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Field Evaluation of Hopper Dredge Overflow for the Delaware River

Jerry L. Miller, Michael R. Palermo, and Thomas W. Groff

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Preface

This report describes the potential economic benefits and potential environmental effects from overflow dredging in the lower Delaware River. This work was conducted by the Environmental Laboratory (EL), U.S. Army Engineer Research and Development Center (ERDC), Vicksburg, MS. Funding for the study was provided by the U.S. Army Engineer District, Philadelphia.

This report was written by Mr. Jerry L. Miller, Ecological Resources Branch, Ecosystem Evaluation and Engineering Division (EEED), EL, Dr. Michael R. Palermo, Environmental Processes and Engineering Division (EPED), EL, and Mr. Thomas W. Groff, Operations Division, U.S. Army Engineer District, Philadelphia. Technical review of this report was provided by Messrs. Thomas R. Patin and Jerry J. Pasquale.

This study was conducted under the direct supervision of Dr. Michael F. Passmore, Chief, Ecological Resources Branch, Dr. Dave J. Tazik, Chief, EEED, and under the general supervision of Dr. Edwin A. Theriot, Director, EL.

At the time of publication of this report, Dr. James R. Houston was Director of ERDC, and COL John W. Morris III, EN, was Commander and Executive Director.

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1 Introduction

Background

The U.S. Army Engineer District (USAED), Philadelphia, has an extensive navigation responsibility throughout the Delaware River Basin. Maintenance dredging averages about 3,000,000 m^3 (4,000,000 yd^3) of material annually of which about 191,000 m^3 (250,000 yd^3) is removed by the Hopper Dredge *McFarland* (Figure 1). The dredging provides a safe navigation channel, which supports the shipping of nearly 136,000,000 metric tons (150,000,000 short tons) of cargo per year.

Figure 1. Dredge *McFarland*

Hopper dredges, like the *McFarland*, are self-propelled ships equipped with propulsion machinery, hoppers for dredged material storage, and dredge pumps. Dredged material is hydraulically raised through trailing dragarms in contact with the channel bottom and is discharged into the hoppers. The material is then held in the hoppers until placed at the disposal site.

Hopper dredges are often loaded past the point of overflow for economic reasons. As the hopper is filled, dredged material is stored in the hopper bins until overflow begins. The density of the hopper contents is increased by allowing the low-density supernatant to overflow back into the waterway. As the low-density supernatant overflows, the average density of the hopper contents increase. Thus, more material can be transported per trip to the disposal site or facility. This practice of overflowing hoppers to achieve a high-density load is referred to as economic loading.

In considering overflow, there is normally a tradeoff between the potential economic benefits and potential environmental effects. Overflow results in increased water column turbidity, and supernatant solids may be redeposited near the dredge site. Also, if sediments are contaminated, the overflow may result in some release of contaminants to the water column. Therefore, the relationship between dredge production, density of the hopper load, and the rate of material overflow are important variables in maximizing the efficiency of the dredging operation while minimizing contaminant release.

State environmental resource agencies have expressed concerns regarding the turbidity, sedimentation of suspended solids, and potential contaminant release from overflow resulting from the presence of oyster seedbeds in some areas near the navigation channel. Currently, overflow is not permitted at any location within the Delaware River Basin.

There is a significant potential for economic benefits to overflow in certain reaches of the project if the impact resulting from overflow is environmentally acceptable. The USAED, Philadelphia, therefore, initiated an evaluation of the practice of overflow for select portions of the Delaware River and Delaware Bay to determine if overflow for those reaches can meet applicable water quality standards. The District requested assistance from the Environmental Laboratory (EL), U.S. Army Engineer Research and Development Center (ERDC), Vicksburg, MS, in conducting a study of overflow in the Delaware River/ Delaware Bay system.

This study helped to quantify the degree of turbidity, suspended solids, and contaminant release generated by overflow and the dispersion of the overflow plume in reaches near the oyster seedbeds. Reaches in the Delaware River Basin where overflow would be acceptable were determined.

Study Location

Two test areas were selected in the Delaware River in conjunction with recommendations from the New Jersey Department of Environmental Protection (NJDEP) and Delaware's Department of Natural Resources and Environmental Control (DNREC) (Figure 2). These areas were selected on the basis of historical knowledge of the Delaware Basin and known locations of material types (sand, silt, and clay) within the river. The first site

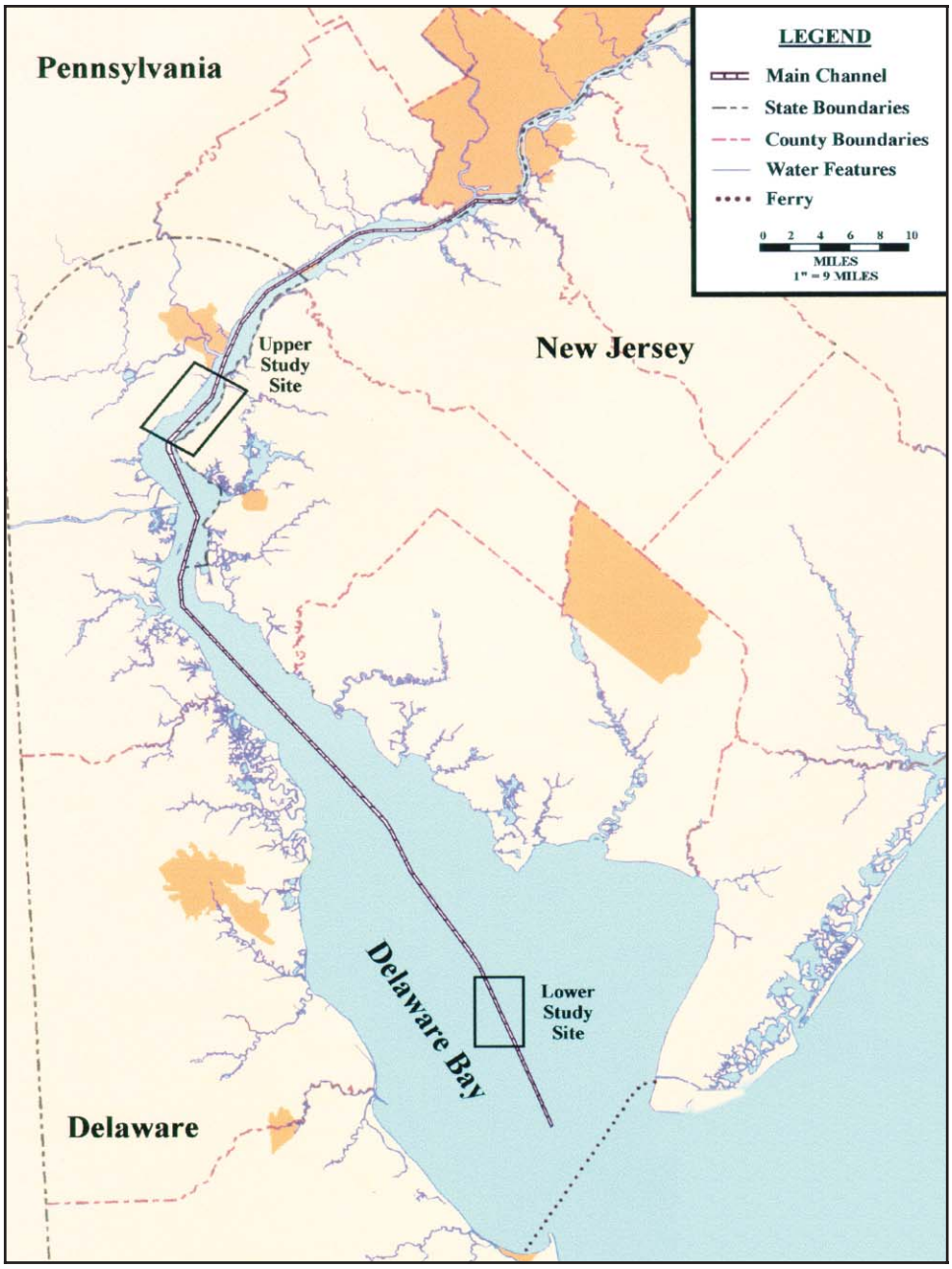

Figure 2. Locations of the lower and upper hopper dredge overflow test study sites

was located at the Brandywine range (Lower Study Site) in the lower Delaware Bay (mile marker 17.7) and was selected to represent a predominantly coarse-grained material. The second site was located at the Deepwater Point range (Upper Study Site) just below the Delaware Memorial Bridge (mile marker 67.9) and was selected to represent a typical fine-grained material. All the proposed activities for the study were reviewed with members of the Delaware River Fish Cooperative Technical Committee prior to submitting applications to the respective regulatory offices for Water Quality Certification (WQC) approvals.

Purpose and Scope

The purpose of this study was to evaluate the efficiency of economic loading of a hopper dredge and the physical and chemical characteristics of hopper overflow for the Delaware River dredging project. The study was designed to evaluate the effectiveness of increasing the hopper load during overflow and to determine the physical and chemical characteristics of the overflow into the Delaware River.

The study involved the following activities:

a. Loading data collection - measurements of the load in the hopper at and following overflow.

b. Characterization of in situ sediment - physical and chemical analysis including elutriate testing.

c. Hopper inflow monitoring - physical and chemical analysis.

d. Hopper contents monitoring - physical and chemical analysis.

e. Hopper overflow monitoring - physical and chemical analysis.

f. Plume monitoring - physical and chemical analysis; and in situ turbidity measurements.

g. Sedimentation assessment - photo imagery of recent sediment deposits.

h. Elutriate and Bioassay Testing - elutriate tests and acute toxicity testing on a fish and a crustacean species were performed for purposes of prediction and potential effects of overflow for the entire project.

These activities provided information to characterize the in situ sediment, hopper inflow as pumped from the draghead, and hopper overflow. Measurement of the material density in the hopper, solids concentration, particle size, and rate of overflow provided information for the development of hopper filling relationships. Elutriate tests were performed to predict the contaminant release back into the water column. These test results were also compared with the data results of the hopper overflow for consistency in sample analysis. Samples taken from the water column defined the relative difference between sediment resuspended by the draghead and that caused by overflow. One overflow and one nonoverflow dredge pass or overflow event was monitored in each of the two reaches of the river.

2 Field Monitoring

Dredging Equipment and Sampling Operations

The Dredge *McFarland* was used on September 15 and 16, 1998, to dredge in the two test reaches. The field sampling and monitoring was conducted during representative hopper operations with and without overflow in both reaches.

The tasks described in this technical report were the responsibility of the ERDC, Vicksburg, MS, with support provided by the USAED, Philadelphia. The USAED, Philadelphia, provided the necessary boats and personnel to assist the ERDC in all field monitoring, in situ data collection, and sample collection. ERDC staff members were present at the dredging site during the monitoring effort to direct the field efforts and assist in data and sample collection. ERDC performed all subsequent laboratory testing of samples, data analysis, and report preparation.

Dredge Operation Variables

At a minimum, it was necessary to have a complete record of the dredge operating variables during the monitoring and sampling periods. In addition to these standard dredge data, the time and duration of overflow during sampling events were recorded along with loading charts using the automated charts of the *McFarland*.

Collection of In Situ Sediment and Site Water

On September 14, in situ sediment and site water were collected at the two study sites prior to dredging to provide samples for sediment and water characterization and elutriate testing. Fifteen (15) sediment samples were taken at even intervals in a transect along which the dredge was expected to pass during overflow and nonoverflow conditions. Samples were collected with a grab-type apparatus. A 200-ml portion of the sample was

retained from each of the 15 samples for water content and density analysis (15 individual analyses). The remaining material of the 15 samples,were composited for sediment and water characterization and elutriate tests.

Composited samples were also obtained for elutriate testing from three sampling locations. Thus, five buckets and fifteen 250-ml bottles of sediment were obtained and shipped to the ERDC to characterize the in situ sediment. The five buckets of sediment were further composited to produce a single uniform composite. From this composite, standard elutriate testing was performed using the site water to prepare the samples. Density (or water content) estimates were made on all 15 samples, and the other physical and chemical tests were performed on the composite sediment sample.

Hopper Inflow Monitoring

The sediment slurry that was picked up by the draghead and transported through the hydraulic suction line was sampled as it entered the hopper (in 3-min intervals during filling and overflow). Grab samples at the inflow port(s) were collected and analyzed for solids concentration and appropriately composited and analyzed for grain size distribution, particle size distribution of fines, and chemical concentrations. The composited samples represented sediment from five equal time intervals during hopper loading.

Hopper Contents Monitoring

As material is pumped into the hoppers, a layer of high-density settled material is formed in the lower portion of the hopper with a layer of water with suspended material in the upper portion of the hopper. The vertical distribution of suspended material density or concentration in the upper portion of the hopper was measured. These data, in conjunction with overflow concentration data, can be used to determine when an economic load is achieved and when material density in the hopper is at a maximum. A second use for hopper vertical density measurements is to examine the potential for equipment modification, such as introducing settling tubes to enhance settling rates of solids in hopper bins. Hopper sampling at three depths was taken at the beginning of overflow and at the end of overflow. Three locations in the hopper were sampled.

Hopper Overflow Monitoring

Because of the variability in solids concentration at the hopper overflow, 40 samples were taken to determine suspended solids for each overflow

period. Samples were composited for chemical contaminant determination of chemical concentrations, grain size, particle size distribution of fines, and toxicity testing.

Plume Monitoring

Plume monitoring provided an evaluation of the amount of sediment in the water column resuspended by the operating draghead vs. the amount of sediment contributed by overflow. Data on plume concentrations as a function of distance and time provided information to determine an appropriate buffer distance from the oyster beds in which overflow should be restricted. Differentiation between the magnitude of sediment plumes caused by the draghead and plumes from overflow materials required monitoring both overflow and nonoverflow periods. Monitoring one dredge pass without overflow and one dredge pass with overflow was the minimal plume monitoring effort. To reduce the variability of results between tests, the dredge was required to be moving in the same direction relative to the current flow for every overflow and nonoverflow test monitored. Plume monitoring also provided information on contaminant dispersion in the water column.

Plume monitoring required two boats. One boat was positioned behind the hopper dredge in its path immediately after it passed and began sampling the water column to evaluate the rate of settling of the plume. The other boat towed a turbidimeter (in situ-type probe) across the plume to give information on lateral plume dispersion. Thus, the duration and geometry of the plume could be estimated. Both boats in the monitoring area carried out background sampling immediately before the dredging began.

Lateral plume dispersion measurements were made at middepth by locating the turbidimeter probe at the midpoint of the water column. Background turbidity was extensively measured. The boat towing the turbidimeter monitored distance from the dredge, using a range finder and hand bearing compass, and distance from the anchored sample boat. The whole plume was traversed, going outside of the plume at each extreme of the turbidity plume.

While the mobile boat was measuring lateral plume dispersion, the anchored boat measured decay of the plume as it settled through the water column. Water samples were taken at the surface (less than 1 m deep), middepth, and near bottom (within 1 to 2 m of the bottom). Fifteen samples at three depths for a 50-min period were taken to characterize background total suspended solids (TSS) conditions, and about 30 samples at three depths in a 30-min time frame were taken to characterize the overflow plume after the dredging pass. The latter sampling protocol was also used for the nonoverflow sediment plume measurements.

TSS was measured for all plume samples and a compositing scheme was used to reduce the number of samples for chemical analysis. Three compos-

ite samples for the plume monitoring were obtained (one at each of the three depths) by mixing portions of the samples taken at all three depths over one-third of the plume monitoring effort. Chemical analysis included heavy metals, polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs) and provided data on potential contamination of the water column by the dredging operation.

Sedimentation Assessment

One difficulty in assessing potential impacts of sedimentation resulting from hopper overflow is detection of thin overburdens in habitats in the vicinity of the dredging operation. Although thin (<5 cm) overburdens could have detrimental impacts, for example on the settlement and attachment of oyster larvae, this exceeds the detection limits of most conventional techniques. One method effective in measuring sedimentation events of less than 1 cm is sediment-profiling imagery using a sediment profile camera. This technique involves insertion of a prism into the substrate through which images of the sediment-water interface are obtained. The images provide rapid, accurate measures of recent sedimentation, particularly if the overburden sediments are dissimilar from the ambient substrate. The images also provide indications of impacts to benthic communities (e.g., distribution and position of annelid worms and bivalve mollusks relative to the relict and overburden surface) and changes in physical/chemical conditions of the sediment (e.g., altered redox potential discontinuity, evidence of hypoxia). This camera system is unaffected by ambient turbidity. An attached plan-view underwater camera also provided photographs at the sediment profile stations.

The sediment profiling camera system was deployed at the Delaware River overflow operation site. Because the area is tidally influenced, stations were occupied both up and down current from the dredging project. Stations were allocated to gather information for transects across several cross sections of the river reach potentially influenced by overflow, including any charted oyster bars.

Bioassay

Samples were taken at the hopper overflow for use in a 96-hr water column bioassay. This portion of the study will help in determining the possible biological effects of water column exposure to Delaware River sediment.

3 Data Analysis

Hopper Loading Characteristics

Coarse-grained site

The loading data provided by the USAED, Philadelphia, for the coarse-grained site are shown in Figure 3, and the summary data for the load increase can be found in Table 1. Loading volumes are based on calculations using historical density data in the area being dredged.

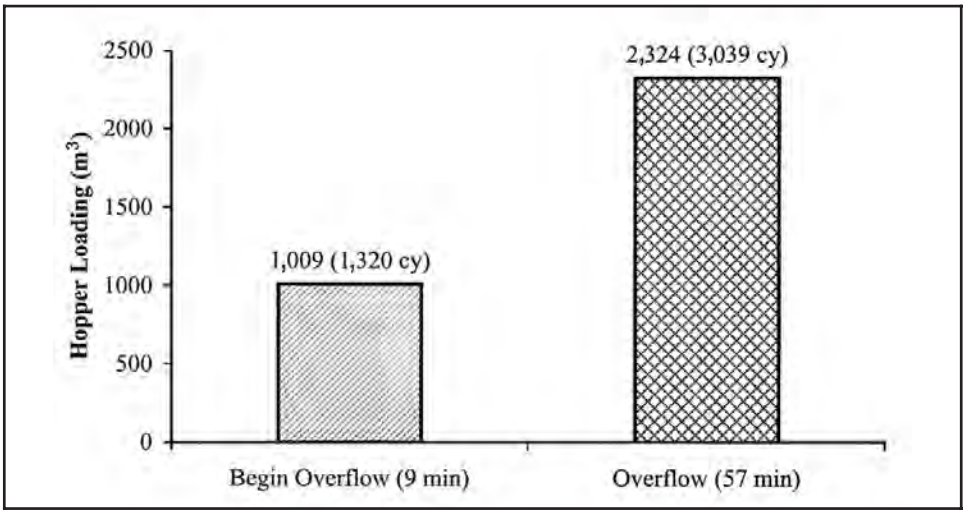

Figure 3. Hopper loading at coarse-grained site

It took 9 min of dredging to reach overflow status. During the first 9 min, material increased at a rate of 112.4 m^3/min (147 yd^3/min). Once overflow began, the increase in material loading was determined to be 22.9 m^3/min (30 yd^3/min). Overflow continued for 57 min with a gain of 130 percent realized. At the end of the overflow period, the hopper was full of sediment.

Table 1
Delaware River Coarse- and Fine-Grained Loading Data

Coarse-Grained Material				Fine-Grained Material			
Time, min	Loading, m^3		**Loading, yd^3**	**Time, min**	Loading, m^3		**Loading, yd^3**
0	0			0	0		
9	1,009 Begin overflow (9 min)		1,320	13	871 Begin overflow (13 min)		1,139
66	2,324 Overflow (57 min)		3,039	34	1,031 Overflow (21 min)		1,348
				0	0		
				13	871 Begin overflow (13 min)		1,139
				18	961 Overflow (5 min)		1,257
Time, min	**Loading m^3/min**	**Losing to Overflow m^3/min**	**% Gain**	**Time, min**	**Loading m^3/min**	**Losing to Overflow m^3/min**	**% Gain**
9	112.4			13	67.0		
57	22.9	89.5	130.3	21	7.6	59.4	18.4
				5	18.0	49.0	10.3

Fine-grained site

The loading diagram for the fine-grained site is shown in Figure 4 and the summary data for the load increase can be found in Table 1. For this site, the dredge operated 13 min before overflow began. During this first 13 min of dredging, material increased at a rate of 67.0 m^3/min (87 yd^3/min). Once overflow began, the increase in material loading was determined to be 7.6 m^3/min (10 yd^3/min). Overflow continued for 21 min with a gain of 18 percent realized. The percent gain realized for the coarse reach was interpolated for 21 min and was 50 percent, so that a comparison could be made during the same time frame between the two sites.

Economics

These results are consistent with the material composition at the two sites. The coarse-grained site would be expected to settle at a more rapid rate, therefore, showing a significant gain in material. Whereas, the fine-grained material would tend to stay in suspension, resulting in most of the sediment being discharged out the overflow. Because of the large amount of gain realized at the coarse-grained site, a rate of return of about 50 to 60 percent may be realized based on the amount of material retained in the hopper and the round-trip travel time required to the dump site. Basically, for every 3 days of nonoverflow dredging, approximately the same amount of material can be removed by allowing overflow dredging in a 2-day period. This percent return also assumes that the material being discharged in the overflow settles in the navigation channel and will require redredging the area. At the fine-grained site, the rate of return is negligible because of the small gain in load achieved. This is also based on round-trip travel time required to the pump-out site, material being discharged in the overflow settling in the navigation channel and requiring redredging of the area. If

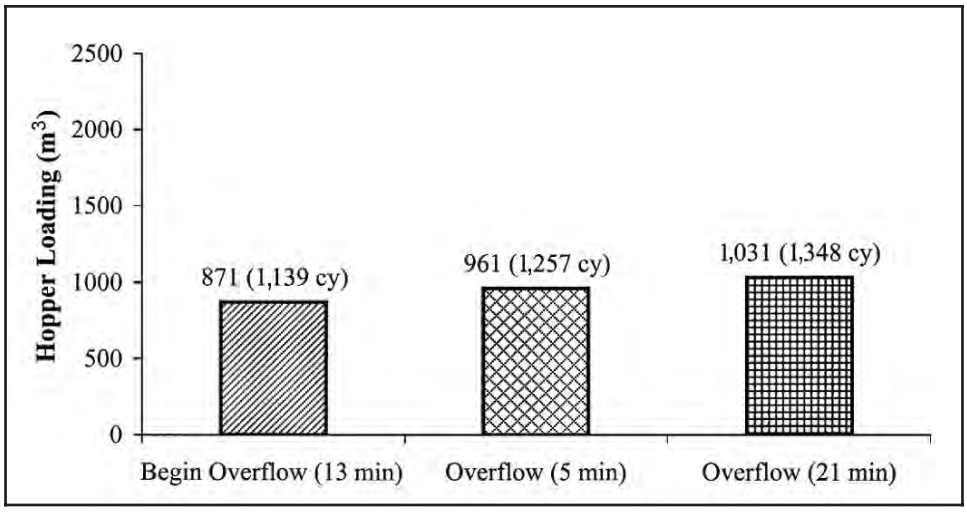

Figure 4. Hopper loading at fine-grained site

redredging the area at either site is not required, then the percent return estimated at those sites may increase.

In Situ Sediment and Background Water Samples

Coarse-grained site

The composited sediment samples at the coarse-grained site show the proposed dredged area to average 97 percent sand (Figure 5). The range was less than 1 percent ± of the average value (96.5 to 97.7 percent). Background water chemical concentrations were compared with the contaminants of concern as listed in the acute marine objectives for toxic pollutants for the protection of aquatic life in the Delaware River estuary. This information can be found in the Delaware River Basin Commission West Trenton, New Jersey, Administrative Manual-Part III, Water Quality Regulations, October 23, 1996. The only parameter above the standard was background dissolved copper (Table 2). The standard for copper is 5.3 µg/l, and the background value was 13 µg/l. The water quality and sediment data for the coarse-grained site can be found in Appendix A.

Fine-grained site

The composited sediment samples at the fine-grained site show the proposed dredged area to average 33 percent sand (Figure 6). The range for sand was from 18 to 50 percent. Background water concentrations for the contaminants of concern were all below the more stringent of the freshwater or marine stream quality objectives for acute toxicity standards as

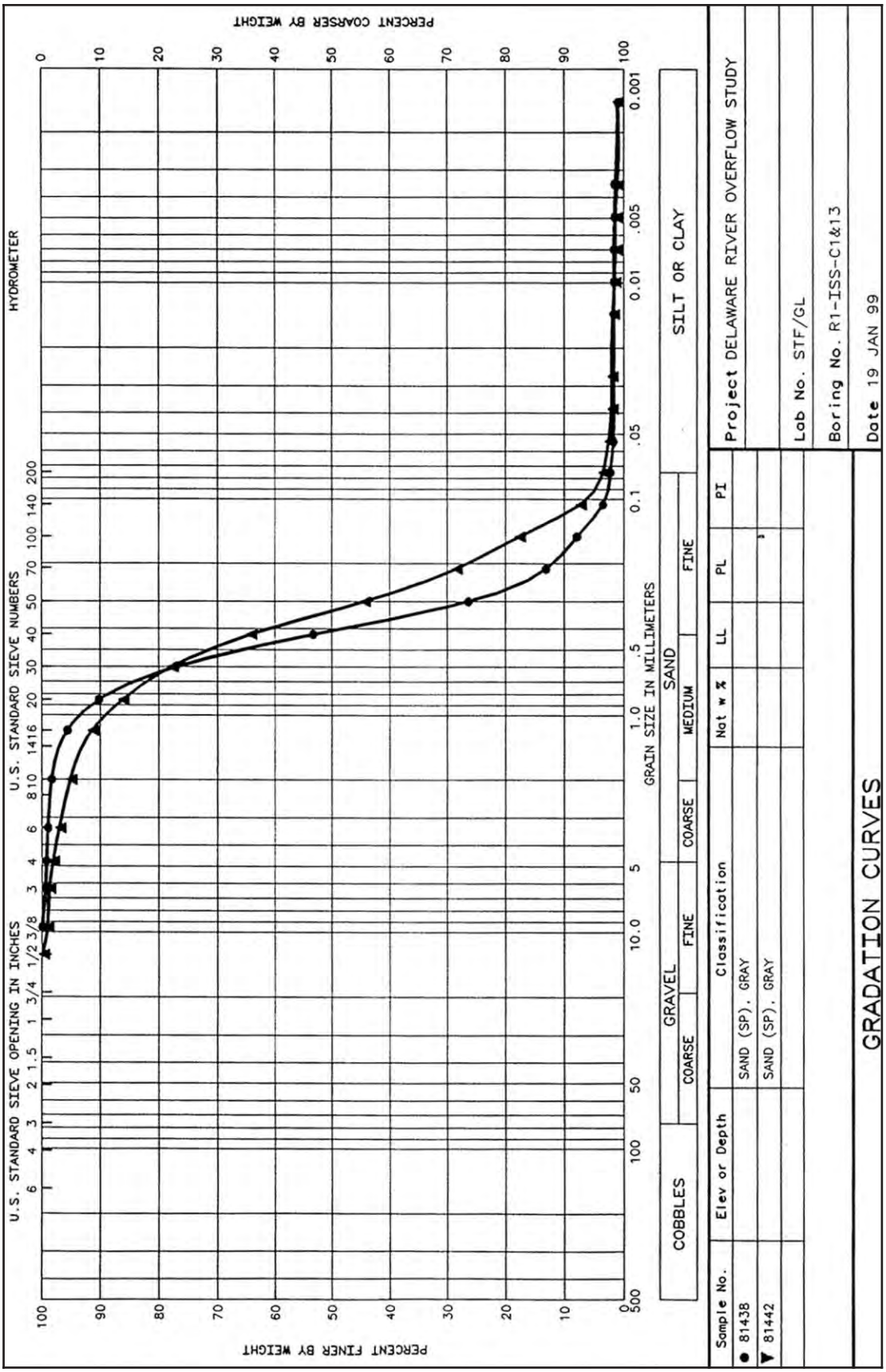

Figure 5. Range of gradation curves from in situ sediment collected at the coarse-grained site

Table 2
Delaware River Coarse-Grained Site, Summary of Sediment and Water Quality Data

Effluent Suspended Solids Concentration - 1395.000 mg/l

PARAMETER	SEDIMENT CONC mg/kg	DETECTION LIMIT µg/l	WATER QUALITY STANDARDS[1] µg/l	BACKGROUND CONC µg/l	ELUTRIATE CONC µg/l	OVERFLOW CONC µg/l
2-METHYLNAPHTHALENE	0.000	0.3000	NL	BD	BD	BD
A-BHC	0.000	0.0250	NL	BD	BD	BD
A-ENDOSULFAN	0.000	0.0250	NL	BD	BD	BD
ACENAPHTHENE	0.000	0.3000	20	BD	BD	BD
ACENAPHTHYLENE	0.000	0.3000	NL	BD	BD	BD
ALDRIN	0.000	0.0250	0.65	BD	BD	BD
ALUMINUM (Al)	1673.000	25.0000	NA	BD	BD	BD
ANTHRACENE	0.000	0.3000	NL	BD	BD	BD
ANTIMONY	0.000	3.0000	NL	BD	BD	BD
ARSENIC (As)	3.170	2.0000	69	44.0000	49.6667	46
B-BHC	0.001	0.0250	NL	BD	BD	BD
B-ENDOSULFAN	0.000	0.0500	NL	BD	BD	BD
BARIUM (Ba)	4.900	2.0000	NL	39.0000	91.6667	117
BENXO(a)ANTHRACENE	0.017	0.3000	NL	BD	BD	BD
BENZO(G,H,I)PERYLENE	0.017	0.3000	NL	BD	BD	BD
BENZO(a)PYRENE	0.022	0.3000	NL	BD	BD	BD
BENZO(b)FLUORANTHENE	0.021	0.3000	NL	BD	BD	BD
BENZO(k)FLORANTHENE	0.022	0.3000	NL	BD	BD	BD
BERYLLIUM (Be)	0.200	1.0000	NL	BD	BD	BD
CADMIUM (Cd)	0.000	0.2000	43	BD	BD	BD
CHROMIUM (TRI)(Cr)	6.300	2.0000	NA	BD	2.0000	BD
CHRYSENE	0.019	0.3000	NL	BD	BD	BD
COBALT (Co)	2.300	2.0000	NL	BD	BD	BD
COPPER (Cu)	2.330	1.0000	5.3	13.0000	7.0000	5
D-BHC	0.000	0.0250	NL	BD	BD	BD
DIBENZO(A,H)ANTHRACENE	0.002	0.3000	NL	BD	BD	BD
DIELDRIN	0.001	0.0500	0.355	BD	BD	BD
ENDOSULFAN SULFATE	0.000	0.0500	NL	BD	BD	BD
ENDRIN	0.000	0.0500	0.019	BD	BD	BD
ENDRIN ALDEHYDE	0.000	0.0500	NL	BD	BD	BD
FLUORANTHENE	0.010	0.3000	NL	BD	BD	BD
FLUORENE	0.000	0.3000	NL	BD	BD	BD
G-BHC	0.003	0.0250	0.08	BD	BD	BD

Table 2 (Continued)

PARAMETER	SEDIMENT CONC mg/kg	DETECTION LIMIT µg/l	WATER QUALITY STANDARDS[1] µg/l	BACKGROUND CONC µg/l	ELUTRIATE CONC µg/l	OVERFLOW CONC µg/l
HEPTACHLOR	0.001	0.0250	0.027	BD	BD	BD
HEPTACHLOR EPOXIDE	0.002	0.0250	NL	BD	BD	BD
INDENO(1,2,3-C,D)PYRENE	0.021	0.3000	NL	BD	BD	BD
IRON (Fe)	5903.000	20.0000	NL	BD	BD	BD
LEAD (Pb)	12.300	1.0000	220	BD	BD	BD
MANGANESE (Mn)	94.800	1.0000	NL	6.0000	1.6667	BD
MERCURY (Hg)	0.093	0.2000	2.1	BD	BD	BD
METHOXYCHLOR	0.000	0.2500	NL	BD	BD	BD
NAPHTHALENE	0.000	0.3000	NL	BD	BD	BD
NICKEL (Ni)	3.300	1.0000	75	9.0000	5.0000	9
TOTAL PCB's			5.0			
PCB 101	0.000	0.0010	NL	BD	0.0010	BD
PCB 105	0.000	0.0010	NL	BD	BD	BD
PCB 110	0.000	0.0010	NL	BD	BD	BD
PCB 114	0.000	0.0010	NL	BD	BD	BD
PCB 118	0.000	0.0010	NL	BD	BD	BD
PCB 119	0.000	0.0010	NL	BD	BD	BD
PCB 120	0.000	0.0010	NL	BD	BD	BD
PCB 121	0.000	0.0010	NL	BD	BD	BD
PCB 123	0.000	0.0010	NL	BD	BD	BD
PCB 126	0.000	0.0010	NL	BD	BD	BD
PCB 127	0.000	0.0010	NL	BD	BD	BD
PCB 128	0.000	0.0010	NL	BD	BD	BD
PCB 132	0.000	0.0010	NL	BD	BD	BD
PCB 135	0.000	0.0010	NL	BD	BD	BD
PCB 136	0.000	0.0010	NL	BD	BD	BD
PCB 137	0.000	0.0010	NL	BD	BD	BD
PCB 138	0.000	0.0010	NL	BD	BD	BD
PCB 141	0.000	0.0010	NL	BD	BD	BD
PCB 146	0.000	0.0010	NL	BD	BD	BD
PCB 149	0.000	0.0010	NL	BD	BD	BD
PCB 151	0.000	0.0010	NL	BD	BD	BD
PCB 153	0.000	0.0010	NL	BD	BD	BD
PCB 156	0.000	0.0010	NL	BD	BD	BD
PCB 157	0.000	0.0010	NL	BD	BD	BD
PCB 158	0.000	0.0010	NL	BD	BD	BD
PCB 166	0.000	0.0010	NL	BD	BD	BD
PCB 167	0.000	0.0010	NL	BD	BD	BD
PCB 168	0.000	0.0010	NL	BD	BD	BD

Table 2 (Continued)

PARAMETER	SEDIMENT CONC mg/kg	DETECTION LIMIT µg/l	WATER QUALITY STANDARDS[1] µg/l	BACKGROUND CONC µg/l	ELUTRIATE CONC µg/l	OVERFLOW CONC µg/l
PCB 169	0.000	0.0010	NL	BD	BD	BD
PCB 170	0.000	0.0010	NL	BD	BD	BD
PCB 171	0.000	0.0010	NL	BD	BD	BD
PCB 174	0.000	0.0010	NL	BD	BD	BD
PCB 177	0.000	0.0010	NL	BD	BD	BD
PCB 178	0.000	0.0010	NL	BD	BD	BD
PCB 179	0.000	0.0010	NL	BD	BD	BD
PCB 18	0.000	0.0010	NL	BD	BD	BD
PCB 180	0.000	0.0010	NL	BD	BD	BD
PCB 182	0.000	0.0010	NL	BD	BD	BD
PCB 183	0.000	0.0010	NL	BD	BD	BD
PCB 185	0.000	0.0010	NL	BD	BD	BD
PCB 187	0.000	0.0010	NL	BD	BD	BD
PCB 189	0.000	0.0010	NL	BD	BD	BD
PCB 190	0.000	0.0010	NL	BD	BD	BD
PCB 191	0.000	0.0010	NL	BD	BD	BD
PCB 194	0.000	0.0010	NL	BD	BD	BD
PCB 195	0.000	0.0010	NL	BD	BD	BD
PCB 196	0.000	0.0010	NL	BD	BD	BD
PCB 198	0.000	0.0010	NL	BD	BD	BD
PCB 200	0.000	0.0010	NL	BD	BD	BD
PCB 201	0.000	0.0010	NL	BD	BD	BD
PCB 203	0.000	0.0010	NL	BD	BD	BD
PCB 205	0.000	0.0010	NL	BD	BD	BD
PCB 206	0.000	0.0010	NL	0.0020	0.0024	0.0017
PCB 207	0.000	0.0010	NL	BD	BD	BD
PCB 208	0.000	0.0010	NL	BD	0.0012	BD
PCB 22	0.000	0.0010	NL	BD	BD	BD
PCB 28	0.000	0.0010	NL	BD	BD	BD
PCB 31	0.000	0.0010	NL	BD	0.0029	BD
PCB 33	0.000	0.0010	NL	BD	BD	BD
PCB 37	0.000	0.0010	NL	BD	BD	BD
PCB 40	0.000	0.0010	NL	BD	BD	BD
PCB 42	0.000	0.0010	NL	BD	BD	0.0014
PCB 44	0.000	0.0010	NL	0.0014	BD	BD
PCB 47	0.000	0.0010	NL	BD	BD	BD
PCB 49	0.000	0.0010	NL	BD	BD	BD
PCB 52	0.000	0.0010	NL	BD	0.0010	BD
PCB 60	0.000	0.0010	NL	BD	BD	BD

Table 2 (Concluded)

PARAMETER	SEDIMENT CONC mg/kg	DETECTION LIMIT µg/l	WATER QUALITY STANDARDS[1] µg/l	BACKGROUND CONC µg/l	ELUTRIATE CONC µg/l	OVERFLOW CONC µg/l
PCB 64	0.000	0.0010	NL	BD	BD	BD
PCB 66	0.000	0.0010	NL	BD	BD	BD
PCB 70	0.000	0.0010	NL	BD	BD	BD
PCB 74	0.000	0.0010	NL	BD	BD	BD
PCB 77	0.000	0.0010	NL	BD	BD	BD
PCB 8	0.000	0.0010	NL	BD	BD	BD
PCB 80	0.000	0.0010	NL	BD	BD	BD
PCB 81	0.000	0.0010	NL	BD	BD	BD
PCB 82	0.000	0.0010	NL	BD	BD	BD
PCB 84	0.000	0.0010	NL	BD	BD	BD
PCB 86	0.000	0.0010	NL	BD	BD	BD
PCB 87	0.000	0.0010	NL	BD	BD	BD
PCB 91	0.000	0.0010	NL	BD	BD	BD
PCB 92	0.000	0.0010	NL	BD	BD	BD
PCB 95	0.000	0.0010	NL	BD	BD	BD
PCB 97	0.000	0.0010	NL	BD	BD	BD
PCB 99	0.000	0.0010	NL	BD	BD	BD
PHENANTHRENE	0.001	0.3000	NL	BD	BD	BD
PPDDD	0.000	0.0500	NL	BD	BD	BD
PPDDE	0.000	0.0500	NL	BD	BD	BD
PPDDT	0.000	0.0500	NL	BD	BD	BD
PYRENE	0.013	0.3000	NL	BD	BD	BD
SELENIUM (Se)	0.866	2.0000	300	152.0000	167.6667	160
SILVER (Ag)	0.333	1.0000	2.3	BD	1.0000	BD
THALLIUM (Tl)	0.000	2.0000	NL	BD	BD	BD
TOC-TOTAL ORGANIC CARBON	166.700	3000.0000	NL	BD	BD	13160
TOXAPHENE	0.000	0.2500	0.21	BD	BD	BD
VANADIUM (V)	4.130	1.0000	NL	2.0000	1.6667	4
ZINC (Zn)	29.200	10.0000	95	BD	28.0000	27
a-CHLORDANE	0.000	0.0250	NL	BD	BD	BD
b-CHLORDANE	0.002	0.0250	NL	BD	BD	BD

[1]Marine Objectives Acute
BD = below detection
NA = not applicable
NL = not listed
0.000 = below detection for sediment conc. (mg/kg)

found in the Delaware River Basin Commission West Trenton, New Jersey, Administrative Manual-Part III, Water Quality Regulations, October 23, 1996. Only two exceedances were found in the dissolved overflow water (Table 3). Endrin was measured at a concentration of 0.0754 µg/l as compared to the standard of 0.019 µg/l. Zinc was measured at a concentration of 131 µg/l as compared to the standard of 95 µg/l. See Appendix A for the Delaware River water quality and sediment analysis for the fine-grained site.

