<14	<15
SW8270 Semivolatile organics by GC/MS							
Matrix Spike	Phenol	200	6.7	12-110	26-90	<42	<35
	2-Chlorophenol	200	6.7	27-123	25-102	<40	<50
	1,4-Dichlorobenzene	100	3.3	36-97	28-104	<28	<27
	N-Nitroso-di-n-propylamine	100	3.3	41-116	41-126	<38	<38
	1,2,4-Trichlorobenzene	100	3.3	39-98	38-107	<28	<23
	4-Chloro-3-methylphenol	200	6.7	23-97	26-103	<42	<33
	Acenaphthene	100	3.3	46-118	31-137	<31	<19
	4-Nitrophenol	200	6.7	10-80	11-114	<50	<50
	2,4-Dinitrotoluene	100	3.3	24-96	28-89	<38	<47
	Pentachlorophenol	200	6.7	9-103	17-109	<50	<47
	Pyrene	100	3.3	26-127	35-142	<31	<36
Surrogate Spike	Nitrobenzene d5	100	3.3	35-114	23-120	--	--
	2-Fluorobiphenyl	100	3.3	43-116	30-115	--	--
	Terphenyl-d14	100	3.3	33-141	18-137	--	--
	2-Fluorophenol	200	6.7	21-100	25-121	--	--
	Phenol-d5	200	6.7	10-94	24-113	--	--

(a) Laboratory Control Sample (LCS) limits are based on historical performance data and are updated annually.
(b) Precision for matrix spikes is listed for relative % difference (%RPD): for the LCS the value is the precision calculated as the moving range for successive LCS recoveries.
(c) RL - Reporting Limit.
(d) LCS is commercially prepared reference standard: therefore, concentrations will vary.
(e) Approximate value: actual value determined through standardization of stock.
(f) SRM and LCS are the same reference solid matrix standard.

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APPENDIX A QUALITY CONTROL CRITERIA FOR PRECISION & ACCURACY FOR MATRIX SPIKES, MATRIX SPIKE DUPLICATES, SURROGATES, LABORATORY CONTROL SAMPLES, AND STANDARD REFERENCE MATERIALS (a)

QC Parameter	Spiking Compounds	Spike Concentration		Accuracy (%R)		Precision (b)	
		Water(ug/L)	Soil(mg/kg)	Water	Soil	Water	Soil
	2,4,6-Tribromophenol	200	6.7	10-123	19-122	--	--
LCS	Phenol	200	6.7	41-85	33-105	<15	<20
	2-Chlorophenol	200	6.7	50-84	42-102	<15	<20
	1,4-Dichlorobenzene	100	3.3	44-84	51-106	<15	<20
	N-Nitroso-di-n-propylamine	100	3.3	57-96	50-111	<15	<20
	1,2,4-Trichlorobenzene	100	3.3	34-85	49-108	<15	<20
	4-Chloro-3-methylphenol	200	6.7	50-88	40-103	<15	<20
	Acenaphthene	100	3.3	48-92	52-106	<15	<20
	4-Nitrophenol	200	6.7	59-110	33-130	<15	<20
	2,4-Dinitrotoluene	100	3.3	65-105	56-114	<15	<20
	Pentachlorophenol	200	6.7	55-103	27-130	<15	<25
	Pyrene	100	3.3	53-113	48-111	<15	<20
SW8310-PAHs (HPLC)							
Matrix spike	Benzo[a]anthracene	0.64	0.0213	40-120	30-150	<25	<35
	Benzo[b]fluoranthene	1.28	0.0427	40-120	30-150	<25	<35
	Benzo[k]fluoranthene	0.64	0.0213	40-120	30-150	<25	<35
	Benzo[a]pyrene	0.64	0.0213	40-120	30-150	<25	<35
	Chrysene	0.64	0.0213	40-120	30-150	<25	<35
	Dibenz(a,h)anthracene	1.28	0.0427	40-120	30-150	<25	<35
	Indeno[1,2,3-cd]pyrene	0.64	0.0213	40-120	30-150	<25	<35

(a) Laboratory Control Sample (LCS) limits are based on historical performance data and are updated annually.
(b) Precision for matrix spikes is listed for relative % difference (%RPD): for the LCS the value is the precision calculated as the moving range for successive LCS recoveries.
(c) RL - Reporting Limit.
(d) LCS is commercially prepared reference standard: therefore, concentrations will vary.
(e) Approximate value: actual value determined through standardization of stock.
(f) SRM and LCS are the same reference solid matrix standard.