Hopper Inflow

Coarse-grained site

Samples collected for grain-size distribution at the hopper inflow at the coarse-grained site averaged 84 percent sand (Figure 7). The range was from 52 to 98 percent. Eliminating the 52-percent sample resulted in a sandy composition of 92 percent with a range from 86 to 98 percent. This is more representative of that collected from the in situ sampling. Suspended solids concentrations in the hopper inflow could not be accurately determined because the coarse-grained material rapidly settled to the bottom of the sampling buckets, and the total bucket sample was not retained for analysis.

Fine-grained site

Samples collected for grain-size distribution at the hopper inflow at the fine-grained site averaged 12 percent sand (Figure 8). The range was from 9 to 15 percent. This is much less than the 33 percent represented by the in situ sampling.

Hopper Contents

Coarse-grained site

Suspended solids concentrations in the hopper at the coarse-grained site were <15 g/l (Figure 9). This indicates that settling was occurring very rapidly. Although the samples should be representative of the water column, it should be realized that the agitation occurring inside the hopper will keep the material in suspension for an extended period of time. Therefore, when the sample was collected, the material being agitated quickly settled and was not collected in the 250-ml sample bottle.

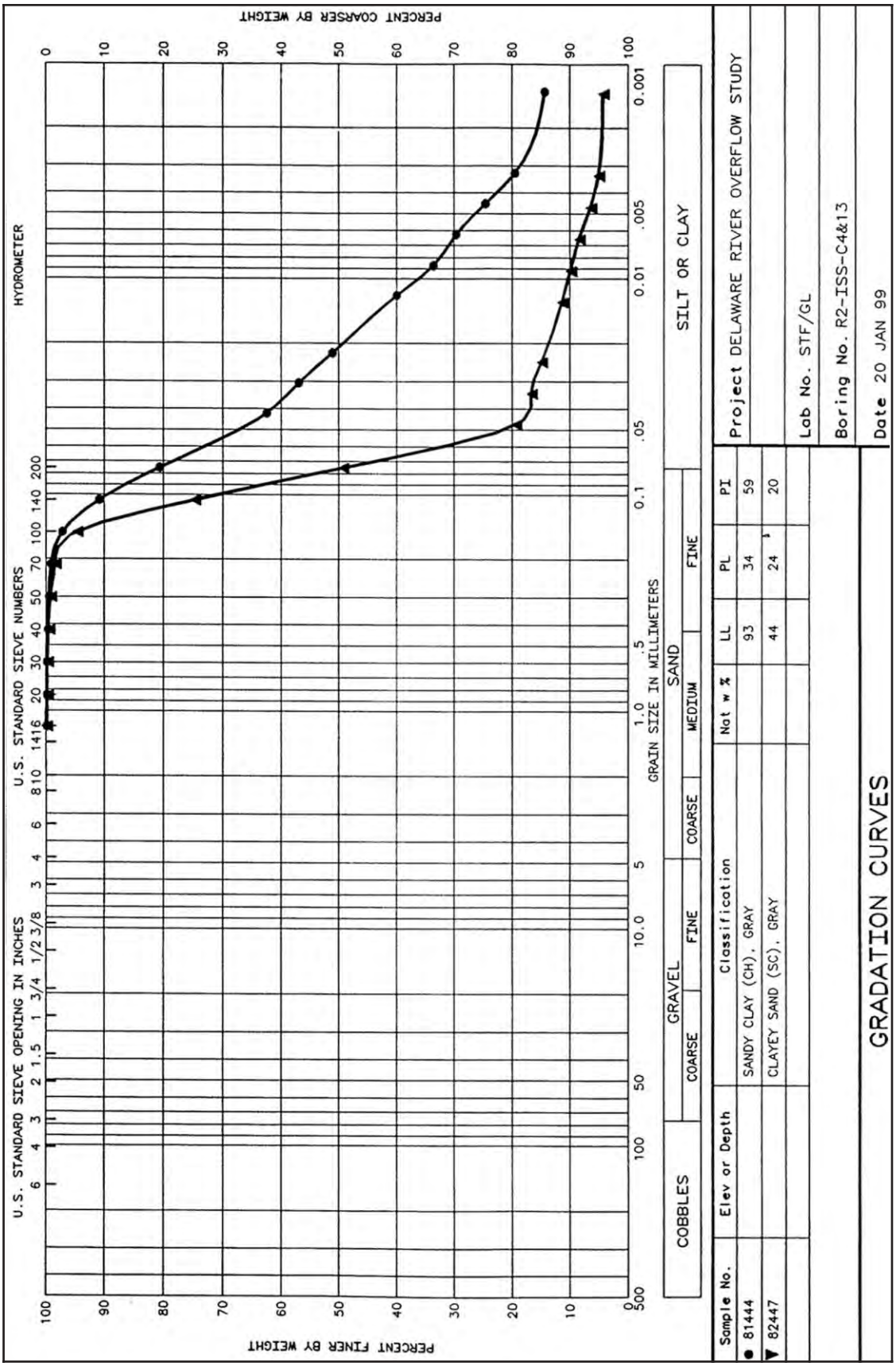

Figure 6. Range of gradation curves from in situ sediment collected at the fine-grained site

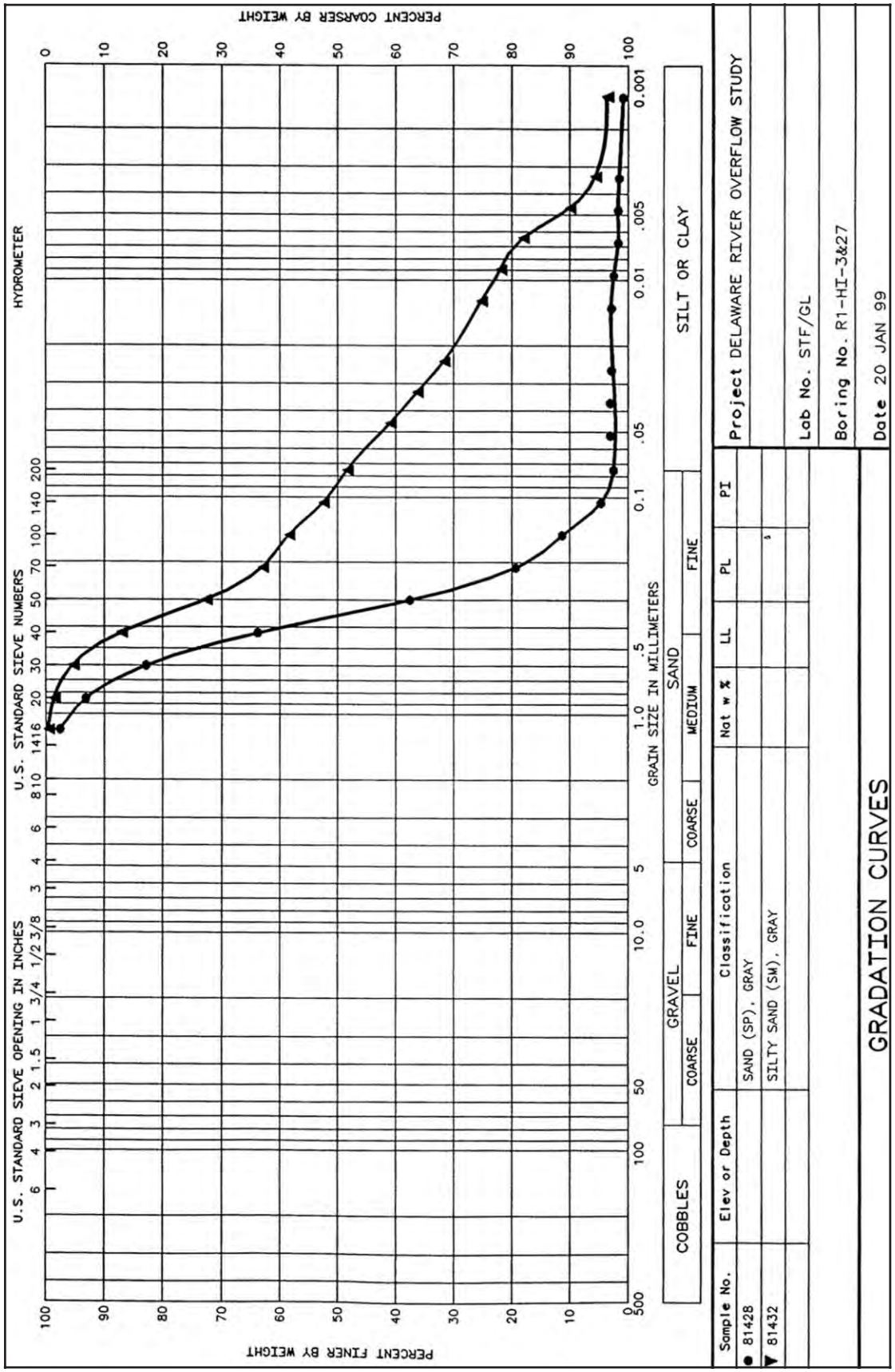

Figure 7. Range of gradation curves from hopper inflow at the coarse-grained site

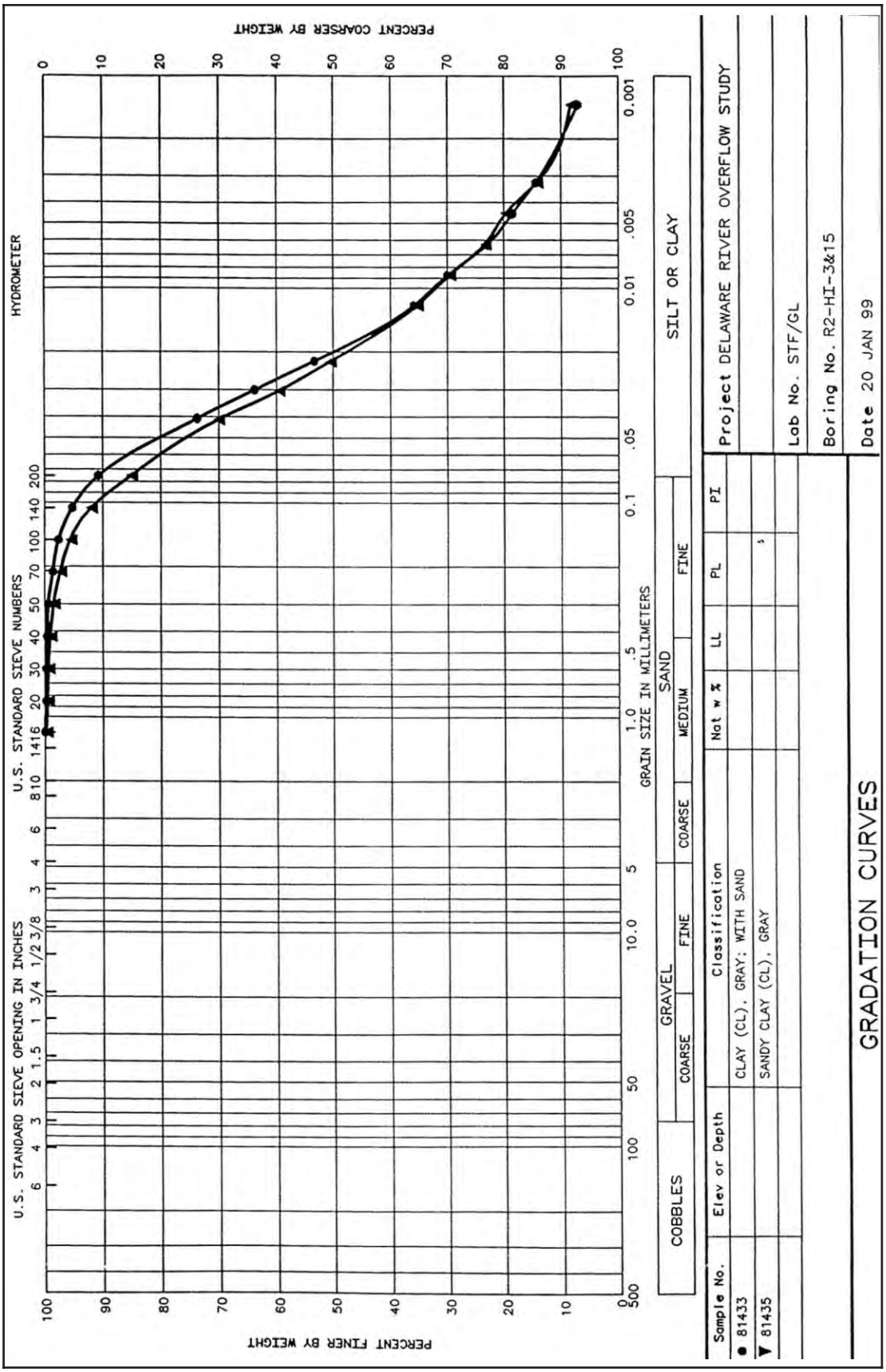

Figure 8. Range of gradation curves from hopper inflow at the fine-grained site

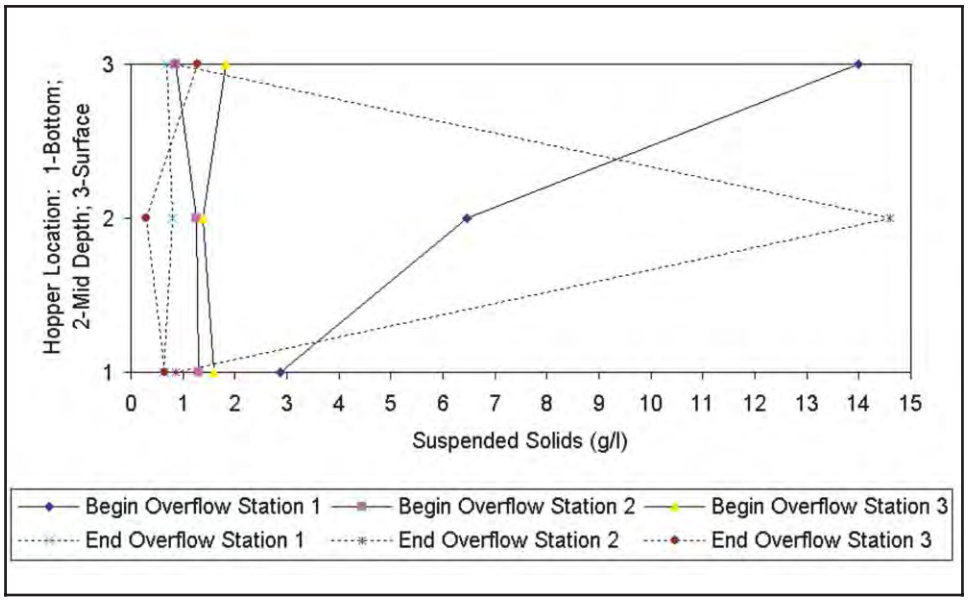

Figure 9. Hopper contents—solids concentrations of coarse-grained material

Fine-grained site

Suspended solids concentrations in the hopper at the fine-grained site were upward of 150 g/l at the bottom and approximately 80 g/l at the surface (Figure 10). It is expected that high concentrations of suspended solids would be found in the water column as the hopper agitates the fine-grained material and keeps it in suspension. The high concentrations of suspended solids at the surface indicate that a large amount of the material was lost to overflow in the fine-grained site.

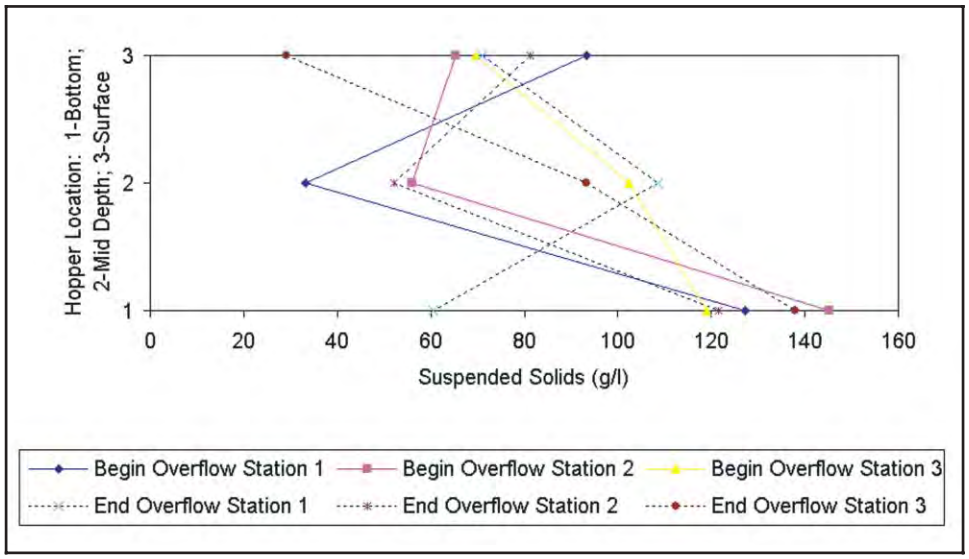

Figure 10. Hopper contents—solids concentrations of fine-grained material

Hopper Overflow

Coarse-grained site

Samples collected for grain-size distribution at the hopper overflow at the coarse-grained site averaged 81.1 percent sand with a range from 24.4 to 96.1 percent (Figure 11). Composites of five samples were obtained and the average grain-size distribution was 78.1 percent with a range from 66.7 to 87.7 percent (Figure 12). This shows that a large amount of the sandy material was being agitated in the hopper and being washed out during overflow. This is consistent with the loading data that show a loading of about 112.4 m^3/min (147 yd^3/min) before overflow and an average loading of about 22.9 m^3/min (30 yd^3/min) over the 57-min period during overflow. However, the rate of loading in the initial stages of overflow was likely much higher with the material in the overflow increasing as the hopper filled and retention time was decreased. None of the chemistry parameters analyzed in the overflow samples collected at the coarse-grained site exceeded marine acute objectives as listed in the Delaware River Basin Water Quality Regulations for dissolved criteria limits. Although the background value for copper (13 µg/l) exceeded the criteria (5.3 µg/l), the dissolved value for copper in the overflow was 5 µg/l, indicating a scavenging of metals by the suspended material during the dredging and overflow process.

Fine-grained site

Samples collected for grain-size distribution at the hopper overflow at the fine-grained site averaged 12.2 percent sand with a range from 6.2 to 31.2 percent (Figure 13). Composites of five samples were obtained and the average grain-size distribution was 10.6 percent with a range from 9.3 to 11.6 percent (Figure 14). The suspended solids concentrations in the overflow averaged 110 g/l over the total overflow period of 21 min. The solids concentrations were essentially consistent throughout the overflow period, indicating little retention of the fine material in the hopper once overflow began. A large amount of material, about 59.4 m^3/min (78 yd^3/min) or about 89 percent of the inflow is being lost to overflow. Zinc (131 µg/l) and endrin (0.0754 µg/l) were the only two chemical parameters measured in the overflow that exceeded the more stringent acute objectives of the freshwater and marine stream quality standards (95 µg/l for zinc and 0.019 µg/l for endrin) as listed in the Delaware River Basin Water Quality Regulations for dissolved criteria limits. The value for endrin exceeded standards by a factor of 4, indicating that both water quality objectives could be met a short distance from the point of overflow. None of the other chemistry parameters analyzed in the overflow samples collected at the fine-grained site exceeded the acute objectives.

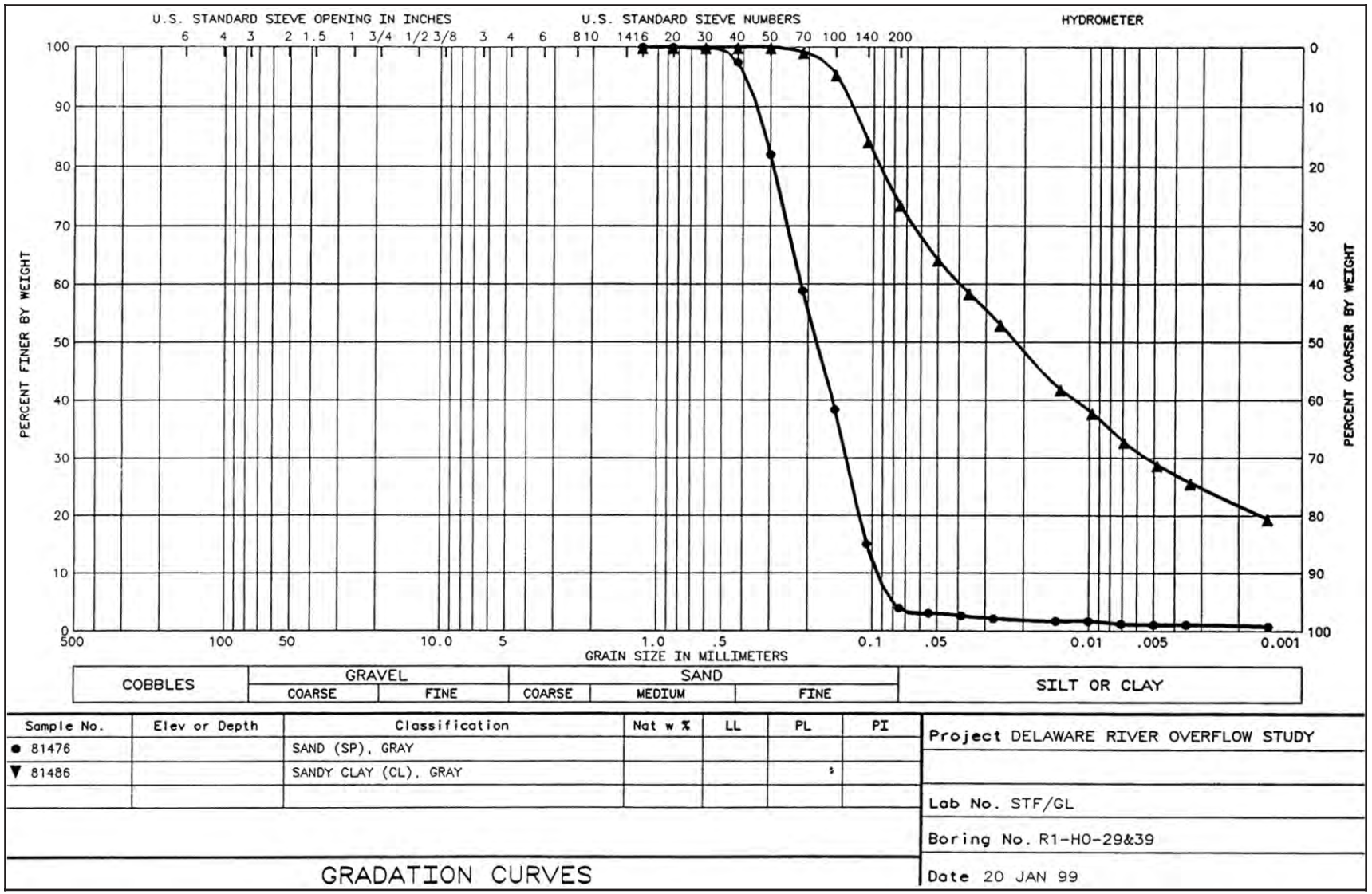

Figure 11. Range of gradation curves from hopper overflow at the coarse-grained site

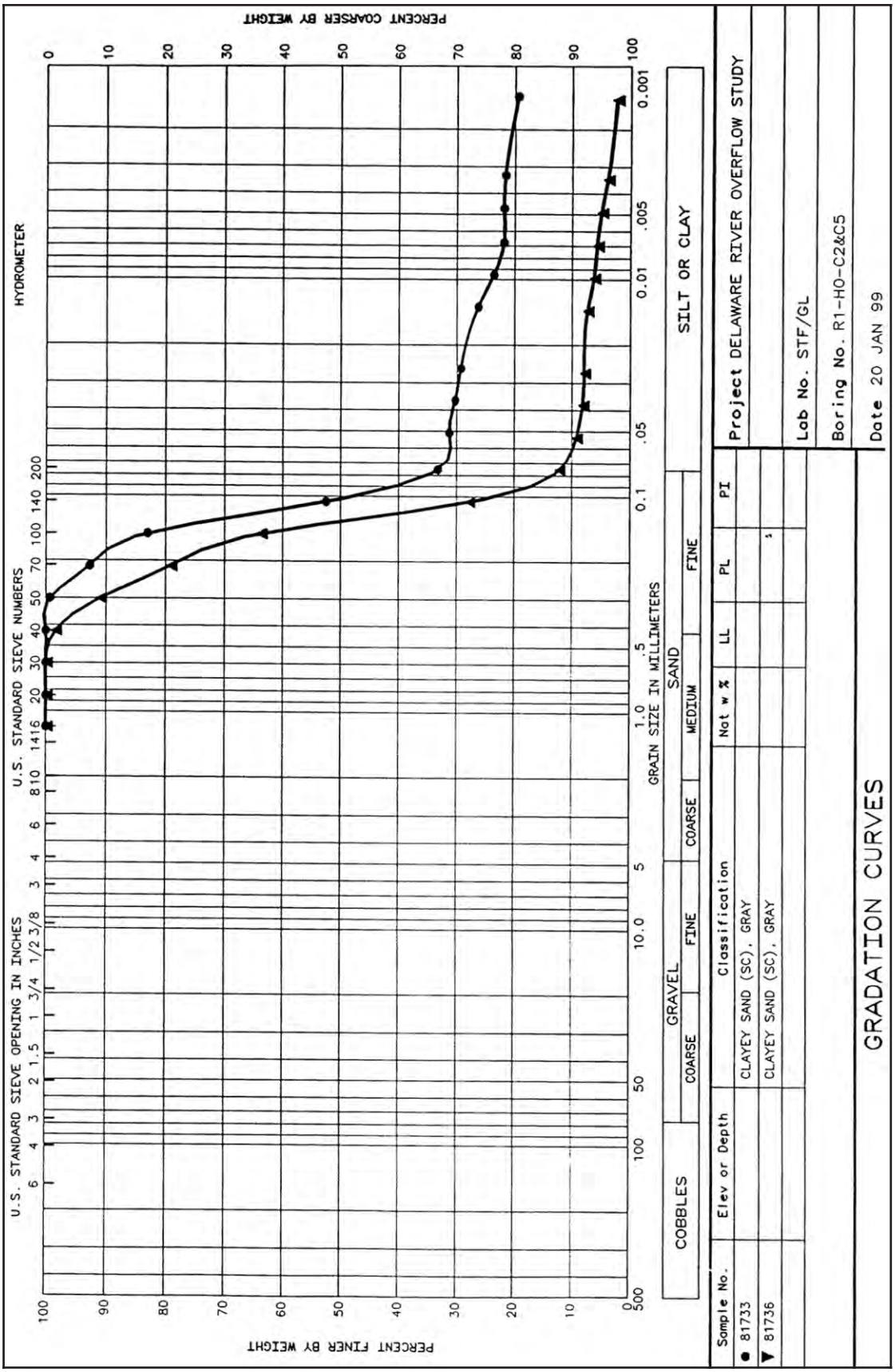

Figure 12. Range of gradation curves from hopper overflow composites at the coarse-grained site

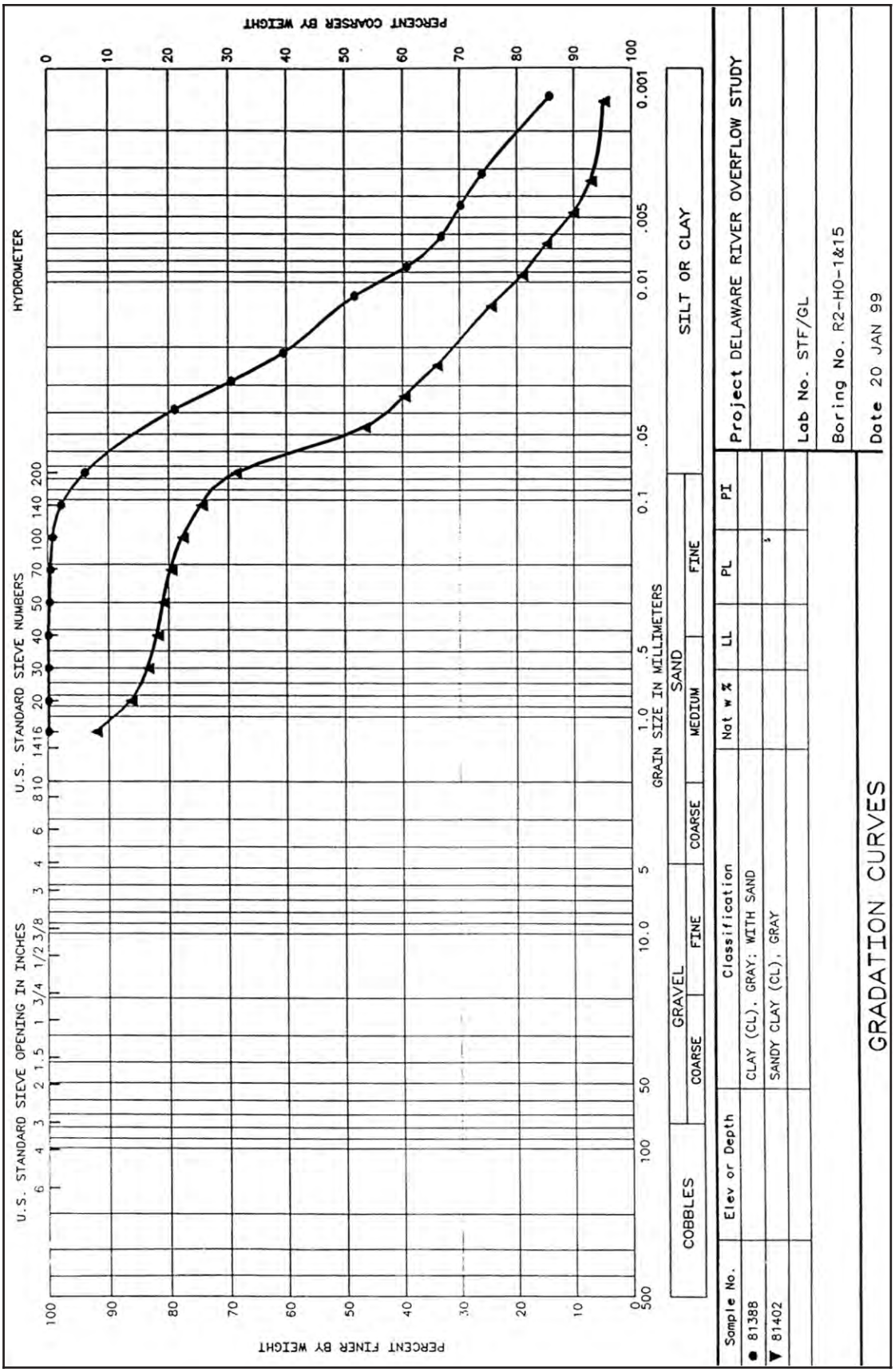

Figure 13. Range of gradation curves from hopper overflow at the fine-grained site

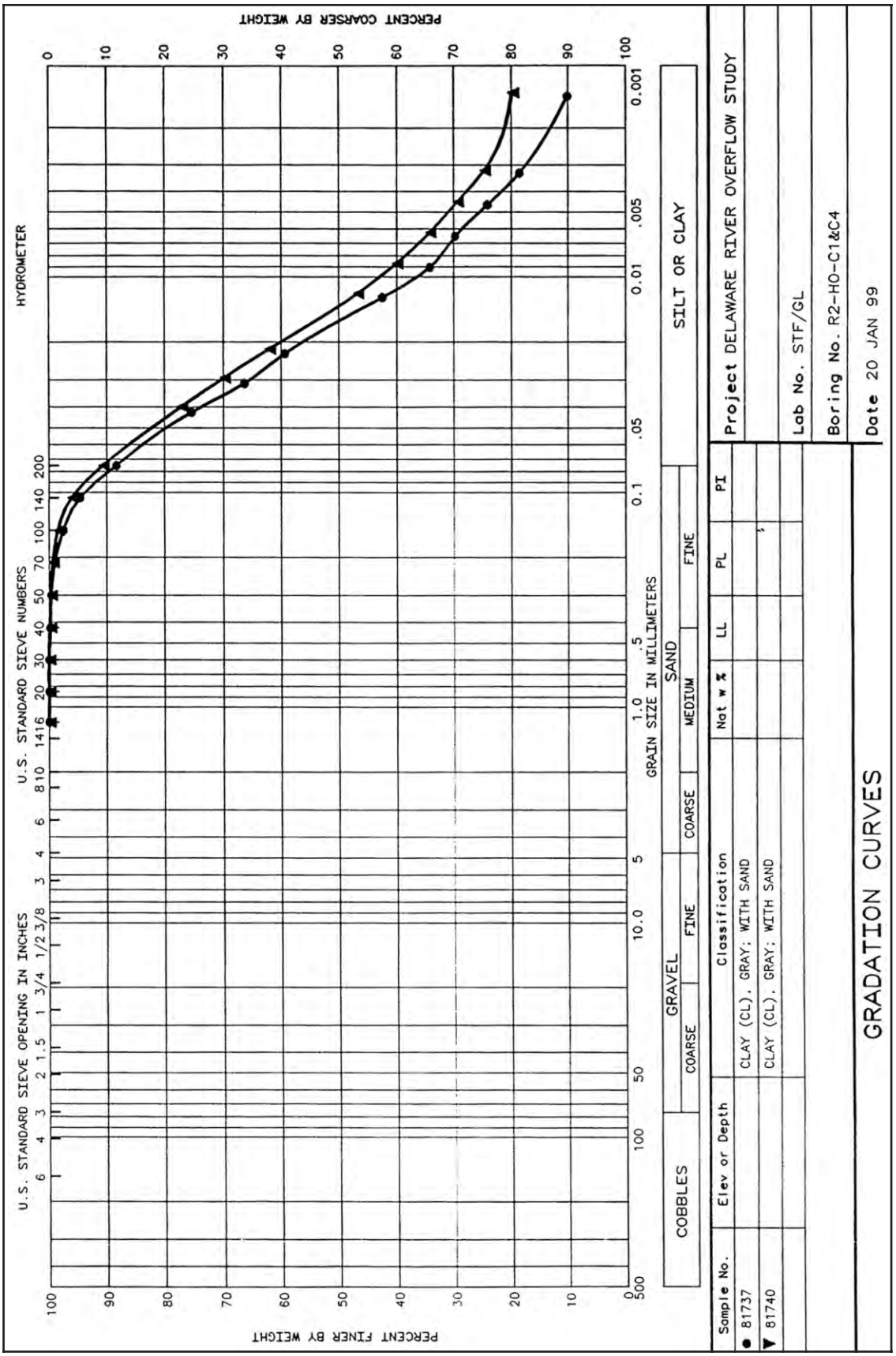

Figure 14. Range of gradation curves from hopper overflow composites at the fine-grained site

Plume Monitoring

Monitoring of the sediment plumes was accomplished using a boat-mounted 1,200-kHz Broad-Band Acoustic Doppler Current Profiler (ADCP). The instrument collects velocity vectors in the water column together with backscatter levels to determine the position and relative intensity of the sediment plume. Along with the ADCP, a MicroLite recording instrument with an Optical Backscatterance (OBS) Sensor was towed by the vessel at a depth of 15 ft. The MicroLite recorded data at 0.5-sec intervals. Navigation data for monitoring were obtained by a Starlink differential Global Positioning System (GPS). The GPS monitors the boat position from the starting and ending points along each transect.

Coarse-grained site

Transects were monitored in each test area to obtain the background levels of suspended materials prior to dredging activities. A period of 8 min following the dredge passing during nonoverflow dredging shows the level of suspended material to be returning to background levels. No lateral dispersion of the plume out of the channel was observed during the nonoverflow dredging operation.

During overflow dredging, a wider transect was performed to determine the lateral extent of the plume. No significant change above background levels could be detected. At 1-hr elapsed time following the end of the overflow dredging operation, the levels of suspended material returned to background conditions. Again, no lateral dispersion of the plume out of the channel area was observed. A complete analysis of the plume study can be found in Appendix B.

Figure 15 is a surface profile of the solids concentrations measured during nonoverflow and overflow conditions. Both sets of data fall within the minimum and maximum range of the background solids concentrations measured prior to dredging. Figure 16 is a middepth profile of the solids concentrations. Because of the narrow range between the measured values of the minimum and maximum range, both the nonoverflow and the overflow measured solids concentrations were above the maximum range. Figure 17 is a bottom profile of the solids concentrations and can be described much like that of the surface profile in that both sets of data fall within the minimum and maximum range of the background solids concentrations. In all three instances, there is not a significant difference in the solids concentrations measured during nonoverflow and the solids concentrations measured during overflow. Figure 18 shows that all solids concentrations measured during nonoverflow and overflow fell within the total minimum and maximum range measured in the background prior to dredging.

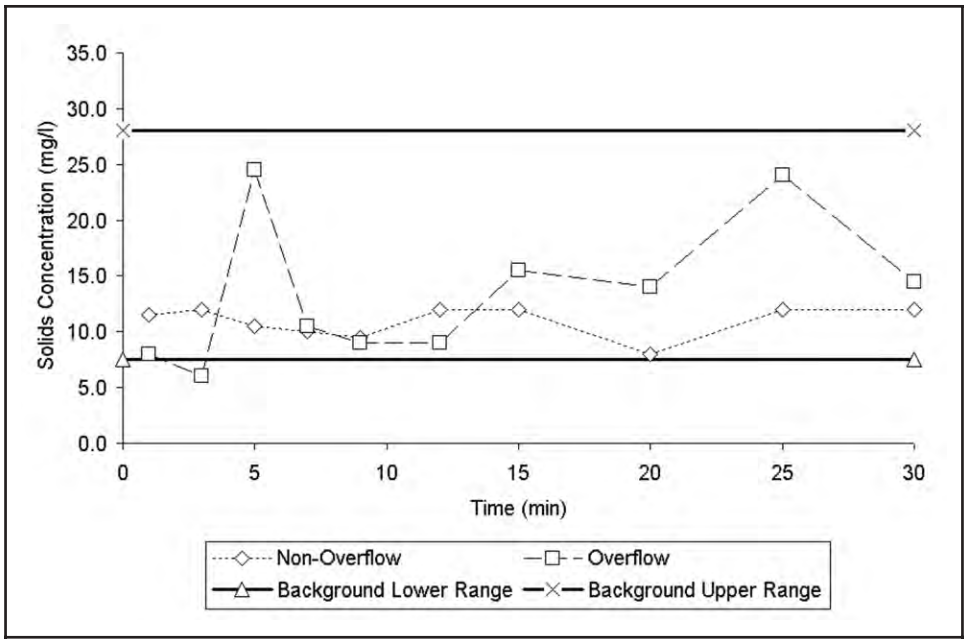

Figure 15. Plume solids concentrations at surface (coarse-grained material)

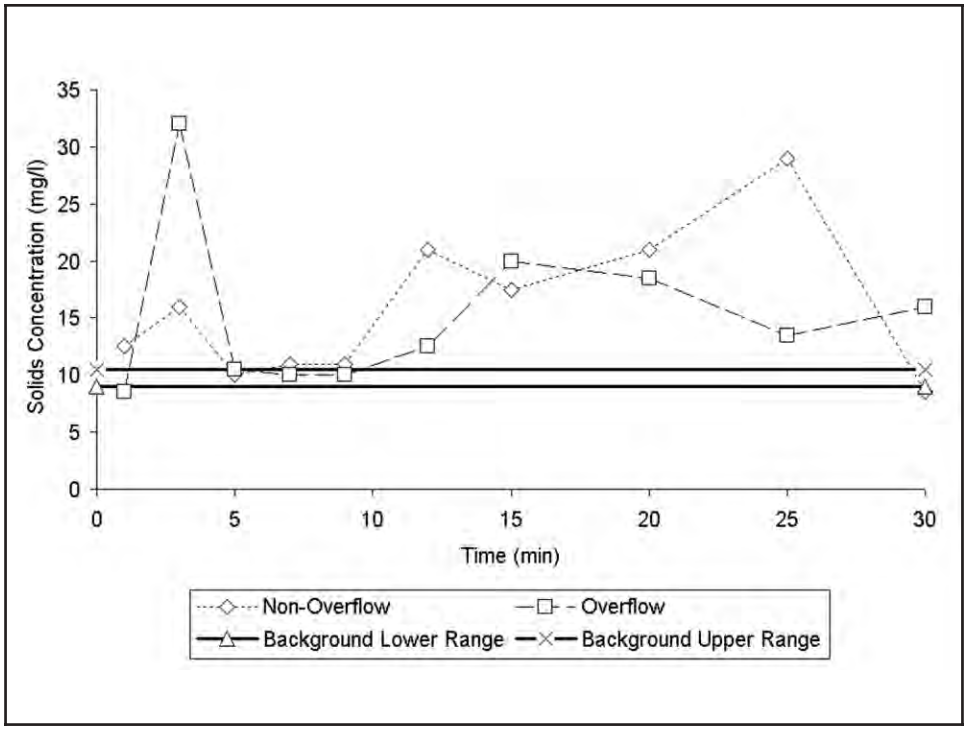

Figure 16. Plume solids concentrations at middepth (coarse-grained material)

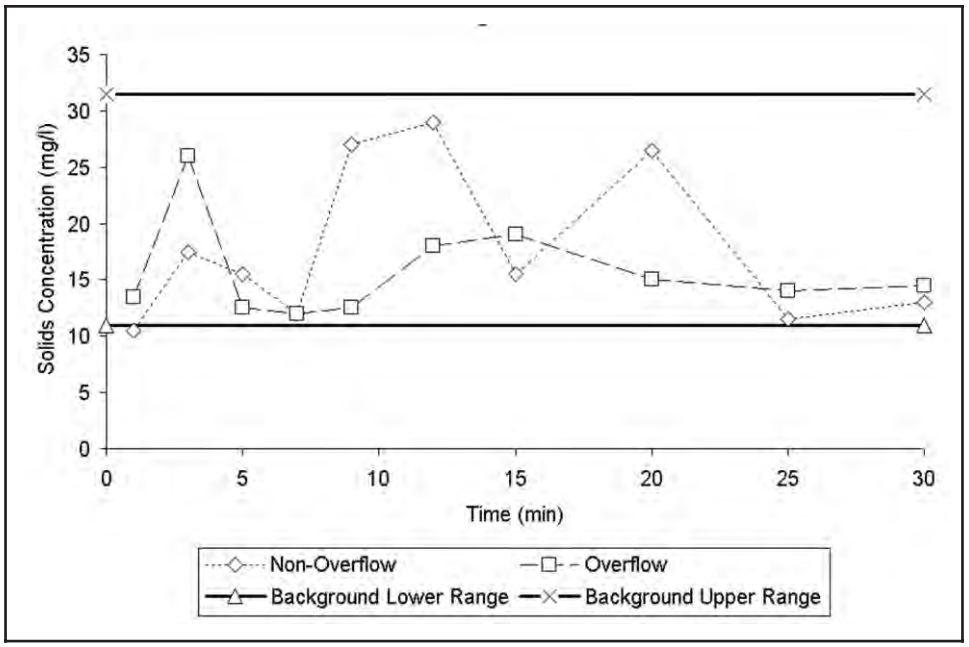

Figure 17. Plume solids concentrations at bottom (coarse-grained material)

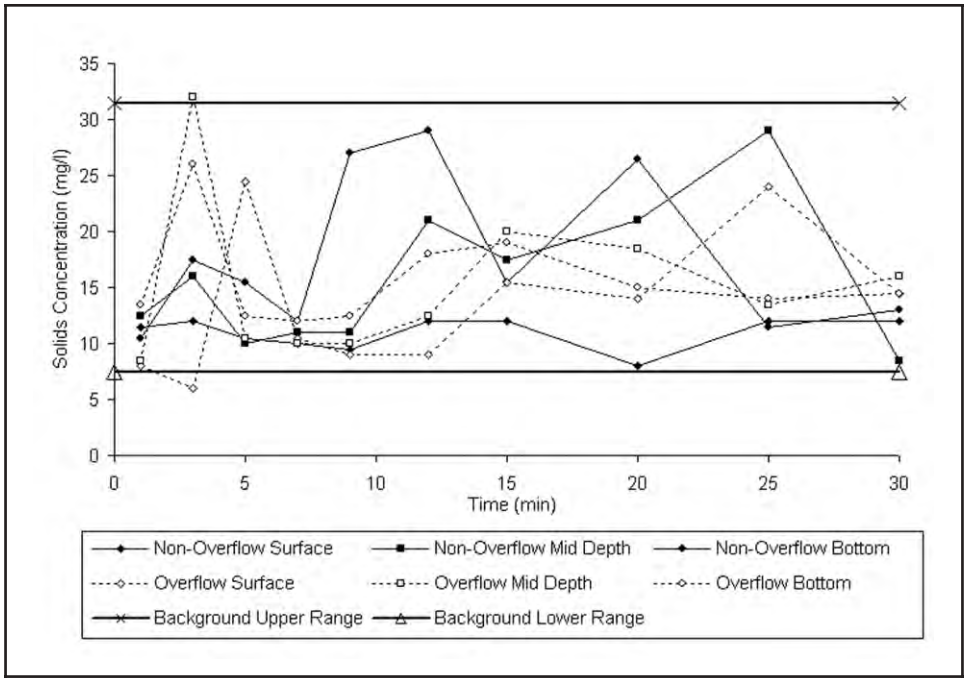

Figure 18. Plume solids concentrations at coarse-grained site

Fine-grained site

During the nonoverflow dredging operation, the tidal flow in the dredging area reversed from flood flow to ebb flow conditions. This accounts for the relative change in observed background levels taken before the nonoverflow and overflow test dredging. At 19 min following the end of nonoverflow dredging, the levels of suspended material had returned to background conditions. Despite the change in direction of flow in the dredging area, no lateral movement of the plume beyond the channel limits was observed.

Immediately prior to overflow conditions, an increase in the background suspended material was observed. This increase is assumed to be the result of the increase in the ebb flow velocities and the resulting disturbance of bottom materials from near-bottom velocities and not dredge plume dispersion. When hopper overflow conditions began, the width of the transect was increased to observe the lateral extent of the dispersion of the dredge plume. After an elapsed time of 1 hr following the completion of the overflow dredging operation, levels of suspended materials had returned to background conditions. As in the previous dredge operations, no lateral dispersion of the dredge plume beyond the channel limits was observed. A complete analysis of the plume study can be found in Appendix B.

Figure 19 shows the solids concentrations as measured at the surface during nonoverflow and overflow conditions. The overflow solids concentrations oscillate outside the maximum background solids concentration. Toward the end of overflow, the concentrations fall back within the background range. Figure 20 shows the solids concentration as measured at middepth. The same pattern as the surface profile is exhibited. Figure 21 shows the solids concentration as measured at the bottom. The nonoverflow solids concentrations remain within the measured range of the background; however, the overflow solids concentrations remain above the maximum background range throughout the duration of overflow. Figure 22 shows the maximum background range of solids concentration measured. The nonoverflow solids measured are well within the total range while the overflow solids concentrations oscillate outside the maximum range. This is consistent since 70 percent or more of the material is fine-grained and would settle slowly.

Sedimentation Results

Coarse-grained site

Sediment profile images from a total of 14 stations were analyzed from the coarse-grained site as shown in Figure 2 of Appendix C. There was evidence that recent sedimentation had occurred at several of the stations

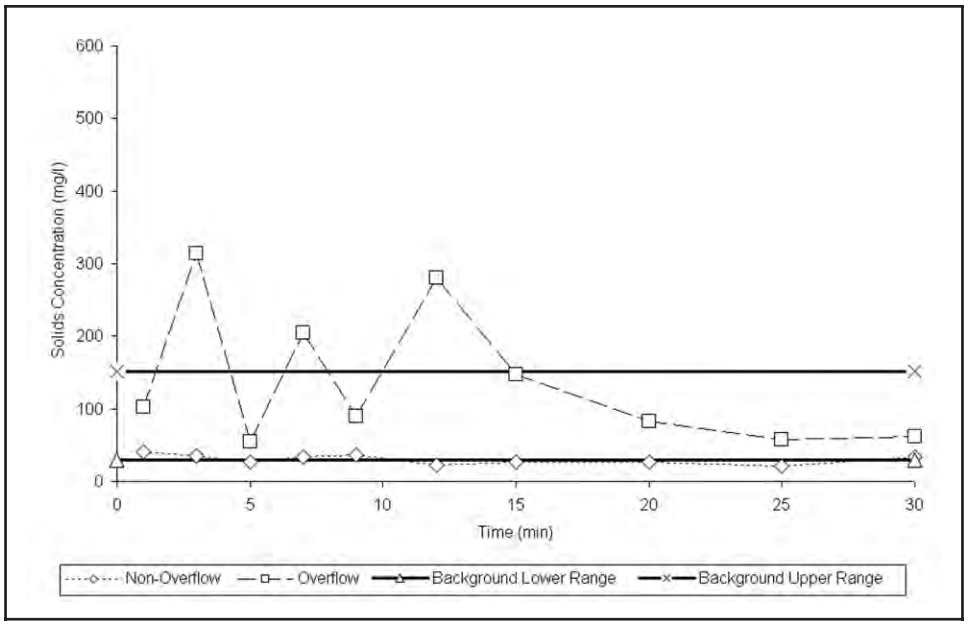

Figure 19. Plume solids concentrations at surface (fine-grained material)

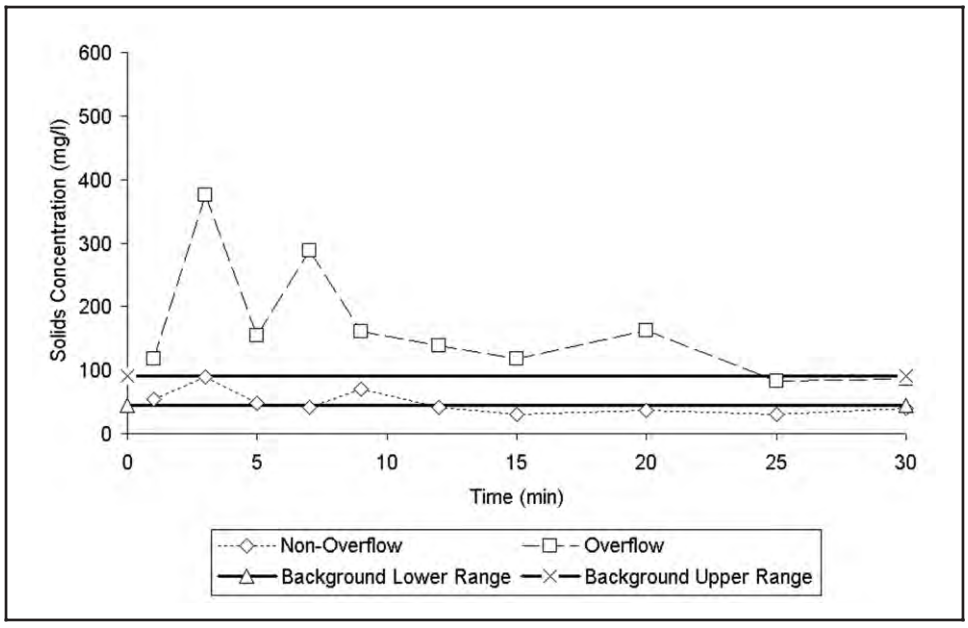

Figure 20. Plume solids concentrations at middepth (fine-grained material)

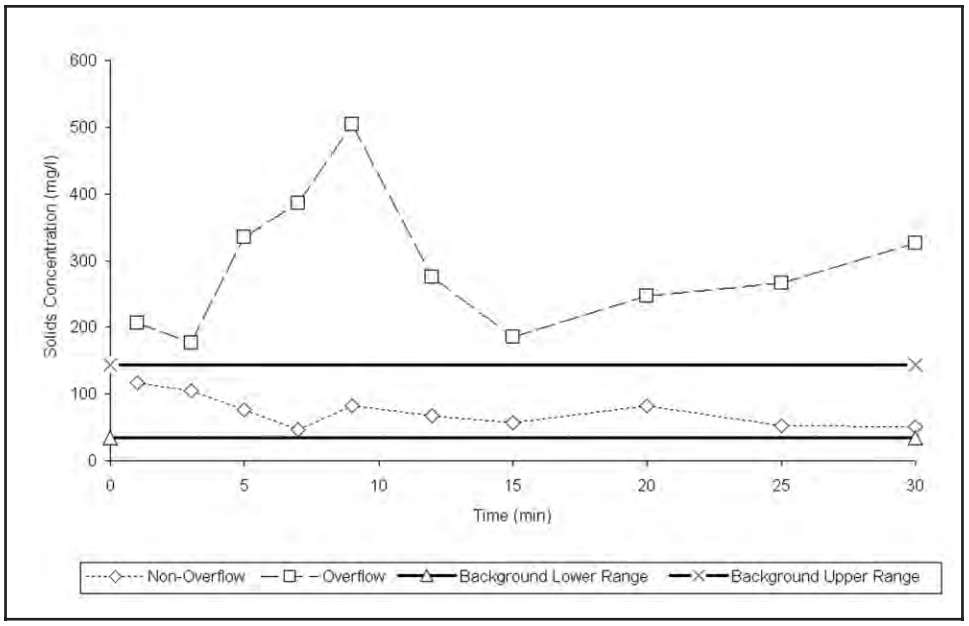

Figure 21. Plume solids concentrations at bottom (fine-grained material)

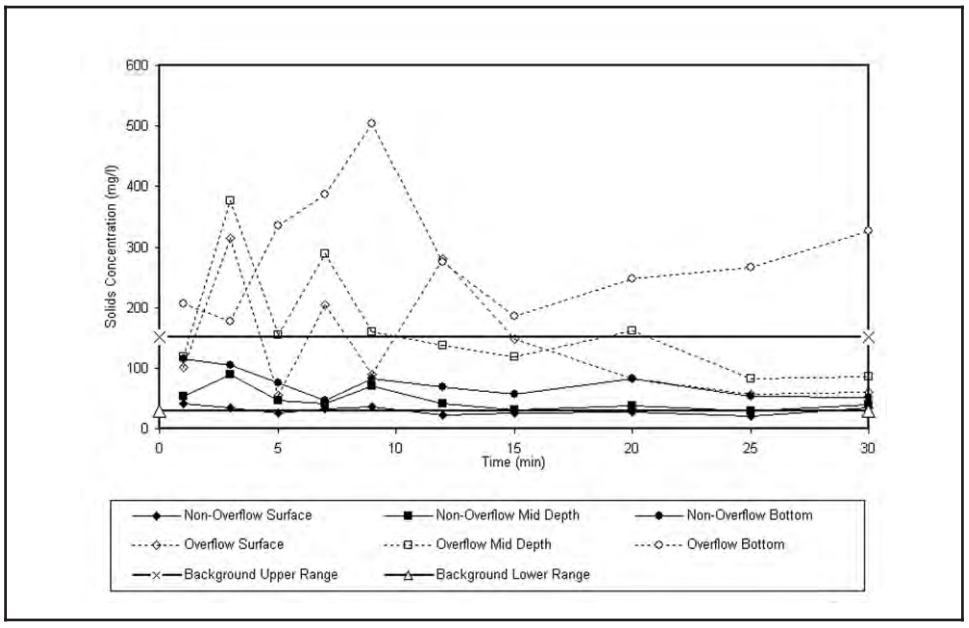

Figure 22. Plume solids concentrations of fine-grained material

within the channel, possibly a result of the dredging operations. Gray colored suspended material, indicative of hopper overflow material, was observed at two of the stations. Four of the stations had layering from grain-size changes but are assumed to have occurred because of normal sediment transport processes rather than hopper overflow operations.

Fine-grained site

Sediment profile images from a total of 41 stations were analyzed from the fine-grained site as shown in Figure 3 of Appendix C. No evidence of recent physical disturbance was detected at any of the stations, but material that could have come from the hopper overflow was observed at one station. Five of the stations on the edge of the channel had grain-size layering with sands on the surface overlaying clayey sediments. Since the sediments in the channel were finer silts and clays, it was unlikely that the layers at the channel edge stations were the result of the dredging operations. Three of the stations on the edge of the channel had sediment layering with amphipod and worm tubes which could not have reestablished living position in the short interval between dredging and sampling. Flocculent sediment layers, thin layers of unconsolidated surface sediments, occurred at six shoal stations and one channel edge station. Based on their color tones, all flock layers appeared to be composed of background sediments and not hopper overflow or dredged material.

No indication of newly deposited dredged material was observed at stations outside the edge of the navigation channel at either study site. Although the sampling station coverage was not extensive, given the relatively short duration of the tests, the risk of significant sedimentation as a consequence of the hopper dredging operations appears largely restricted to the bottom and side slopes of the channel. The full report on the sedimentation analysis is attached as Appendix C.

Standard Elutriate Tests

The standard elutriate analysis was performed using the composited in-situ sediment and site water. The purpose of the standard elutriate testing was to gain data on possible application of the test for prediction of overflow contaminant concentrations. The mean predicted dissolved values from the elutriates were calculated using the EFQUAL computer program, a module of the ADDAMS software package.[1] The elutriate test was conducted using standard procedures.[2]

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[1] Palermo, M. R., and Schroder, P. R. (1991). "Documentation of the EFQUAL module for ADDAMS: Comparison of predicted effluent water quality with standards," Technical Note EEDP-06-13, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS

[2] U.S. Environmental Protection Agency and U.S. Army Corps of Engineers. (1998). "Evaluation of dredged material proposed for discharge in inland and near-coastal waters - Testing manual," EPA-823-B-98-004, U.S. Environmental Protection Agency, Washington, DC.

Coarse-grained site

At the coarse-grained site, background dissolved copper was the only contaminant of concern that was predicted to be above the standard (Table 2). The program predicted that copper would be discharged at 7 µg/l which is above the marine objective acute criteria but well below the background value of 13 µg/l. Therefore, a dilution of the background with respect to copper would naturally occur as a result of the dredging operation, and a mixing zone would not be required. The actual value recorded at the hopper overflow (effluent) for copper was 5 µg/l, which was below both the background and the standard of 5.3 µg/l.

Fine-grained site

At the fine-grained site, the predicted dissolved value of selenium was 24.3 µg/l (Table 3). The more stringent acute value of the freshwater or marine stream quality standard for selenium is 20 µg/l and the background was 19 µg/l. The actual value recorded at the hopper overflow for selenium was 14.2 µg/l, which is below the criteria and the background value, which would indicate a natural dilution of the contaminant of concern during dredging operations. Again, because of this natural dilution, a mixing zone would not be required.

At both reaches, the predicted elutriate values appear somewhat conservative when compared with the overflow values. The close agreement of the elutriate values with the actual overflow values (Tables 2 and 3) indicate that the elutriate test can be used as a valid predictor of overflow quality for the Delaware River. Summaries of the standard elutriate and predicted effluent quality results for the two sites can be found in Tables 2 and 3. A complete listing of the water quality, sediment, and elutriate analysis for both sites can be found in Appendix A.

Technical Findings of a 96-hr Water Column Bioassay

This test was performed to determine the possible biological effects of water column exposure to Delaware River overflow. Two species were used in performing the bioassays, the mysid shrimp, a crustacean species, *Mysidopsis bahia*, and the inland silverside, a fish species, *Menidia beryllina*. These species were selected based on conversations with personnel from the Delaware Department of Natural Resources and Environmental Control. The filtered elutriate was diluted with standard laboratory control seawater (6-ppt salinity for the fine-grained site and 30-ppt salinity for the coarse-grained site) to yield the following concentrations: 0-, 6.25-, 12.5-, 25-, 50-, and 100-percent elutriate. Each treatment was replicated five

Table 3
Delaware River Fine-Grained Site, Summary of Sediment and Water Quality Data

Effluent Suspended Solids Concentration - 77385.000 mg/l

PARAMETER	SEDIMENT CONC mg/kg	DETECTION LIMIT µg/l	WATER QUALITY STANDARDS[1] µg/l	BACKGROUND CONC µg/l	ELUTRIATE CONC µg/l	OVERFLOW CONC µg/l
2-METHYLNAPHTHALENE	0.034	0.3000	NL	BD	BD	BD
A-BHC	0.000	0.0500	NL	BD	BD	BD
A-ENDOSULFAN	0.003	0.0500	NL	BD	BD	BD
ACENAPHTHENE	0.000	0.3000	NL	BD	BD	BD
ACENAPHTHYLENE	0.000	0.3000	NL	BD	BD	BD
ALDRIN	0.000	0.0500	0.65	BD	BD	BD
ALUMINUM (Al)	3367.000	25.0000	750	BD	136.0000	BD
ANTHRACENE	0.033	0.3000	NL	BD	BD	BD
ANTIMONY	0.410	3.0000	NL	BD	BD	BD
ARSENIC (As)	10.400	2.0000	69	7.0000	10.0000	9
B-BHC	0.001	0.0500	NL	BD	BD	BD
B-ENDOSULFAN	0.000	0.1000	NL	BD	BD	BD
BARIUM (Ba)	52.200	2.0000	NL	223.0000	234.3333	674
BENXO(a)ANTHRACENE	0.100	0.3000	NL	BD	BD	BD
BENZO(G,H,I)PERYLENE	0.067	0.3000	NL	BD	BD	BD
BENZO(a)PYRENE	0.091	0.3000	NL	BD	BD	BD
BENZO(b)FLUORANTHENE	0.079	0.3000	NL	BD	BD	BD
BENZO(k)FLORANTHENE	0.089	0.3000	NL	BD	BD	BD
BERYLLIUM (Be)	0.900	1.0000	NL	BD	BD	BD
CADMIUM (Cd)	0.297	0.2000	34	BD	BD	BD
CALCIUM (Ca)	2223.000	200.0000	NL	70200.000	66500.000	117000
CHROMIUM(TRI)(Cr)	41.500	2.0000	8340	BD	BD	BD
CHRYSENE	0.120	0.3000	NL	BD	BD	BD
COBALT (Co)	11.100	2.0000	NL	BD	2.3333	5
COPPER (Cu)	16.400	1.0000	5.3	4.0000	2.3333	BD
D-BHC	0.000	0.0500	NL	BD	BD	BD
DIBENZO(A,H)ANTHRACENE	0.008	0.3000	NL	BD	BD	BD
DIELDRIN	0.000	0.1000	0.355	BD	BD	BD
ENDOSULFAN SULFATE	0.006	0.1000	NL	BD	BD	BD
ENDRIN	0.000	0.1000	0.019	BD	BD	0.0754
ENDRIN ALDEHYDE	0.000	0.1000	NL	BD	BD	BD
FLUORANTHENE	0.150	0.3000	NL	BD	BD	BD
FLUORENE	0.015	0.3000	NL	BD	BD	BD
G-BHC	0.000	0.0500	0.08	BD	BD	BD

Table 3 (Continued)

PARAMETER	SEDIMENT CONC mg/kg	DETECTION LIMIT µg/l	WATER QUALITY STANDARDS[1] µg/l	BACKGROUND CONC µg/l	ELUTRIATE CONC µg/l	OVERFLOW CONC µg/l
HEPTACHLOR	0.001	0.0250	0.027	BD	0.0263	BD
HEPTACHLOR EPOXIDE	0.000	0.0500	NL	BD	BD	BD
INDENO(1,2,3-C,D)PYRENE	0.078	0.3000	NL	BD	BD	BD
IRON (Fe)	25567.000	20.0000	NL	BD	40.6667	5964
LEAD (Pb)	32.900	1.0000	48	4.500	BD	12
MAGNESIUM (Mg)	5080.000	200.0000	NL	180000.000	147666.672	142000
MANGANESE (Mn)	1107.000	1.0000	NL	2.000	8230.000	7932
MERCURY (Hg)	0.157	0.2000	2.1	BD	BD	BD
METHOXYCHLOR	0.000	0.0500	NL	BD	BD	BD
NAPHTHALENE	0.060	0.3000	NL	BD	BD	BD
NICKEL (Ni)	21.800	1.0000	75	1.0000	2.3333	5
TOTAL PCB'S						
PCB 101	0.001	0.0010	NL	0.0011	0.0011	0.0010
PCB 105	0.000	0.0010	NL	BD	BD	BD
PCB 110	0.001	0.0010	NL	BD	BD	0.0010
PCB 114	0.000	0.0010	NL	BD	BD	BD
PCB 118	0.001	0.0010	NL	BD	BD	BD
PCB 119	0.000	0.0010	NL	BD	BD	BD
PCB 120	0.000	0.0010	NL	BD	BD	BD
PCB 121	0.000	0.0010	NL	BD	BD	BD
PCB 123	0.000	0.0010	NL	BD	BD	BD
PCB 126	0.000	0.0010	NL	BD	BD	BD
PCB 127	0.000	0.0010	NL	BD	BD	BD
PCB 128	0.000	0.0010	NL	BD	BD	BD
PCB 132	0.000	0.0010	NL	BD	BD	BD
PCB 135	0.000	0.0010	NL	BD	BD	BD
PCB 136	0.000	0.0010	NL	BD	BD	BD
PCB 137	0.000	0.0010	NL	BD	BD	BD
PCB 138	0.000	0.0010	NL	BD	BD	BD
PCB 141	0.000	0.0010	NL	BD	BD	BD
PCB 146	0.000	0.0010	NL	BD	BD	BD
PCB 149	0.001	0.0010	NL	BD	BD	BD
PCB 151	0.000	0.0010	NL	BD	BD	BD
PCB 153	0.001	0.0010	NL	BD	BD	BD
PCB 156	0.000	0.0010	NL	BD	BD	BD
PCB 157	0.000	0.0010	NL	BD	BD	BD
PCB 158	0.000	0.0010	NL	BD	BD	BD
PCB 166	0.000	0.0010	NL	BD	BD	BD
PCB 167	0.000	0.0010	NL	BD	BD	BD
PCB 168	0.000	0.0010	NL	BD	0.0011	BD

Table 3 (Continued)

PARAMETER	SEDIMENT CONC mg/kg	DETECTION LIMIT µg/l	WATER QUALITY STANDARDS[1] µg/l	BACKGROUND CONC µg/l	ELUTRIATE CONC µg/l	OVERFLOW CONC µg/l
PCB 169	0.000	0.0010	NL	BD	BD	BD
PCB 170	0.000	0.0010	NL	BD	BD	BD
PCB 171	0.000	0.0010	NL	BD	BD	BD
PCB 174	0.000	0.0010	NL	BD	BD	BD
PCB 177	0.000	0.0010	NL	BD	BD	BD
PCB 178	0.000	0.0010	NL	BD	BD	BD
PCB 179	0.000	0.0010	NL	BD	BD	BD
PCB 18	0.000	0.0010	NL	BD	BD	BD
PCB 180	0.002	0.0010	NL	BD	BD	BD
PCB 182	0.000	0.0010	NL	BD	BD	BD
PCB 183	0.000	0.0010	NL	BD	BD	BD
PCB 185	0.000	0.0010	NL	BD	BD	BD
PCB 187	0.000	0.0010	NL	BD	BD	BD
PCB 189	0.000	0.0010	NL	BD	BD	BD
PCB 190	0.000	0.0010	NL	BD	BD	BD
PCB 191	0.000	0.0010	NL	BD	BD	BD
PCB 194	0.000	0.0010	NL	BD	BD	BD
PCB 195	0.000	0.0010	NL	BD	BD	BD
PCB 196	0.000	0.0010	NL	BD	BD	BD
PCB 198	0.000	0.0010	NL	BD	BD	BD
PCB 200	0.000	0.0010	NL	BD	BD	BD
PCB 201	0.000	0.0010	NL	BD	BD	BD
PCB 203	0.001	0.0010	NL	BD	BD	BD
PCB 205	0.000	0.0010	NL	BD	BD	BD
PCB 206	0.003	0.0010	NL	0.0025	0.0020	0.0017
PCB 207	0.000	0.0010	NL	BD	BD	BD
PCB 208	0.002	0.0010	NL	0.0013	BD	BD
PCB 22	0.000	0.0010	NL	BD	BD	BD
PCB 28	0.000	0.0010	NL	BD	BD	BD
PCB 31	0.000	0.0010	NL	0.0017	BD	0.0027
PCB 33	0.000	0.0010	NL	BD	BD	BD
PCB 37	0.000	0.0010	NL	BD	BD	BD
PCB 40	0.000	0.0010	NL	BD	BD	BD
PCB 42	0.000	0.0010	NL	BD	BD	BD
PCB 44	0.000	0.0010	NL	BD	BD	BD
PCB 47	0.000	0.0010	NL	BD	BD	BD
PCB 49	0.001	0.0010	NL	BD	BD	BD
PCB 52	0.002	0.0010	NL	BD	0.0010	0.0011
PCB 60	0.001	0.0010	NL	BD	BD	BD

Table 3 (Concluded)

PARAMETER	SEDIMENT CONC mg/kg	DETECTION LIMIT µg/l	WATER QUALITY STANDARDS[1] µg/l	BACKGROUND CONC µg/l	ELUTRIATE CONC µg/l	OVERFLOW CONC µg/l
PCB 64	0.000	0.0010	NL	BD	BD	BD
PCB 66	0.000	0.0010	NL	BD	BD	BD
PCB 70	0.002	0.0010	NL	BD	0.0014	BD
PCB 74	0.000	0.0010	NL	BD	BD	BD
PCB 77	0.000	0.0010	NL	BD	BD	BD
PCB 8	0.000	0.0010	NL	BD	BD	BD
PCB 80	0.000	0.0010	NL	BD	BD	BD
PCB 81	0.000	0.0010	NL	BD	BD	BD
PCB 82	0.000	0.0010	NL	BD	BD	BD
PCB 84	0.000	0.0010	NL	BD	BD	BD
PCB 86	0.000	0.0010	NL	BD	BD	BD
PCB 87	0.000	0.0010	NL	BD	BD	BD
PCB 91	0.000	0.0010	NL	BD	BD	BD
PCB 92	0.000	0.0010	NL	BD	BD	BD
PCB 95	0.000	0.0010	NL	BD	0.0010	0.0017
PCB 97	0.000	0.0010	NL	BD	BD	BD
PCB 99	0.001	0.0010	NL	BD	BD	BD
PHENANTHRENE	0.085	0.3000	NL	BD	BD	BD
POTASSIUM (K)	2340.000	200.0000	NL	56400.000	39066.6680	32220
PPDDD	0.011	0.1000	NL	BD	BD	BD
PPDDE	0.008	0.1000	NL	BD	BD	BD
PPDDT	0.010	0.1000	NL	BD	BD	BD
PYRENE	0.164	0.3000	NL	BD	BD	BD
SELENIUM (Se)	1.630	2.0000	20	19.000	24.3333	14
SILVER (Ag)	0.683	1.0000	2.3	BD	1.3333	1
THALLIUM (Tl)	0.000	2.0000	NL	BD	BD	BD
TOC-TOTAL ORGANIC CARBON	7603.000	3000.0000	BD	BD		
TOXAPHENE	0.000	0.0500	0.21	BD	BD	BD
VANADIUM (V)	37.800	2.0000	NL	4.0000	6.6667	BD
ZINC	131.000	10.0000	95	53.0000	74.6667	131
a-CHLORDANE	0.001	0.0500	0.045	BD	BD	BD
b-CHLORDANE	0.004	0.0500	0.045	BD	BD	BD

[1]More stringent acute value of the freshwater or marine stream quality objectives.
BD = below detection
NL = not listed
0.0 = below detection for sediment conc. (mg/kg)

times. The trimmed Spearman-Karber method was used to calculate LC_{50} values. The bioassay report is attached as Appendix D.

Coarse-grained site

Survival in test concentrations from the coarse-grained site ranged from 100 to 88 percent for *Mysidopsis bahia* and from 88 to 68 percent for *Menidia beryllina*. Exposures in elutriate test concentrations from the coarse-grained site did not adversely affect survival of either test species. Since neither test species had mortality values greater than 50 percent, an LC_{50} value could not be calculated.

Fine-grained site

Survival in test concentrations from the fine-grained site ranged from 90 to 0 percent with 0-percent survival in the 50- and 100-percent exposures for *Mysidopsis bahia*. Survival for *Menidia beryllina* ranged from 98 to 0 percent with 4- to 0-percent survival in the 50- and 100-percent elutriate treatments. An LC_{50} value of 30.04 percent was calculated for *Mysidopsis bahia* and an LC_{50} value of 31.66 percent was calculated for *Menidia beryllina*. Mortality observed from exposures in elutriate test concentrations was attributed to the high level of NH_3. In the short term, high levels of NH_3 are common in predominately fine-grained sites during dredging operations.

4 Summary and Conclusions

Based on the results of the study, the following conclusions can be made:

a. Loading data at the coarse-grained site shows a gain of 130 percent over a period of 57 min after overflow began. Based on the round-trip travel time required to the disposal site and the amount of material retained in the hopper, rates of return greater than 50 percent may be realized for the coarse-grained material. Loading data at the fine-grained site show a gain of 18 percent over a period of 21 min after overflow began. Based on the round-trip travel time required to the pump-out site and the amount of material retained in the hopper, there was no economic benefit to overflow for the fine-grained material. In both instances, rates of return are also based on the assumption that all material in the overflow will return to the channel and will require redredging.

b. Using the same economic assumptions as discussed above, about a 20-percent return may be realized from a material containing about 60 percent sand and about a 40-percent return may be realized from a material containing about 80 percent sand.

c. Based on the water chemistry analysis at the two sites, no contaminants of concern caused a problem because of the dredging operation. None of the contaminants of concern exceeded water quality objectives in the overflow at the coarse-grained site. At the coarse-grained site, only dissolved copper was above the standard in the background. Samples taken for dissolved copper at the hopper overflow, however, were within standards. This indicates a scavenging of the metal by the suspended material occurred during the dredging and overflow process. At the fine-grained site, only zinc and endrin were measured at the overflow to be above the standard. However, the predicted elutriate for both zinc and endrin were measured at below detection levels.

d. The plume study results showed that the coarse-grained material settled quite rapidly and that no lateral dispersion of the plume out of the channel was observed. No significant change above background levels could be detected. At 1 hr elapsed time following

the end of the overflow dredging operation, the levels of suspended material had returned to background conditions. At the fine-grained site, an increase in the suspended material was observed. However, after an elapsed time of 1 hr following the completion of the overflow dredging operation, levels of suspended materials had returned to background conditions. Again, no lateral dispersion of the dredge plume beyond the channel limits was observed.

e. The sedimentation portion of the study confirmed what was observed during the plume study. At the coarse-grained site, there was evidence that recent sedimentation had occurred at several of the stations, possibly a result of dredging operations. But no indication of newly deposited dredged material was observed at stations outside the edge of the navigation channel. At the fine-grained site, some sediment layering was found even though no evidence of recent physical disturbance was detected at any of the stations. Again, no indication of newly deposited dredged material was observed at stations outside the edge of the navigation channel.

f. Although the sampling station coverage was not extensive, the risk of significant sedimentation as a consequence of the hopper dredging operations appears to be restricted to the bottom and side slopes of the channel.

g. The elutriate test results were consistent with and slightly conservative as compared to the overflow samples, indicating that the elutriate test is a valid prediction of overflow quality for the Delaware system.

h. The bioassay analysis showed no adverse effects to exposures of fish and crustaceans species being exposed to the elutriate samples from the coarse-grained site. Some species mortality were observed using elutriates from the fine-grained site, but was determined to be caused from high levels of NH_3, which is a common short-term by-product of dredging in fine-grained material.

i. The overall results of the study indicate that overflow meets the applicable water quality objectives and has no measurable physical impact outside the navigation channels. The loading data indicate that overflow in coarse-grained reaches results in significant load gains, while load gains in fine-grained reaches are small. Based on these results, overflow in coarse-grained reaches should be considered for future operations.