APPENDIX A QUALITY CONTROL CRITERIA FOR PRECISION & ACCURACY FOR MATRIX SPIKES, MATRIX SPIKE DUPLICATES, SURROGATES, LABORATORY CONTROL SAMPLES, AND STANDARD REFERENCE MATERIALS (a)

QC Parameter	Spiking Compounds	Spike Concentration		Accuracy (%R)		Precision (b)	
		Water(ug/L)	Soil(mg/kg)	Water	Soil	Water	Soil
Surrogate spike	Benzo (e) pyrene	8.0	0.267	40-120	30-150	--	--
	4,4'-Dibromooctafluorobiphenyl	12.8	0.427	30-120	25-150	--	--
	p-Terphenyl	7.5	0.250	30-150	30-150	--	--
LCS (b)	Benzo[a]anthracene	0.64	0.0213	40-120	30-150	<25	<35
	Benzo[b]fluoranthene	1.28	0.0427	40-120	30-150	<25	<35
	Benzo[k]fluoranthene	0.64	0.0213	40-120	30-150	<25	<35
	Benzo[a]pyrene	0.64	0.0213	40-120	30-150	<25	<35
	Chrysene	0.64	--0.0213	40-120	30-150	<25	<35
	Dibenz(a,h)anthracene	1.28	0.0427	40-120	30-150	<25	<35
	Indeno[1,2,3-cd]pyrene	0.64	0.0213	40-120	30-150	<25	<35
SW9012 Total and amenable cyanide by automated colorimetry							
Matrix Spike	Cyanide	94.3	943	75-125	75-125	<20	<20
LCS	Cyanide	94.3	943	80-120	80-120	<20	<20
SRM	Cyanide	(d)	(d)	80-120	80-120	--	--
SW9060 Total Organic Carbon							
Matrix Spike	KHP	20000	500000	80-120	71-133	<20	<50
LCS	KHP	20000	500000	80-114	71-133	<15	<50
SRM	KHP	(d)	(d)	80-120	80-120	--	--
SW 9030 Total Sulfide							
Matrix Spike	Sulfide	6900 (e)	725 (e)	75-125	30-80	<20	<20

(a) Laboratory Control Sample (LCS) limits are based on historical performance data and are updated annually.
(b) Precision for matrix spikes is listed for relative % difference (%RPD): for the LCS the value is the precision calculated as the moving range for successive LCS recoveries.
(c) RL - Reporting Limit.
(d) LCS is commercially prepared reference standard: therefore, concentrations will vary.
(e) Approximate value: actual value determined through standardization of stock.
(f) SRM and LCS are the same reference solid matrix standard.

APPENDIX A QUALITY CONTROL CRITERIA FOR PRECISION & ACCURACY FOR MATRIX SPIKES, MATRIX SPIKE DUPLICATES, SURROGATES, LABORATORY CONTROL SAMPLES, AND STANDARD REFERENCE MATERIALS (a)

QC Parameter	Spiking Compounds	Spike Concentration		Accuracy (%R)		Precision (b)	
		Water(ug/L)	Soil(mg/kg)	Water	Soil	Water	Soil
LCS	Sulfide	6900 (e)	725 (e)	80-120	30-80	<20	<20
SRM	Sulfide	(d)	(d)	80-120	--	--	--
EPA 365.3 Total Phosphorus							
Matirx Spike	Potassium dihydrogen phosphate	50	---	75-125	---	<20	---
LCS	Potassium dihydrogen phosphate	40	---	70-102	---	<20	---
SRM	Potassium dihydrogen phosphate	(d)	--	80-120	--	--	--
EPA351.2 Nitrogen, Total Kjeldahl							
Matrix Spike	Ammonium Chloride	400	200	75-125	75-125	<20	<20
LCS	Ammonium Chloride	4[illegible]	200	75-120	75-120	<20	<20
SRM	Ammonium Chloride	(d)	--	80-120	--	--	--
EPA353.2 Nitrate plus Nitrite							
Matrix Spike	Potassium Nitrate	50	---	75-125	---	<20	---
LCS	Potassium Nitrate	50	---	95-106	---	<20	---
SRM	Potassium Nitrate	(d)	--	80-120	--	--	--
EPA350.1 Nitrogen, Ammonia							
Matrix Spike	Ammonium Chloride	50	12.5	75-125	75-125	<20	<20
LCS	Ammonium Chloride	50	12.5	91-110	75-125	<20	<20
SRM	Ammonium Chloride	(d)	--	80-120	--	--	--
EPA 405.1 Biochemical Oxygen Demand							
Matrix Spike	Glucose, Glutamic acid	NA	NA	NA	NA	NA	NA

(a) Laboratory Control Sample (LCS) limits are based on historical performance data and are updated annually.
(b) Precision for matrix spikes is listed for relative % difference (%RPD): for the LCS the value is the precision calculated as the moving range for successive LCS recoveries.
(c) RL - Reporting Limit.
(d) LCS is commercially prepared reference standard: therefore, concentrations will vary.
(e) Approximate value: actual value determined through standardization of stock.
(f) SRM and LCS are the same reference solid matrix standard.