Appendix A
Delaware River Sediment and Water Quality Analysis

Delaware River Sediment and Water Quality Analysis (Coarse and Fine-Grained Sites)

Metscoar	- Metals (Coarse-Grained Site)
PAHscoar	- PAH's (Coarse-Grained Site)
Pestcoar	- Pesticides (Coarse-Grained Site)
PCBscoar	- PCB's (Coarse-Grained Site)
Tsscoar	- Total Suspended Solids (Coarse-Grained Site)
Nutcoar	- Nutrients (Coarse-Grained Site)
Spgrcoar	- Specific Gravity and %Moisture (Coarse-Grained Site)
Metsfine	- Metals (Fine-Grained Site)
PAHsfine	- PAH's (Fine-Grained Site)
Pestfine	- Pesticides (Fine-Grained Site)
PCBsfine	- PCB's (Fine-Grained Site)
Tssfine	- Total Suspended Solids (Fine-Grained Site)
Nutfine	- Nutrients (Fine-Grained Site)
Spgrfine	- Specific Gravity and % Moisture (Fine-Grained Site)

Metscoar

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	SB	AS	BE	CD	CR	CU	PB	HG
		Detection Limit (mg/l)	0.003	0.002	0.002	0.0002	0.002	0.001	0.001	0.00020
		Plume Monitoring								
Water	80827	Background, dissolved	**0.003**	0.044	**0.002**	0.0002	**0.002**	0.013	**0.001**	**0.00020**
Water	80735	Background, total	**0.003**	0.044	**0.001**	**0.0002**	**0.002**	0.012	0.003	**0.00020**
Water	80828	0-10 min, overflow, dissolved	**0.003**	0.044	**0.002**	**0.0002**	**0.002**	0.011	**0.001**	**0.00020**
Water	80829	10-20 min, overflow, dissolved	**0.003**	0.044	**0.002**	**0.0002**	**0.002**	0.010	**0.001**	**0.00020**
Water	80830	20-30 min, overflow, dissolved	**0.003**	0.046	**0.002**	**0.0002**	**0.002**	0.013	**0.001**	**0.00020**
Water	80736	0-10 min, overflow, total	0.006	0.045	**0.001**	**0.0002**	**0.002**	0.011	0.001	**0.00020**
Water	80737	10-20 min, overflow, total	**0.003**	0.046	**0.001**	**0.0002**	**0.002**	0.012	0.001	**0.00020**
Water	80738	20-30 min, overflow, total	**0.003**	0.045	**0.001**	**0.0002**	0.002	0.011	**0.001**	**0.00020**
Water	80831	0-10 min, non-overflow, dissolved	**0.003**	0.047	**0.002**	0.0002	**0.002**	0.012	**0.001**	**0.00020**
Water	80832	10-20 min, non-overflow, dissolved	**0.003**	0.048	**0.002**	0.0004	**0.002**	0.011	**0.001**	**0.00020**
Water	80833	20-30 min, non-overflow, dissolved	**0.003**	0.047	**0.002**	**0.0002**	**0.002**	0.012	**0.001**	**0.00020**
Water	80739	0-10 min, non-overflow, total	**0.003**	0.044	**0.001**	**0.0002**	**0.002**	0.011	0.002	**0.00020**
Water	80740	10-20 min, non-overflow, total	**0.003**	0.048	**0.001**	**0.0002**	**0.002**	0.011	0.001	**0.00020**
Water	80741	20-30 min, non-overflow, total	**0.003**	0.044	**0.001**	**0.0002**	**0.002**	0.010	0.001	**0.00020**
		Hopper Inflow Monitoring								
Water	80780	3& 6 min, dissolved	**0.003**	0.051	**0.001**	**0.0002**	**0.002**	0.007	**0.001**	**0.00020**
Water	80781	9&12 min, dissolved	**0.003**	0.045	**0.001**	**0.0002**	**0.002**	0.005	**0.001**	**0.00020**
Water	80782	15&18 min, dissolved	**0.003**	0.046	**0.001**	**0.0002**	**0.002**	0.006	**0.001**	**0.00020**
Water	80783	21&24 min, dissolved	**0.003**	0.046	**0.001**	**0.0002**	**0.002**	0.007	0.001	**0.00020**
Water	80784	27&30 min, dissolved	**0.003**	0.050	**0.001**	**0.0002**	**0.002**	0.006	**0.001**	**0.00020**
Water	80668	3& 6 min, total	**0.003**	0.076	0.002	0.0029	0.088	0.090	0.168	0.00083
Water	80669	9&12 min, total	**0.003**	0.070	0.002	0.0010	0.088	0.062	0.140	0.00064
Water	80670	15&18 min, total	**0.003**	0.069	0.002	0.0005	0.140	0.094	0.132	0.00129
Water	80671	21&24 min, total	**0.003**	0.105	0.007	0.0008	0.332	0.127	0.292	0.00369
Water	80672	27&30 min, total	**0.003**	0.115	0.008	0.0009	0.392	0.158	0.208	0.00126
		Hopper Overflow Monitoring								
Water	80785	2& 4 min, dissolved	**0.003**	0.045	**0.001**	**0.0002**	**0.002**	0.005	**0.001**	**0.00020**
Water	80786	6& 8 min, dissolved	**0.003**	0.048	**0.001**	**0.0002**	**0.002**	0.005	**0.001**	**0.00020**
Water	80787	10&12 min, dissolved	**0.003**	0.047	**0.001**	**0.0002**	**0.002**	0.005	**0.001**	**0.00020**
Water	80788	14&16 min, dissolved	**0.003**	0.046	**0.001**	**0.0002**	**0.002**	0.005	**0.001**	**0.00020**
Water	80789	18&20 min, dissolved	**0.003**	0.045	**0.001**	**0.0002**	**0.002**	0.005	**0.001**	**0.00020**
Water	80674	2& 4 min, total	0.006	0.047	0.001	0.0027	0.059	0.031	0.080	0.00053
Water	80675	6& 8 min, total	**0.003**	0.052	0.002	0.0017	0.074	0.030	0.104	0.00113
Water	80676	10&12 min, total	**0.003**	0.066	0.002	0.0013	0.080	0.035	0.114	0.00086
Water	80677	14&16 min, total	0.007	0.052	**0.001**	0.0034	0.040	0.028	0.049	0.00056
Water	80678	18&20 min, total	**0.003**	0.046	**0.001**	**0.0002**	0.048	0.018	0.040	0.00048
		Site Water								
Water	81648	Sample 1 Total	**0.003**	0.034	**0.001**	**0.0002**	0.005	0.027	0.003	**0.00020**
Water	81649	Sample 2 Total	**0.003**	0.037	**0.001**	**0.0002**	**0.002**	0.021	0.002	**0.00020**
Water	81650	Sample 3 Total	**0.003**	0.037	**0.001**	**0.0002**	**0.002**	0.016	**0.001**	**0.00020**
		Elutriate								
Water	81654	Sample 1 Dissolved	**0.003**	0.050	**0.001**	**0.0002**	**0.002**	0.005	**0.001**	**0.00020**
Water	81655	Sample 2 Dissolved	**0.003**	0.052	**0.001**	**0.0002**	0.002	0.006	**0.001**	**0.00020**
Water	81656	Sample 3 Dissolved	**0.003**	0.047	**0.001**	**0.0002**	0.002	0.010	**0.001**	**0.00020**
Water	81651	Sample 1 Total	**0.003**	0.040	**0.001**	**0.0002**	0.002	0.006	0.002	**0.00020**
Water	81652	Sample 2 Total	**0.003**	0.042	**0.001**	**0.0002**	**0.002**	0.005	0.001	**0.00020**
Water	81653	Sample 3 Total	**0.003**	0.043	**0.001**	**0.0002**	**0.002**	0.005	0.001	**0.00020**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	SB	AS	BE	CD	CR	CU	PB	HG
		Detection Limit (mg/kg)	0.30	0.20	0.1	0.020	0.2	0.10	1.0	0.020
		Insitu Sediment								
Sediment	81726	Sample #1	**0.30**	3.50	0.1	**0.020**	5.6	3.00	12.9	0.084
Sediment	81727	Sample #2	**0.30**	2.90	0.2	**0.020**	6.3	1.30	12.1	0.110
Sediment	81728	Sample #3	**0.30**	3.10	0.2	**0.020**	7.0	2.70	12.0	0.084

SB - Antimony AS - Arsenic BE - Beryllium CD - Cadmium CR - Chromium CU - Copper PB - Lead HG - Mercury
BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit

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Metscoar

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	NI	SE	AG	TL	ZN	AL	BA	CA
		Detection Limit (mg/l)	0.001	0.002	0.001	0.002	0.010	0.025	0.002	0.200
		Plume Monitoring								
Water	80827	Background, dissolved	0.009	0.152	**0.001**	**0.002**	**0.010**	**0.025**	0.039	323
Water	80735	Background, total	0.009	0.138	0.003	**0.002**	0.017	0.644	0.016	254
Water	80828	0-10 min, overflow, dissolved	0.008	0.150	0.001	**0.002**	**0.010**	**0.025**	0.042	334
Water	80829	10-20 min, overflow, dissolved	0.008	0.146	0.001	**0.002**	**0.010**	**0.025**	0.061	369
Water	80830	20-30 min, overflow, dissolved	0.012	0.158	**0.001**	**0.002**	0.011	**0.025**	0.077	331
Water	80736	0-10 min, overflow, total	0.010	0.157	0.004	**0.002**	0.015	0.864	0.016	253
Water	80737	10-20 min, overflow, total	0.010	0.153	0.004	**0.002**	0.017	0.984	0.016	261
Water	80738	20-30 min, overflow, total	0.008	0.157	0.003	**0.002**	0.013	0.676	0.016	260
Water	80831	0-10 min, non-overflow, dissolved	0.009	0.158	**0.001**	**0.002**	**0.010**	**0.025**	0.038	319
Water	80832	10-20 min, non-overflow, dissolved	0.009	0.160	**0.001**	**0.002**	**0.010**	**0.025**	0.062	314
Water	80833	20-30 min, non-overflow, dissolved	0.008	0.153	**0.001**	**0.002**	**0.010**	**0.025**	0.043	319
Water	80739	0-10 min, non-overflow, total	0.007	0.149	0.003	**0.002**	**0.010**	0.716	0.016	243
Water	80740	10-20 min, non-overflow, total	0.009	0.163	0.003	**0.002**	0.017	1.100	0.016	242
Water	80741	20-30 min, non-overflow, total	0.008	0.154	0.003	**0.002**	0.012	0.664	0.016	247
		Hopper Inflow Monitoring								
Water	80780	3& 6 min, dissolved	0.010	0.175	**0.001**	**0.002**	0.038	**0.025**	0.209	374
Water	80781	9&12 min, dissolved	0.008	0.149	**0.001**	**0.002**	0.025	**0.025**	0.100	329
Water	80782	15&18 min, dissolved	0.009	0.161	**0.001**	**0.002**	0.034	**0.025**	0.152	342
Water	80783	21&24 min, dissolved	0.009	0.163	**0.001**	**0.002**	0.043	**0.025**	0.139	360
Water	80784	27&30 min, dissolved	0.009	0.167	**0.001**	**0.002**	0.048	0.107	0.207	393
Water	80668	3& 6 min, total	0.076	0.069	0.006	**0.002**	1.120	32.6	0.157	1610
Water	80669	9&12 min, total	0.060	0.062	0.012	**0.002**	0.728	29.9	0.090	648
Water	80670	15&18 min, total	0.072	0.103	0.014	**0.002**	0.366	52.4	0.147	460
Water	80671	21&24 min, total	0.152	0.113	0.015	**0.002**	1.100	120.0	0.223	1120
Water	80672	27&30 min, total	0.184	0.129	0.019	**0.002**	0.719	147.0	0.316	1020
		Hopper Overflow Monitoring								
Water	80785	2& 4 min, dissolved	0.008	0.155	**0.001**	**0.002**	0.038	**0.025**	0.148	345
Water	80786	6& 8 min, dissolved	0.009	0.165	**0.001**	**0.002**	0.028	**0.025**	0.108	347
Water	80787	10&12 min, dissolved	0.009	0.166	**0.001**	**0.002**	0.042	**0.025**	0.166	361
Water	80788	14&16 min, dissolved	0.009	0.162	**0.001**	**0.002**	0.015	**0.025**	0.080	376
Water	80789	18&20 min, dissolved	0.008	0.153	0.003	**0.002**	0.012	**0.025**	0.084	319
Water	80674	2& 4 min, total	0.044	0.053	0.007	**0.002**	0.330	20.9	0.088	480
Water	80675	6& 8 min, total	0.048	0.064	0.006	**0.002**	0.399	25.2	0.090	460
Water	80676	10&12 min, total	0.050	0.089	0.006	**0.002**	0.609	25.8	0.077	476
Water	80677	14&16 min, total	0.035	0.113	0.054	0.002	0.155	18.6	0.066	380
Water	80678	18&20 min, total	0.026	0.118	0.011	**0.002**	0.118	18.2	0.060	345
		Site Water								
Water	81648	Sample 1 Total	0.005	0.115	0.003	**0.002**	0.012	1.260	0.015	322
Water	81649	Sample 2 Total	0.008	0.124	0.005	**0.002**	**0.010**	0.056	0.012	305
Water	81650	Sample 3 Total	0.004	0.134	0.004	**0.002**	**0.010**	0.064	0.012	307
		Elutriate								
Water	81654	Sample 1 Dissolved	0.005	0.172	0.001	**0.002**	0.022	**0.025**	0.073	318
Water	81655	Sample 2 Dissolved	0.005	0.170	0.001	**0.002**	0.031	**0.025**	0.097	318
Water	81656	Sample 3 Dissolved	0.005	0.161	0.001	**0.002**	0.031	**0.025**	0.105	314
Water	81651	Sample 1 Total	0.006	0.135	0.004	**0.002**	**0.010**	1.140	0.018	309
Water	81652	Sample 2 Total	0.005	0.140	0.003	**0.002**	**0.010**	1.140	0.018	304
Water	81653	Sample 3 Total	0.005	0.141	0.003	**0.002**	**0.010**	1.590	0.026	437

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	NI	SE	AG	TL	ZN	AL	BA	CA
		Detection Limit (mg/kg)	0.5	0.200	0.100	0.200	1.0	1	0.1	20
		Insitu Sediment								
Sediment	81726	Sample #1	3.2	0.800	0.100	**0.200**	29.9	1580	5.7	19600
Sediment	81727	Sample #2	3.3	0.900	0.400	**0.200**	29.0	1720	4.8	11600
Sediment	81728	Sample #3	3.5	0.899	0.499	**0.200**	28.7	1720	4.3	9820

NI - Nickel SE - Selenium AG - Silver TL - Thallium ZN - Zinc AL - Aluminum BA - Barium CA - Calcium
BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

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Metscoar

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	CO	FE	MG	MN	K	NA	V
		Detection Limit (mg/l)	0.002	0.020	0.200	0.001	0.200	0.200	0.001
		Plume Monitoring							
Water	80827	Background, dissolved	**0.001**	**0.020**	961	0.006	284	9,540	0.002
Water	80735	Background, total	**0.001**	0.204	968	0.012	291	7,970	0.004
Water	80828	0-10 min, overflow, dissolved	**0.001**	**0.020**	994	0.002	294	8,280	0.002
Water	80829	10-20 min, overflow, dissolved	**0.001**	**0.020**	985	0.002	290	9,230	0.002
Water	80830	20-30 min, overflow, dissolved	**0.001**	**0.020**	1030	0.004	302	8,890	0.002
Water	80736	0-10 min, overflow, total	**0.001**	0.312	940	0.012	300	9,560	0.004
Water	80737	10-20 min, overflow, total	**0.001**	0.364	1030	0.015	368	8,580	0.004
Water	80738	20-30 min, overflow, total	**0.001**	0.184	944	0.009	324	7,880	0.004
Water	80831	0-10 min, non-overflow, dissolved	**0.001**	**0.020**	992	0.005	292	8,930	0.002
Water	80832	10-20 min, non-overflow, dissolved	**0.001**	**0.020**	986	0.006	288	8,510	0.002
Water	80833	20-30 min, non-overflow, dissolved	**0.001**	**0.020**	957	0.005	282	9,040	0.002
Water	80739	0-10 min, non-overflow, total	**0.001**	0.256	908	0.014	318	7,480	0.005
Water	80740	10-20 min, non-overflow, total	**0.001**	0.572	912	0.015	272	8,480	0.004
Water	80741	20-30 min, non-overflow, total	**0.001**	0.192	916	0.008	334	8,120	0.003
		Hopper Inflow Monitoring							
Water	80780	3& 6 min, dissolved	0.002	**0.020**	1003	0.011	308	10,900	0.003
Water	80781	9&12 min, dissolved	**0.002**	**0.020**	1007	0.002	306	8,950	0.004
Water	80782	15&18 min, dissolved	**0.002**	0.029	1023	0.002	310	9,110	0.004
Water	80783	21&24 min, dissolved	0.002	**0.020**	1052	0.002	317	10,200	0.004
Water	80784	27&30 min, dissolved	0.002	0.074	1035	0.099	315	9,150	0.006
Water	80668	3& 6 min, total	0.060	98.0	1050	3.770	316	8,400	0.128
Water	80669	9&12 min, total	0.042	31.3	1040	2.170	319	8,570	0.124
Water	80670	15&18 min, total	0.020	71.7	968	1.500	311	8,020	0.172
Water	80671	21&24 min, total	0.062	288.0	1090	4.440	338	8,530	0.328
Water	80672	27&30 min, total	0.056	218.0	1020	3.200	349	8,660	0.408
		Hopper Overflow Monitoring							
Water	80785	2& 4 min, dissolved	**0.002**	**0.020**	993	**0.001**	299	8,750	0.004
Water	80786	6& 8 min, dissolved	0.002	**0.020**	962	**0.001**	290	9,240	0.004
Water	80787	10&12 min, dissolved	0.002	**0.020**	999	**0.001**	302	8,750	0.004
Water	80788	14&16 min, dissolved	0.002	**0.020**	1,000	**0.001**	303	8,960	0.004
Water	80789	18&20 min, dissolved	**0.002**	**0.020**	990	**0.001**	294	8,870	0.004
Water	80674	2& 4 min, total	0.023	66.4	1,060	1.130	333	8,800	0.084
Water	80675	6& 8 min, total	0.026	70.4	1,060	1.470	335	9,170	0.104
Water	80676	10&12 min, total	0.034	92.0	968	1.420	308	7,980	0.105
Water	80677	14&16 min, total	0.015	29.8	1,000	0.608	309	8,640	0.064
Water	80678	18&20 min, total	0.009	28.2	984	0.544	310	9,170	0.060
		Site Water							
Water	81648	Sample 1 Total	**0.002**	0.837	998	0.028	306	8,370	0.003
Water	81649	Sample 2 Total	**0.002**	0.048	974	0.004	289	8,780	**0.001**
Water	81650	Sample 3 Total	**0.002**	0.039	968	0.005	289	8,980	0.001
		Elutriate							
Water	81654	Sample 1 Dissolved	**0.002**	**0.020**	1,020	0.002	303	8,820	0.002
Water	81655	Sample 2 Dissolved	**0.002**	**0.020**	1,030	0.001	304	9,250	0.001
Water	81656	Sample 3 Dissolved	**0.002**	**0.020**	1,030	0.002	304	9,040	0.002
Water	81651	Sample 1 Total	**0.002**	0.742	982	0.024	292	8,620	0.004
Water	81652	Sample 2 Total	**0.002**	0.632	991	0.019	294	8,760	0.003
Water	81653	Sample 3 Total	**0.002**	0.799	1,400	0.024	423	12,300	0.004

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	CO	FE	MG	MN	K	NA	V	% Moisture
		Detection Limit (mg/kg)	0.1	2	20	0.1	20	20	0.10	
		Insitu Sediment								
Sediment	81726	Sample #1	2.2	5,810	1,260	91.7	443	2180	4.10	13.8
Sediment	81727	Sample #2	2.4	6,040	1,330	95.2	474	1920	4.30	13.8
Sediment	81728	Sample #3	2.4	5,860	1,320	97.4	482	1900	4.00	13.8

CO - Cobalt FE - Iron MG - Magnesium MN - Manganese K - Potassium NA - Sodium V - Vanadium
BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

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PAHscoar

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	NAPHTH	ACENAY	ACENAP	FLUORE	PHENAN	ANTRAC	FLANTHE
		Detection Limit (mg/l)	0.0003	0.0003	0.0003	0.0003	0.00030	0.00030	0.00030
		Plume Monitoring							
Water	80848	Background, dissolved	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80763	Background, total	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80849	0-10 min, overflow, dissolved	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80850	10-20 min, overflow, dissolved	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80851	20-30 min, overflow, dissolved	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80764	0-10 min, overflow, total	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80765	10-20 min, overflow, total	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80766	20-30 min, overflow, total	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80852	0-10 min, non-overflow, dissolved	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80853	10-20 min, non-overflow, dissolved	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80854	20-30 min, non-overflow, dissolved	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80767	0-10 min, non-overflow, total	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80768	10-20 min, non-overflow, total	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80769	20-30 min, non-overflow, total	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
		Hopper Inflow Monitoring							
Water	80810	3& 6 min, dissolved	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80811	9&12 min, dissolved	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80812	15&18 min, dissolved	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80813	21&24 min, dissolved	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80814	27&30 min, dissolved	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80716	3& 6 min, total	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80717	9&12 min, total	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80718	15&18 min, total	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	0.00015
Water	80719	21&24 min, total	**0.0003**	**0.0003**	**0.0003**	**0.0003**	0.00016	**0.00030**	0.00024
Water	80720	27&30 min, total	**0.0003**	**0.0003**	**0.0003**	**0.0003**	0.00012	**0.00030**	0.00019
		Hopper Overflow Monitoring							
Water	80815	2& 4 min, dissolved	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80816	6& 8 min, dissolved	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80817	10&12 min, dissolved	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80818	14&16 min, dissolved	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80819	18&20 min, dissolved	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80722	2& 4 min, total	0.0006	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	0.00014
Water	80723	6& 8 min, total	0.0006	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80724	10&12 min, total	0.0006	**0.0003**	**0.0003**	**0.0003**	0.00073	0.00018	0.00075
Water	80725	14&16 min, total	0.0006	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	80726	18&20 min, total	0.0006	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
		Site Water							
Water	81630	Sample 1 Total	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	81631	Sample 2 Total	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	81632	Sample 3 Total	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
		Elutriate							
Water	81636	Sample 1 Dissolved	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	81637	Sample 2 Dissolved	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	81638	Sample 3 Dissolved	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	81633	Sample 1 Total	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	81634	Sample 2 Total	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**
Water	81635	Sample 3 Total	**0.0003**	**0.0003**	**0.0003**	**0.0003**	**0.00030**	**0.00030**	**0.00030**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	NAPHTH	ACENAY	ACENAP	FLUORE	PHENAN	ANTRAC	FLANTHE
		Detection Limit (mg/kg)	0.011	0.011	0.011	0.011	0.0110	0.011	0.0110
		Insitu Sediment							
Sediment	81702	Sample #1	**0.011**	**0.011**	**0.011**	**0.011**	**0.0110**	**0.011**	**0.0110**
Sediment	81703	Sample #2	**0.011**	**0.011**	**0.011**	**0.011**	0.0038	**0.011**	0.0267
Sediment	81704	Sample #3	**0.011**	**0.011**	**0.011**	**0.011**	**0.0110**	**0.011**	0.0042

NAPHTH - Naphthalene ACENAY - Acenaphthylene ACENAP - Acenaphthene FLUORE - Fluorene PHENAN - Phenanthrene
ANTRAC - Anthracene FLANTHE - Fluoranthene
BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PYRENE	CHRYSE	BAANTHR	BBFLANT	BKFLANT	BAPYRE	I123PYR
		Detection Limit (mg/l)	0.00030	0.00030	0.0003	0.00030	0.00030	0.00030	0.00030
		Plume Monitoring							
Water	80848	Background, dissolved	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80763	Background, total	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80849	0-10 min, overflow, dissolved	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80850	10-20 min, overflow, dissolved	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80851	20-30 min, overflow, dissolved	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80764	0-10 min, overflow, total	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80765	10-20 min, overflow, total	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80766	20-30 min, overflow, total	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80852	0-10 min, non-overflow, dissolved	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80853	10-20 min, non-overflow, dissolved	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80854	20-30 min, non-overflow, dissolved	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80767	0-10 min, non-overflow, total	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80768	10-20 min, non-overflow, total	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80769	20-30 min, non-overflow, total	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
		Hopper Inflow Monitoring							
Water	80810	3& 6 min, dissolved	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80811	9&12 min, dissolved	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80812	15&18 min, dissolved	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80813	21&24 min, dissolved	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80814	27&30 min, dissolved	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80716	3& 6 min, total	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80717	9&12 min, total	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80718	15&18 min, total	0.00013	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80719	21&24 min, total	0.00019	0.00016	**0.0003**	0.00010	0.00012	**0.00030**	**0.00030**
Water	80720	27&30 min, total	0.00017	0.00012	**0.0003**	0.00010	0.00010	**0.00030**	**0.00030**
		Hopper Overflow Monitoring							
Water	80815	2& 4 min, dissolved	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80816	6& 8 min, dissolved	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80817	10&12 min, dissolved	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80818	14&16 min, dissolved	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80819	18&20 min, dissolved	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80722	2& 4 min, total	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80723	6& 8 min, total	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80724	10&12 min, total	0.00062	0.00041	0.0030	0.00019	0.00028	0.00025	0.00019
Water	80725	14&16 min, total	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80726	18&20 min, total	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
		Site Water							
Water	81630	Sample 1 Total	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81631	Sample 2 Total	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81632	Sample 3 Total	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
		Elutriate							
Water	81636	Sample 1 Dissolved	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81637	Sample 2 Dissolved	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81638	Sample 3 Dissolved	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81633	Sample 1 Total	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81634	Sample 2 Total	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81635	Sample 3 Total	**0.00030**	**0.00030**	**0.0003**	**0.00030**	**0.00030**	**0.00030**	**0.00030**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PYRENE	CHRYSE	BAANTHR	BBFLANT	BKFLANT	BAPYRE	I123PYR
		Detection Limit (mg/kg)	0.0110	0.0110	0.0110	0.0110	0.0110	0.0110	0.0110
		Insitu Sediment							
Sediment	81702	Sample #1	**0.0110**	**0.0110**	**0.0110**	**0.0110**	**0.0110**	**0.0110**	**0.0110**
Sediment	81703	Sample #2	0.0332	0.0583	0.0514	0.0617	0.0671	0.0644	0.0621
Sediment	81704	Sample #3	0.0042	**0.0110**	**0.0110**	**0.0110**	**0.0110**	**0.0110**	**0.0110**

PYRENE - Pyrene CHRYSE - Chrysene BAANTHR - Benxo(a)Anthracene BBFLANT - Benzo(b)Fluoranthene
BKFLANT - Benzo(k)Fluoranthene BAPYRE - Benzo(a)Pyrene I123PYR - Indeno(1,2,3-C,D)Pyrene
BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

PAHscoar

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	DBAHANT	B-GHI-PY	2MeNAPH	2FIBP-S	PTERP-S
		Detection Limit (mg/l)	0.0003	0.00030	0.0003		
		Plume Monitoring					
Water	80848	Background, dissolved	**0.0003**	**0.00030**	**0.0003**	89.6%	71.9%
Water	80763	Background, total	**0.0003**	**0.00030**	**0.0003**	95.4%	73.8%
Water	80849	0-10 min, overflow, dissolved	**0.0003**	**0.00030**	**0.0003**	88.8%	68.8%
Water	80850	10-20 min, overflow, dissolved	**0.0003**	**0.00030**	**0.0003**	91.2%	76.0%
Water	80851	20-30 min, overflow, dissolved	**0.0003**	**0.00030**	**0.0003**	89.0%	65.8%
Water	80764	0-10 min, overflow, total	**0.0003**	**0.00030**	**0.0003**	59.1%	76.3%
Water	80765	10-20 min, overflow, total	**0.0003**	**0.00030**	**0.0003**	36.6%	31.1%
Water	80766	20-30 min, overflow, total	**0.0003**	**0.00030**	**0.0003**	92.1%	71.0%
Water	80852	0-10 min, non-overflow, dissolved	**0.0003**	**0.00030**	**0.0003**	94.3%	74.7%
Water	80853	10-20 min, non-overflow, dissolved	**0.0003**	**0.00030**	**0.0003**	83.1%	65.0%
Water	80854	20-30 min, non-overflow, dissolved	**0.0003**	**0.00030**	**0.0003**	90.4%	69.1%
Water	80767	0-10 min, non-overflow, total	**0.0003**	**0.00030**	**0.0003**	36.5%	27.1%
Water	80768	10-20 min, non-overflow, total	**0.0003**	**0.00030**	**0.0003**	77.5%	69.9%
Water	80769	20-30 min, non-overflow, total	**0.0003**	**0.00030**	**0.0003**	73.2%	72.0%
		Hopper Inflow Monitoring					
Water	80810	3& 6 min, dissolved	**0.0003**	**0.00030**	**0.0003**	76.0%	67.4%
Water	80811	9&12 min, dissolved	**0.0003**	**0.00030**	**0.0003**	77.5%	69.2%
Water	80812	15&18 min, dissolved	**0.0003**	**0.00030**	**0.0003**	94.5%	76.8%
Water	80813	21&24 min, dissolved	**0.0003**	**0.00030**	**0.0003**	83.0%	63.8%
Water	80814	27&30 min, dissolved	**0.0003**	**0.00030**	**0.0003**	61.7%	54.8%
Water	80716	3& 6 min, total	**0.0003**	**0.00030**	**0.0003**	48.0%	60.3%
Water	80717	9&12 min, total	**0.0003**	**0.00030**	**0.0003**	60.0%	58.4%
Water	80718	15&18 min, total	**0.0003**	**0.00030**	**0.0003**	72.2%	66.1%
Water	80719	21&24 min, total	**0.0003**	**0.00030**	**0.0003**	67.0%	62.9%
Water	80720	27&30 min, total	**0.0003**	**0.00030**	**0.0003**	58.0%	66.6%
		Hopper Overflow Monitoring					
Water	80815	2& 4 min, dissolved	**0.0003**	**0.00030**	**0.0003**	63.0%	60.7%
Water	80816	6& 8 min, dissolved	**0.0003**	**0.00030**	**0.0003**	63.8%	84.8%
Water	80817	10&12 min, dissolved	**0.0003**	**0.00030**	**0.0003**	64.4%	67.7%
Water	80818	14&16 min, dissolved	**0.0003**	**0.00030**	**0.0003**	75.4%	81.3%
Water	80819	18&20 min, dissolved	**0.0003**	**0.00030**	**0.0003**	48.3%	65.8%
Water	80722	2& 4 min, total	**0.0003**	**0.00030**	**0.0003**	56.5%	69.7%
Water	80723	6& 8 min, total	**0.0003**	**0.00030**	**0.0003**	66.9%	70.5%
Water	80724	10&12 min, total	**0.0003**	0.00014	**0.0003**	60.8%	67.6%
Water	80725	14&16 min, total	**0.0003**	**0.00030**	**0.0003**	74.2%	65.0%
Water	80726	18&20 min, total	**0.0003**	**0.00030**	**0.0003**	57.7%	68.1%
		Site Water					
Water	81630	Sample 1 Total	**0.0003**	**0.00030**	**0.0003**	39.7%	61.9%
Water	81631	Sample 2 Total	**0.0003**	**0.00030**	**0.0003**	61.3%	62.4%
Water	81632	Sample 3 Total	**0.0003**	**0.00030**	**0.0003**	68.0%	66.8%
		Elutriate					
Water	81636	Sample 1 Dissolved	**0.0003**	**0.00030**	**0.0003**	55.8%	678.0%
Water	81637	Sample 2 Dissolved	**0.0003**	**0.00030**	**0.0003**	79.2%	56.1%
Water	81638	Sample 3 Dissolved	**0.0003**	**0.00030**	**0.0003**	63.3%	58.3%
Water	81633	Sample 1 Total	**0.0003**	**0.00030**	**0.0003**	65.9%	64.0%
Water	81634	Sample 2 Total	**0.0003**	**0.00030**	**0.0003**	37.7%	71.0%
Water	81635	Sample 3 Total	**0.0003**	**0.00030**	**0.0003**	53.8%	71.2%

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	DBAHANT	B-GHI-PY	2MeNAPH	2FIBP-S	PTERP-S
		Detection Limit (mg/kg)	0.0110	0.0110	0.011		
		Insitu Sediment					
Sediment	81702	Sample #1	**0.0110**	**0.0110**	**0.011**	62.7%	46.1%
Sediment	81703	Sample #2	0.0046	0.0514	**0.011**	76.0%	49.7%
Sediment	81704	Sample #3	**0.0110**	**0.0110**	**0.011**	68.8%	52.0%

DBAHANT - Dibenzo(A,H)Anthracene B-GHI-PY - Benzo(G,H,I)Perylene 2MeNAPH - 2-Methylnaphthalene
2FIBP-S - 2-Fluorobiphenyl(Surrogate (43-116 W)) PTERP-S - p-Terphenyl-D14(Surrogate (33-141 W))
BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

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Pestcoar

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	ALDRIN	A-BHC	B-BHC	G-BHC	D-BHC	PPDDD
		Detection Limit (mg/l)	0.000035	0.000035	0.000035	0.000035	0.000035	0.000070
		Plume Monitoring						
Water	80841	Background, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80756	Background, total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80842	0-10 min, overflow, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80843	10-20 min, overflow, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80844	20-30 min, overflow, dissolved	**0.000024**	**0.000024**	**0.000024**	**0.000024**	**0.000024**	**0.000049**
Water	80757	0-10 min, overflow, total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80758	10-20 min, overflow, total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80759	20-30 min, overflow, total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80845	0-10 min, non-overflow, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80846	10-20 min, non-overflow, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80847	20-30 min, non-overflow, dissolved	**0.000035**	**0.000035**	**0.000035**	**0.000035**	**0.000035**	**0.000070**
Water	80760	0-10 min, non-overflow, total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80761	10-20 min, non-overflow, total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	70762	20-30 min, non-overflow, total	**0.000028**	**0.000028**	**0.000028**	**0.000028**	**0.000028**	**0.000055**
		Hopper Inflow Monitoring						
Water	80800	3& 6 min, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80801	9&12 min, dissolved	**0.000025**	0.000020	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80802	15&18 min, dissolved	**0.000025**	**0.000025**	0.000046	**0.000025**	**0.000025**	**0.000050**
Water	80803	21&24 min, dissolved	**0.000025**	0.000011	0.000036	**0.000025**	**0.000025**	**0.000050**
Water	80804	27&30 min, dissolved	**0.000025**	**0.000025**	0.000043	**0.000025**	**0.000025**	**0.000050**
Water	80704	3& 6 min, total	**0.000025**	0.000031	0.000075	0.000021	0.000039	0.000035
Water	80705	9&12 min, total	**0.000025**	0.000018	**0.000025**	**0.000025**	0.000022	0.000095
Water	80706	15&18 min, total	**0.000027**	0.000046	**0.000027**	**0.000027**	0.000023	0.000060
Water	80707	21&24 min, total	**0.000027**	**0.000027**	**0.000027**	**0.000027**	**0.000027**	0.000110
Water	80708	27&30 min, total	**0.000025**	**0.000025**	0.000025	**0.000025**	**0.000025**	0.000016
		Hopper Overflow Monitoring						
Water	80805	2& 4 min, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80806	6& 8 min, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80807	10&12 min, dissolved	**0.000025**	0.000013	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80808	14&16 min, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80809	18&20 min, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80710	2& 4 min, total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80711	6& 8 min, total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80712	10&12 min, total	**0.000027**	**0.000027**	**0.000027**	**0.000027**	**0.000027**	**0.000053**
Water	80713	14&16 min, total	**0.000027**	**0.000027**	**0.000027**	**0.000027**	**0.000027**	0.000012
Water	80714	18&20 min, total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
		Site Water						
Water	81612	Sample 1 Total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	81613	Sample 2 Total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	81614	Sample 3 Total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
		Elutriate						
Water	81618	Sample 1 Dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	81619	Sample 2 Dissolved	**0.000025**	**0.000025**	**0.000025**	0.000011	**0.000025**	**0.000050**
Water	81620	Sample 3 Dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	81615	Sample 1 Total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	81616	Sample 2 Total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	81617	Sample 3 Total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	ALDRIN	A-BHC	B-BHC	G-BHC	D-BHC	PPDDD
		Detection Limit (mg/kg)	0.00096	0.00096	0.00096	0.0018	0.00096	0.0019
		Insitu Sediment						
Sediment	81708	Sample #1	**0.00096**	**0.00096**	0.0012	0.0021	**0.00096**	**0.0019**
Sediment	81709	Sample #2	**0.00096**	**0.00096**	0.0013	0.0034	**0.00096**	**0.0019**
Sediment	81710	Sample #3	**0.00096**	**0.00096**	0.0012	0.0027	**0.00096**	**0.0019**

ALDRIN - Aldrin A-BHC - A-BHC B-BHC - B-BHC G-BHC - G-BHC D-BHC - D-BHC PPDDD - PPDDD
BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit

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Pestcoar

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE		DESCRIPTION	PPDDE	PPDDT	HPTCL	DIELDRIN	ENDOI	ENDOII
		Detection Limit (mg/l)	0.000070	0.000070	0.0000350	0.000070	0.000035	0.000070
		Plume Monitoring						
Water	80841	Background, dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80756	Background, total	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80842	0-10 min, overflow, dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80843	10-20 min, overflow, dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80844	20-30 min, overflow, dissolved	**0.000050**	**0.000049**	**0.0000240**	**0.000049**	**0.000024**	**0.000049**
Water	80757	0-10 min, overflow, total	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80758	10-20 min, overflow, total	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80759	20-30 min, overflow, total	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80845	0-10 min, non-overflow, dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80846	10-20 min, non-overflow, dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80847	20-30 min, non-overflow, dissolved	**0.000070**	**0.000070**	**0.0000350**	**0.000070**	**0.000035**	**0.000070**
Water	80760	0-10 min, non-overflow, total	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80761	10-20 min, non-overflow, total	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	70762	20-30 min, non-overflow, total	**0.000055**	**0.000055**	**0.0000280**	**0.000055**	**0.000028**	**0.000055**
		Hopper Inflow Monitoring						
Water	80800	3& 6 min, dissolved	**0.000050**	**0.000050**	0.0000100	**0.000050**	**0.000025**	**0.000050**
Water	80801	9&12 min, dissolved	**0.000050**	**0.000050**	0.0000140	**0.000050**	**0.000025**	**0.000050**
Water	80802	15&18 min, dissolved	**0.000050**	**0.000050**	0.0000270	**0.000050**	**0.000025**	**0.000050**
Water	80803	21&24 min, dissolved	**0.000050**	**0.000050**	0.0000100	**0.000050**	**0.000025**	**0.000050**
Water	80804	27&30 min, dissolved	**0.000050**	**0.000050**	0.0000130	**0.000050**	0.000010	**0.000050**
Water	80704	3& 6 min, total	**0.000050**	0.000042	0.0000270	**0.000050**	**0.000025**	**0.000050**
Water	80705	9&12 min, total	0.000024	0.000660	0.0000160	**0.000050**	**0.000025**	**0.000050**
Water	80706	15&18 min, total	0.000023	**0.000053**	0.0000190	**0.000053**	**0.000027**	**0.000053**
Water	80707	21&24 min, total	0.000017	**0.000053**	0.0000070	**0.000053**	**0.000027**	**0.000053**
Water	80708	27&30 min, total	0.000029	0.000036	0.0000130	0.000027	**0.000025**	**0.000050**
		Hopper Overflow Monitoring						
Water	80805	2& 4 min, dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80806	6& 8 min, dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80807	10&12 min, dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80808	14&16 min, dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80809	18&20 min, dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80710	2& 4 min, total	0.000010	0.000024	0.0000040	**0.000050**	**0.000025**	**0.000050**
Water	80711	6& 8 min, total	0.000005	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80712	10&12 min, total	**0.000053**	**0.000053**	**0.0000270**	**0.000053**	**0.000027**	**0.000053**
Water	80713	14&16 min, total	0.001100	**0.000053**	**0.0000270**	**0.000053**	**0.000027**	**0.000053**
Water	80714	18&20 min, total	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
		Site Water						
Water	81612	Sample 1 Total	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	81613	Sample 2 Total	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	81614	Sample 3 Total	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
		Elutriate						
Water	81618	Sample 1 Dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	81619	Sample 2 Dissolved	**0.000050**	**0.000050**	0.0000039	**0.000050**	**0.000025**	**0.000050**
Water	81620	Sample 3 Dissolved	**0.000050**	**0.000050**	0.0000050	**0.000050**	**0.000025**	**0.000050**
Water	81615	Sample 1 Total	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	81616	Sample 2 Total	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	81617	Sample 3 Total	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PPDDE	PPDDT	HPTCL	DIELDRIN	ENDOI	ENDOII
		Detection Limit (mg/kg)	0.0019	0.0019	0.00096	0.0036	0.00096	0.0019
		Insitu Sediment						
Sediment	81708	Sample #1	**0.0019**	**0.0019**	0.00059	0.00046	**0.00096**	**0.0019**
Sediment	81709	Sample #2	**0.0019**	**0.0019**	0.00052	0.00067	**0.00096**	**0.0019**
Sediment	81710	Sample #3	**0.0019**	**0.0019**	0.00049	0.00058	**0.00096**	**0.0019**

PPDDE - PPDDE PPDDT - PPDDT HPTCL - Heptachlor DIELDRIN - Dieldrin ENDOI - A-Endosulfan ENDOII - B-Endosulfan
BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	ENDOSU	ENDRIN	ENDALD	HPTCLE	METOXYCL	CLORDANE
		Detection Limit (mg/l)	0.000070	0.000070	0.000070	0.000035	0.00035	0.000035
		Plume Monitoring						
Water	80841	Background, dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80756	Background, total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80842	0-10 min, overflow, dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80843	10-20 min, overflow, dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80844	20-30 min, overflow, dissolved	**0.000049**	**0.000049**	**0.000049**	**0.000024**	**0.00024**	**0.000024**
Water	80757	0-10 min, overflow, total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80758	10-20 min, overflow, total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80759	20-30 min, overflow, total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80845	0-10 min, non-overflow, dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80846	10-20 min, non-overflow, dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80847	20-30 min, non-overflow, dissolved	**0.000070**	**0.000070**	**0.000070**	**0.000035**	**0.00035**	**0.000035**
Water	80760	0-10 min, non-overflow, total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80761	10-20 min, non-overflow, total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	70762	20-30 min, non-overflow, total	**0.000055**	**0.000055**	**0.000055**	**0.000028**	**0.00028**	**0.000028**
		Hopper Inflow Monitoring						
Water	80800	3& 6 min, dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	80801	9&12 min, dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	80802	15&18 min, dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	80803	21&24 min, dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	80804	27&30 min, dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	80704	3& 6 min, total	**0.000050**	0.000018	**0.000050**	0.000020	**0.00025**	
Water	80705	9&12 min, total	0.000750	0.000012	0.000560	0.000011	**0.00025**	
Water	80706	15&18 min, total	0.000260	0.000020	**0.000053**	0.000023	**0.00027**	
Water	80707	21&24 min, total	0.000320	**0.000053**	**0.000053**	**0.000027**	**0.00027**	
Water	80708	27&30 min, total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
		Hopper Overflow Monitoring						
Water	80805	2& 4 min, dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	80806	6& 8 min, dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	80807	10&12 min, dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	80808	14&16 min, dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	80809	18&20 min, dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	80710	2& 4 min, total	**0.000050**	**0.000050**	**0.000050**	0.000009	**0.00025**	
Water	80711	6& 8 min, total	**0.000050**	**0.000050**	**0.000050**	0.000590	**0.00025**	
Water	80712	10&12 min, total	**0.000053**	**0.000053**	**0.000053**	**0.000027**	**0.00027**	
Water	80713	14&16 min, total	**0.000053**	**0.000053**	**0.000053**	**0.000027**	**0.00027**	
Water	80714	18&20 min, total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
		Site Water						
Water	81612	Sample 1 Total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	81613	Sample 2 Total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	81614	Sample 3 Total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
		Elutriate						
Water	81618	Sample 1 Dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	81619	Sample 2 Dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	81620	Sample 3 Dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	81615	Sample 1 Total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	81616	Sample 2 Total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	81617	Sample 3 Total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	ENDOSU	ENDRIN	ENDALD	HPTCLE	METOXYCL
		Detection Limit (mg/kg)	0.0036	0.0036	0.0036	0.0018	0.018
		Insitu Sediment					
Sediment	81708	Sample #1	**0.00083**	**0.0019**	**0.0019**	0.0014	**0.0083**
Sediment	81709	Sample #2	**0.00083**	**0.0019**	**0.0019**	0.0020	**0.0083**
Sediment	81710	Sample #3	**0.00083**	**0.0019**	**0.0019**	0.0020	**0.0083**

ENDOSU - Endosulfan sulfate ENDRIN - Endrin ENDALD - Endrin Aldehyde HPTCLE - Heptachlor Epoxide METOXYCL - Methoxychlor
CLORDANE - Chlordane
BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	TOXAPHEN	TcLXYL-S	DCLBP	a-CHLORD	g-CHLORD
		Detection Limit (mg/l)	0.000350				
		Plume Monitoring					
Water	80841	Background, dissolved	**0.000250**	81.60%	88.70%		
Water	80756	Background, total	**0.000250**	90.10%	93.00%		
Water	80842	0-10 min, overflow, dissolved	**0.000250**	87.70%	91.60%		
Water	80843	10-20 min, overflow, dissolved	**0.000250**	93.90%	102.00%		
Water	80844	20-30 min, overflow, dissolved	**0.000240**	92.30%	97.90%		
Water	80757	0-10 min, overflow, total	**0.000250**	88.00%	95.70%		
Water	80758	10-20 min, overflow, total	**0.000250**	82.40%	82.60%		
Water	80759	20-30 min, overflow, total	**0.000250**	89.20%	92.20%		
Water	80845	0-10 min, non-overflow, dissolved	**0.000250**	91.60%	101.00%		
Water	80846	10-20 min, non-overflow, dissolved	**0.000250**	74.70%	86.30%		
Water	80847	20-30 min, non-overflow, dissolved	**0.000350**	96.00%	103.00%		
Water	80760	0-10 min, non-overflow, total	**0.000250**	90.60%	95.30%		
Water	80761	10-20 min, non-overflow, total	**0.000250**	53.40%	72.90%		
Water	70762	20-30 min, non-overflow, total	**0.000280**	99.10%	101.00%		
		Hopper Inflow Monitoring					
Water	80800	3& 6 min, dissolved	**0.000025**	79.14%	90.86%	**0.000025**	**0.000025**
Water	80801	9&12 min, dissolved	**0.000025**	77.94%	88.38%	**0.000025**	**0.000025**
Water	80802	15&18 min, dissolved	**0.000025**	65.90%	73.68%	0.000013	**0.000025**
Water	80803	21&24 min, dissolved	**0.000025**	75.24%	69.59%	**0.000025**	**0.000025**
Water	80804	27&30 min, dissolved	**0.000025**	78.33%	70.11%	0.000011	0.000016
Water	80704	3& 6 min, total	**0.000250**	68.26%	81.31%	0.000018	0.000048
Water	80705	9&12 min, total	**0.000250**	62.04%	99.69%	0.000014	0.000051
Water	80706	15&18 min, total	**0.000270**	68.15%	89.41%	0.000021	0.000052
Water	80707	21&24 min, total	**0.000270**	56.44%	69.56%	**0.000025**	0.000009
Water	80708	27&30 min, total	**0.000250**	52.93%	64.41%	0.000008	0.000018
		Hopper Overflow Monitoring					
Water	80805	2& 4 min, dissolved	**0.000025**	93.58%	98.19%	**0.000025**	**0.000025**
Water	80806	6& 8 min, dissolved	**0.000025**	87.07%	92.15%	**0.000025**	0.000011
Water	80807	10&12 min, dissolved	**0.000025**	90.84%	97.36%	0.000016	0.000012
Water	80808	14&16 min, dissolved	**0.000025**	87.46%	95.06%	**0.000025**	**0.000025**
Water	80809	18&20 min, dissolved	**0.000025**	91.71%	94.46%	**0.000025**	**0.000025**
Water	80710	2& 4 min, total	**0.000250**	69.36%	69.00%	**0.000025**	0.000007
Water	80711	6& 8 min, total	**0.000250**	81.76%	75.25%	**0.000025**	**0.000025**
Water	80712	10&12 min, total	**0.000270**	73.21%	68.25%	**0.000027**	0.000071
Water	80713	14&16 min, total	**0.000270**	73.06%	66.74%	**0.000027**	**0.000027**
Water	80714	18&20 min, total	**0.000250**	82.29%	68.42%	**0.000025**	**0.000025**
		Site Water					
Water	81612	Sample 1 Total	**0.000250**	79.55%	79.71%	**0.000025**	**0.000025**
Water	81613	Sample 2 Total	**0.000250**	83.18%	76.81%	**0.000025**	**0.000025**
Water	81614	Sample 3 Total	**0.000250**	80.62%	73.95%	**0.000025**	**0.000025**
		Elutriate					
Water	81618	Sample 1 Dissolved	**0.000250**	82.64%	76.37%	**0.000025**	**0.000025**
Water	81619	Sample 2 Dissolved	**0.000250**	82.61%	74.72%	**0.000025**	**0.000025**
Water	81620	Sample 3 Dissolved	**0.000250**	82.47%	74.18%	**0.000025**	**0.000025**
Water	81615	Sample 1 Total	**0.000250**	81.55%	75.14%	**0.000025**	**0.000025**
Water	81616	Sample 2 Total	**0.000250**	79.75%	70.89%	**0.000025**	**0.000025**
Water	81617	Sample 3 Total	**0.000250**	80.50%	74.91%	**0.000025**	**0.000025**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	TOXAPHEN	TcLXYL-S	DCLBP	a-CHLORD	g-CHLORD
		Detection Limit (mg/kg)	0.018			0.00096	0.0019
		Insitu Sediment					
Sediment	81708	Sample #1	**0.0096**	90.16%	90.52%	**0.00096**	0.0011
Sediment	81709	Sample #2	**0.0096**	85.63%	90.13%	**0.00096**	0.0013
Sediment	81710	Sample #3	**0.0096**	84.81%	90.58%	**0.00096**	0.0022

TOXAPHEN - Toxaphene TcLXYL-S - 2,4,5,6-Tetrachloro-m-xylene(Surrogate(60-150 WS)) DCLBP - Decachlorobiphenyl(Surrogate (60-150 WS))
a-CHLORD - a-CHLORDANE g-CHLORD - g-CHLORDANE
BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

PCBscoar

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 22	PCB 33	PCB 37	PCB 42	PCB 47	PCB 64	PCB 74
		Detection Limit (mg/l)	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
		Plume Monitoring							
Water	80834	Background, dissolved	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80749	Background, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80835	0-10 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80836	10-20 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80837	20-30 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80750	0-10 min, overflow, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80751	10-20 min, overflow, total	0.0000004	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80752	20-30 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80838	0-10 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80839	10-20 min, non-overflow, dissolve	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80840	20-30 min, non-overflow, dissolve	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80753	0-10 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80754	10-20 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80755	20-30 min, non-overflow, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	0.0000022	**0.0000010**	**0.0000010**	**0.0000010**
Water	80791	9&12 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	0.0000020	**0.0000010**	**0.0000010**	**0.0000010**
Water	80792	15&18 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	0.0000014	0.0000005	**0.0000010**	**0.0000010**
Water	80793	21&24 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	0.0000012	0.0000015	**0.0000010**	**0.0000010**
Water	80794	27&30 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	0.0000009	0.0000008	**0.0000010**	**0.0000010**
Water	80692	3& 6 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80693	9&12 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80694	15&18 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80695	21&24 min, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	0.0000027	**0.0000011**
Water	80696	27&30 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.0000020	**0.0000010**
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	0.0000017	**0.0000010**	**0.0000010**	**0.0000010**
Water	80796	6& 8 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	0.0000019	**0.0000010**	**0.0000010**	**0.0000010**
Water	80797	10&12 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	0.0000011	**0.0000010**	**0.0000010**	**0.0000010**
Water	80798	14&16 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	0.0000015	**0.0000010**	**0.0000010**	**0.0000010**
Water	80799	18&20 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80698	2& 4 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80699	6& 8 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80700	10&12 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80701	14&16 min, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80702	18&20 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Site Water							
Water	81594	Sample 1 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81595	Sample 2 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81596	Sample 3 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Elutriate							
Water	81600	Sample 1 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81601	Sample 2 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81602	Sample 3 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81597	Sample 1 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81598	Sample 2 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81599	Sample 3 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**

SAMPLE	SAMPLE ID	DESCRIPTION	PCB 22	PCB 33	PCB 37	PCB 42	PCB 47	PCB 64	PCB 74
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81715	Sample #2	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81716	Sample #3	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

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PCBscoar

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 80	PCB 81	PCB 84	PCB 91	PCB 92	PCB 95	PCB 99
		Detection Limit (mg/l)	0.0000011	0.0000011	0.00000110	0.0000011	0.0000011	0.00000110	0.00000110
		Plume Monitoring							
Water	80834	Background, dissolved	**0.0000011**	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**	0.00000080	**0.00000110**
Water	80749	Background, total	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	0.00000060	**0.00000100**
Water	80835	0-10 min, overflow, dissolved	**0.0000010**	**0.0000010**	0.00000060	**0.0000010**	**0.0000010**	0.00000090	**0.00000100**
Water	80836	10-20 min, overflow, dissolved	**0.0000010**	**0.0000010**	0.00000060	**0.0000010**	**0.0000010**	0.00000080	0.00000040
Water	80837	20-30 min, overflow, dissolved	**0.0000010**	**0.0000010**	0.00000050	**0.0000010**	**0.0000010**	0.00000090	0.00000070
Water	80750	0-10 min, overflow, total	**0.0000011**	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**	**0.00000110**	**0.00000110**
Water	80751	10-20 min, overflow, total	**0.0000010**	**0.0000010**	0.00000040	**0.0000010**	**0.0000010**	0.00000090	**0.00000100**
Water	80752	20-30 min, overflow, total	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	0.00000050	**0.00000100**
Water	80838	0-10 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	0.00000080	**0.0000010**	**0.0000010**	0.00000080	0.00000050
Water	80839	10-20 min, non-overflow, dissolve	**0.0000011**	**0.0000011**	0.00000050	**0.0000011**	**0.0000011**	0.00000090	0.00000040
Water	80840	20-30 min, non-overflow, dissolve	**0.0000011**	**0.0000011**	0.00000050	**0.0000011**	**0.0000011**	0.00000110	0.00000040
Water	80753	0-10 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	0.00000050	**0.00000100**
Water	80754	10-20 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	0.00000070	**0.00000100**
Water	80755	20-30 min, non-overflow, total	**0.0000011**	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**	0.00000110	0.00000050
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	**0.0000010**	**0.0000010**	0.00000140	**0.0000010**	**0.0000010**	0.00000120	0.00000050
Water	80791	9&12 min, dissolved	**0.0000010**	**0.0000010**	0.00000110	**0.0000010**	**0.0000010**	0.00000110	0.00000040
Water	80792	15&18 min, dissolved	**0.0000010**	**0.0000010**	0.00000100	**0.0000010**	**0.0000010**	0.00000100	**0.00000100**
Water	80793	21&24 min, dissolved	**0.0000010**	**0.0000010**	0.00000110	**0.0000010**	**0.0000010**	0.00000160	0.00000060
Water	80794	27&30 min, dissolved	**0.0000010**	**0.0000010**	0.00000170	**0.0000010**	**0.0000010**	0.00000160	**0.00000100**
Water	80692	3& 6 min, total	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	0.00000120	**0.00000100**
Water	80693	9&12 min, total	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	0.00000140	**0.00000100**
Water	80694	15&18 min, total	**0.0000010**	**0.0000010**	0.00000280	**0.0000010**	**0.0000010**	0.00000230	**0.00000100**
Water	80695	21&24 min, total	**0.0000011**	**0.0000011**	0.00000330	**0.0000011**	**0.0000011**	0.00000290	0.00000060
Water	80696	27&30 min, total	**0.0000010**	**0.0000010**	0.00000240	**0.0000010**	**0.0000010**	0.00000200	0.00000130
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**
Water	80796	6& 8 min, dissolved	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	0.00000050	**0.00000100**
Water	80797	10&12 min, dissolved	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	0.00000050	**0.00000100**
Water	80798	14&16 min, dissolved	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	0.00000060	**0.00000100**
Water	80799	18&20 min, dissolved	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	0.00000060	**0.00000100**
Water	80698	2& 4 min, total	**0.0000010**	**0.0000010**	0.00000120	**0.0000010**	**0.0000010**	0.00000130	**0.00000100**
Water	80699	6& 8 min, total	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	0.00000090	**0.00000100**
Water	80700	10&12 min, total	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	0.00000140	**0.00000100**
Water	80701	14&16 min, total	**0.0000011**	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**	**0.00000110**	**0.00000110**
Water	80702	18&20 min, total	**0.0000010**	**0.0000010**	0.00000080	**0.0000010**	**0.0000010**	0.00000180	**0.00000100**
		Site Water							
Water	81594	Sample 1 Total	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**
Water	81595	Sample 2 Total	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	0.00000090	0.00000047
Water	81596	Sample 3 Total	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**
		Elutriate							
Water	81600	Sample 1 Dissolved	**0.0000010**	**0.0000010**	0.00000043	**0.0000010**	**0.0000010**	0.00000086	**0.00000100**
Water	81601	Sample 2 Dissolved	**0.0000010**	**0.0000010**	0.00000034	**0.0000010**	**0.0000010**	0.00000065	**0.00000100**
Water	81602	Sample 3 Dissolved	**0.0000010**	**0.0000010**	0.00000035	**0.0000010**	**0.0000010**	0.00000069	0.00000032
Water	81597	Sample 1 Total	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	0.00000048	**0.00000100**
Water	81598	Sample 2 Total	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	0.00000150	0.00000049
Water	81599	Sample 3 Total	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**

SAMPLE	SAMPLE ID	DESCRIPTION	PCB 80	PCB 81	PCB 84	PCB 91	PCB 92	PCB 95	PCB 99
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81715	Sample #2	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81716	Sample #3	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 110	PCB 119	PCB 120	PCB 123	PCB 126	PCB 127	PCB 132
		Detection Limit (mg/l)	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
		Plume Monitoring							
Water	80834	Background, dissolved	0.00000100	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80749	Background, total	0.00000050	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80835	0-10 min, overflow, dissolved	0.00000090	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80836	10-20 min, overflow, dissolved	0.00000110	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80837	20-30 min, overflow, dissolved	0.00000080	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80750	0-10 min, overflow, total	0.00000050	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80751	10-20 min, overflow, total	0.00000070	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80752	20-30 min, overflow, total	0.00000050	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80838	0-10 min, non-overflow, dissolve	0.00000110	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80839	10-20 min, non-overflow, dissolve	0.00000070	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80840	20-30 min, non-overflow, dissolve	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80753	0-10 min, non-overflow, total	0.00000050	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80754	10-20 min, non-overflow, total	0.00000060	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80755	20-30 min, non-overflow, total	0.00000090	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000005**
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	0.00000210	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80791	9&12 min, dissolved	0.00000160	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80792	15&18 min, dissolved	0.00000100	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80793	21&24 min, dissolved	0.00000160	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80794	27&30 min, dissolved	0.00000160	**0.0000010**	0.0000007	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80692	3& 6 min, total	0.00000160	**0.0000010**	0.0000026	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80693	9&12 min, total	0.00000200	**0.0000010**	0.0000019	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80694	15&18 min, total	0.00000260	**0.0000010**	0.0000054	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80695	21&24 min, total	0.00000260	**0.0000011**	0.0000061	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80696	27&30 min, total	0.00000230	**0.0000010**	0.0000071	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	0.00000070	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80796	6& 8 min, dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80797	10&12 min, dissolved	0.00000050	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80798	14&16 min, dissolved	0.00000060	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80799	18&20 min, dissolved	0.00000050	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80698	2& 4 min, total	0.00000150	**0.0000010**	0.0000008	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80699	6& 8 min, total	0.00000120	**0.0000010**	0.0000005	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80700	10&12 min, total	0.00000150	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80701	14&16 min, total	0.00000110	**0.0000011**	0.0000006	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80702	18&20 min, total	0.00000160	**0.0000010**	0.0000005	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Site Water							
Water	81594	Sample 1 Total	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81595	Sample 2 Total	0.00000097	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81596	Sample 3 Total	0.00000077	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Elutriate							
Water	81600	Sample 1 Dissolved	0.00000091	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81601	Sample 2 Dissolved	0.00000063	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81602	Sample 3 Dissolved	0.00000064	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81597	Sample 1 Total	0.00000061	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81598	Sample 2 Total	0.00000110	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81599	Sample 3 Total	0.00000059	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 110	PCB 119	PCB 120	PCB 123	PCB 126	PCB 127	PCB 132
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81715	Sample #2	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81716	Sample #3	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 135	PCB 146	PCB 149	PCB 157	PCB 158	PCB 166	PCB 168
		Detection Limit (mg/l)	0.0000011	0.00000110	0.00000110	0.0000011	0.0000011	0.0000011	0.00000110
		Plume Monitoring							
Water	80834	Background, dissolved	**0.0000011**	**0.00000110**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80749	Background, total	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80835	0-10 min, overflow, dissolved	**0.0000010**	**0.00000100**	0.00000040	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80836	10-20 min, overflow, dissolved	**0.0000010**	0.00000050	0.00000040	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80837	20-30 min, overflow, dissolved	**0.0000010**	**0.00000100**	0.00000040	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80750	0-10 min, overflow, total	**0.0000011**	**0.00000110**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80751	10-20 min, overflow, total	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80752	20-30 min, overflow, total	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80838	0-10 min, non-overflow, dissolve	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80839	10-20 min, non-overflow, dissolve	**0.0000011**	**0.00000110**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80840	20-30 min, non-overflow, dissolve	**0.0000011**	**0.00000110**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80753	0-10 min, non-overflow, total	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80754	10-20 min, non-overflow, total	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80755	20-30 min, non-overflow, total	**0.0000011**	**0.00000110**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	**0.0000010**	**0.00000100**	0.00000040	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80791	9&12 min, dissolved	**0.0000010**	**0.00000100**	0.00000040	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80792	15&18 min, dissolved	**0.0000010**	**0.00000100**	0.00000040	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80793	21&24 min, dissolved	**0.0000010**	**0.00000100**	0.00000070	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80794	27&30 min, dissolved	**0.0000010**	0.00000100	0.00000130	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80692	3& 6 min, total	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	0.00000075
Water	80693	9&12 min, total	**0.0000010**	**0.00000100**	0.00000130	**0.0000010**	**0.0000010**	**0.0000010**	0.00000075
Water	80694	15&18 min, total	**0.0000010**	**0.00000100**	0.00000290	**0.0000010**	**0.0000010**	**0.0000010**	0.00000160
Water	80695	21&24 min, total	**0.0000011**	0.00000100	0.00000300	**0.0000011**	**0.0000011**	**0.0000011**	0.00000140
Water	80696	27&30 min, total	**0.0000010**	0.00000097	0.00000300	**0.0000010**	**0.0000010**	**0.0000010**	0.00000100
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80796	6& 8 min, dissolved	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80797	10&12 min, dissolved	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80798	14&16 min, dissolved	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80799	18&20 min, dissolved	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80698	2& 4 min, total	**0.0000010**	0.00000070	0.00000160	**0.0000010**	**0.0000010**	**0.0000010**	0.00000061
Water	80699	6& 8 min, total	**0.0000010**	**0.00000100**	0.00000088	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80700	10&12 min, total	**0.0000010**	**0.00000100**	0.00000120	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80701	14&16 min, total	**0.0000011**	0.00000067	0.00000240	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80702	18&20 min, total	**0.0000010**	0.00000084	0.00000110	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
		Site Water							
Water	81594	Sample 1 Total	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81595	Sample 2 Total	**0.0000010**	**0.00000100**	0.00000050	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81596	Sample 3 Total	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
		Elutriate							
Water	81600	Sample 1 Dissolved	**0.0000010**	**0.00000100**	0.00000038	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81601	Sample 2 Dissolved	**0.0000010**	**0.00000100**	0.00000037	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81602	Sample 3 Dissolved	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81597	Sample 1 Total	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81598	Sample 2 Total	**0.0000010**	**0.00000100**	0.00000066	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81599	Sample 3 Total	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 135	PCB 146	PCB 149	PCB 157	PCB 158	PCB 166	PCB 168
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81715	Sample #2	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81716	Sample #3	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 169	PCB 174	PCB 177	PCB 178	PCB 179	PCB 8	PCB 18
		Detection Limit (mg/l)	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110
		Plume Monitoring							
Water	80834	Background, dissolved	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80749	Background, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80835	0-10 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80836	10-20 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80837	20-30 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80750	0-10 min, overflow, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80751	10-20 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80752	20-30 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80838	0-10 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80839	10-20 min, non-overflow, dissolve	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80840	20-30 min, non-overflow, dissolve	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80753	0-10 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80754	10-20 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80755	20-30 min, non-overflow, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.00000460
Water	80791	9&12 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80792	15&18 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80793	21&24 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80794	27&30 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80692	3& 6 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80693	9&12 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80694	15&18 min, total	**0.0000010**	0.0000084	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80695	21&24 min, total	**0.0000011**	0.0000058	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80696	27&30 min, total	**0.0000010**	0.0000042	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80796	6& 8 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80797	10&12 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80798	14&16 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80799	18&20 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80698	2& 4 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80699	6& 8 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80700	10&12 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80701	14&16 min, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80702	18&20 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
		Site Water							
Water	81594	Sample 1 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.00000070
Water	81595	Sample 2 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.00000063
Water	81596	Sample 3 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.00000082
		Elutriate							
Water	81600	Sample 1 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81601	Sample 2 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81602	Sample 3 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81597	Sample 1 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.00000052
Water	81598	Sample 2 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.00000058
Water	81599	Sample 3 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 169	PCB 174	PCB 177	PCB 178	PCB 179	PCB 8	PCB 18
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81715	Sample #2	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81716	Sample #3	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 28	PCB 31	PCB 40	PCB 44	PCB 49	PCB 52	PCB 60
		Detection Limit (mg/l)	0.0000011	0.0000011	0.0000011	0.00000110	0.0000011	0.00000110	0.0000011
		Plume Monitoring							
Water	80834	Background, dissolved	**0.0000011**	**0.0000011**	**0.0000011**	0.00000140	**0.0000011**	0.00000090	**0.0000011**
Water	80749	Background, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	0.00000060	**0.0000010**
Water	80835	0-10 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	0.00000100	**0.0000010**	0.00000090	**0.0000010**
Water	80836	10-20 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	0.00000100	**0.0000010**	0.00000110	**0.0000010**
Water	80837	20-30 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	0.00000080	**0.0000010**	0.00000100	**0.0000010**
Water	80750	0-10 min, overflow, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**	**0.0000011**	0.00000060	**0.0000011**
Water	80751	10-20 min, overflow, total	**0.0000010**	0.0000051	**0.0000010**	**0.00000100**	**0.0000010**	0.00000090	**0.0000010**
Water	80752	20-30 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	0.00000050	**0.0000010**
Water	80838	0-10 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000130**	**0.0000010**	0.00000090	**0.0000010**
Water	80839	10-20 min, non-overflow, dissolve	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**	**0.0000011**	0.00000090	**0.0000011**
Water	80840	20-30 min, non-overflow, dissolve	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000070**	**0.0000011**	0.00000100	**0.0000011**
Water	80753	0-10 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	0.00000060	**0.0000010**
Water	80754	10-20 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	0.00000080	**0.0000010**
Water	80755	20-30 min, non-overflow, total	**0.0000011**	**0.0000011**	**0.0000010**	**0.00000110**	**0.0000011**	**0.00000110**	**0.0000011**
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	0.00000050	**0.0000010**
Water	80791	9&12 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	0.00000080	**0.0000010**
Water	80792	15&18 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	0.00000440	**0.0000010**
Water	80793	21&24 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	0.00000000	**0.0000010**
Water	80794	27&30 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	0.00000100	**0.0000010**
Water	80692	3& 6 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	0.0000010	**0.00000100**	**0.0000010**
Water	80693	9&12 min, total	**0.0000010**	**0.0000010**	**0.0000010**	0.00000110	0.0000041	**0.00000100**	**0.0000010**
Water	80694	15&18 min, total	**0.0000010**	**0.0000010**	**0.0000010**	0.00000170	**0.0000010**	0.00000200	**0.0000010**
Water	80695	21&24 min, total	**0.0000011**	**0.0000011**	**0.0000011**	0.00000210	**0.0000011**	0.00000280	**0.0000011**
Water	80696	27&30 min, total	**0.0000010**	**0.0000010**	**0.0000010**	0.00000470	**0.0000010**	0.00000390	**0.0000010**
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**
Water	80796	6& 8 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	0.00000060	**0.0000010**
Water	80797	10&12 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	0.00000050	**0.0000010**
Water	80798	14&16 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	0.00000060	**0.0000010**
Water	80799	18&20 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	0.00000060	**0.0000010**
Water	80698	2& 4 min, total	**0.0000010**	**0.0000010**	**0.0000010**	0.00000100	**0.0000010**	**0.00000100**	**0.0000010**
Water	80699	6& 8 min, total	**0.0000010**	**0.0000010**	**0.0000010**	0.00000100	**0.0000010**	0.00000094	**0.0000010**
Water	80700	10&12 min, total	**0.0000010**	**0.0000010**	**0.0000010**	0.00000063	**0.0000010**	**0.00000100**	**0.0000010**
Water	80701	14&16 min, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**	**0.0000011**	0.00000089	**0.0000011**
Water	80702	18&20 min, total	**0.0000010**	**0.0000010**	**0.0000010**	0.00000060	**0.0000010**	0.00000140	**0.0000010**
		Site Water							
Water	81594	Sample 1 Total	**0.0000010**	0.0000022	**0.0000010**	**0.00000100**	**0.0000010**	0.00000082	**0.0000010**
Water	81595	Sample 2 Total	**0.0000010**	0.0000033	**0.0000010**	0.00000064	**0.0000010**	0.00000096	**0.0000010**
Water	81596	Sample 3 Total	**0.0000010**	0.0000036	**0.0000010**	0.00000073	**0.0000010**	0.00000078	**0.0000010**
		Elutriate							
Water	81600	Sample 1 Dissolved	**0.0000010**	0.0000032	**0.0000010**	**0.00000100**	**0.0000010**	0.00000100	**0.0000010**
Water	81601	Sample 2 Dissolved	**0.0000010**	0.0000022	**0.0000010**	**0.00000100**	**0.0000010**	0.00000084	**0.0000010**
Water	81602	Sample 3 Dissolved	**0.0000010**	0.0000032	**0.0000010**	**0.00000100**	**0.0000010**	0.00000095	**0.0000010**
Water	81597	Sample 1 Total	**0.0000010**	0.0000021	**0.0000010**	**0.00000100**	**0.0000010**	0.00000054	**0.0000010**
Water	81598	Sample 2 Total	**0.0000010**	0.0000040	**0.0000010**	0.00000130	**0.0000010**	0.00000170	**0.0000010**
Water	81599	Sample 3 Total	**0.0000010**	0.0000025	**0.0000010**	**0.00000100**	**0.0000010**	0.00000058	**0.0000010**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 28	PCB 31	PCB 40	PCB 44	PCB 49	PCB 52	PCB 60
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81715	Sample #2	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81716	Sample #3	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

PCBscoar

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 70	PCB 77	PCB 82	PCB 86	PCB 87	PCB 97	PCB 101
		Detection Limit (mg/l)	0.00000110	0.0000011	0.0000011	0.00000110	0.00000110	0.00000110	0.00000110
		Plume Monitoring							
Water	80834	Background, dissolved	**0.00000110**	**0.0000011**	**0.0000011**	0.00000090	0.00000080	0.00000090	0.00000090
Water	80749	Background, total	**0.00000100**	**0.0000010**	**0.0000010**	0.00000080	0.00000050	0.00000080	0.00000050
Water	80835	0-10 min, overflow, dissolved	0.00000040	**0.0000010**	**0.0000010**	0.00000070	0.00000080	0.00000070	0.00000090
Water	80836	10-20 min, overflow, dissolved	0.00000040	**0.0000010**	**0.0000010**	0.00000070	0.00000050	0.00000070	0.00000110
Water	80837	20-30 min, overflow, dissolved	0.00000040	**0.0000010**	**0.0000010**	0.00000060	0.00000040	0.00000060	0.00000090
Water	80750	0-10 min, overflow, total	0.00000050	**0.0000011**	**0.0000011**	**0.00000110**	0.00000040	**0.00000110**	0.00000060
Water	80751	10-20 min, overflow, total	0.00000050	**0.0000010**	**0.0000010**	0.00000040	0.00000080	0.00000040	0.00000060
Water	80752	20-30 min, overflow, total	0.00000040	**0.0000010**	**0.0000010**	0.00000050	**0.00000100**	0.00000050	0.00000050
Water	80838	0-10 min, non-overflow, dissolve	0.00000050	**0.0000010**	**0.0000010**	0.00000080	0.00000070	0.00000080	0.00000090
Water	80839	10-20 min, non-overflow, dissolve	0.00000050	**0.0000011**	**0.0000011**	0.00000060	0.00000070	0.00000060	0.00000090
Water	80840	20-30 min, non-overflow, dissolve	0.00000060	**0.0000011**	**0.0000011**	0.00000100	0.00000080	0.00000100	0.00000090
Water	80753	0-10 min, non-overflow, total	**0.00000100**	**0.0000010**	**0.0000010**	0.00000040	0.00000050	0.00000040	0.00000050
Water	80754	10-20 min, non-overflow, total	**0.00000100**	**0.0000010**	**0.0000010**	0.00000040	0.00000050	0.00000040	0.00000070
Water	80755	20-30 min, non-overflow, total	0.00000050	**0.0000010**	**0.0000011**	0.00000100	0.00000070	**0.00000110**	0.00000110
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	0.00000040	**0.0000010**	**0.0000010**	0.00000080	0.00000110	0.00000080	0.00000140
Water	80791	9&12 min, dissolved	0.00000100	**0.0000010**	**0.0000010**	0.00000060	0.00000090	0.00000060	0.00000120
Water	80792	15&18 min, dissolved	0.00000040	**0.0000010**	**0.0000010**	**0.00000100**	0.00000130	**0.00000100**	**0.00000100**
Water	80793	21&24 min, dissolved	0.00000060	**0.0000010**	**0.0000010**	0.00000130	0.00000150	0.00000130	0.00000030
Water	80794	27&30 min, dissolved	0.00000090	**0.0000010**	**0.0000010**	0.00000180	0.00000110	0.00000180	0.00000100
Water	80692	3& 6 min, total	0.00000280	**0.0000010**	**0.0000010**	0.00000190	**0.00000100**	0.00000190	0.00000430
Water	80693	9&12 min, total	0.00000180	**0.0000010**	**0.0000010**	0.00000088	**0.00000100**	0.00000088	0.00000300
Water	80694	15&18 min, total	0.00000250	**0.0000010**	**0.0000010**	0.00000290	**0.00000100**	0.00000290	0.00000390
Water	80695	21&24 min, total	0.00000150	**0.0000011**	**0.0000011**	0.00000049	**0.00000110**	0.00000049	0.00000360
Water	80696	27&30 min, total	0.00000140	**0.0000010**	**0.0000010**	0.00000220	**0.00000100**	0.00000220	0.00000380
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	0.00000080
Water	80796	6& 8 min, dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	**0.00000100**
Water	80797	10&12 min, dissolved	0.00000030	**0.0000010**	**0.0000010**	**0.00000100**	0.00000050	**0.00000100**	**0.00000100**
Water	80798	14&16 min, dissolved	0.00000050	**0.0000010**	**0.0000010**	0.00000040	**0.00000100**	0.00000040	**0.00000100**
Water	80799	18&20 min, dissolved	0.00000040	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	**0.00000100**
Water	80698	2& 4 min, total	**0.00000100**	**0.0000010**	**0.0000010**	0.00000061	**0.00000100**	0.00000061	0.00000240
Water	80699	6& 8 min, total	0.00000073	**0.0000010**	**0.0000010**	0.00000044	**0.00000100**	0.00000044	0.00000140
Water	80700	10&12 min, total	**0.00000100**	**0.0000010**	**0.0000010**	0.00000051	0.00000063	0.00000051	0.00000200
Water	80701	14&16 min, total	**0.00000110**	**0.0000011**	**0.0000011**	0.00000052	**0.00000110**	0.00000052	0.00000210
Water	80702	18&20 min, total	**0.00000100**	**0.0000010**	**0.0000010**	0.00000063	**0.00000100**	0.00000063	0.00000240
		Site Water							
Water	81594	Sample 1 Total	0.00000058	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	0.00000079
Water	81595	Sample 2 Total	0.00000078	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	0.00000130
Water	81596	Sample 3 Total	0.00000078	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	0.00000110
		Elutriate							
Water	81600	Sample 1 Dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.00000100**	0.00000038	**0.00000100**	0.00000100
Water	81601	Sample 2 Dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.00000100**	0.00000062	**0.00000100**	0.00000071
Water	81602	Sample 3 Dissolved	0.00000049	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	0.00000077
Water	81597	Sample 1 Total	0.00000053	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	0.00000054
Water	81598	Sample 2 Total	0.00000120	**0.0000010**	**0.0000010**	0.00000057	0.00000068	0.00000057	0.00000160
Water	81599	Sample 3 Total	0.00000052	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	0.00000078

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 70	PCB 77	PCB 82	PCB 86	PCB 87	PCB 97	PCB 101
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81715	Sample #2	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81716	Sample #3	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 105	PCB 114	PCB 118	PCB 121	PCB 128	PCB 136	PCB 137
		Detection Limit (mg/l)	0.00000110	0.0000011	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011
		Plume Monitoring							
Water	80834	Background, dissolved	**0.00000110**	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80749	Background, total	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80835	0-10 min, overflow, dissolved	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80836	10-20 min, overflow, dissolved	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80837	20-30 min, overflow, dissolved	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80750	0-10 min, overflow, total	**0.00000110**	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80751	10-20 min, overflow, total	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80752	20-30 min, overflow, total	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80838	0-10 min, non-overflow, dissolve	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80839	10-20 min, non-overflow, dissolve	**0.00000110**	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80840	20-30 min, non-overflow, dissolve	**0.00000110**	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80753	0-10 min, non-overflow, total	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80754	10-20 min, non-overflow, total	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80755	20-30 min, non-overflow, total	**0.00000110**	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80791	9&12 min, dissolved	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	0.0000007	**0.0000010**
Water	80792	15&18 min, dissolved	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80793	21&24 min, dissolved	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80794	27&30 min, dissolved	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80692	3& 6 min, total	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80693	9&12 min, total	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80694	15&18 min, total	0.00000250	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80695	21&24 min, total	0.00000240	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80696	27&30 min, total	0.00000250	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80796	6& 8 min, dissolved	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80797	10&12 min, dissolved	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80798	14&16 min, dissolved	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80799	18&20 min, dissolved	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80698	2& 4 min, total	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80699	6& 8 min, total	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80700	10&12 min, total	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80701	14&16 min, total	**0.00000110**	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80702	18&20 min, total	**0.00000100**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Site Water							
Water	81594	Sample 1 Total	**0.00000100**	**0.0000010**	0.00000054	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81595	Sample 2 Total	0.00000047	**0.0000010**	0.00000097	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81596	Sample 3 Total	**0.00000100**	**0.0000010**	0.00000057	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Elutriate							
Water	81600	Sample 1 Dissolved	0.00000036	**0.0000010**	0.00000062	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81601	Sample 2 Dissolved	0.00000032	**0.0000010**	0.00000046	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81602	Sample 3 Dissolved	0.00000042	**0.0000010**	0.00000065	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81597	Sample 1 Total	**0.00000100**	**0.0000010**	0.00000049	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81598	Sample 2 Total	**0.00000100**	**0.0000010**	0.00000086	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81599	Sample 3 Total	**0.00000100**	**0.0000010**	0.00000049	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 105	PCB 114	PCB 118	PCB 121	PCB 128	PCB 136	PCB 137
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	**0.00033**	**0.00033**	0.00010	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81715	Sample #2	**0.00033**	**0.00033**	0.00016	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81716	Sample #3	**0.00033**	**0.00033**	0.00020	**0.00033**	**0.00033**	**0.00033**	**0.00033**

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

PCBscoar

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 138	PCB 141	PCB 151	PCB 153	PCB 156	PCB 167	PCB 170
		Detection Limit (mg/l)	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110
		Plume Monitoring							
Water	80834	Background, dissolved	**0.0000011**	**0.0000011**	**0.0000011**	0.0000007	**0.0000011**	**0.0000011**	**0.00000110**
Water	80749	Background, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80835	0-10 min, overflow, dissolved	0.0000004	**0.0000010**	**0.0000010**	0.0000009	**0.0000010**	**0.0000010**	**0.00000100**
Water	80836	10-20 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80837	20-30 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	0.0000005	**0.0000010**	**0.0000010**	**0.00000100**
Water	80750	0-10 min, overflow, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80751	10-20 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80752	20-30 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80838	0-10 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80839	10-20 min, non-overflow, dissolve	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80840	20-30 min, non-overflow, dissolve	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80753	0-10 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80754	10-20 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80755	20-30 min, non-overflow, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000010**	**0.0000011**	**0.0000011**	**0.00000110**
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	0.0000006	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80791	9&12 min, dissolved	0.0000005	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80792	15&18 min, dissolved	0.0000006	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80793	21&24 min, dissolved	0.0000007	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80794	27&30 min, dissolved	0.0000014	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80692	3& 6 min, total	0.0000019	**0.0000010**	**0.0000010**	0.0000030	**0.0000010**	**0.0000010**	0.00000074
Water	80693	9&12 min, total	0.0000019	**0.0000010**	**0.0000010**	0.0000028	**0.0000010**	**0.0000010**	**0.00000100**
Water	80694	15&18 min, total	0.0000043	**0.0000010**	**0.0000010**	0.0000048	**0.0000010**	**0.0000010**	0.00000140
Water	80695	21&24 min, total	0.0000034	**0.0000011**	**0.0000011**	0.0000055	**0.0000011**	**0.0000011**	0.00000110
Water	80696	27&30 min, total	0.0000029	**0.0000010**	**0.0000010**	0.0000036	**0.0000010**	**0.0000010**	**0.00000100**
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80796	6& 8 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80797	10&12 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80798	14&16 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80799	18&20 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80698	2& 4 min, total	0.0000018	**0.0000010**	**0.0000010**	0.0000026	**0.0000010**	**0.0000010**	**0.00000100**
Water	80699	6& 8 min, total	0.0000013	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80700	10&12 min, total	0.0000011	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80701	14&16 min, total	0.0000020	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80702	18&20 min, total	0.0000015	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
		Site Water							
Water	81594	Sample 1 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81595	Sample 2 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81596	Sample 3 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
		Elutriate							
Water	81600	Sample 1 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81601	Sample 2 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81602	Sample 3 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81597	Sample 1 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81598	Sample 2 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81599	Sample 3 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 138	PCB 141	PCB 151	PCB 153	PCB 156	PCB 167	PCB 170
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81715	Sample #2	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81716	Sample #3	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 171	PCB 180	PCB 182	PCB 183	PCB 185	PCB 187	PCB 189
		Detection Limit (mg/l)	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
		Plume Monitoring							
Water	80834	Background, dissolved	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80749	Background, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80835	0-10 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80836	10-20 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80837	20-30 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80750	0-10 min, overflow, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80751	10-20 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80752	20-30 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80838	0-10 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80839	10-20 min, non-overflow, dissolve	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80840	20-30 min, non-overflow, dissolve	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80753	0-10 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80754	10-20 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80755	20-30 min, non-overflow, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000010**	**0.0000011**	**0.0000011**	0.0000029
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80791	9&12 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80792	15&18 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80793	21&24 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80794	27&30 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80692	3& 6 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.0000021	**0.0000010**
Water	80693	9&12 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.0000017	**0.0000010**
Water	80694	15&18 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.0000033	**0.0000010**
Water	80695	21&24 min, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80696	27&30 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80796	6& 8 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80797	10&12 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80798	14&16 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80799	18&20 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80698	2& 4 min, total	**0.0000010**	0.0000015	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80699	6& 8 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80700	10&12 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80701	14&16 min, total	**0.0000011**	0.0000024	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80702	18&20 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Site Water							
Water	81594	Sample 1 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81595	Sample 2 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81596	Sample 3 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Elutriate							
Water	81600	Sample 1 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81601	Sample 2 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81602	Sample 3 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81597	Sample 1 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81598	Sample 2 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81599	Sample 3 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 171	PCB 180	PCB 182	PCB 183	PCB 185	PCB 187	PCB 189
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81715	Sample #2	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81716	Sample #3	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 191	PCB 194	PCB 195	PCB 196	PCB 201	PCB 203	PCB 205
		Detection Limit (mg/l)	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
		Plume Monitoring							
Water	80834	Background, dissolved	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80749	Background, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80835	0-10 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80836	10-20 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80837	20-30 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80750	0-10 min, overflow, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80751	10-20 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80752	20-30 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80838	0-10 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80839	10-20 min, non-overflow, dissolve	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80840	20-30 min, non-overflow, dissolve	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80753	0-10 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80754	10-20 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80755	20-30 min, non-overflow, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80791	9&12 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80792	15&18 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80793	21&24 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80794	27&30 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80692	3& 6 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80693	9&12 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80694	15&18 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80695	21&24 min, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80696	27&30 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80796	6& 8 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80797	10&12 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80798	14&16 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80799	18&20 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80698	2& 4 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80699	6& 8 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80700	10&12 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80701	14&16 min, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80702	18&20 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Site Water							
Water	81594	Sample 1 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81595	Sample 2 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81596	Sample 3 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Elutriate							
Water	81600	Sample 1 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81601	Sample 2 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81602	Sample 3 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81597	Sample 1 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81598	Sample 2 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81599	Sample 3 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 191	PCB 194	PCB 195	PCB 196	PCB 201	PCB 203	PCB 205
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81715	Sample #2	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**
Sediment	81716	Sample #3	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**	**0.00033**