APPENDIX A QUALITY CONTROL CRITERIA FOR PRECISION & ACCURACY FOR MATRIX SPIKES, MATRIX SPIKE DUPLICATES, SURROGATES, LABORATORY CONTROL SAMPLES, AND STANDARD REFERENCE MATERIALS (a)

QC Parameter	Spiking Compounds	Spike Concentration		Accuracy (%R)		Precision (b)	
		Water(ug/L)	Soil(mg/kg)	Water	Soil	Water	Soil
LCS	Glucose, Glutamic acid	20000	---	69-107	---	<20	---
SRM	Glucose, Glutamic acid	(d)	--	80-120	--	--	--
EPA410.4 Chemical Oxygen Demand							
Matrix Spike	KHP	25000	---	75-125	---	<20	---
LCS	KHP	25000	---	88-111	---	<20	---
SRM	KHP	(d)	--	80-120	--	--	--
Tributyl Tin							
Matrix Spike	Tributyltin chloride, Dibutyltin chloride	0.1	4	40-120	40-120	<30	<30
Surrogate Spike	Tripentyltin	0.1	4	10-120	10-120	<30	<30

(a) Laboratory Control Sample (LCS) limits are based on historical performance data and are updated annually.
(h) Precision for matrix spikes is listed for relative % difference (%RPD): for the LCS the value is the precision calculated as the moving range for successive LCS recoveries.
(c) RL - Reporting Limit.
(d) LCS is commercially prepared reference standard: therefore, concentrations will vary.
(e) Approximate value: actual value determined through standardization of stock.
(f) SRM and LCS are the same reference solid matrix standard.

APPENDIX B

LABORATORY QUALITY CONTROL AND CORRECTIVE ACTION PROCEDURES

QC Check	Frequency	Acceptance Criteria [b]	Corrective Action
SW6010 Metals/ICP **Aluminum, Arsenic, Antimony, Beryllium, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Nickel, Selenium, Silver, Zinc**			
Rinsate blank	1 per sampling event	None	None, report result.
Holding time	6 months from sampling	Digestion and analysis are completed within holding time.	Laboratory Project Manager contacts client to determine if sample will be processed or site resampled.
Calibration	1. Initial calibration. 2. Verify using a mid-level standard prior to each analytical sequence and, at a minimum, middle and end of each batch	1. Initial calibration per instrument manufacturer's specifications. 2. Continuing calibration should be within ±15% of inital calibration on average for all analytes, not to exceed ±25% for any one analyte	1. If initial calibration fails, verify standard preparation. 2. If continuing calibration fails, reanalyze the standard. 3. If similar results are obtained, recalibrate instrument. 4. All sample extracts ananlyzed since the last acceptable calibration must be reanalyzed. 5. Document actions taken.
Interelement Check Sample	Daily	Concentration of analyte subject to potential spectral interference is within 20 percent of known value.	1. Recalibrate instrument and reanalyze interelement check sample. 2. Check interelement correction factors and update if necessary. 3. Document actions taken.
Method Blank	1 per analytical batch	Concentration of target analytes is less than three times the MDL.	1. Determine source of contamination, i.e. instrument, blank water, reagents. Take appropriate corrective action and document. 2. Reanalyze or reprepare analytical batch if sample results <10 times blank value. 3. If samples cannot be reanalyzed or reprepared, qualify data.
LCS	1 per analytical batch	Acceptance criteria listed in Appendix A.	1. Validate instrument parameters, sensitivity and linearity. Correct problems and document. 2. Validate standards. 3. Validate LCS preparation. 4. Reprepare and reanalyze LCS and samples. 5. If repreparation of samples is not possible, qualify data. 6. Document actions taken.
SRM	1 per analytical batch	Acceptance criteria listed in Appendix A.	1. Validate instrument parameters, sensitivity and linearity. 2. Validate standards. 3. Validate SRM preparation. 4. Reprepare and reanalyze SRM and samples. 5. If repreparation of samples is not possible, qualify data. 6. Document actions taken.

(a) Abbreviations: RPD, relative percent difference; MDL, method detection limit; QC, quality control; LCS, laboratory control sample; SRM, standard reference material; SD, standard deviation; MS/MSD, matrix spike/matrix spike duplicate.

(b) Acceptance criteria for LCS, SRM and MS/MSD are in Appendix A

QC Check	Frequency	Acceptance Criteria [b]	Corrective Action
MS/MSD	1 per 20 samples	Acceptance criteria listed in Appendix A.	1. Verify spike concentration is at least 50 percent of the unspiked concentration. 2. Verify that correct spiking solutions and amounts were used. 3. Check method blanks and LCS recovery. 4. Reprepare and reanalyze samples if laboratory error is suspected. 5. If no errors or problems are discovered for sample preparation, qualify data. 6. Document actions taken.
Metals **SW7060 - Arsenic/F** **SW7421 - Lead/F** **SW7470, SW7471 - Mercury/CV** **SW7740 - Selenium/F** **SW7841 - Thallium/F**			
Rinsate blank	1 per sampling event	None	None, report results.
Holding time	6 months from sampling for all metals, except 28 days for mercury	Digestion and analysis are completed within holding time.	Laboratory Project Manager contacts client to determine if sample will be processed or site resampled.
Calibration	1. Initial 5 point calibration. 2. Verify using a mid-level standard prior to each analytical sequence and, at a minimum, middle and end of each batch	1. Initial calibration curve is linear (r= >0.995). 2. Continuing calibration standard concentration is within ±15% of inital calibration on average for all analytes, not to exceed ±25% for any one analyte.	1. If initial calibration fails, verify standard preparation. 2. If continuing calibration fails, reanalyze the standard. 3. If similar results are obtained, recalibrate instrument. 4. All sample extracts ananlyzed since the last acceptable calibration must be reanalyzed. 5. Document actions taken.
Method Blank	1 per analytical batch	Concentration is less than three times the MDL of the analyte.	1. Determine source of contamination, i.e. instrument, blank water, reagents. Take appropriate corrective action and document. 2. Reanalyze or reprepare analytical batch. 3. If samples cannot be reanalyzed or reprepared, qualify data.
LCS	One per analytical batch	Acceptance criteria listed in Appendix A.	1. Validate instrument parameters, sensitivity and linearity. 2. Validate standards. 3. Validate LCS preparation. 4. Reprepare and reanalyze LCS and samples. 5. If repreparation of samples is not possible, qualify data. 6. Document actions taken.

(a) Abbreviatio[illegible] RPD, relative percent difference; MDL, method detection limit; QC, quality control; LCS, laboratory [illegible] sample; SRM, standard reference material; SD, standard deviation; MS/MSD, matrix spike/ma[illegible] duplicate[illegible].
(b) Acceptan[illegible] for LCS, SRM and MS/MSD are in Appendix A.

QC Check	Frequency	Acceptance Criteria [b]	Corrective Action
SRM	One per analytical batch (1 sediment SRM only for entire sampling effort for this project)	Acceptance criteria listed in Appendix A.	1. Validate instrument parameters, sensitivity and linearity. 2. Validate standards. 3. Validate SRM preparation. 4. Reprepare and reanalyze SRM and samples. 5. If repreparation of samples is not possible, qualify data. 6. Document actions taken.
MS/MSD	1 per 20 samples	Acceptance criteria listed in Appendix A for soil and tissue must be met for 80% of the target analtyes.	1. Verify that the spike concentration is at least 50 percent of the unspiked concentration. 2. Verify that correct spiking solutions and amounts were used. 3. Check method blanks and LCS recovery. 4. Reprepare and reanalyze samples if laboratory error is suspected. 5. If no errors or problems are discovered for sample preparation, qualify data. 6. Document actions taken.
SW8080 - Organochlorine pesticides, PCB Congeners			
Rinsate blank	1 per day	None	None, report results.
Holding time	5 days (water), 10 days (sediment) from sampling to extraction; 40 days for analysis after extraction	Extraction and analysis are completed within holding time.	Laboratory Project Manager contacts client to determine if sample will be processed or site resampled.
Calibration	1. Initial 5 point calibration. 2. Verify continuing calibration using a mid-level standard prior to each analytical sequence and at a minimum, in the middle and end of each batch.	1. Initial calibration %RSD for all target analytes is $\leq$ 20%, or use calibration curve (r=$\geq$0.995) if %RSD >20%. 2. Continuing calibration should be within $\pm$15% of initial calibration on average for all analytes.	1. If initial calibration fails, verify standard preparation. Recalibrate. 2. If continuing calibration standard fails, reanalyze the standard. 3. If similar results are obtained, recalibrate instrument. 4. Document actions taken.
Method Blank	1 per analytical batch	Concentation of each target analyte is less than 3 times the MDL.	1. Determine source of contamination, i.e. instrument, blank water, reagents. Take appropriate corrective action and document. 2. Reanalyze or reprepare analytical batch. 3. If samples cannot be reanalyzed or reprepared, qualify data.
LCS	1 per analytical batch	Acceptance criteria listed in Appendix A for sediment must be met for at least 80% of the target analytes.	1. Validate instrument parameters, sensitivity and linearity. Correct problems and document. 2. Validate LCS standard. 3. Validate LCS preparation. 4. Reprepare and reanalyze LCS and affected samples. 5. If repreparation of samples is not possible, qualify data. 6. Document actions taken.

(a) Abbreviations: RPD, relative percent difference; MDL, method detection limit; QC, quality control; LCS, laboratory control sample; SRM, standard reference material; SD, standard deviation; MS/MSD, matrix spike/matrix spike duplicate.

(b) Acceptance criteria for LCS, SRM and MS/MSD are in Appendix A.