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 206	PCB 207	PCB 208	PCB 209	PCB 66	PCB 190	PCB 198
		Detection Limit (mg/l)	0.0000011	0.00000110	0.00000110		0.0000011	0.0000011	0.0000011
		Plume Monitoring							
Water	80834	Background, dissolved	0.0000020	0.00000040	0.00000080	110.02%	**0.0000011**	**0.0000011**	**0.0000011**
Water	80749	Background, total	0.0000015	**0.00000100**	0.00000060	95.61%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80835	0-10 min, overflow, dissolved	0.0000017	**0.00000100**	0.00000050	100.35%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80836	10-20 min, overflow, dissolved	0.0000018	**0.00000100**	0.00000080	110.93%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80837	20-30 min, overflow, dissolved	0.0000020	**0.00000100**	0.00000060	109.27%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80750	0-10 min, overflow, total	0.0000017	**0.00000110**	0.00000070	96.69%	**0.0000011**	**0.0000011**	**0.0000011**
Water	80751	10-20 min, overflow, total	0.0000017	**0.00000100**	0.00000050	89.46%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80752	20-30 min, overflow, total	0.0000017	**0.00000100**	0.00000060	99.52%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80838	0-10 min, non-overflow, dissolve	0.0000020	**0.00000100**	0.00000070	111.00%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80839	10-20 min, non-overflow, dissolve	0.0000019	**0.00000110**	0.00000080	109.59%	**0.0000011**	**0.0000011**	**0.0000011**
Water	80840	20-30 min, non-overflow, dissolve	0.0000022	**0.00000110**	0.00000070	105.27%	**0.0000011**	**0.0000011**	**0.0000011**
Water	80753	0-10 min, non-overflow, total	0.0000017	**0.00000100**	0.00000060	94.00%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80754	10-20 min, non-overflow, total	0.0000016	**0.00000100**	0.00000050	92.43%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80755	20-30 min, non-overflow, total	0.0000017	**0.00000110**	0.00000060	103.87%	**0.0000011**	**0.0000011**	**0.0000011**
		Hopper Inflow Monitoring							
Water	80790	3& 6 min, dissolved	0.0000016	**0.00000100**	0.00000060	102.69%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80791	9&12 min, dissolved	0.0000015	**0.00000100**	0.00000050	93.31%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80792	15&18 min, dissolved	0.0000014	**0.00000100**	0.00000050	83.49%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80793	21&24 min, dissolved	0.0000013	**0.00000100**	**0.00000100**	83.82%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80794	27&30 min, dissolved	0.0000013	**0.00000100**	0.00000040	74.65%	**0.0000011**	**0.0000010**	**0.0000010**
Water	80692	3& 6 min, total	0.0000013	**0.00000100**	**0.00000100**	75.42%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80693	9&12 min, total	0.0000015	**0.00000100**	0.00000040	83.26%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80694	15&18 min, total	0.0000019	**0.00000100**	**0.00000100**	74.76%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80695	21&24 min, total	0.0000022	0.00000130	0.00000048	77.49%	**0.0000011**	**0.0000011**	**0.0000011**
Water	80696	27&30 min, total	0.0000018	0.00000150	0.00000064	61.74%	**0.0000010**	**0.0000010**	**0.0000010**
		Hopper Overflow Monitoring							
Water	80795	2& 4 min, dissolved	0.0000016	**0.00000100**	0.00000050	97.89%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80796	6& 8 min, dissolved	0.0000017	**0.00000100**	0.00000050	99.86%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80797	10&12 min, dissolved	0.0000017	**0.00000100**	0.00000050	100.24%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80798	14&16 min, dissolved	0.0000017	**0.00000100**	0.00000050	105.68%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80799	18&20 min, dissolved	0.0000017	**0.00000100**	0.00000050	105.68%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80698	2& 4 min, total	0.0000016	**0.00000100**	0.00000055	60.08%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80699	6& 8 min, total	0.0000015	**0.00000100**	**0.00000100**	51.08%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80700	10&12 min, total	0.0000031	**0.00000100**	**0.00000100**	145.37%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80701	14&16 min, total	0.0000020	**0.00000110**	**0.00000110**	98.00%	**0.0000011**	**0.0000011**	**0.0000011**
Water	80702	18&20 min, total	0.0000016	**0.00000100**	**0.00000100**	88.00%	**0.0000010**	**0.0000010**	**0.0000010**
		Site Water							
Water	81594	Sample 1 Total	0.0000026	0.00000110	0.00000130	95.54%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81595	Sample 2 Total	0.0000027	0.00000100	0.00000140	100.33%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81596	Sample 3 Total	0.0000024	0.00000085	0.00000120	98.44%	**0.0000010**	**0.0000010**	**0.0000010**
		Elutriate							
Water	81600	Sample 1 Dissolved	0.0000025	0.00000088	0.00000140	110.94%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81601	Sample 2 Dissolved	0.0000022	0.00000083	0.00000120	92.51%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81602	Sample 3 Dissolved	0.0000024	0.00000066	0.00000110	98.83%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81597	Sample 1 Total	0.0000022	0.00000064	0.00000110	97.19%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81598	Sample 2 Total	0.0000021	0.00000051	0.00000097	100.67%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81599	Sample 3 Total	0.0000022	**0.00000100**	0.00000110	103.83%	**0.0000010**	**0.0000010**	**0.0000010**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 206	PCB 207	PCB 208	PCB 209	PCB 66	PCB 190	PCB 198
		Detection Limit (mg/kg)	0.00033	0.00033	0.00033		0.00033	0.00033	0.00033
		Insitu Sediment							
Sediment	81714	Sample #1	0.00019	**0.00033**	0.00015	109.80%	**0.00033**	**0.00033**	**0.00033**
Sediment	81715	Sample #2	0.00044	**0.00033**	**0.00033**	109.30%	**0.00033**	**0.00033**	**0.00033**
Sediment	81716	Sample #3	0.00020	**0.00033**	0.00015	106.21%	**0.00033**	**0.00033**	**0.00033**

BOLD - less than values
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Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 200
		Detection Limit (mg/l)	0.0000011
		Plume Monitoring	
Water	80834	Background, dissolved	**0.0000011**
Water	80749	Background, total	**0.0000010**
Water	80835	0-10 min, overflow, dissolved	**0.0000010**
Water	80836	10-20 min, overflow, dissolved	**0.0000010**
Water	80837	20-30 min, overflow, dissolved	**0.0000010**
Water	80750	0-10 min, overflow, total	**0.0000011**
Water	80751	10-20 min, overflow, total	**0.0000010**
Water	80752	20-30 min, overflow, total	**0.0000010**
Water	80838	0-10 min, non-overflow, dissolve	**0.0000010**
Water	80839	10-20 min, non-overflow, dissolve	**0.0000011**
Water	80840	20-30 min, non-overflow, dissolve	**0.0000011**
Water	80753	0-10 min, non-overflow, total	**0.0000010**
Water	80754	10-20 min, non-overflow, total	**0.0000010**
Water	80755	20-30 min, non-overflow, total	**0.0000011**
		Hopper Inflow Monitoring	
Water	80790	3& 6 min, dissolved	**0.0000010**
Water	80791	9&12 min, dissolved	**0.0000010**
Water	80792	15&18 min, dissolved	**0.0000010**
Water	80793	21&24 min, dissolved	**0.0000010**
Water	80794	27&30 min, dissolved	**0.0000010**
Water	80692	3& 6 min, total	**0.0000010**
Water	80693	9&12 min, total	**0.0000010**
Water	80694	15&18 min, total	**0.0000010**
Water	80695	21&24 min, total	**0.0000011**
Water	80696	27&30 min, total	**0.0000010**
		Hopper Overflow Monitoring	
Water	80795	2& 4 min, dissolved	**0.0000010**
Water	80796	6& 8 min, dissolved	**0.0000010**
Water	80797	10&12 min, dissolved	**0.0000010**
Water	80798	14&16 min, dissolved	**0.0000010**
Water	80799	18&20 min, dissolved	**0.0000010**
Water	80698	2& 4 min, total	**0.0000010**
Water	80699	6& 8 min, total	**0.0000010**
Water	80700	10&12 min, total	**0.0000010**
Water	80701	14&16 min, total	**0.0000011**
Water	80702	18&20 min, total	**0.0000010**
		Site Water	
Water	81594	Sample 1 Total	**0.0000010**
Water	81595	Sample 2 Total	**0.0000010**
Water	81596	Sample 3 Total	**0.0000010**
		Elutriate	
Water	81600	Sample 1 Dissolved	**0.0000010**
Water	81601	Sample 2 Dissolved	**0.0000010**
Water	81602	Sample 3 Dissolved	**0.0000010**
Water	81597	Sample 1 Total	**0.0000010**
Water	81598	Sample 2 Total	**0.0000010**
Water	81599	Sample 3 Total	**0.0000010**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 200
		Detection Limit (mg/kg)	0.00033
		Insitu Sediment	
Sediment	81714	Sample #1	**0.00033**
Sediment	81715	Sample #2	**0.00033**
Sediment	81716	Sample #3	**0.00033**

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tsscoar

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	TSS										TS mg/l
		Detection Limit (mg/l)	4.0									Det Limit	4
		Plume Monitoring Background	10 min	20 min	30 min	40 min	50 min					Plume Monitoring Background	34
Water	81134	TSS Top Depth	8.5	28.0	7.5	25.0	8.0						
Water	81135	TSS Mid-Depth	10.5	10.0	10.0	9.5	9.0						
Water	81137	TSS Bottom Depth	14.0	12.5	11.0	31.5	13.0						
		Plume Monitoring Non-Overflow	1 min	3 min	5 min	7 min	9 min	12 min	15 min	20 min	25 min	30 min	Plume Monitoring NOF
Water	81179	TSS Top Depth	11.5	12.0	10.5	10.0	9.5	12.0	12.0	8.0	12.0	12.0	Sample 1 33544
Water	81180	TSS Mid-Depth	12.5	16.0	10.0	11.0	11.0	21.0	17.5	21.0	29.0	8.5	Sample 2 31586
Water	81181	TSS Bottom Depth	10.5	17.5	15.5	12.0	27.0	29.0	15.5	26.5	11.5	13.0	Sample 3 32556
		Plume Monitoring Overflow	1 min	3 min	5 min	7 min	9 min	12 min	15 min	20 min	25 min	30 min	Plume Monitoring OF
Water	81149	TSS Top Depth	8.0	6.0	24.5	10.5	9.0	9.0	15.5	14.0	24.0	14.5	Sample 1 40788
Water	81150	TSS Mid-Depth	8.5	32.0	10.5	10.0	10.0	12.5	20.0	18.5	13.5	16.0	Sample 2 40476
Water	81151	TSS Bottom Depth	13.5	26.0	12.5	12.0	12.5	18.0	19.0	15.0	14.0	14.5	Sample 3 32490
		Hopper Inflow	3 min	6 min	9 min	12 min	15 min	18 min	21 min	24 min	27 min	30 min	Hopper Inflow
Water	81314	TSS (mg/l)	1840	1890	1310	1220	640	1300	1320	1045	2040	26160	Sample 1 35080
													Sample 2 34753
													Sample 3 34980
													Sample 4 37973
													Sample 5 40853
		Hopper Contents Beginning of Overflow	Location 1	Location 2	Location 3								
Water	81334	TSS Top Depth	14000	870	1827								
Water	81335	TSS Mid-Depth	6470	1290	1395								
Water	81336	TSS Bottom Depth	2880	1300	1600								
		Hopper Contents End of Overflow	Location 1	Location 2	Location 3								
Water	81343	TSS Top Depth	690	837	1290								
Water	81344	TSS Mid-Depth	807	14610	303								
Water	81345	TSS Bottom Depth	633	867	857								
		Hopper Overflow	0.5 min	1.0 min	1.5 min	2.0 min	2.5 min	3.0 min	3.5 min	4.0 min	4.5 min	5.0 min	Hopper Overflow
Water	81004	TSS (mg/l)	926	920	982	2808	836	862	800	800	1416	1048	Sample 1 39427
													Sample 2 35180
		Hopper Overflow	5.5 min	6.0 min	6.5 min	7.0 min	7.5 min	8.0 min	8.5 min	9.0 min	9.5 min	10.0 min	Sample 3 42653
Water	81014	TSS (mg/l)	986	970	728	690	800	1046	790	820	760	1184	Sample 4 34600
													Sample 5 35127
		Hopper Overflow	10.5 min	11.0 min	11.5 min	12.0 min	12.5 min	13.0 min	13.5 min	14.0 min	14.5 min	15.0 min	
Water	81024	TSS (mg/l)	952	638	634	772	954	732	668	642	788	688	
		Hopper Overflow	15.5 min	16.0 min	16.5 min	17.0 min	17.5 min	18.0 min	18.5 min	19.0 min	19.5 min	20.0 min	
Water	81034	TSS (mg/l)	722	894	1424	1076	914	1112	2090	2468	8084	9590	
			TSS										TS
		Site Water											Site Water
Water	81666	Sample 1 Total	38										Sample 1 T 31216
Water	81667	Sample 2 Total	22										Sample 2 T 30896
Water	81668	Sample 3 Total	22										Sample 3 T 30662
		Elutriate											Elutriate
Water	81672	Sample 1 Dissolved	11										Sample 1 D 30900
Water	81673	Sample 2 Dissolved	16										Sample 2 D 30870
Water	81674	Sample 3 Dissolved	9										Sample 3 D 30624
Water	81669	Sample 1 Total	59										Sample 1 T 30720
Water	81670	Sample 2 Total	32										Sample 2 T 30862
Water	81671	Sample 3 Total	21										Sample 3 T 31016

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nutrcoar

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	TOC
		Detection Limit (mg/l)	3.00
		Plume Monitoring	
Water	80820	Background, dissolved	5.67
Water	80728	Background, total	8.00
Water	80821	0-10 min, overflow, dissolved	8.98
Water	80822	10-20 min, overflow, dissolved	11.30
Water	80823	20-30 min, overflow, dissolved	9.35
Water	80729	0-10 min, overflow, total	7.92
Water	80730	10-20 min, overflow, total	7.59
Water	80731	20-30 min, overflow, total	8.86
Water	80824	0-10 min, non-overflow, dissolved	10.20
Water	80825	10-20 min, non-overflow, dissolved	10.30
Water	80826	20-30 min, non-overflow, dissolved	10.10
Water	80732	0-10 min, non-overflow, total	6.80
Water	80733	10-20 min, non-overflow, total	10.30
Water	80734	20-30 min, non-overflow, total	8.52
		Hopper Inflow Monitoring	
Water	80770	3& 6 min, dissolved	14.80
Water	80771	9&12 min, dissolved	3.45
Water	80772	15&18 min, dissolved	13.50
Water	80773	21&24 min, dissolved	14.50
Water	80774	27&30 min, dissolved	16.20
Water	80656	3& 6 min, total	216.00
Water	80657	9&12 min, total	46.80
Water	80658	15&18 min, total	16.50
Water	80659	21&24 min, total	28.60
Water	80660	27&30 min, total	54.20
		Hopper Overflow Monitoring	
Water	80775	2& 4 min, dissolved	12.40
Water	80776	6& 8 min, dissolved	11.20
Water	80777	10&12 min, dissolved	13.80
Water	80778	14&16 min, dissolved	11.80
Water	80779	18&20 min, dissolved	16.60
Water	80662	2& 4 min, total	41.90
Water	80663	6& 8 min, total	4.56
Water	80664	10&12 min, total	12.10
Water	80665	14&16 min, total	70.00
Water	80666	18&20 min, total	59.40
		Site Water	
Water	81684	Sample 1 Total	5.12
Water	81685	Sample 2 Total	1.21
Water	81686	Sample 3 Total	**3.00**
		Elutnate	
Water	81690	Sample 1 Dissolved	1.07
Water	81691	Sample 2 Dissolved	**3.00**
Water	81692	Sample 3 Dissolved	**3.00**
Water	81687	Sample 1 Total	1.32
Water	81688	Sample 2 Total	**3.00**
Water	81689	Sample 3 Total	**3.00**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	TOC
		Detection Limit (mg/kg)	3.0
		Insitu Sediment	
Sediment	81720	Sample #1	174.0
Sediment	81721	Sample #2	155.0
Sediment	81722	Sample #3	170.0

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

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spgrcoar

Delaware River Water Analysis (Coarse-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	Sp. Gr.	%Moisture
		Insitu Sediment		
Sediment	81209	Sample #1	2.71	22.57%
Sediment	81210	Sample #2	2.70	25.39%
Sediment	81211	Sample #3	2.71	22.00%
Sediment	81212	Sample #4	2.71	23.83%
Sediment	81213	Sample #5	2.71	21.04%
Sediment	81214	Sample #6	2.72	20.33%
Sediment	81215	Sample #7	2.71	20.06%
Sediment	81216	Sample #8	2.72	21.82%
Sediment	81217	Sample #9	2.72	21.30%
Sediment	81218	Sample #10	2.72	19.87%
Sediment	81219	Sample #11	2.74	23.49%
Sediment	81220	Sample #12	2.74	20.47%
Sediment	81221	Sample #13	2.73	23.70%
Sediment	81222	Sample #14	2.74	20.90%
Sediment	81223	Sample #15	2.73	21.95%
		Average	2.72	21.91%

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Metsfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	SB	AS	BE	CD	CR	CU	PB	HG
		Detection Limit (mg/l)	0.0030	0.002	0.002	0.0002	0.002	0.001	0.0010	0.0002
		Plume Monitoring								
Water	80976	Background, dissolved	**0.0030**	0.007	**0.001**	**0.0002**	**0.002**	0.004	0.0045	**0.0002**
Water	80934	Background, total	**0.0030**	0.011	**0.001**	**0.0002**	0.006	0.004	0.0060	0.0002
Water	80977	0-10 min, overflow, dissolved	**0.0030**	0.006	**0.001**	**0.0002**	**0.002**	**0.001**	**0.0010**	**0.0002**
Water	80978	10-20 min, overflow, dissolved	**0.0030**	0.006	**0.001**	**0.0002**	**0.002**	**0.001**	**0.0010**	**0.0002**
Water	90979	20-30 min, overflow, dissolved	**0.0030**	0.006	**0.001**	**0.0002**	**0.002**	0.003	0.0010	**0.0002**
Water	80935	0-10 min, overflow, total	**0.0030**	0.011	**0.001**	**0.0002**	0.019	0.009	0.0190	**0.0002**
Water	80936	10-20 min, overflow, total	**0.0030**	0.013	**0.001**	**0.0002**	0.018	0.008	0.0160	**0.0002**
Water	80937	20-30 min, overflow, total	**0.0030**	0.011	**0.001**	**0.0002**	0.012	0.004	0.0100	**0.0002**
Water	80980	0-10 min, non-overflow, dissolved	**0.0030**	0.008	**0.001**	**0.0002**	**0.002**	0.003	0.0010	**0.0002**
Water	80981	10-20 min, non-overflow, dissolved	**0.0030**	0.008	**0.001**	**0.0002**	**0.002**	0.003	0.0017	**0.0002**
Water	80982	20-30 min, non-overflow, dissolved	**0.0030**	0.008	**0.001**	**0.0002**	**0.002**	0.001	0.0010	**0.0002**
Water	80938	0-10 min, non-overflow, total	**0.0030**	0.011	**0.001**	**0.0002**	0.004	0.001	0.0020	**0.0002**
Water	90939	10-20 min, non-overflow, total	**0.0030**	0.010	**0.001**	**0.0002**	0.004	0.008	0.0030	**0.0002**
Water	80940	20-30 min, non-overflow, total	**0.0030**	0.011	**0.001**	**0.0002**	0.003	0.005	0.0030	**0.0002**
		Hopper Inflow Monitoring								
Water	81094	3& 6 min, dissolved	**0.0030**	0.009	**0.001**	**0.0002**	**0.002**	**0.001**	0.0015	**0.0002**
Water	81095	9&12 min, dissolved	**0.0030**	0.019	**0.001**	**0.0002**	**0.002**	**0.001**	0.0017	**0.0002**
Water	81096	15&18 min, dissolved	**0.0030**	0.023	**0.001**	**0.0002**	0.002	**0.001**	0.0011	**0.0002**
Water	81097	21&24 min, dissolved	**0.0030**	0.009	**0.001**	**0.0002**	**0.002**	**0.001**	0.0011	**0.0002**
Water	81098	27&30 min, dissolved	**0.0030**	0.019	**0.001**	**0.0002**	**0.002**	**0.001**	**0.0010**	**0.0002**
Water	80867	3& 6 min, total	0.0156	0.392	0.040	0.0206	1.810	1.080	1.7800	0.0019
Water	80868	9&12 min, total	0.0504	0.844	0.088	0.0527	3.980	2.520	4.4000	0.0182
Water	80869	15&18 min, total	0.0870	1.470	0.140	0.0974	6.550	4.120	7.7500	0.0422
Water	80870	21&24 min, total	0.0288	0.528	0.056	0.0376	2.510	1.580	2.6800	0.0110
Water	80871	27&30 min, total	0.1090	1.990	0.210	0.1750	9.600	6.900	12.0000	0.0578
		Hopper Overflow Monitoring								
Water	81099	2& 4 min, dissolved	**0.0030**	0.009	**0.001**	**0.0002**	**0.002**	**0.001**	0.0012	**0.0002**
Water	81100	6& 8 min, dissolved	**0.0030**	0.009	**0.001**	**0.0002**	**0.002**	**0.001**	0.0010	**0.0002**
Water	81101	10&12 min, dissolved	**0.0030**	0.008	**0.001**	**0.0002**	**0.002**	**0.001**	0.0011	**0.0002**
Water	81102	14&16 min, dissolved	**0.0030**	0.010	**0.001**	**0.0002**	**0.002**	**0.001**	0.0016	**0.0002**
Water	81103	18&20 min, dissolved	**0.0030**	0.010	**0.001**	**0.0002**	**0.002**	**0.001**	0.0010	**0.0002**
Water	80873	2& 4 min, total	0.0895	1.460	0.145	0.0061	6.700	4.410	7.9500	0.0354
Water	80874	6& 8 min, total	0.0950	1.440	0.140	0.0055	6.640	4.300	7.9000	0.0281
Water	80875	10&12 min, total	0.0840	1.290	0.130	0.0899	6.000	4.000	6.0500	0.0244
Water	80876	14&16 min, total	0.0905	1.640	0.160	0.1260	7.550	5.100	7.6000	0.0360
Water	80877	18&20 min, total	0.0815	1.600	0.160	0.1170	7.450	4.980	7.9500	0.0372
		Site Water								
Water	81657	Sample 1 Total	0.0030	0.010	**0.001**	**0.0002**	0.005	0.005	0.0040	**0.0002**
Water	81658	Sample 2 Total	**0.0030**	0.009	**0.001**	**0.0002**	0.004	0.004	0.0060	**0.0002**
Water	81659	Sample 3 Total	**0.0030**	**0.002**	**0.001**	**0.0002**	0.004	**0.001**	**0.0010**	**0.0002**
		Elutriate								
Water	81663	Sample 1 Dissolved	**0.0030**	0.011	**0.001**	**0.0002**	**0.002**	0.002	**0.0010**	**0.0002**
Water	81664	Sample 2 Dissolved	**0.0030**	0.010	**0.001**	**0.0002**	**0.002**	0.002	**0.0010**	**0.0002**
Water	81665	Sample 3 Dissolved	**0.0030**	0.009	**0.001**	**0.0002**	**0.002**	0.003	**0.0010**	**0.0002**
Water	81660	Sample 1 Total	**0.0030**	0.015	**0.001**	**0.0002**	0.024	0.007	0.0140	**0.0002**
Water	81661	Sample 2 Total	**0.0030**	0.014	0.001	**0.0002**	0.025	0.007	0.0140	**0.0002**
Water	81662	Sample 3 Total	**0.0030**	0.014	0.001	**0.0002**	0.024	0.009	0.0130	**0.0002**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	SB	AS	BE	CD	CR	CU	PB	HG
		Detection Limit (mg/kg)	0.30	0.2	0.1	0.020	0.2	0.1	1.0	0.020
		Insitu Sediment								
Sediment	81729	Sample #1	0.36	10.3	0.9	0.300	41.4	16.2	32.1	0.154
Sediment	81730	Sample #2	0.49	10.7	0.9	0.310	42.2	16.8	34.2	0.152
Sediment	81731	Sample #3	0.37	10.1	0.8	0.280	41.0	16.2	32.4	0.166

SB - Antimony AS - Arsenic BE - Beryllium CD - Cadmium CR - Chromium CU - Copper PB - Lead HG - Mercury
BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

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Metsfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	NI	SE	AG	TL	ZN	AL	BA	CA
		Detection Limit (mg/l)	0.001	0.002	0.001	0.0020	0.010	0.025	0.002	0.200
		Plume Monitoring								
Water	80976	Background, dissolved	0.001	0.019	**0.001**	**0.0020**	0.053	**0.025**	0.223	70.2
Water	80934	Background, total	0.004	0.025	**0.001**	**0.0020**	0.071	2.900	0.050	67.4
Water	80977	0-10 min, overflow, dissolved	**0.001**	0.013	0.001	**0.0020**	0.014	**0.025**	0.094	57.1
Water	80978	10-20 min, overflow, dissolved	**0.001**	0.013	0.001	**0.0020**	0.013	**0.025**	0.086	58.3
Water	90979	20-30 min, overflow, dissolved	**0.001**	0.014	**0.001**	**0.0020**	0.013	**0.025**	0.089	53.1
Water	80935	0-10 min, overflow, total	0.007	0.019	0.001	**0.0020**	0.059	7.920	0.061	56.5
Water	80936	10-20 min, overflow, total	0.008	0.023	0.001	**0.0020**	0.060	7.640	0.065	57.7
Water	80937	20-30 min, overflow, total	0.004	0.021	0.001	**0.0020**	0.036	5.140	0.048	53.8
Water	80980	0-10 min, non-overflow, dissolved	0.001	0.021	**0.001**	**0.0020**	0.058	**0.025**	0.245	70.9
Water	80981	10-20 min, non-overflow, dissolved	0.001	0.023	**0.001**	0.0021	0.046	**0.025**	0.193	69.6
Water	80982	20-30 min, non-overflow, dissolved	**0.001**	0.021	**0.001**	**0.0020**	0.048	**0.025**	0.207	70.8
Water	80938	0-10 min, non-overflow, total	0.001	0.027	**0.001**	**0.0020**	0.013	1.800	0.170	70.6
Water	90939	10-20 min, non-overflow, total	0.003	0.027	0.001	**0.0020**	0.017	2.160	0.040	67.6
Water	80940	20-30 min, non-overflow, total	0.003	0.028	0.001	**0.0020**	0.010	1.790	0.038	66.1
		Hopper Inflow Monitoring								
Water	81094	3& 6 min, dissolved	0.003	0.015	**0.001**	**0.0020**	0.074	0.025	0.435	82.7
Water	81095	9&12 min, dissolved	0.004	0.015	0.002	**0.0020**	0.084	0.092	0.549	93.8
Water	81096	15&18 min, dissolved	0.005	0.014	0.001	**0.0020**	0.076	0.033	0.529	111.0
Water	81097	21&24 min, dissolved	0.003	0.014	0.001	**0.0020**	0.057	0.028	0.380	73.4
Water	81098	27&30 min, dissolved	0.005	0.015	0.001	**0.0020**	0.089	**0.025**	0.636	108.0
Water	80867	3& 6 min, total	0.912	0.068	0.004	0.0110	5.880	744.0	3.000	178.0
Water	80868	9&12 min, total	1.950	0.116	0.076	0.0160	13.300	1856.0	6.440	392.0
Water	80869	15&18 min, total	3.240	0.180	0.098	0.0310	21.400	3320.0	10.200	640.0
Water	80870	21&24 min, total	1.270	0.084	0.044	0.0110	8.760	1110.0	4.200	241.0
Water	80871	27&30 min, total	4.750	0.255	0.150	0.0540	34.800	5440.0	16.800	1000.0
		Hopper Overflow Monitoring								
Water	81099	2& 4 min, dissolved	0.005	0.015	**0.001**	**0.0020**	0.145	**0.025**	0.607	117.0
Water	81100	6& 8 min, dissolved	0.005	0.015	**0.001**	**0.0020**	0.157	**0.025**	0.713	121.0
Water	81101	10&12 min, dissolved	0.005	0.015	0.001	**0.0020**	0.130	**0.025**	0.748	112.0
Water	81102	14&16 min, dissolved	0.005	0.013	**0.001**	**0.0020**	0.138	**0.025**	0.749	119.0
Water	81103	18&20 min, dissolved	0.004	0.013	0.002	**0.0020**	0.085	**0.025**	0.551	116.0
Water	80873	2& 4 min, total	3.350	0.010	0.007	0.0020	23.400	3450.0	11.000	590.0
Water	80874	6& 8 min, total	3.310	0.010	0.005	0.0020	22.900	3080.0	10.700	615.0
Water	80875	10&12 min, total	3.030	0.141	0.053	0.0230	21.200	2860.0	10.000	565.0
Water	80876	14&16 min, total	3.820	0.195	0.114	0.0340	27.100	3930.0	12.800	745.0
Water	80877	18&20 min, total	3.760	0.191	0.078	0.0360	26.800	3740.0	12.500	760.0
		Site Water								
Water	81657	Sample 1 Total	0.002	0.026	0.003	**0.0020**	0.019	2.330	0.043	59.7
Water	81658	Sample 2 Total	0.003	0.024	0.002	**0.0020**	0.019	2.060	0.042	60.7
Water	81659	Sample 3 Total	**0.001**	**0.002**	**0.002**	**0.0020**	0.018	2.340	0.042	60.2
		Elutriate								
Water	81663	Sample 1 Dissolved	0.003	0.028	**0.001**	**0.0020**	0.073	0.185	0.280	65.8
Water	81664	Sample 2 Dissolved	0.002	0.024	**0.001**	**0.0020**	0.075	0.118	0.209	67.6
Water	81665	Sample 3 Dissolved	0.002	0.021	0.002	**0.0020**	0.076	0.105	0.214	66.1
Water	81660	Sample 1 Total	0.011	0.030	0.002	**0.0020**	0.075	12.900	0.104	61.3
Water	81661	Sample 2 Total	0.011	0.028	0.002	**0.0020**	0.074	13.200	0.107	62.8
Water	81662	Sample 3 Total	0.012	0.030	0.002	**0.0020**	0.072	13.000	0.113	61.9

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	NI	SE	AG	TL	ZN	AL	BA	CA
		Detection Limit (mg/kg)	0.5	0.20	0.100	0.200	1	1	0.1	20
		Insitu Sediment								
Sediment	81729	Sample #1	21.7	1.60	0.700	**0.200**	131	13300	51.4	2180
Sediment	81730	Sample #2	22.2	1.60	0.700	**0.200**	133	13800	53.5	2260
Sediment	81731	Sample #3	21.5	1.70	0.649	**0.200**	130	13000	51.7	2230

NI - Nickel SE - Selenium AG - Silver TL - Thallium ZN - Zinc AL - Aluminum BA - Barium CA - Calcium
BOLD - less than values
Values below less than values are estimated results Results are less than the reporting limit

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Metsfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	CO	FE	MG	MN	K	NA	V
		Detection Limit (mg/l)	0.002	0.020	0.200	0.001	0.20	0.20	0.002
		Plume Monitoring							
Water	80976	Background, dissolved	**0.001**	**0.020**	180	0.002	56.4	1540	0.004
Water	80934	Background, total	**0.001**	2.420	162	0.118	49.6	1350	0.008
Water	80977	0-10 min, overflow, dissolved	**0.001**	**0.020**	121	0.062	41.8	1030	0.003
Water	80978	10-20 min, overflow, dissolved	**0.001**	**0.020**	116	0.027	41.1	973	0.003
Water	90979	20-30 min, overflow, dissolved	**0.001**	**0.020**	112	0.010	36.4	942	0.003
Water	80935	0-10 min, overflow, total	0.002	9.710	120	0.465	37.6	916	0.020
Water	80936	10-20 min, overflow, total	0.002	9.260	121	0.450	38.5	920	0.020
Water	80937	20-30 min, overflow, total	**0.001**	5.730	109	0.278	34.0	857	0.013
Water	80980	0-10 min, non-overflow, dissolved	**0.001**	0.027	179	0.011	57.8	1570	0.003
Water	80981	10-20 min, non-overflow, dissolved	**0.001**	**0.020**	171	0.011	55.6	1520	0.003
Water	80982	20-30 min, non-overflow, dissolved	**0.001**	**0.020**	160	0.005	55.7	1380	0.002
Water	80938	0-10 min, non-overflow, total	**0.001**	1.420	180	0.073	54.9	1470	0.006
Water	90939	10-20 min, non-overflow, total	**0.001**	1.820	175	0.098	53.8	1370	0.007
Water	80940	20-30 min, non-overflow, total	**0.001**	1.140	159	0.061	48.8	1280	0.006
		Hopper Inflow Monitoring							
Water	81094	3& 6 min, dissolved	0.002	0.928	150	7.600	45.1	1240	**0.001**
Water	81095	9&12 min, dissolved	0.004	6.850	144	9.200	38.9	1030	0.001
Water	81096	15&18 min, dissolved	0.006	10.200	148	11.200	36.1	1030	0.001
Water	81097	21&24 min, dissolved	0.004	0.467	123	3.840	40.0	1060	**0.001**
Water	81098	27&30 min, dissolved	0.006	11.600	127	6.920	33.6	940	0.002
Water	80867	3& 6 min, total	0.480	1,160.0	370	58.0	160.0	1070	1.800
Water	80868	9&12 min, total	1.030	2,860.0	725	132.0	289.0	1104	3.950
Water	80869	15&18 min, total	1.700	5,130.0	1180	244.0	451.0	1060	6.550
Water	80870	21&24 min, total	0.684	1,630.0	476	74.8	188.0	1020	3.130
Water	80871	27&30 min, total	2.510	9,200.0	1830	412.0	700.0	970	9.650
		Hopper Overflow Monitoring							
Water	81099	2& 4 min, dissolved	0.004	2.930	151	9.580	32.9	1000	**0.001**
Water	81100	6& 8 min, dissolved	0.004	3.600	153	9.500	33.4	1030	**0.001**
Water	81101	10&12 min, dissolved	0.005	5.980	133	7.310	32.3	956	**0.001**
Water	81102	14&16 min, dissolved	0.006	10.900	140	6.460	30.0	932	**0.001**
Water	81103	18&20 min, dissolved	0.006	6.410	133	6.810	32.5	895	**0.001**
Water	80873	2& 4 min, total	1.760	4,750.0	1,040	225.0	474.0	885	6.650
Water	80874	6& 8 min, total	1.740	2,700.0	1,060	224.0	389.0	970	6.600
Water	80875	10&12 min, total	1.620	4,160.0	965	197.0	415.0	960	5.900
Water	80876	14&16 min, total	2.030	5,600.0	1,205	265.0	520.0	930	7.400
Water	80877	18&20 min, total	1.980	6,150.0	1,320	287.0	510.0	960	7.350
		Site Water							
Water	81657	Sample 1 Total	0.002	2.420	135	0.120	39.80	1130	0.007
Water	81658	Sample 2 Total	**0.002**	2.370	134	0.121	36.90	1140	0.007
Water	81659	Sample 3 Total	0.002	2.470	133	0.119	38.30	1130	0.008
		Elutriate							
Water	81663	Sample 1 Dissolved	0.003	0.043	146	8.280	40.40	1140	0.006
Water	81664	Sample 2 Dissolved	0.002	0.042	153	8.100	40.40	1180	0.007
Water	81665	Sample 3 Dissolved	0.002	0.037	144	8.310	36.40	1160	0.007
Water	81660	Sample 1 Total	0.008	12.900	61	8.160	36.70	1060	0.032
Water	81661	Sample 2 Total	0.008	13.200	140	8.360	37.70	1060	0.034
Water	81662	Sample 3 Total	0.008	13.000	136	8.430	33.00	1020	0.034

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	CO	FE	MG	MN	K	NA	V	% Moisture
		Detection Limit (mg/kg)	0.1	2	20	0.1	20	20	0.1	
		Insitu Sediment								
Sediment	81729	Sample #1	11.1	25,300	5,050	1,070.0	2,290	2110	33.8	65.6
Sediment	81730	Sample #2	11.2	26,200	5,120	1,130.0	2,380	2160	42.6	65.6
Sediment	81731	Sample #3	11.0	25,200	5,070	1,120.0	2,350	2140	37.1	65.6

CO - Cobalt FE - Iron MG - Magnesium MN - Manganese K - Potassium NA - Sodium V - Vanadium
BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