QC Check	Frequency	Acceptance Criteria [b]	Corrective Action
Surrogate spike	All field and QC samples	Acceptance criteria listed in Appendix A.	1. Examine all QC (including but not limited to LCS, MB). 2. If surrogate in LCS and/or MB is out-of-control, check quantitation. If quantitation is correct reanalyze. 3. If similar results are obtained from reanalysis, obtain fresh, verified surrogate solution and reanalyze the analytical batch. 4. If samples cannot be reprepared, qualify data. 5. If surrogate spike in LCS and MB are acceptable but out-of-control for samples, validate preparation of samples. If no errors or problems are discovered for sample preparation, qualify data. 6. If errors are discovered in preparation of samples, reprepare QC samples and all affected samples. 7. Document actions taken.
MS/MSD	1 set per 20 samples	Acceptance criteria listed in Appendix A for sediment must be met for at least 80% of the target analytes.	1. Analyze spiking solution. 2. If spiking solution is valid, qualify data. 3. If spiking solution is not valid, obtain fresh, certified spiking solution and reanalyze the sample and the associated matrix spikes. 4. If reanalysis of samples is not possible, qualify data. 5. Document actions taken.
SW9060 - TOC SW9012 - Cyanide, total and amenable SW9030 - Total Sulfide EPA365.3 - Total Phosphorus EPA351.2 - Nitrogen, Total Kjeldahl EPA353.2 - Nitrate plus Nitrite EPA 350.1 - Nitrogen, Ammonia EPA405.1 - Biochemical Oxygen Demand EPA410.4 - Chemical Oxygen Demand			
Rinsate blank	1 per day	None	None, report results.
Holding time	28 days from sampling, except: Cyanide: 14 days from sampling BOD: 48 hours from sampling Total sulfide: 7 days from sampling.	Preparation and analysis are completed within holding time.	Laboratory Project Manager contacts client to determine if sample will be processed or site resampled.
Calibration	1. Initial 5 point calibration. 2. Verify using a mid-level standard prior to each analytical sequence and, at a minimum, middle and end of each batch	1. Initial calibration curve is linear (r= $\geq$0.995). 2. Continuing calibration standard concentration is within $\pm$15% of inital calibration on average for all analytes, not to exceed $\pm$25% for any one analyte.	1. If initial calibration fails, verify standard preparation. Recalibrate. 2. If continuing calibration standard fails, reanalyze the standard. 3. If similar results are obtained, recalibrate instrument. 4. All sample extracts analyzed since the last acceptable calibration must be reanalyzed. 5. Document actions taken.

(a) Abbreviatio RPD, relative percent difference; MDL, method detection limit; QC, quality control; LCS, laboratory sample; SRM, standard reference material; SD, standard deviation; MS/MSD, matrix spike/ma duplicate.

(b) Acceptan for LCS, SRM and MS/MSD are in Appendix A.

QC Check	Frequency	Acceptance Criteria [b]	Corrective Action
Method Blank	1 per analytical batch	Concentration of target analyte is less than 3 times the MDL.	1. Determine source of contamination, i.e. instrument, blank water, reagents. Take appropriate corrective action and document. 2. Reanalyze or reprepare analytical batch. 3. If samples cannot be reanalyzed or reprepared, qualify data.
LCS	1 per analytical batch	Acceptance criteria listed in Appendix A must be met for each target analyte.	1. Validate instrument parameters, sensitivity and linearity. Correct problems and document. 2. Validate standards and LCS preparation. Correct any problems and document. 3. Reprepare and reanalyze method blank, LCS and all field samples. 4. If repreparation of samples is not possible, qualify data, and note in the report narrative. 5. Document all actions taken
SRM	1 per analytical batch	Acceptance criteria listed in Appendix A must be met for each target analyte.	1. Validate instrument parameters, sensitivity and linearity. Correct problems and document. 2. Validate standards and SRM preparation. Correct any problems and document. 3. Reprepare and reanalyze method blank, SRM and all field samples. 4. If repreparation of samples is not possible, qualify data, and note in the report narrative. 5. Document all actions taken
MS/MSD	1 set per 20 samples	Acceptance criteria listed in Appendix A must be met for each target analyte.	1. Analyze spiking solution. 2. If spiking solution is valid, qualify data. 3. If spiking solution is not valid, obtain fresh, certified spiking solution and reanalyze the sample and associated matrix spikes.
SW8240 - Volatile organics			
Trip blank	1 per shipment to lab	Target compounds are not present at concentrations greater than the RL.	None required.
Equipment blank	1 per day	Target compounds are not present at concentrations greater than the RL.	None required.
Field duplicate	1 set per 10 samples	Within 10 percent for water samples and within 30 percent RPD for soils	None required.
Holding time	14 days from sampling (preserved); 7 days (unpreserved)	Analysis is completed within holding time.	Notify client, determine if laboratory to proceed or if client will resample.
Tuning	Every 12 hours	Within limits of method	Adjust instrument parameters.

(a) Abbreviations: RPD, relative percent difference; MDL, method detection limit; QC, quality control; LCS, laboratory control sample; SRM, standard reference material; SD, standard deviation; MS/MSD, matrix spike/matrix spike duplicate.

(b) Acceptance criteria for LCS, SRM and MS/MSD are in Appendix A

QC Check	Frequency	Acceptance Criteria [b]	Corrective Action
Calibration curve	Established initially at 5 concentration levels, verified every 12 hours at mid level	1. Initial calibration %RSD for all CCCs is less than 30 percent; RF for SPCCs is >0.30 (0.25 for bromoform). 2. Continuing calibration %D for CCCs from initial calibration is less than 25 percent; RF for SPCCs is >0.30 (0.25 for bromoform).	1. Recalibrate instrument. 2. Reanalyze samples since last criteria met. 3. Document actions taken.
Method Blank	1 per analytical batch	Concentration is less than the RL of the analyte except that the common laboratory contaminates MeC12, MEK, and acetone are less than five times the RL.	1. Determine source of contamination, i.e. instrument, blank water, reagents. 2. Take appropriate corrective action and document. 3. Reanalyze or prepare analytical batch. 4. If samples cannot be reanalyzed or reprepared, qualify data.
LCS	1 per analytical batch	Values are within three SD of mean historical values or method control limits of precision and accuracy. Acceptance criteria are in Appendix A.	1. Validate instrument parameters, sensitivity and linearity. Correct problems and document. 2. Validate standards. 3. Validate LCS preparation. 4. Reanalyze LCS and samples. 5. If repreparation of samples is not possible, qualify data. 6. Document actions taken.
Surrogate spike	All laboratory blanks, LCS, MS/MSD and field samples	See Appendix A for surrogate spiking compounds, spike concentrations and control limits.	1. Examine all QC (including but not limited to LCS, MB). 2. If surrogate in LCS and/or MB is out-of-control, check quantitation. If quantitation is correct reanalyze. 3. If similar results are obtained from reanalysis, obtain fresh, verified surrogate solution and reanalyze the analytical batch. 4. If samples cannot be reprepared, qualify data. 5. Document actions taken.
MS/MSD	1 set per 20 samples	See Appendix A for matrix spiking compounds, spike concentrations, and control limits.	1. Analyze spiking solution. 2. If spiking solution is valid, qualify data. 3. If spiking solution is not valid, obtain fresh, certified spiking solution and reanalyze the sample and the associated matrix spikes. 4. If reanalysis of samples is not possible, qualify data. 5. Document actions taken.
SW8270 - Semivolatile organics			

(a) Abbreviati[illegible]D, relative percent difference; MDL, method detection limit; QC, quality control; LCS, laboratory [illegible]ample; SRM, standard reference material; SD, standard deviation; MS/MSD, matrix spike/mat[illegible] duplicate.
(b) Acceptanc[illegible] for LCS, SRM and MS/MSD are in Appendix A.

QC Check	Frequency	Acceptance Criteria [b]	Corrective Action
Equipment blank	1 per day	Target compounds are not present at concentrations greater than the RL.	None required.
Sampling duplicate	1 set per 10 samples	Within 10 percent for water samples and within 30 percent RPD for soils.	None required.
Holding time	Aqueous: extract within 7 days of sampling; analyze within 40 days of extraction. Solid: extract within 14 days of sampling; analyze within 40 days of extraction.	Extraction and analysis are completed within holding time.	Notify client, determine if laboratory to proceed or if client will resample.
Tuning	Every 12 hours	Within limits of method	Adjust instrument parameters.
Calibration curve	Established initially at 5 concentration levels, verified every 12 hours at mid level	1. Initial calibration %RSD for all CCCs is less than 30 percent; RF for SPCCs is >0.05. 2. Continuing calibration %D for CCCs from initial calibration is less than 30 percent; RF for SPCCs is >0.05.	1. Reanalyze check standard. 2. If similar results are obtained recalibrate instrument. 3. Reanalyze samples since last criteria met. 4. Document actions taken.
Method Blank	1 per analytical batch	Concentrations are less than the RL of the analyte except that the common laboratory contaminate bis-2-ethylhexylphthalate is less than five times the RL.	1. Determine source of contamination, i.e. instrument, blank water, reagents. 2. Take appropriate corrective action and document. 3. Reanalyze or prepare analytical batch. 4. If samples cannot be reanalyzed or reprepared, qualify data. 5. Document actions taken.
LCS	1 per analytical batch	80 percent of values are within three SD of mean historical values or method control limits of precision and accuracy. Acceptance criteria are in Appendix A.	1. Validate instrument parameters, sensitivity and linearity. Correct problems and document. 2. Validate standards. 3. Validate LCS preparation. 4. Reanalyze LCS and samples. 5. If repreparation of samples is not possible, qualify data. 6. Document actions taken.

(a) Abbreviations: RPD, relative percent difference; MDL, method detection limit; QC, quality control; LCS, laboratory control sample; SRM, standard reference material; SD, standard deviation; MS/MSD, matrix spike/matrix spike duplicate.

(b) Acceptance criteria for LCS, SRM and MS/MSD are in Appendix A.