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PAHsfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	NAPHTH	ACENAY	ACENAP	FLUORE	PHENAN	ANTRAC	FLANTHE
		Detection Limit (mg/l)	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
		Plume Monitoring							
Water	80997	Background, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80962	Background, total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80998	0-10 min, overflow, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80999	10-20 min, overflow, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81000	20-30 min, overflow, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80963	0-10 min, overflow, total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80964	10-20 min, overflow, total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80965	20-30 min, overflow, total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81001	0-10 min, non-overflow, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81002	10-20 min, non-overflow, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81003	20-30 min, non-overflow, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80966	0-10 min, non-overflow, total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80967	10-20 min, non-overflow, total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80968	20-30 min, non-overflow, total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
		Hopper Inflow Monitoring							
Water	81124	3& 6 min, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81125	9&12 min, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81126	15&18 min, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81127	21&24 min, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81128	27&30 min, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80915	3& 6 min, total	0.00043	**0.00030**	**0.00030**	0.00014	0.00054	0.00031	0.00221
Water	80916	9&12 min, total	0.00110	**0.00030**	0.00029	0.00057	0.00349	0.00103	0.00758
Water	80917	15&18 min, total	0.00057	**0.00030**	0.00017	0.00036	0.00217	0.00061	0.00484
Water	80918	21&24 min, total	0.00053	**0.00030**	0.00012	0.00023	0.00158	0.00048	0.00370
Water	80919	27&30 min, total	0.00183	0.00015	0.00047	0.00085	0.00582	0.00183	0.01320
		Hopper Overflow Monitoring							
Water	81129	2& 4 min, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81130	6& 8 min, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81131	10&12 min, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81132	14&16 min, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81133	18&20 min, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80921	2& 4 min, total	0.00120	0.00011	0.00031	0.00051	0.00377	0.00104	0.00900
Water	80922	6& 8 min, total	0.00121	0.00012	0.00042	0.00068	0.00529	0.00311	0.01260
Water	80923	10&12 min, total	0.00062	**0.00030**	0.00020	0.00054	0.00325	0.00083	0.00838
Water	80924	14&16 min, total	0.00052	**0.00030**	0.00015	0.00047	0.00267	0.00074	0.00657
Water	80925	18&20 min, total	0.00257	0.00023	0.00073	0.00124	0.00923	0.00259	0.02030
		Site Water							
Water	81639	Sample 1 Total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81640	Sample 2 Total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81641	Sample 3 Total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
		Elutriate							
Water	81645	Sample 1 Dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81646	Sample 2 Dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81647	Sample 3 Dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81642	Sample 1 Total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	0.00012
Water	81643	Sample 2 Total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	0.00011
Water	81644	Sample 3 Total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	0.00010

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	NAPHTH	ACENAY	ACENAP	FLUORE	PHENAN	ANTRAC	FLANTHE
		Detection Limit (mg/kg)	0.0220	0.022	0.022	0.022	0.0220	0.0220	0.022
		Insitu Sediment							
Sediment	81705	Sample #1	0.0640	**0.022**	**0.022**	0.015	0.0921	0.0367	0.188
Sediment	81706	Sample #2	0.0591	**0.022**	**0.022**	0.014	0.0800	0.0303	0.126
Sediment	81707	Sample #3	0.0581	**0.022**	**0.022**	0.015	0.0828	0.0327	0.136

NAPHTH - Naphthalene ACENAY - Acenaphthylene ACENAP - Acenaphthene FLUORE - Fluorene PHENAN - Phenanthrene
ANTRAC - Anthracene FLANTHE - Fluoranthene
BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit

PAHsfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PYRENE	CHRYSE	BAANTHR	BBFLANT	BKFLANT	BAPYRE	I123PYR
		Detection Limit (mg/l)	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
		Plume Monitoring							
Water	80997	Background, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80962	Background, total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80998	0-10 min, overflow, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80999	10-20 min, overflow, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81000	20-30 min, overflow, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80963	0-10 min, overflow, total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80964	10-20 min, overflow, total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80965	20-30 min, overflow, total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81001	0-10 min, non-overflow, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81002	10-20 min, non-overflow, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81003	20-30 min, non-overflow, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80966	0-10 min, non-overflow, total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80967	10-20 min, non-overflow, total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80968	20-30 min, non-overflow, total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
		Hopper Inflow Monitoring							
Water	81124	3& 6 min, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81125	9&12 min, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81126	15&18 min, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81127	21&24 min, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81128	27&30 min, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80915	3& 6 min, total	0.00227	0.00159	0.00118	0.00177	0.00120	0.00088	0.00309
Water	80916	9&12 min, total	0.00782	0.00547	0.00451	0.00492	0.00385	0.00519	0.00549
Water	80917	15&18 min, total	0.00465	0.00341	0.00276	0.00371	0.00227	0.00360	0.00436
Water	80918	21&24 min, total	0.00364	0.00256	0.00204	0.00236	0.00183	0.00246	0.00255
Water	80919	27&30 min, total	0.01400	0.00948	0.00841	0.00785	0.00629	0.00838	0.00701
		Hopper Overflow Monitoring							
Water	81129	2& 4 min, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81130	6& 8 min, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81131	10&12 min, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81132	14&16 min, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81133	18&20 min, dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	80921	2& 4 min, total	0.00903	0.00642	0.00576	0.00548	0.00433	0.00614	0.00542
Water	80922	6& 8 min, total	0.01270	0.00907	0.00868	0.00823	0.00614	0.00838	0.00741
Water	80923	10&12 min, total	0.00711	0.00643	0.00543	0.00653	0.00438	0.00596	0.00579
Water	80924	14&16 min, total	0.00611	0.00566	0.00472	0.00555	0.00437	0.00619	0.00547
Water	80925	18&20 min, total	0.02000	0.01380	0.01290	0.01160	0.00953	0.01220	0.01050
		Site Water							
Water	81639	Sample 1 Total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81640	Sample 2 Total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81641	Sample 3 Total	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
		Elutriate							
Water	81645	Sample 1 Dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81646	Sample 2 Dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81647	Sample 3 Dissolved	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81642	Sample 1 Total	0.00010	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81643	Sample 2 Total	0.00010	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**
Water	81644	Sample 3 Total	0.00009	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**	**0.00030**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PYRENE	CHRYSE	BAANTHR	BBFLANT	BKFLANT	BAPYRE	I123PYR
		Detection Limit (mg/kg)	0.022	0.022	0.0220	0.0220	0.0220	0.0220	0.0220
		Insitu Sediment							
Sediment	81705	Sample #1	0.196	0.145	0.1290	0.0871	0.1090	0.1120	0.0899
Sediment	81706	Sample #2	0.146	0.107	0.0865	0.0742	0.0850	0.0793	0.0699
Sediment	81707	Sample #3	0.150	0.108	0.0858	0.0770	0.0727	0.0828	0.0749

PYRENE - Pyrene CHRYSE - Chrysene BAANTHR - Benxo(a)Anthracene BBFLANT - Benzo(b)Fluoranthene
BKFLANT - Benzo(k)Fluoranthene BAPYRE - Benzo(a)Pyrene I123PYR - Indeno(1,2,3-C,D)Pyrene
BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit

PAHsfine

Delaware River Water Analysis (Plume Monitoring)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	DBAHANT	B-GHI-PY	2MeNAPH	2FIBP-S	PTERP-S
		Detection Limit (mg/l)	0.00030	0.00030	0.00030		
		Plume Monitoring					
Water	80997	Background, dissolved	**0.00030**	**0.00030**	**0.00030**	56.0%	84.1%
Water	80962	Background, total	**0.00030**	**0.00030**	**0.00030**	73.2%	85.1%
Water	80998	0-10 min, overflow, dissolved	**0.00030**	**0.00030**	**0.00030**	64.7%	87.3%
Water	80999	10-20 min, overflow, dissolved	**0.00030**	**0.00030**	**0.00030**	83.0%	87.8%
Water	81000	20-30 min, overflow, dissolved	**0.00030**	**0.00030**	**0.00030**	65.1%	81.5%
Water	80963	0-10 min, overflow, total	**0.00030**	**0.00030**	**0.00030**	63.2%	79.3%
Water	80964	10-20 min, overflow, total	**0.00030**	**0.00030**	**0.00030**	63.4%	85.5%
Water	80965	20-30 min, overflow, total	**0.00030**	**0.00030**	**0.00030**	58.7%	88.4%
Water	81001	0-10 min, non-overflow, dissolved	**0.00030**	**0.00030**	**0.00030**	69.4%	84.7%
Water	81002	10-20 min, non-overflow, dissolved	**0.00030**	**0.00030**	**0.00030**	63.4%	87.5%
Water	81003	20-30 min, non-overflow, dissolved	**0.00030**	**0.00030**	**0.00030**	61.6%	86.0%
Water	80966	0-10 min, non-overflow, total	**0.00030**	**0.00030**	**0.00030**	66.5%	91.6%
Water	80967	10-20 min, non-overflow, total	**0.00030**	**0.00030**	**0.00030**	68.1%	88.6%
Water	80968	20-30 min, non-overflow, total	**0.00030**	**0.00030**	**0.00030**	87.1%	90.5%
		Hopper Inflow Monitoring					
Water	81124	3& 6 min, dissolved	**0.00030**	**0.00030**	**0.00030**	72.4%	85.9%
Water	81125	9&12 min, dissolved	**0.00030**	**0.00030**	**0.00030**	43.8%	80.7%
Water	81126	15&18 min, dissolved	**0.00030**	**0.00030**	**0.00030**	51.7%	80.2%
Water	81127	21&24 min, dissolved	**0.00030**	**0.00030**	**0.00030**	62.9%	88.0%
Water	81128	27&30 min, dissolved	**0.00030**	**0.00030**	**0.00030**	62.0%	83.8%
Water	80915	3& 6 min, total	0.00019	0.00167	0.00029	58.2%	48.6%
Water	80916	9&12 min, total	0.00231	0.00424	0.00068	68.6%	60.4%
Water	80917	15&18 min, total	0.00217	0.00312	0.00038	64.5%	60.7%
Water	80918	21&24 min, total	0.00111	0.00197	0.00035	57.9%	51.3%
Water	80919	27&30 min, total	0.00169	0.00629	0.00116	67.5%	53.6%
		Hopper Overflow Monitoring					
Water	81129	2& 4 min, dissolved	**0.00030**	**0.00030**	**0.00030**	62.8%	83.2%
Water	81130	6& 8 min, dissolved	**0.00030**	**0.00030**	**0.00030**	76.4%	82.0%
Water	81131	10&12 min, dissolved	**0.00030**	**0.00030**	**0.00030**	47.2%	65.7%
Water	81132	14&16 min, dissolved	**0.00030**	**0.00030**	**0.00030**	70.7%	71.0%
Water	81133	18&20 min, dissolved	**0.00030**	**0.00030**	**0.00030**	46.2%	66.7%
Water	80921	2& 4 min, total	0.00153	0.00460	0.00073	69.1%	58.1%
Water	80922	6& 8 min, total	0.00204	0.00607	0.00076	67.1%	62.3%
Water	80923	10&12 min, total	0.00175	0.00473	0.00037	41.5%	59.6%
Water	80924	14&16 min, total	0.00165	0.00431	0.00030	36.4%	61.5%
Water	80925	18&20 min, total	0.00240	0.00883	0.00163	66.5%	61.5%
		Site Water					
Water	81639	Sample 1 Total	**0.00030**	**0.00030**	**0.00030**	50.6%	61.9%
Water	81640	Sample 2 Total	**0.00030**	**0.00030**	**0.00030**	60.2%	62.4%
Water	81641	Sample 3 Total	**0.00030**	**0.00030**	**0.00030**	46.3%	66.8%
		Elutriate					
Water	81645	Sample 1 Dissolved	**0.00030**	**0.00030**	**0.00030**	43.3%	67.8%
Water	81646	Sample 2 Dissolved	**0.00030**	**0.00030**	**0.00030**	83.7%	56.1%
Water	81647	Sample 3 Dissolved	**0.00030**	**0.00030**	**0.00030**	28.2%	58.3%
Water	81642	Sample 1 Total	**0.00030**	**0.00030**	**0.00030**	62.7%	64.0%
Water	81643	Sample 2 Total	**0.00030**	**0.00030**	**0.00030**	56.7%	71.0%
Water	81644	Sample 3 Total	**0.00030**	**0.00030**	**0.00030**	65.9%	71.2%

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	DBAHANT	B-GHI-PY	2MeNAPH	2FIBP-S	PTERP-S
		Detection Limit (mg/kg)	0.0220	0.0220	0.0220		
		Insitu Sediment					
Sediment	81705	Sample #1	0.0086	0.0748	0.0353	60.3%	48.6%
Sediment	81706	Sample #2	0.0072	0.0605	0.0324	63.0%	49.1%
Sediment	81707	Sample #3	0.0087	0.0647	0.0342	61.2%	51.1%

DBAHANT - Dibenzo(A,H)Anthracene B-GHI-PY - Benzo(G,H,I)Perylene 2MeNAPH - 2-Methylnaphthalene
2FIBP-S - 2-Fluorobiphenyl(Surrogate (43-116 W)) PTERP-S - p-Terphenyl-D14(Surrogate (33-141 W))
BOLD - less than values
Values below less than values are estimated results Results are less than the reporting limit.

Pestfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	ALDRIN	A-BHC	B-BHC	G-BHC	D-BHC	PPDDD
		Detection Limit (mg/l)	0.000028	0.000028	0.000028	0.000028	0.000028	0.000055
		Plume Monitoring						
Water	80990	Background, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80955	Background, total	**0.000028**	**0.000028**	**0.000028**	**0.000028**	**0.000028**	**0.000055**
Water	80991	0-10 min, overflow, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80992	10-20 min, overflow, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80993	20-30 min, overflow, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80956	0-10 min, overflow, total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80957	10-20 min, overflow, total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80958	20-30 min, overflow, total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80994	0-10 min, non-overflow, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80995	10-20 min, non-overflow, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80996	20-30 min, non-overflow, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80959	0-10 min, non-overflow, total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80960	10-20 min, non-overflow, total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80961	20-30 min, non-overflow, total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
		Hopper Inflow Monitoring						
Water	81114	3& 6 min, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	81115	9&12 min, dissolved	**0.000026**	**0.000026**	**0.000026**	**0.000026**	**0.000026**	**0.000052**
Water	81116	15&18 min, dissolved	**0.000027**	**0.000027**	**0.000027**	**0.000027**	**0.000027**	**0.000054**
Water	81117	21&24 min, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	81118	27&30 min, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	80903	3& 6 min, total	0.000016	**0.000025**	**0.000025**	**0.000025**	**0.000025**	0.000120
Water	80904	9&12 min, total	0.000024	**0.000025**	**0.000025**	0.000009	**0.000025**	0.000160
Water	80905	15&18 min, total	0.000024	**0.000027**	**0.000027**	**0.000027**	**0.000027**	0.000200
Water	80906	21&24 min, total	0.000022	**0.000027**	**0.000027**	0.000014	**0.000027**	0.000130
Water	80907	27&30 min, total	0.000026	**0.000025**	**0.000025**	**0.000025**	**0.000025**	0.000130
		Hopper Overflow Monitoring						
Water	81119	2& 4 min, dissolved	**0.000026**	**0.000026**	**0.000026**	**0.000026**	**0.000026**	**0.000052**
Water	81120	6& 8 min, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	81121	10&12 min, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	81122	14&16 min, dissolved	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	81123	18&20 min, dissolved	**0.000024**	**0.000024**	**0.000024**	**0.000024**	**0.000024**	**0.000049**
Water	80909	2& 4 min, total	0.000030	**0.000027**	**0.000027**	0.000010	**0.000027**	0.000740
Water	80910	6& 8 min, total	0.000045	**0.000027**	**0.000027**	**0.000027**	**0.000027**	0.000300
Water	80911	10&12 min, total	Broken	Broken	Broken	Broken	Broken	Broken
Water	80912	14&16 min, total	0.000062	**0.000025**	**0.000025**	0.000015	**0.000025**	0.000540
Water	80913	18&20 min, total	0.000043	**0.000027**	**0.000027**	**0.000027**	**0.000027**	0.000320
		Site Water						
Water	81621	Sample 1 Total	**0.000025**	**0.000025**	**0.000025**	0.000017	**0.000025**	**0.000050**
Water	81622	Sample 2 Total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	81623	Sample 3 Total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
		Elutriate						
Water	81627	Sample 1 Dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000050**	**0.000050**	**0.000100**
Water	81628	Sample 2 Dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000050**	**0.000050**	**0.000100**
Water	81629	Sample 3 Dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000050**	**0.000050**	**0.000100**
Water	81624	Sample 1 Total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000050**
Water	81625	Sample 2 Total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	0.000016
Water	81626	Sample 3 Total	**0.000025**	**0.000025**	**0.000025**	**0.000025**	**0.000025**	0.000015

SAMPLE	SAMPLE	DESCRIPTION	ALDRIN	A-BHC	B-BHC	G-BHC	D-BHC	PPDDD
		Detection Limit (mg/kg)	0.0018	0.0018	0.00096	0.0018	0.0018	0.0019
		Insitu Sediment						
Sediment	81711	Sample #1	**0.0018**	**0.0018**	0.00067	**0.0018**	**0.0018**	0.0063
Sediment	81712	Sample #2	**0.0018**	**0.0018**	0.00062	**0.0018**	**0.0018**	0.0054
Sediment	81713	Sample #3	**0.0018**	**0.0018**	0.00092	**0.0018**	**0.0018**	0.0210

ALDRIN - Aldrin A-BHC - A-BHC B-BHC - B-BHC G-BHC - G-BHC D-BHC - D-BHC PPDDD - PPDDD
BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

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Pestfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE		DESCRIPTION	PPDDE	PPDDT	HPTCL	DIELDRIN	ENDOI	ENDOII
		Detection Limit (mg/l)	0.000055	0.000055	0.0000280	0.000055	0.000028	0.000055
		Plume Monitoring						
Water	80990	Background, dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80955	Background, total	**0.000055**	**0.000055**	**0.0000280**	**0.000055**	**0.000028**	**0.000055**
Water	80991	0-10 min, overflow, dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80992	10-20 min, overflow, dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80993	20-30 min, overflow, dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80956	0-10 min, overflow, total	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80957	10-20 min, overflow, total	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80958	20-30 min, overflow, total	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80994	0-10 min, non-overflow, dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80995	10-20 min, non-overflow, dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80996	20-30 min, non-overflow, dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80959	0-10 min, non-overflow, total	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80960	10-20 min, non-overflow, total	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80961	20-30 min, non-overflow, total	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
		Hopper Inflow Monitoring						
Water	81114	3& 6 min, dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	81115	9&12 min, dissolved	**0.000052**	**0.000052**	**0.0000260**	**0.000052**	**0.000026**	**0.000052**
Water	81116	15&18 min, dissolved	**0.000054**	**0.000054**	**0.0000270**	**0.000054**	**0.000027**	**0.000054**
Water	81117	21&24 min, dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	81118	27&30 min, dissolved	**0.000050**	**0.000050**	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	80903	3& 6 min, total	0.000079	0.000050	**0.0000250**	**0.000050**	0.000025	**0.000050**
Water	80904	9&12 min, total	0.000110	0.000082	0.0000130	**0.000050**	0.000029	**0.000050**
Water	80905	15&18 min, total	0.000150	0.000050	0.0000130	**0.000053**	0.000033	**0.000053**
Water	80906	21&24 min, total	0.000120	0.000075	**0.0000207**	**0.000053**	0.000032	**0.000053**
Water	80907	27&30 min, total	0.000110	0.000068	0.0000290	**0.000050**	0.000032	**0.000050**
		Hopper Overflow Monitoring						
Water	81119	2& 4 min, dissolved	**0.000052**	**0.000052**	**0.0000260**	**0.000052**	**0.000026**	**0.000052**
Water	81120	6& 8 min, dissolved	**0.000050**	0.000066	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	81121	10&12 min, dissolved	**0.000050**	0.000069	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	81122	14&16 min, dissolved	**0.000050**	0.000065	**0.0000250**	**0.000050**	**0.000025**	**0.000050**
Water	81123	18&20 min, dissolved	**0.000049**	**0.000049**	**0.0000240**	**0.000049**	**0.000024**	**0.000049**
Water	80909	2& 4 min, total	0.000190	0.000110	0.0000170	**0.000053**	0.000017	**0.000053**
Water	80910	6& 8 min, total	0.000180	0.000360	**0.0000270**	**0.000053**	0.000050	**0.000053**
Water	80911	10&12 min, total	Broken	Broken	Broken	Broken	Broken	Broken
Water	80912	14&16 min, total	0.000470	0.000340	0.0000280	**0.000050**	0.000033	**0.000050**
Water	80913	18&20 min, total	0.000300	0.000140	0.0000270	**0.000053**	0.000020	**0.000053**
		Site Water						
Water	81621	Sample 1 Total	**0.000050**	**0.000050**	0.0000037	**0.000050**	**0.000025**	**0.000050**
Water	81622	Sample 2 Total	**0.000050**	**0.000050**	0.0000340	**0.000050**	**0.000025**	**0.000050**
Water	81623	Sample 3 Total	**0.000050**	**0.000050**	0.0000370	**0.000050**	**0.000025**	**0.000050**
		Elutriate						
Water	81627	Sample 1 Dissolved	**0.000100**	**0.000100**	0.0000170	**0.000100**	**0.000050**	**0.000100**
Water	81628	Sample 2 Dissolved	**0.000100**	**0.000100**	0.0000180	**0.000100**	**0.000050**	**0.000100**
Water	81629	Sample 3 Dissolved	**0.000100**	**0.000100**	0.0000290	**0.000100**	**0.000050**	**0.000100**
Water	81624	Sample 1 Total	**0.000050**	**0.000050**	0.0000130	**0.000050**	**0.000025**	**0.000050**
Water	81625	Sample 2 Total	**0.000050**	**0.000050**	0.0000350	**0.000050**	**0.000025**	**0.000050**
Water	81626	Sample 3 Total	**0.000050**	**0.000050**	0.0000330	**0.000050**	**0.000025**	**0.000050**

SAMPLE	SAMPLE	DESCRIPTION	PPDDE	PPDDT	HPTCL	DIELDRIN	ENDOI	ENDOII
		Detection Limit (mg/kg)	0.0019	0.0019	0.00096	0.0036	0.00096	0.0036
		Insitu Sediment						
Sediment	81711	Sample #1	0.0061	0.0120	0.00058	**0.0036**	0.0030	**0.0055**
Sediment	81712	Sample #2	0.0110	0.0059	0.00038	**0.0036**	0.0030	**0.0036**
Sediment	81713	Sample #3	0.0075	0.0120	0.00051	**0.0036**	0.0030	**0.0036**

PPDDE - PPDDE PPDDT - PPDDT HPTCL - Heptachlor DIELDRIN - Dieldrin ENDOI - A-Endosulfan ENDOII - B-Endosulfan
BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

Pestfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE		DESCRIPTION	ENDOSU	ENDRIN	ENDALD	HPTCLE	METOXYCL	CLORDANE
		Detection Limit (mg/l)	0.000055	0.000050	0.000055	0.000028	0.00028	0.000028
		Plume Monitoring						
Water	80990	Background, dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80955	Background, total	**0.000055**	0.000110	**0.000055**	**0.000028**	**0.00028**	**0.000028**
Water	80991	0-10 min, overflow, dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80992	10-20 min, overflow, dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80993	20-30 min, overflow, dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80956	0-10 min, overflow, total	**0.000050**	0.000110	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80957	10-20 min, overflow, total	**0.000050**	0.000120	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80958	20-30 min, overflow, total	**0.000050**	0.000100	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80994	0-10 min, non-overflow, dissolved	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80995	10-20 min, non-overflow, dissolved	**0.000050**	0.000110	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80996	20-30 min, non-overflow, dissolved	**0.000050**	0.000110	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80959	0-10 min, non-overflow, total	**0.000050**	0.000100	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80960	10-20 min, non-overflow, total	**0.000050**	0.000120	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80961	20-30 min, non-overflow, total	**0.000050**	0.000130	**0.000050**	**0.000025**	**0.00025**	**0.000025**
		Hopper Inflow Monitoring						
Water	81114	3& 6 min, dissolved	**0.000050**	0.000081	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	81115	9&12 min, dissolved	**0.000052**	0.000061	**0.000052**	**0.000026**	**0.00026**	**0.000026**
Water	81116	15&18 min, dissolved	**0.000054**	0.000060	**0.000054**	**0.000027**	**0.00027**	**0.000027**
Water	81117	21&24 min, dissolved	**0.000050**	0.000081	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	81118	27&30 min, dissolved	**0.000050**	0.000069	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	80903	3& 6 min, total	0.000022	**0.000050**	**0.000050**	0.000013	**0.00025**	
Water	80904	9&12 min, total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	80905	15&18 min, total	0.000047	**0.000053**	**0.000053**	**0.000027**	**0.00027**	
Water	80906	21&24 min, total	0.000041	**0.000053**	**0.000053**	**0.000027**	**0.00027**	
Water	80907	27&30 min, total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
		Hopper Overflow Monitoring						
Water	81119	2& 4 min, dissolved	**0.000052**	0.000095	**0.000052**	**0.000026**	**0.00026**	**0.000026**
Water	81120	6& 8 min, dissolved	**0.000050**	0.000079	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	81121	10&12 min, dissolved	**0.000050**	0.000085	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	81122	14&16 min, dissolved	**0.000050**	0.000063	**0.000050**	**0.000025**	**0.00025**	**0.000025**
Water	81123	18&20 min, dissolved	**0.000049**	0.000055	**0.000049**	**0.000024**	**0.00024**	**0.000024**
Water	80909	2& 4 min, total	**0.000053**	**0.000053**	**0.000053**	0.000014	**0.00027**	
Water	80910	6& 8 min, total	**0.000053**	**0.000053**	**0.000053**	**0.000027**	**0.00027**	
Water	80911	10&12 min, total	Broken	Broken	Broken	Broken	Broken	
Water	80912	14&16 min, total	0.000140	**0.000050**	**0.000050**	0.000020	**0.00025**	
Water	80913	18&20 min, total	**0.000053**	**0.000053**	**0.000053**	**0.000027**	**0.00027**	
		Site Water						
Water	81621	Sample 1 Total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	81622	Sample 2 Total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	81623	Sample 3 Total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
		Elutriate						
Water	81627	Sample 1 Dissolved	**0.000100**	**0.000100**	**0.000100**	**0.000050**	**0.00050**	
Water	81628	Sample 2 Dissolved	**0.000100**	**0.000100**	**0.000100**	**0.000050**	**0.00050**	
Water	81629	Sample 3 Dissolved	**0.000100**	**0.000100**	**0.000100**	**0.000050**	**0.00050**	
Water	81624	Sample 1 Total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	81625	Sample 2 Total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	
Water	81626	Sample 3 Total	**0.000050**	**0.000050**	**0.000050**	**0.000025**	**0.00025**	

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	ENDOSU	ENDRIN	ENDALD	HPTCLE	METOXYCL
		Detection Limit (mg/kg)	0.0036	0.0036	0.0036	0.0018	0.018
		Insitu Sediment					
Sediment	81711	Sample #1	**0.0036**	**0.0036**	**0.0036**	**0.0018**	**0.018**
Sediment	81712	Sample #2	0.0019	**0.0036**	**0.0036**	**0.0018**	**0.018**
Sediment	81713	Sample #3	**0.0036**	**0.0036**	**0.0036**	**0.0018**	**0.018**

ENDOSU - Endosulfan sulfate ENDRIN - Endrin ENDALD - Endrin Aldehyde HPTCLE - Heptachlor Epoxide METOXYCL - Methoxychlor
CLORDANE - Chlordane
BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

Pestfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	TOXAPHEN	TcLXYL-S	DCLBP	a-CHLORD	g-CHLORD
		Detection Limit (mg/l)	0.00028			0.000025	0.000025
		Plume Monitoring					
Water	80990	Background, dissolved	**0.00025**	83.00%	92.60%		
Water	80955	Background, total	**0.00028**	87.40%	72.90%		
Water	80991	0-10 min, overflow, dissolved	**0.00025**	75.70%	92.20%		
Water	80992	10-20 min, overflow, dissolved	**0.00025**	75.10%	81.70%		
Water	80993	20-30 min, overflow, dissolved	**0.00025**	73.20%	83.20%		
Water	80956	0-10 min, overflow, total	**0.00025**	83.50%	70.90%		
Water	80957	10-20 min, overflow, total	**0.00025**	92.40%	72.10%		
Water	80958	20-30 min, overflow, total	**0.00025**	74.40%	63.90%		
Water	80994	0-10 min, non-overflow, dissolved	**0.00025**	73.30%	84.10%		
Water	80995	10-20 min, non-overflow, dissolved	**0.00025**	79.50%	87.40%		
Water	80996	20-30 min, non-overflow, dissolved	**0.00025**	73.40%	84.10%		
Water	80959	0-10 min, non-overflow, total	**0.00025**	82.40%	75.20%		
Water	80960	10-20 min, non-overflow, total	**0.00025**	86.80%	79.50%		
Water	80961	20-30 min, non-overflow, total	**0.00025**	82.30%	80.60%		
		Hopper Inflow Monitoring					
Water	81114	3& 6 min, dissolved	**0.00025**	80.80%	78.00%		
Water	81115	9&12 min, dissolved	**0.00026**	82.20%	75.20%		
Water	81116	15&18 min, dissolved	**0.00027**	82.10%	73.50%		
Water	81117	21&24 min, dissolved	**0.00025**	95.30%	85.80%		
Water	81118	27&30 min, dissolved	**0.00025**	91.60%	80.70%		
Water	80903	3& 6 min, total	**0.00025**	35.50%	45.20%	0.000034	0.000026
Water	80904	9&12 min, total	**0.00025**	31.64%	43.66%	0.000043	0.000032
Water	80905	15&18 min, total	**0.00027**	39.39%	59.50%	0.000052	0.000032
Water	80906	21&24 min, total	**0.00027**	44.21%	59.72%	0.000046	0.000029
Water	80907	27&30 min, total	**0.00025**	44.04%	41.07%	0.000043	0.000025
		Hopper Overflow Monitoring					
Water	81119	2& 4 min, dissolved	**0.00026**	88.10%	80.40%		
Water	81120	6& 8 min, dissolved	**0.00025**	92.10%	76.20%		
Water	81121	10&12 min, dissolved	**0.00025**	91.70%	81.80%		
Water	81122	14&16 min, dissolved	**0.00025**	72.30%	56.10%		
Water	81123	18&20 min, dissolved	**0.00024**	73.50%	61.10%		
Water	80909	2& 4 min, total	**0.00027**	40.11%	58.27%	0.000068	0.000050
Water	80910	6& 8 min, total	**0.00027**	47.04%	64.93%	0.000069	0.000048
Water	80911	10&12 min, total	Broken	Broken	Broken	Broken	Broken
Water	80912	14&16 min, total	**0.00025**	48.41%	78.19%	0.000130	0.000093
Water	80913	18&20 min, total	**0.00027**	44.62%	83.94%	0.000088	0.000059
		Site Water					
Water	81621	Sample 1 Total	**0.00025**	76.88%	68.76%	**0.000025**	**0.000025**
Water	81622	Sample 2 Total	**0.00025**	60.17%	69.83%	**0.000025**	**0.000025**
Water	81623	Sample 3 Total	**0.00025**	71.76%	68.80%	**0.000025**	**0.000025**
		Elutriate					
Water	81627	Sample 1 Dissolved	**0.00050**	75.82%	87.54%	**0.000050**	**0.000050**
Water	81628	Sample 2 Dissolved	**0.00050**	85.13%	88.79%	**0.000050**	**0.000050**
Water	81629	Sample 3 Dissolved	**0.00050**	76.31%	87.53%	**0.000050**	**0.000050**
Water	81624	Sample 1 Total	**0.00025**	81.58%	64.33%	**0.000025**	**0.000025**
Water	81625	Sample 2 Total	**0.00025**	60.65%	55.24%	**0.000025**	**0.000025**
Water	81626	Sample 3 Total	**0.00025**	67.60%	61.90%	**0.000025**	**0.000025**

SAMPLE	SAMPLE	DESCRIPTION	TOXAPHEN	TcLXYL-S	DCLBP	a-CHLORD	g-CHLORD
		Detection Limit (mg/kg)	0.018			0.00096	0.0019
		Insitu Sediment					
Sediment	81711	Sample #1	**0.018**	86.90%	92.01%	0.0011	0.0035
Sediment	81712	Sample #2	**0.018**	91.01%	92.77%	0.0016	0.0035
Sediment	81713	Sample #3	**0.018**	84.77%	102.76%	0.0011	0.0038

TOXAPHEN - Toxaphene TcLXYL-S - 2,4,5,6-Tetrachloro-m-xylene(Surrogate(60-150 WS)) DCLBP - Decachlorobiphenyl(Surrogate (60-150 WS))
a-CHLORD - a-CHLORDANE g-CHLORD - g-CHLORDANE
BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

PCBsfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 22	PCB 33	PCB 37	PCB 42	PCB 47	PCB 64	PCB 74
		Detection Limit (mg/l)	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110	0.0000011	0.0000011
		Plume Monitoring							
Water	80983	Background, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80948	Background, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**
Water	80984	0-10 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80985	10-20 min, overflow, dissolved	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**
Water	80986	20-30 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80949	0-10 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80950	10-20 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80951	20-30 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80987	0-10 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80988	10-20 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80989	20-30 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80952	0-10 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80953	10-20 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80954	20-30 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81105	9&12 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81106	15&18 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000050**	**0.0000010**	**0.0000010**
Water	81107	21&24 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81108	27&30 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80891	3& 6 min, total	**0.0000011**	**0.0000011**	**0.0000011**	0.0000016	0.00000095	**0.0000011**	0.0000013
Water	80892	9&12 min, total	**0.0000010**	**0.0000010**	**0.0000010**	0.0000031	0.00000180	0.0000092	0.0000042
Water	80893	15&18 min, total	**0.0000010**	**0.0000010**	**0.0000010**	0.0000021	0.00000055	**0.0000010**	0.0000021
Water	80894	21&24 min, total	**0.0000011**	**0.0000011**	**0.0000011**	0.0000021	0.00000250	0.0000084	**0.0000011**
Water	80895	27&30 min, total	**0.0000011**	**0.0000011**	**0.0000011**	0.0000038	**0.00000110**	**0.0000011**	**0.0000011**
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81110	6& 8 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81111	10&12 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81112	14&16 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81113	18&20 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80897	2& 4 min, total	**0.0000011**	**0.0000011**	**0.0000011**	0.0000046	0.00000830	**0.0000011**	**0.0000011**
Water	80898	6& 8 min, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**	0.0000150	0.0000061
Water	80899	10&12 min, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**	0.0000160	0.0000064
Water	80900	14&16 min, total	**0.0000011**	**0.0000011**	**0.0000011**	0.0000069	**0.00000110**	0.0000200	0.0000080
Water	80901	18&20 min, total	**0.0000010**	**0.0000010**	**0.0000010**	0.0000058	**0.00000100**	0.0000190	0.0000074
		Site Water							
Water	81603	Sample 1 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81604	Sample 2 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81605	Sample 3 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
		Elutriate							
Water	81609	Sample 1 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81610	Sample 2 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81611	Sample 3 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81606	Sample 1 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81607	Sample 2 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.00000057	**0.0000010**	**0.0000010**
Water	81608	Sample 3 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.00000051	**0.0000010**	**0.0000010**

SAMPLE	SAMPLE ID	DESCRIPTION	PCB 22	PCB 33	PCB 37	PCB 42	PCB 47	PCB 64	PCB 74
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**
Sediment	81718	Sample #2	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**
Sediment	81719	Sample #3	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

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PCBsfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 80	PCB 81	PCB 84	PCB 91	PCB 92	PCB 95	PCB 99
		Detection Limit (mg/l)	0.0000011	0.0000011	0.00000110	0.00000110	0.0000011	0.00000110	0.00000110
		Plume Monitoring							
Water	80983	Background, dissolved	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	0.00000058	**0.00000100**
Water	80948	Background, total	**0.0000011**	**0.0000011**	**0.00000110**	**0.00000110**	**0.0000011**	**0.00000110**	**0.00000110**
Water	80984	0-10 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	0.00000058	**0.00000100**
Water	80985	10-20 min, overflow, dissolved	**0.0000011**	**0.0000011**	**0.00000110**	**0.00000110**	**0.0000011**	0.00000085	**0.00000110**
Water	80986	20-30 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	0.00000049	**0.00000100**
Water	80949	0-10 min, overflow, total	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.00000100**	**0.00000100**
Water	80950	10-20 min, overflow, total	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.00000100**	**0.00000100**
Water	80951	20-30 min, overflow, total	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.00000100**	**0.00000100**
Water	80987	0-10 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	0.00000049	**0.00000100**
Water	80988	10-20 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	0.00000120	**0.00000100**
Water	80989	20-30 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	0.00000056	**0.00000100**
Water	80952	0-10 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.00000100**	**0.00000100**
Water	80953	10-20 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.00000100**	**0.00000100**
Water	80954	20-30 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.00000100**	**0.00000100**
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	0.00000084	0.00000060
Water	81105	9&12 min, dissolved	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	0.00000110	**0.00000100**
Water	81106	15&18 min, dissolved	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	0.00000095	**0.00000100**
Water	81107	21&24 min, dissolved	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	0.00000084	0.00000045
Water	81108	27&30 min, dissolved	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	0.00000072	**0.00000100**
Water	80891	3& 6 min, total	**0.0000011**	**0.0000011**	**0.00000110**	**0.00000110**	**0.0000011**	**0.00000110**	**0.00000110**
Water	80892	9&12 min, total	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	0.0000010	**0.00000100**	**0.00000100**
Water	80893	15&18 min, total	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	0.0000084	**0.00000100**	**0.00000100**
Water	80894	21&24 min, total	**0.0000011**	**0.0000011**	**0.00000110**	0.00000320	0.0000068	0.00001200	0.00000730
Water	80895	27&30 min, total	**0.0000011**	**0.0000011**	**0.00000110**	0.00000830	0.0000150	0.00002400	0.00001300
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	0.00000250	0.00000046
Water	81110	6& 8 min, dissolved	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	0.00000120	0.00000058
Water	81111	10&12 min, dissolved	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	0.00000300	0.00000058
Water	81112	14&16 min, dissolved	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	0.00000097	0.00000037
Water	81113	18&20 min, dissolved	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	0.00000170	0.00000063
Water	80897	2& 4 min, total	**0.0000011**	**0.0000011**	**0.00000110**	0.00001100	0.0000150	0.00002700	0.00001500
Water	80898	6& 8 min, total	**0.0000011**	**0.0000011**	**0.00000110**	0.00000980	0.0000180	0.00002700	0.00001400
Water	80899	10&12 min, total	**0.0000011**	**0.0000011**	**0.00000110**	0.00001100	0.0000160	0.00003100	0.00001900
Water	80900	14&16 min, total	**0.0000011**	**0.0000011**	**0.00000110**	0.00001400	0.0000250	0.00003700	0.00002100
Water	80901	18&20 min, total	**0.0000010**	**0.0000010**	**0.00000100**	0.00001200	0.0000170	0.00003300	0.00001700
		Site Water							
Water	81603	Sample 1 Total	**0.0000010**	**0.0000010**	**0.00000100**	0.00000046	**0.0000010**	0.00000093	**0.00000100**
Water	81604	Sample 2 Total	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	0.00000100	**0.00000100**
Water	81605	Sample 3 Total	**0.0000010**	**0.0000010**	**0.00000100**	0.00000046	**0.0000010**	0.00000095	**0.00000100**
		Elutriate							
Water	81609	Sample 1 Dissolved	**0.0000010**	**0.0000010**	**0.00000100**	0.00000054	**0.0000010**	0.00000110	0.00000038
Water	81610	Sample 2 Dissolved	**0.0000010**	**0.0000010**	**0.00000100**	0.00000068	**0.0000010**	0.00000094	0.00000047
Water	81611	Sample 3 Dissolved	**0.0000010**	**0.0000010**	0.00000091	0.00000093	**0.0000010**	0.00000057	0.00000028
Water	81606	Sample 1 Total	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	0.00000110	**0.00000100**
Water	81607	Sample 2 Total	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	0.00000140	**0.00000100**
Water	81608	Sample 3 Total	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	0.00000110	**0.00000100**

SAMPLE	SAMPLE ID	DESCRIPTION	PCB 80	PCB 81	PCB 84	PCB 91	PCB 92	PCB 95	PCB 99
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	0.00046
Sediment	81718	Sample #2	**0.00077**	**0.00077**	**0.00077**	0.00040	0.00049	**0.00077**	0.00071
Sediment	81719	Sample #3	**0.00077**	**0.00077**	**0.00077**	0.00052	0.00062	**0.00077**	0.00074