QC Check	Frequency	Acceptance Criteria [b]	Corrective Action
Surrogate spike	All blanks, LCS, and samples	Surrogate spiking compounds, spike concentrations and control limits are consistent with Appendix A.	1. Examine all QC (including but not limited to LCS, MB). 2. If surrogate in LCS and/or MB is out-of-control, check quantitation. If quantitation is correct reanalyze. 3. If similar results are obtained from reanalysis, obtain fresh, verified surrogate solution and reanalyze the analytical batch. 4. If samples cannot be reprepared, qualify data. 5. If surrogate spike in LCS and MB are acceptable but: (a) any 2 base/neutral or and 2 acid surrogates are out-of-control for samples, or (b) any one surrogate recovery is < 10%, repreparation and reanalysis is required. If results are repeated on reanalysis, qualify data. 6. If errors are discovered in preparation of samples, reprepare QC samples and all affected samples. 7. Document actions taken.
MS/MSD	1 set per 20 samples	See Appendix A for matrix spiking compounds, spike concentrations, and control limits.	1. Analyze spiking solution. 2. If spiking solution is valid, qualify data. 3. If spiking solution is not valid, obtain fresh, certified spiking solution and reanalyze the sample and the associated matrix spikes.
Tributyltin			
Matrix Spike	1 per 20 samples	In accordance with Appendix A.	1. Examine all QC (including but not limited to LCS, MB). 2. If surrogate in LCS and/or MB is out-of-control, check quantitation. If quantitation is correct reanalyze. 3. If similar results are obtained from reanalysis, obtain fresh, verified surrogate solution and reanalyze the analytical batch. 4. If samples cannot be reprepared, qualify data. 5. If surrogate spike in LCS and MB are acceptable but: (a) any 2 base/neutral or and 2 acid surrogates are out-of-control for samples, or (b) any one surrogate recovery is < 10%, repreparation and reanalysis is required. If results are repeated on reanalysis, qualify data. 6. If errors are discovered in preparation of samples, reprepare QC samples and all affected samples. 7. Document actions taken.
Surrogate Spike	All blanks, samples, LCS	In accordance with Appendix A.	1. Analyze spiking solution. 2. If spiking solution is valid, qualify data. 3. If spiking solution is not valid, obtain fresh, certified spiking solution and reanalyze the sample and the associated matrix spikes.

(a) Abbreviati... RPD, relative percent difference; MDL, method detection limit; QC, quality control; LCS, laboratory ... l sample; SRM, standard reference material; SD, standard deviation; MS/MSD, matrix spike/m... ke duplicate

(b) Acceptan... a for LCS, SRM and MS/MSD are in Appendix A.

QC Check	Frequency	Acceptance Criteria [b]	Corrective Action
LCS	1 per 20 samples	In accordance with Appendix A.	1. Validate instrument parameters, sensitivity and linearity. Correct problems and document. 2. Validate standards. 3. Validate LCS preparation. 4. Reanalyze LCS and samples. 5. If repreparation of samples is not possible, qualify data. 6. Document actions taken.
SW8310 Polynuclear Aromatic Hydrocarbons by HPLC			
Equipment blank	1 per day	Target compounds are not present at concentrations greater than the RL.	None required.
Field duplicate	~10%	Within 35 percent RPD for soils	None required.
Holding time	Water: extract within 7 days of samping; analyze within 40 days of extraction. Solid: extract within 14 days of sampling; analyze within 40 days of extraction.	Extraction and analysis are completed within holding time.	Notify client, determine if laboratory to proceed or if client will resample.
Calibration curve	Initial 5 point calibration, verified daily at mid level and at end of sequence.	1. Initial calibration curve ($r \geq 0.990$) 2. Continuing calibration %D from initial calibration no greater than +/-15 percent.	1. Reanalyze check standard. 2. If similar results are obtained, recalibrate instrument. 3. Evaluate data useability. Reanalyze if data useability is impacted. 4. Document actions taken in a Nonconformance Record, and in the analytical report.
Method Blank	1 per analytical batch	Concentration is less than the RL of the analyte.	1. Determine source of contamination, i.e. instrument, blank water, reagents. 2. Take appropriate corrective action and document. 3. If preparation in error reanalyze or prepare analytical batch. 4. If samples cannot be reanalyzed or reprepared, qualify data. 5. Document actions taken in a Nonconformance Record, and in the analytical report .

(a) Abbreviations: RPD, relative percent difference; MDL, method detection limit; QC, quality control; LCS, laboratory control sample; SRM, standard reference material; SD, standard deviation; MS/MSD, matrix spike/matrix spike duplicate.

(b) Acceptance criteria for LCS, SRM and MS/MSD are in Appendix A.

QC Check	Frequency	Acceptance Criteria [b]	Corrective Action
LCS	1 per analytical batch	Control analyte values are within three SD of mean historical values or method control limits of precision and accuracy. Acceptance criteria are in Table A-7.	1. Validate instrument parameters, sensitivity and linearity. Correct problems and document. 2. Validate standard and LCS preparation. Correct any problems and document. 3. Reprepare and reanalyze the method blank, LCS and all field samples in the batch. 4. If repreparation of samples is not possible, qualify data, and note in the report narrative. 5. Document all actions taken in a Nonconformance Record.
Surrogate spike	All field and QC samples	Surrogate spiking compounds spike concentrations and control limits are in Table A-7.	1. Examine all QC (including but not limited to LCS, MB). 2. If surrogate in LCS and/or MB is out-of-control, check quantitation. If quantitation is correct reanalyze. 3. If similar results are obtained from reanalysis, obtain fresh, verified surrogate solution and reprepare the analytical batch. 4. If samples cannot be reprepared, qualify data. 5. If surrogate spike in LCS and MB are acceptable but out-of-control for samples, validate preparation of samples. If no errors or problems are discovered for sample preparation, qualify data. 6. If errors are discovered in preparation of samples, reprepare QC samples and all affected samples. 7. Document actions taken in a Nonconformance Record and in the report narrative.
MS/MSD	1 set per 20 samples	Matrix spiking compounds, spike concentrations, and control limits are in Table A-7	1. Analyze spiking solution. 2. Verify that correct spiking solutions and amounts were used. 3. Check method blanks and LCS recovery. 4. Reanalyze samples if laboratory error is suspected. 5. Document actions taken.

(a) Abbreviati[illegible]RPD, relative percent difference; MDL, method detection limit; QC, quality control; LCS, laboratory [illegible]l sample; SRM, standard reference material; SD, standard deviation; MS/MSD, matrix spike/m[illegible]e duplicate[illegible]

(b) Accepta[illegible]a for LCS, SRM and MS/MSD are in Appendix A.

APPENDIX C

STANDARD OPERATING PROCEDURES

EFFECTIVE DATE: July 6, 1995
SUPERSEDES: May 2, 1995

EA LABORATORIES

STANDARD OPERATING PROCEDURES (SOPs)
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GROUP SECTION: GENERAL LABORATORY DISTRIBUTION (ALL)

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GROUP SECTION: **HPLC**

APPENDIX D

ANALYTICAL METHODS

Method for TOC in Sediment

from Plumb, 1981

Procedures for Sediment Samples (S1D, 83)

Method 1: Sample Ignition

Apparatus

Induction furnace such as the Leco WR-12, Dohrmann DC-5C, Coleman CH analyzer, or Perkin Elmer 240 elemental analyzer

Combustion boats

Microbalance

Desiccator

Reagents

10 percent hydrochloric acid: mix 100 ml concentrated HCl with 900 ml distilled water.

Copper oxide fines.

Benzoic acid.

Procedure

Dry at 70°C and grind the sediment sample.

Weigh a combustion boat and record the weight. Place 0.2 to 0.5 g homogenized sediment in the combustion boat and reweigh. Combustion boats should not be handled with the bare hand during this process.

If total carbon or inorganic carbon is to be determined, Cupric oxide fines may be added to the sample to assist in combustion. Combust the sample in an induction furnace. Record the result as total carbon.

If organic carbon is to be determined, treat a known weight of dried sediment with several drops of 10 percent HCl. Wait until the effervescing is completed and add more acid. Continue this process until the incremental addition of acid causes no further effervescence. Do not add too much acid at one time as this may cause loss of sample due to frothing.

Dry the sample at 70°C and place in a desiccator. Add Cupric oxide fines, combust the sample in an induction furnace, and record the result as organic carbon.

Calculations

The carbon content of the sample can be calculated as:

$$\%C = \frac{\text{weight of tube (after-before)}}{\text{sample weight}} \times 27.29$$

Derivation of factor:

$$27.29 = \frac{12.011 \text{ (molecular weight carbon)}}{44.011 \text{ (molecular weight carbon dioxide)}} \times 100\%$$

When the total sample results are used, the result is percent carbon in the sample. When acid-treated samples are used, the result is percent organic carbon. Inorganic carbon is calculated as total carbon minus organic carbon.

Method 2: Differential Combustion[4,5]

Apparatus

Sargent programmed microcombustion apparatus or equivalent

Microbalance

Procedure

Air dry the sediment sample. Using a mortar and pestle, grind the sample to pass a 100-mesh screen.

Combust a known weight of sediment at a programmed heating rate of 300° to 950°C in 10 min and then maintain 950°C for 20 min. Trap the CO_2 in ascarite and record the weight as total carbon. A sample size should be selected that will produce 25 to 50 mg CO_2.

Weigh a second portion of the dried sediment. Combust this sample at a programmed rate of 300° to 650°C in 10 min and maintain 650°C for 20 min. Trap the CO_2 in ascarite and record the weight as organic carbon.

Calculations

The total carbon concentration, C_t, of the sample (in mg/g) is calculated as follows:

$$C_t = \frac{(X_t)\left(\frac{12}{44}\right)}{(g)}$$

where

X_t = weight of CO_2 evolved at 950°C, mg

g = weight of sample combusted, g

The organic carbon, C_o, concentration of the sample (in mg/g) is calculated as follows:

$$C_o = \frac{(x_o)\left(\frac{12}{44}\right)}{(g)}$$

where

x_o = weight of CO_2 evolved at 650°C, mg

g = weight of sample combusted, g

Inorganic carbon, C_I, (in mg/g) is calculated as:

$$C_I = C_t - C_o$$

Method 3: Wet Combustion[6,8]

A third method has been used for carbon in sediments. This is based on the oxidation of the sample with dichromate and back titration of the sample with ferrous ammonium sulfate. References are provided for the procedure but details are not given. The procedure is similar to the chemical oxygen demand test which is not specific for carbon. The wet combustion method is a redox procedure and any reduced chemicals in the sediment samples (ferrous iron, manganous manganese, sulfide) will react with the dichromate. Therefore, this procedure is not recommended unless other instrumentation is not available.

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APPENDIX E

ANALYTICAL REPORT TABLE OF CONTENTS

TABLE 6. TABLE OF CONTENTS FOR EA LABORATORIES LEVEL 4 CLIENT REPORT

(a) "Other Analysis Documentation" refers to any written documentation associated with the analysis not covered in the Table of Contents (e.g., memos, NCRs, communications records).
(b) UV traces for GPC calibration solution, and chromatograms and data system reports for GPC blank.

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