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

PCBsfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 110	PCB 119	PCB 120	PCB 123	PCB 126	PCB 127	PCB 132
		Detection Limit (mg/l)	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
		Plume Monitoring							
Water	80983	Background, dissolved	0.00000062	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80948	Background, total	0.00000078	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80984	0-10 min, overflow, dissolved	0.00000060	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80985	10-20 min, overflow, dissolved	0.00000087	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80986	20-30 min, overflow, dissolved	0.00000065	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80949	0-10 min, overflow, total	0.00000100	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80950	10-20 min, overflow, total	0.00000110	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80951	20-30 min, overflow, total	0.00000110	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80987	0-10 min, non-overflow, dissolve	0.00000074	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80988	10-20 min, non-overflow, dissolve	0.00000068	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80989	20-30 min, non-overflow, dissolve	0.00000065	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80952	0-10 min, non-overflow, total	0.00000095	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80953	10-20 min, non-overflow, total	0.00000120	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80954	20-30 min, non-overflow, total	0.00000073	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	0.00000095	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81105	9&12 min, dissolved	0.00000068	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81106	15&18 min, dissolved	0.00000076	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81107	21&24 min, dissolved	0.00000090	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81108	27&30 min, dissolved	0.00000076	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80891	3& 6 min, total	0.00000990	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80892	9&12 min, total	0.00000250	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.0000088
Water	80893	15&18 min, total	0.00001200	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80894	21&24 min, total	0.00001400	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	0.0000066
Water	80895	27&30 min, total	0.00002900	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	0.0000110
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	0.00000095	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81110	6& 8 min, dissolved	0.00000100	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81111	10&12 min, dissolved	0.00000120	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81112	14&16 min, dissolved	0.00000095	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81113	18&20 min, dissolved	0.00000110	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80897	2& 4 min, total	0.00003500	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	0.0000140
Water	80898	6& 8 min, total	0.00003500	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	0.0000230
Water	80899	10&12 min, total	0.00004100	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	0.0000150
Water	80900	14&16 min, total	0.00004900	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	0.0000300
Water	80901	18&20 min, total	0.00004100	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.0000170
		Site Water							
Water	81603	Sample 1 Total	0.00000077	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81604	Sample 2 Total	0.00000099	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81605	Sample 3 Total	0.00000110	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Elutriate							
Water	81609	Sample 1 Dissolved	0.00000091	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81610	Sample 2 Dissolved	0.00000088	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81611	Sample 3 Dissolved	0.00000057	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81606	Sample 1 Total	0.00000120	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81607	Sample 2 Total	0.00000130	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81608	Sample 3 Total	0.00000110	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 110	PCB 119	PCB 120	PCB 123	PCB 126	PCB 127	PCB 132
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	0.00100	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**
Sediment	81718	Sample #2	0.00087	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**
Sediment	81719	Sample #3	0.00100	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

PCBsfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 135	PCB 146	PCB 149	PCB 157	PCB 158	PCB 166	PCB 168
		Detection Limit (mg/l)	0.0000011	0.00000110	0.00000110	0.0000011	0.0000011	0.0000011	0.00000110
		Plume Monitoring							
Water	80983	Background, dissolved	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80948	Background, total	**0.0000011**	**0.00000110**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80984	0-10 min, overflow, dissolved	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80985	10-20 min, overflow, dissolved	**0.0000011**	**0.00000110**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80986	20-30 min, overflow, dissolved	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80949	0-10 min, overflow, total	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80950	10-20 min, overflow, total	**0.0000010**	0.00000064	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80951	20-30 min, overflow, total	**0.0000010**	0.00000057	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80987	0-10 min, non-overflow, dissolve	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80988	10-20 min, non-overflow, dissolve	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80989	20-30 min, non-overflow, dissolve	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80952	0-10 min, non-overflow, total	**0.0000010**	0.00000140	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80953	10-20 min, non-overflow, total	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80954	20-30 min, non-overflow, total	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81105	9&12 min, dissolved	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81106	15&18 min, dissolved	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81107	21&24 min, dissolved	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81108	27&30 min, dissolved	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80891	3& 6 min, total	**0.0000011**	0.00000260	0.00001100	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80892	9&12 min, total	**0.0000010**	0.00000660	0.00002500	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80893	15&18 min, total	**0.0000010**	0.00000460	0.00001800	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	80894	21&24 min, total	**0.0000011**	**0.00000110**	0.00001800	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80895	27&30 min, total	0.0000076	**0.00000110**	0.00003200	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81110	6& 8 min, dissolved	**0.0000010**	**0.00000100**	0.00000043	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81111	10&12 min, dissolved	**0.0000010**	**0.00000100**	0.00000054	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81112	14&16 min, dissolved	**0.0000010**	**0.00000100**	0.00000056	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81113	18&20 min, dissolved	**0.0000010**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	0.00000040
Water	80897	2& 4 min, total	0.0000088	**0.00000110**	0.00003800	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80898	6& 8 min, total	0.0000083	**0.00000110**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80899	10&12 min, total	0.0000100	**0.00000110**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80900	14&16 min, total	0.0000140	**0.00000110**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**
Water	80901	18&20 min, total	0.0000150	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
		Site Water							
Water	81603	Sample 1 Total	**0.0000010**	**0.00000100**	0.00000051	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81604	Sample 2 Total	**0.0000010**	**0.00000100**	0.00000053	**0.0000010**	**0.0000010**	**0.0000010**	0.00000056
Water	81605	Sample 3 Total	**0.0000010**	**0.00000100**	0.00000055	**0.0000010**	**0.0000010**	**0.0000010**	0.00000043
		Elutriate							
Water	81609	Sample 1 Dissolved	**0.0000010**	**0.00000100**	0.00000047	**0.0000010**	**0.0000010**	**0.0000010**	0.00000140
Water	81610	Sample 2 Dissolved	**0.0000010**	**0.00000100**	0.00000046	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81611	Sample 3 Dissolved	**0.0000010**	**0.00000100**	0.00000044	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81606	Sample 1 Total	**0.0000010**	**0.00000100**	0.00000091	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81607	Sample 2 Total	**0.0000010**	**0.00000100**	0.00000090	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**
Water	81608	Sample 3 Total	**0.0000010**	**0.00000100**	0.00000076	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 135	PCB 146	PCB 149	PCB 157	PCB 158	PCB 166	PCB 168
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	**0.00077**	**0.00077**	0.00120	**0.00077**	**0.00077**	**0.00077**	**0.00077**
Sediment	81718	Sample #2	**0.00077**	**0.00077**	0.00120	**0.00077**	**0.00077**	**0.00077**	**0.00077**
Sediment	81719	Sample #3	**0.00077**	**0.00077**	0.00100	**0.00077**	**0.00077**	**0.00077**	**0.00077**

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

PCBsfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 169	PCB 174	PCB 177	PCB 178	PCB 179	PCB 8	PCB 18
		Detection Limit (mg/l)	0.0000011	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
		Plume Monitoring							
Water	80983	Background, dissolved	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80948	Background, total	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80984	0-10 min, overflow, dissolved	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80985	10-20 min, overflow, dissolved	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80986	20-30 min, overflow, dissolved	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80949	0-10 min, overflow, total	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80950	10-20 min, overflow, total	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80951	20-30 min, overflow, total	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80987	0-10 min, non-overflow, dissolve	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80988	10-20 min, non-overflow, dissolve	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80989	20-30 min, non-overflow, dissolve	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80952	0-10 min, non-overflow, total	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80953	10-20 min, non-overflow, total	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80954	20-30 min, non-overflow, total	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000015**
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81105	9&12 min, dissolved	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81106	15&18 min, dissolved	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81107	21&24 min, dissolved	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81108	27&30 min, dissolved	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80891	3& 6 min, total	**0.0000011**	0.00000390	0.0000024	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80892	9&12 min, total	**0.0000010**	0.00000970	0.0000067	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80893	15&18 min, total	**0.0000010**	0.00000620	0.0000042	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80894	21&24 min, total	**0.0000011**	0.00000820	0.0000023	**0.0000011**	0.0000017	**0.0000011**	0.0000051
Water	80895	27&30 min, total	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**	0.0000069	0.0000063	**0.0000011**
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	**0.0000010**	0.00000049	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81110	6& 8 min, dissolved	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81111	10&12 min, dissolved	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81112	14&16 min, dissolved	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81113	18&20 min, dissolved	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80897	2& 4 min, total	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80898	6& 8 min, total	**0.0000011**	0.00001700	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80899	10&12 min, total	**0.0000011**	0.00001700	**0.0000011**	**0.0000011**	**0.0000011**	0.0000140	**0.0000011**
Water	80900	14&16 min, total	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80901	18&20 min, total	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Site Water							
Water	81603	Sample 1 Total	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81604	Sample 2 Total	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.0000010
Water	81605	Sample 3 Total	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.0000015
		Elutriate							
Water	81609	Sample 1 Dissolved	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81610	Sample 2 Dissolved	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81611	Sample 3 Dissolved	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81606	Sample 1 Total	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81607	Sample 2 Total	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81608	Sample 3 Total	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 169	PCB 174	PCB 177	PCB 178	PCB 179	PCB 8	PCB 18
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**
Sediment	81718	Sample #2	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**
Sediment	81719	Sample #3	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 28	PCB 31	PCB 40	PCB 44	PCB 49	PCB 52	PCB 60
		Detection Limit (mg/l)	0.0000011	0.0000011	0.0000011	0.0000011	0.00000110	0.00000110	0.00000110
		Plume Monitoring							
Water	80983	Background, dissolved	**0.0000010**	0.0000017	**0.0000010**	**0.0000010**	**0.00000100**	0.00000046	**0.00000100**
Water	80948	Background, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**	0.00000110	**0.00000110**
Water	80984	0-10 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**
Water	80985	10-20 min, overflow, dissolved	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**	**0.00000110**	**0.00000110**
Water	80986	20-30 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**
Water	80949	0-10 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	0.00000120	**0.00000100**
Water	80950	10-20 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	0.00000095	**0.00000100**
Water	80951	20-30 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	0.00000077	**0.00000100**
Water	80987	0-10 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.00000085	**0.00000100**	**0.00000100**
Water	80988	10-20 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.00000044	**0.00000100**	**0.00000100**
Water	80989	20-30 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**
Water	80952	0-10 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	0.00000097	**0.00000100**
Water	80953	10-20 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**
Water	80954	20-30 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	0.00000074	**0.00000100**
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	0.00000083	**0.00000100**
Water	81105	9&12 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	0.00000093	**0.00000100**
Water	81106	15&18 min, dissolved	**0.0000010**	0.0000029	**0.0000010**	0.0000014	0.00000072	0.00000094	**0.00000100**
Water	81107	21&24 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.00000180	0.00000080	**0.00000100**
Water	81108	27&30 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.00000046	0.00000070	**0.00000100**
Water	80891	3& 6 min, total	0.0000067	**0.0000011**	**0.0000011**	0.0000057	0.00000410	0.00001100	0.00000040
Water	80892	9&12 min, total	0.0000080	**0.0000010**	**0.0000010**	0.0000150	0.00000960	0.00002500	0.00000130
Water	80893	15&18 min, total	0.0000080	**0.0000010**	**0.0000010**	0.0000092	0.00000630	0.00001600	0.00000076
Water	80894	21&24 min, total	0.0000067	**0.0000011**	0.0000041	0.0000080	0.00000600	0.00001500	0.00000075
Water	80895	27&30 min, total	0.0000130	**0.0000011**	0.0000079	0.0000170	0.00001200	0.00002600	0.00000150
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	**0.0000010**	0.0000031	**0.0000010**	**0.0000010**	0.00000110	0.00000086	**0.00000100**
Water	81110	6& 8 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.00000047	0.00000082	**0.00000100**
Water	81111	10&12 min, dissolved	**0.0000010**	0.0000038	**0.0000010**	**0.0000010**	0.00000077	0.00000120	**0.00000100**
Water	81112	14&16 min, dissolved	**0.0000010**	0.0000029	**0.0000010**	**0.0000010**	0.00000065	0.00000110	**0.00000100**
Water	81113	18&20 min, dissolved	**0.0000010**	0.0000037	**0.0000010**	**0.0000010**	0.00000060	0.00000140	**0.00000100**
Water	80897	2& 4 min, total	0.0001200	**0.0000011**	0.0000011	0.0000160	0.00001400	0.00003600	0.00002000
Water	80898	6& 8 min, total	**0.0000011**	**0.0000011**	0.0000088	0.0000200	0.00001400	0.00003400	0.00000190
Water	80899	10&12 min, total	0.0000130	**0.0000011**	0.0000120	0.0000260	0.00001600	0.00003700	0.00000220
Water	80900	14&16 min, total	0.0000180	**0.0000011**	0.0000140	0.0000300	0.00002000	0.00004300	0.00000270
Water	80901	18&20 min, total	0.0000180	**0.0000010**	0.0000130	0.0000270	0.00001800	0.00003900	0.00000270
		Site Water							
Water	81603	Sample 1 Total	**0.0000010**	0.0000024	**0.0000010**	0.0000014	0.00000065	0.00000092	**0.00000100**
Water	81604	Sample 2 Total	**0.0000010**	0.0000022	**0.0000010**	0.0000015	**0.00000100**	0.00000100	**0.00000100**
Water	81605	Sample 3 Total	**0.0000010**	0.0000025	**0.0000010**	0.0000014	0.00000047	0.00000110	**0.00000100**
		Elutriate							
Water	81609	Sample 1 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	0.00000100	**0.00000100**
Water	81610	Sample 2 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	0.00000077	**0.00000100**
Water	81611	Sample 3 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	0.00000054	**0.00000100**
Water	81606	Sample 1 Total	**0.0000010**	0.0000039	**0.0000010**	**0.0000010**	0.00000300	0.00000150	**0.00000100**
Water	81607	Sample 2 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.00000330	0.00000180	**0.00000100**
Water	81608	Sample 3 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	0.00000290	0.00000160	**0.00000100**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 28	PCB 31	PCB 40	PCB 44	PCB 49	PCB 52	PCB 60
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	**0.00077**	**0.00077**	**0.00077**	**0.00077**	0.00061	0.00250	0.00057
Sediment	81718	Sample #2	**0.00077**	**0.00077**	**0.00077**	**0.00077**	0.00081	0.00250	0.00047
Sediment	81719	Sample #3	**0.00077**	**0.00077**	**0.00077**	**0.00077**	0.00069	0.00240	0.00039

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 70	PCB 77	PCB 82	PCB 86	PCB 87	PCB 97	PCB 101
		Detection Limit (mg/l)	0.00000110	0.0000011	0.0000011	0.00000110	0.00000110	0.00000110	0.00000110
		Plume Monitoring							
Water	80983	Background, dissolved	0.00000040	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	0.00000110
Water	80948	Background, total	**0.00000110**	**0.0000011**	**0.0000011**	0.00000057	**0.00000110**	0.00000057	0.00000160
Water	80984	0-10 min, overflow, dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	0.00000064
Water	80985	10-20 min, overflow, dissolved	0.00000051	**0.0000011**	**0.0000011**	**0.00000110**	**0.00000110**	**0.00000110**	0.00000093
Water	80986	20-30 min, overflow, dissolved	0.00000044	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	0.00000074
Water	80949	0-10 min, overflow, total	**0.00000100**	**0.0000010**	**0.0000010**	0.00000100	**0.00000100**	0.00000100	0.00000180
Water	80950	10-20 min, overflow, total	0.00000048	**0.0000010**	**0.0000010**	0.00000063	**0.00000100**	0.00000063	0.00000200
Water	80951	20-30 min, overflow, total	0.00000038	**0.0000010**	**0.0000010**	0.00000053	**0.00000100**	0.00000053	0.00000190
Water	80987	0-10 min, non-overflow, dissolve	0.00000037	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	0.00000093
Water	80988	10-20 min, non-overflow, dissolve	0.00000050	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	0.00000085
Water	80989	20-30 min, non-overflow, dissolve	0.00000056	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	0.00000091
Water	80952	0-10 min, non-overflow, total	0.00000041	**0.0000010**	**0.0000010**	0.00000041	**0.00000100**	0.00000041	0.00000150
Water	80953	10-20 min, non-overflow, total	0.00000038	**0.0000010**	**0.0000010**	0.00000047	**0.00000100**	0.00000047	0.00000230
Water	80954	20-30 min, non-overflow, total	0.00000038	**0.0000010**	**0.0000010**	0.00000043	0.00000054	0.00000043	0.00000190
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	0.00000062	**0.0000010**	**0.0000010**	**0.00000100**	0.00000038	**0.00000100**	0.00000120
Water	81105	9&12 min, dissolved	0.00000042	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	0.00000061
Water	81106	15&18 min, dissolved	0.00000053	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	0.00000085
Water	81107	21&24 min, dissolved	0.00000059	**0.0000010**	**0.0000010**	**0.00000100**	0.00000042	**0.00000100**	0.00000120
Water	81108	27&30 min, dissolved	0.00000041	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	0.00000074
Water	80891	3& 6 min, total	0.00000420	**0.0000011**	0.0000014	0.00000300	0.00000310	0.00000300	0.00000900
Water	80892	9&12 min, total	0.00000890	**0.0000010**	**0.0000010**	0.00000600	0.00000420	0.00000600	0.00001900
Water	80893	15&18 min, total	0.00000660	**0.0000010**	**0.0000010**	0.00000420	0.00000290	0.00000420	0.00001100
Water	80894	21&24 min, total	0.00000640	**0.0000011**	**0.0000011**	0.00000730	0.00000290	0.00000730	0.00001200
Water	80895	27&30 min, total	0.00001100	**0.0000011**	**0.0000011**	0.00000730	**0.00000110**	0.00000730	0.00002500
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	0.00000086	**0.0000010**	**0.0000010**	**0.00000100**	0.00000064	**0.00000100**	0.00000090
Water	81110	6& 8 min, dissolved	0.00000120	**0.0000010**	**0.0000010**	**0.00000100**	0.00000058	**0.00000100**	0.00000100
Water	81111	10&12 min, dissolved	0.00000084	**0.0000010**	**0.0000010**	**0.00000100**	0.00000065	**0.00000100**	0.00000120
Water	81112	14&16 min, dissolved	0.00000059	**0.0000010**	**0.0000010**	**0.00000100**	0.00000036	**0.00000100**	0.00000097
Water	81113	18&20 min, dissolved	0.00000074	**0.0000010**	**0.0000010**	**0.00000100**	0.00000050	**0.00000100**	0.00000100
Water	80897	2& 4 min, total	0.00001200	**0.0000011**	**0.0000011**	0.00000870	**0.00000110**	0.00000870	0.00002900
Water	80898	6& 8 min, total	0.00001300	**0.0000011**	**0.0000011**	0.00000950	**0.00000110**	0.00000950	0.00002900
Water	80899	10&12 min, total	0.00001500	**0.0000011**	**0.0000011**	0.00000960	**0.00000110**	0.00000960	0.00003400
Water	80900	14&16 min, total	0.00001600	**0.0000011**	**0.0000011**	0.00001100	0.00000980	0.00001100	0.00004000
Water	80901	18&20 min, total	0.00001600	**0.0000010**	**0.0000010**	0.00000980	**0.00000100**	0.00000980	0.00003400
		Site Water							
Water	81603	Sample 1 Total	**0.00000100**	**0.0000010**	**0.0000010**	**0.00000100**	0.00000054	**0.00000100**	0.00000110
Water	81604	Sample 2 Total	0.00000140	**0.0000010**	**0.0000010**	**0.00000100**	0.00000049	**0.00000100**	0.00000140
Water	81605	Sample 3 Total	0.00000130	**0.0000010**	**0.0000010**	**0.00000100**	0.00000038	**0.00000100**	0.00000150
		Elutriate							
Water	81609	Sample 1 Dissolved	0.00000110	**0.0000010**	**0.0000010**	**0.00000100**	0.00000052	**0.00000100**	0.00000120
Water	81610	Sample 2 Dissolved	0.00000160	**0.0000010**	**0.0000010**	**0.00000100**	0.00000063	**0.00000100**	0.00000075
Water	81611	Sample 3 Dissolved	0.00000150	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	0.00000060
Water	81606	Sample 1 Total	**0.00000100**	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	0.00000075
Water	81607	Sample 2 Total	**0.00000100**	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	0.00000083
Water	81608	Sample 3 Total	**0.00000100**	**0.0000010**	**0.0000010**	**0.00000100**	**0.00000100**	**0.00000100**	0.00000079

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 70	PCB 77	PCB 82	PCB 86	PCB 87	PCB 97	PCB 101
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	0.00210	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	0.00100
Sediment	81718	Sample #2	0.00200	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	0.00120
Sediment	81719	Sample #3	0.00180	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	0.00100

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

PCBsfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 105	PCB 114	PCB 118	PCB 121	PCB 128	PCB 136	PCB 137
		Detection Limit (mg/l)	0.00000110	0.00000110	0.00000110	0.0000011	0.0000011	0.0000011	0.0000011
		Plume Monitoring							
Water	80983	Background, dissolved	0.00000041	**0.00000100**	0.00000077	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80948	Background, total	**0.00000110**	**0.00000110**	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80984	0-10 min, overflow, dissolved	0.00000037	0.00000066	0.00000051	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80985	10-20 min, overflow, dissolved	**0.00000110**	**0.00000110**	0.00000064	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80986	20-30 min, overflow, dissolved	0.00000041	0.00000060	0.00000045	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80949	0-10 min, overflow, total	**0.00000100**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80950	10-20 min, overflow, total	**0.00000100**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80951	20-30 min, overflow, total	**0.00000100**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80987	0-10 min, non-overflow, dissolve	**0.00000100**	0.00000074	0.00000050	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80988	10-20 min, non-overflow, dissolve	0.00000040	**0.00000100**	0.00000046	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80989	20-30 min, non-overflow, dissolve	0.00000039	**0.00000100**	0.00000045	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80952	0-10 min, non-overflow, total	**0.00000100**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80953	10-20 min, non-overflow, total	**0.00000100**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80954	20-30 min, non-overflow, total	**0.00000100**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	0.00000041	**0.00000100**	0.00000054	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81105	9&12 min, dissolved	0.00000056	**0.00000100**	0.00000045	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81106	15&18 min, dissolved	0.00000035	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81107	21&24 min, dissolved	0.00000043	**0.00000100**	0.00000060	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81108	27&30 min, dissolved	0.00000037	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80891	3& 6 min, total	**0.00000110**	**0.00000110**	0.00000750	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80892	9&12 min, total	**0.00000100**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80893	15&18 min, total	**0.00000100**	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80894	21&24 min, total	**0.00000110**	**0.00000110**	0.00000110	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80895	27&30 min, total	**0.00000110**	**0.00000110**	0.00001900	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	0.00000047	**0.00000100**	0.00000065	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81110	6& 8 min, dissolved	0.00000090	**0.00000100**	0.00000065	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81111	10&12 min, dissolved	0.00000097	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81112	14&16 min, dissolved	0.00000036	**0.00000100**	0.00000068	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81113	18&20 min, dissolved	0.00000055	**0.00000100**	0.00000094	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80897	2& 4 min, total	**0.00000110**	**0.00000110**	0.00002400	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80898	6& 8 min, total	**0.00000110**	**0.00000110**	0.00002300	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80899	10&12 min, total	**0.00000110**	**0.00000110**	0.00003000	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80900	14&16 min, total	**0.00000110**	**0.00000110**	0.00003800	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80901	18&20 min, total	**0.00000100**	**0.00000100**	0.00003200	**0.0000010**	**0.0000010**	0.0000190	**0.0000010**
		Site Water							
Water	81603	Sample 1 Total	0.00000043	0.00000140	0.00000096	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81604	Sample 2 Total	0.00000054	0.00000140	0.00000093	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81605	Sample 3 Total	0.00000050	0.00000120	0.00000100	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Elutriate							
Water	81609	Sample 1 Dissolved	0.00000067	**0.00000100**	0.00000058	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81610	Sample 2 Dissolved	0.00000054	**0.00000100**	0.00000048	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81611	Sample 3 Dissolved	0.00000042	**0.00000100**	0.00000052	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81606	Sample 1 Total	0.00000068	**0.00000100**	0.00000120	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81607	Sample 2 Total	0.00000071	**0.00000100**	0.00000130	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81608	Sample 3 Total	0.00000064	**0.00000100**	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 105	PCB 114	PCB 118	PCB 121	PCB 128	PCB 136	PCB 137
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	**0.00077**	**0.00077**	0.00098	**0.00077**	**0.00077**	**0.00077**	**0.00077**
Sediment	81718	Sample #2	**0.00077**	**0.00077**	0.00110	**0.00077**	**0.00077**	**0.00077**	**0.00077**
Sediment	81719	Sample #3	**0.00077**	**0.00077**	0.00100	**0.00077**	**0.00077**	**0.00077**	**0.00077**

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

PCBsfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 138	PCB 141	PCB 151	PCB 153	PCB 156	PCB 167	PCB 170
		Detection Limit (mg/l)	0.00000110	0.0000011	0.0000011	0.0000011	0.00000110	0.0000011	0.0000011
		Plume Monitoring							
Water	80983	Background, dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80948	Background, total	0.00000045	**0.0000011**	**0.0000011**	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**
Water	80984	0-10 min, overflow, dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	0.00000030	**0.0000010**	**0.0000010**
Water	80985	10-20 min, overflow, dissolved	**0.00000110**	**0.0000011**	**0.0000011**	**0.0000011**	0.00000038	**0.0000011**	**0.0000011**
Water	80986	20-30 min, overflow, dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80949	0-10 min, overflow, total	0.00000077	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80950	10-20 min, overflow, total	0.00000066	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80951	20-30 min, overflow, total	0.00000066	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80987	0-10 min, non-overflow, dissolve	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80988	10-20 min, non-overflow, dissolve	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80989	20-30 min, non-overflow, dissolve	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80952	0-10 min, non-overflow, total	0.00000061	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80953	10-20 min, non-overflow, total	0.00000057	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80954	20-30 min, non-overflow, total	0.00000045	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81105	9&12 min, dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81106	15&18 min, dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81107	21&24 min, dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81108	27&30 min, dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80891	3& 6 min, total	0.00001400	**0.0000011**	0.0000027	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**
Water	80892	9&12 min, total	0.00003400	**0.0000010**	0.0000058	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80893	15&18 min, total	0.00002300	**0.0000010**	0.0000062	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80894	21&24 min, total	0.00002400	**0.0000011**	0.0000045	**0.0000011**	0.00000350	0.0000021	0.0000086
Water	80895	27&30 min, total	**0.00000110**	**0.0000011**	0.0000089	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81110	6& 8 min, dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81111	10&12 min, dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81112	14&16 min, dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81113	18&20 min, dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	80897	2& 4 min, total	**0.00000110**	**0.0000010**	0.0000098	**0.0000011**	**0.00000110**	**0.0000011**	**0.0000011**
Water	80898	6& 8 min, total	**0.00000110**	**0.0000010**	0.0000094	**0.0000011**	0.00000760	**0.0000011**	**0.0000011**
Water	80899	10&12 min, total	**0.00000110**	**0.0000010**	0.0000120	**0.0000011**	0.00000790	**0.0000011**	**0.0000011**
Water	80900	14&16 min, total	**0.00000110**	**0.0000010**	0.0000190	**0.0000011**	0.00001200	**0.0000011**	**0.0000011**
Water	80901	18&20 min, total	**0.00000100**	**0.0000010**	0.0000110	**0.0000010**	0.00000790	**0.0000010**	**0.0000010**
		Site Water							
Water	81603	Sample 1 Total	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81604	Sample 2 Total	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81605	Sample 3 Total	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
		Elutriate							
Water	81609	Sample 1 Dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81610	Sample 2 Dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81611	Sample 3 Dissolved	**0.00000100**	**0.0000010**	**0.0000010**	**0.0000010**	**0.00000100**	**0.0000010**	**0.0000010**
Water	81606	Sample 1 Total	**0.00000100**	**0.0000010**	**0.0000010**	0.0000012	**0.00000100**	**0.0000010**	**0.0000010**
Water	81607	Sample 2 Total	**0.00000100**	**0.0000010**	**0.0000010**	0.0000012	**0.00000100**	**0.0000010**	**0.0000010**
Water	81608	Sample 3 Total	**0.00000100**	**0.0000010**	**0.0000010**	0.0000013	**0.00000100**	**0.0000010**	**0.0000010**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 138	PCB 141	PCB 151	PCB 153	PCB 156	PCB 167	PCB 170
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	**0.00077**	**0.00077**	**0.00077**	0.00150	**0.00077**	**0.00077**	**0.00077**
Sediment	81718	Sample #2	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**
Sediment	81719	Sample #3	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

PCBsfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 171	PCB 180	PCB 182	PCB 183	PCB 185	PCB 187	PCB 189
		Detection Limit (mg/l)	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
		Plume Monitoring							
Water	80983	Background, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80948	Background, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80984	0-10 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80985	10-20 min, overflow, dissolved	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80986	20-30 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80949	0-10 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80950	10-20 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80951	20-30 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80987	0-10 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80988	10-20 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80989	20-30 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80952	0-10 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80953	10-20 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80954	20-30 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81105	9&12 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81106	15&18 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81107	21&24 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81108	27&30 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80891	3& 6 min, total	0.0000012	**0.0000011**	**0.0000011**	0.0000029	0.0000046	0.0000092	**0.0000011**
Water	80892	9&12 min, total	0.0000034	**0.0000010**	**0.0000010**	0.0000068	**0.0000010**	0.0000210	**0.0000010**
Water	80893	15&18 min, total	0.0000022	**0.0000010**	**0.0000010**	0.0000038	**0.0000010**	0.0000140	**0.0000010**
Water	80894	21&24 min, total	**0.0000011**	0.0000280	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80895	27&30 min, total	**0.0000011**	0.0000490	**0.0000011**	**0.0000022**	**0.0000011**	**0.0000011**	**0.0000011**
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81110	6& 8 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81111	10&12 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81112	14&16 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81113	18&20 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80897	2& 4 min, total	**0.0000011**	0.0000590	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80898	6& 8 min, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80899	10&12 min, total	0.0000069	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80900	14&16 min, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80901	18&20 min, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Site Water							
Water	81603	Sample 1 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81604	Sample 2 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81605	Sample 3 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Elutriate							
Water	81609	Sample 1 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81610	Sample 2 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81611	Sample 3 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81606	Sample 1 Total	**0.0000010**	0.0000016	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81607	Sample 2 Total	**0.0000010**	0.0000018	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81608	Sample 3 Total	**0.0000010**	0.0000016	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 171	PCB 180	PCB 182	PCB 183	PCB 185	PCB 187	PCB 189
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	**0.00077**	0.00150	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**
Sediment	81718	Sample #2	**0.00077**	0.00140	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**
Sediment	81719	Sample #3	**0.00077**	0.00160	**0.00077**	**0.00077**	**0.00077**	0.00100	**0.00077**

BOLD - less than values
Values below less than values are estimated results. Results are less than the reporting limit.

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 191	PCB 194	PCB 195	PCB 196	PCB 201	PCB 203	PCB 205
		Detection Limit (mg/l)	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011	0.0000011
		Plume Monitoring							
Water	80983	Background, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80948	Background, total	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80984	0-10 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80985	10-20 min, overflow, dissolved	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**	**0.0000011**
Water	80986	20-30 min, overflow, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80949	0-10 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80950	10-20 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80951	20-30 min, overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80987	0-10 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80988	10-20 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80989	20-30 min, non-overflow, dissolve	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80952	0-10 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80953	10-20 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80954	20-30 min, non-overflow, total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81105	9&12 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81106	15&18 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81107	21&24 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81108	27&30 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80891	3& 6 min, total	**0.0000011**	**0.0000011**	0.0000090	0.0000026	**0.0000011**	**0.0000011**	**0.0000011**
Water	80892	9&12 min, total	**0.0000010**	**0.0000010**	0.0000026	0.0000065	**0.0000010**	**0.0000010**	**0.0000010**
Water	80893	15&18 min, total	**0.0000010**	**0.0000010**	0.0000016	0.0000039	**0.0000010**	**0.0000010**	**0.0000010**
Water	80894	21&24 min, total	**0.0000011**	**0.0000011**	**0.0000011**	0.0000036	**0.0000011**	**0.0000011**	**0.0000011**
Water	80895	27&30 min, total	**0.0000011**	**0.0000011**	**0.0000011**	0.0000080	**0.0000011**	**0.0000011**	**0.0000011**
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81110	6& 8 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81111	10&12 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81112	14&16 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81113	18&20 min, dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	80897	2& 4 min, total	**0.0000011**	**0.0000011**	0.0000041	0.0000110	**0.0000011**	**0.0000011**	**0.0000011**
Water	80898	6& 8 min, total	**0.0000011**	**0.0000011**	0.0000081	0.0000067	**0.0000011**	**0.0000011**	**0.0000011**
Water	80899	10&12 min, total	**0.0000011**	**0.0000011**	0.0000044	0.0000100	**0.0000011**	**0.0000011**	**0.0000011**
Water	80900	14&16 min, total	**0.0000011**	**0.0000011**	0.0000110	0.0000190	**0.0000011**	**0.0000011**	**0.0000011**
Water	80901	18&20 min, total	**0.0000010**	**0.0000010**	0.0000150	0.0000097	**0.0000010**	**0.0000010**	**0.0000010**
		Site Water							
Water	81603	Sample 1 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81604	Sample 2 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81605	Sample 3 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
		Elutriate							
Water	81609	Sample 1 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81610	Sample 2 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81611	Sample 3 Dissolved	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81606	Sample 1 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81607	Sample 2 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**
Water	81608	Sample 3 Total	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**	**0.0000010**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 191	PCB 194	PCB 195	PCB 196	PCB 201	PCB 203	PCB 205
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**	**0.00077**
Sediment	81718	Sample #2	**0.00077**	**0.00077**	**0.00077**	0.00033	**0.00077**	0.00082	**0.00077**
Sediment	81719	Sample #3	**0.00077**	**0.00077**	**0.00077**	0.00025	**0.00077**	0.00084	**0.00077**

BOLD - less than values
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PCBsfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 206	PCB 207	PCB 208	PCB 209	PCB 66	PCB 190	PCB 198
		Detection Limit (mg/l)	0.0000011	0.00000110	0.00000110		0.0000011	0.0000011	0.0000011
		Plume Monitoring							
Water	80983	Background, dissolved	0.0000025	0.00000095	0.00000130	106.45%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80948	Background, total	0.0000017	**0.00000110**	0.00000081	74.06%	**0.0000011**	**0.0000011**	**0.0000011**
Water	80984	0-10 min, overflow, dissolved	0.0000024	0.00000090	0.00000150	92.43%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80985	10-20 min, overflow, dissolved	0.0000027	0.00000110	0.00000170	100.50%	**0.0000011**	**0.0000011**	**0.0000011**
Water	80986	20-30 min, overflow, dissolved	0.0000026	0.00000110	0.00000140	99.77%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80949	0-10 min, overflow, total	0.0000020	**0.00000100**	0.00000092	64.53%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80950	10-20 min, overflow, total	0.0000020	**0.00000100**	0.00000085	75.26%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80951	20-30 min, overflow, total	0.0000020	**0.00000100**	0.00000089	81.36%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80987	0-10 min, non-overflow, dissolve	0.0000026	0.00000095	0.00000140	101.88%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80988	10-20 min, non-overflow, dissolve	0.0000025	0.00000074	0.00000130	104.87%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80989	20-30 min, non-overflow, dissolve	0.0000024	0.00000071	0.00000120	112.74%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80952	0-10 min, non-overflow, total	0.0000016	**0.00000100**	0.00000074	80.06%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80953	10-20 min, non-overflow, total	0.0000017	**0.00000100**	0.00000075	88.73%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80954	20-30 min, non-overflow, total	0.0000017	**0.00000100**	0.00000083	87.12%	**0.0000010**	**0.0000010**	**0.0000010**
		Hopper Inflow Monitoring							
Water	81104	3& 6 min, dissolved	0.0000016	0.00000049	0.00000077	90.09%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81105	9&12 min, dissolved	0.0000019	0.00000056	0.00000087	86.49%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81106	15&18 min, dissolved	0.0000019	0.00000040	0.00000150	87.34%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81107	21&24 min, dissolved	0.0000021	0.00000065	0.00000100	94.48%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81108	27&30 min, dissolved	0.0000017	0.00000054	0.00000094	72.89%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80891	3& 6 min, total	0.0000410	0.00000280	0.00001700	97.66%	**0.0000011**	**0.0000011**	**0.0000011**
Water	80892	9&12 min, total	0.0000900	0.00000530	0.00004100	58.62%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80893	15&18 min, total	0.0000580	0.00000650	0.00002500	108.63%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80894	21&24 min, total	0.0000460	0.00000190	0.00001900	108.06%	**0.0000011**	**0.0000011**	**0.0000011**
Water	80895	27&30 min, total	0.0000920	0.00000620	0.00004000	124.79%	**0.0000011**	**0.0000011**	**0.0000011**
		Hopper Overflow Monitoring							
Water	81109	2& 4 min, dissolved	0.0000019	0.00000037	0.00000061	81.94%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81110	6& 8 min, dissolved	0.0000016	**0.00000100**	0.00000061	78.71%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81111	10&12 min, dissolved	0.0000017	**0.00000100**	0.00000084	88.72%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81112	14&16 min, dissolved	0.0000018	0.00000043	0.00000086	83.24%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81113	18&20 min, dissolved	0.0000016	0.00000043	0.00000077	80.18%	**0.0000010**	**0.0000010**	**0.0000010**
Water	80897	2& 4 min, total	0.0001700	0.00000960	0.00007400	220.34%	**0.0000011**	**0.0000011**	**0.0000011**
Water	80898	6& 8 min, total	0.0001200	0.00000720	0.00005100	213.26%	**0.0000011**	**0.0000011**	**0.0000011**
Water	80899	10&12 min, total	0.0001200	0.00000860	0.00005200	175.12%	**0.0000011**	**0.0000011**	**0.0000011**
Water	80900	14&16 min, total	0.0001300	0.00001000	0.00005800	216.74%	**0.0000011**	**0.0000011**	**0.0000011**
Water	80901	18&20 min, total	0.0001200	0.00000840	0.00005900	186.63%	**0.0000010**	**0.0000010**	**0.0000010**
		Site Water							
Water	81603	Sample 1 Total	0.0000028	0.00000062	0.00000110	101.92%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81604	Sample 2 Total	0.0000024	**0.00000100**	0.00000100	90.51%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81605	Sample 3 Total	0.0000022	**0.00000100**	0.00000092	90.22%	**0.0000010**	**0.0000010**	**0.0000010**
		Elutriate							
Water	81609	Sample 1 Dissolved	0.0000018	0.00000027	0.00000058	86.71%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81610	Sample 2 Dissolved	0.0000021	0.00000029	0.00000085	96.44%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81611	Sample 3 Dissolved	0.0000021	0.00000054	0.00000078	101.29%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81606	Sample 1 Total	0.0000052	0.00000059	0.00000270	91.62%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81607	Sample 2 Total	0.0000051	**0.00000100**	0.00000270	90.36%	**0.0000010**	**0.0000010**	**0.0000010**
Water	81608	Sample 3 Total	0.0000052	0.00000068	0.00000280	88.68%	**0.0000010**	**0.0000010**	**0.0000010**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 206	PCB 207	PCB 208	PCB 209	PCB 66	PCB 190	PCB 198
		Detection Limit (mg/kg)	0.00077	0.00077	0.00077		0.00077	0.00077	0.00077
		Insitu Sediment							
Sediment	81717	Sample #1	0.00390	0.00048	0.00220	106.21%	**0.00077**	**0.00077**	**0.00077**
Sediment	81718	Sample #2	0.00120	**0.00077**	0.00210	105.19%	**0.00077**	**0.00077**	**0.00077**
Sediment	81719	Sample #3	0.00370	**0.00077**	0.00180	98.01%	**0.00077**	**0.00077**	**0.00077**

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Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 200
		Detection Limit (mg/l)	0.0000011
		Plume Monitoring	
Water	80983	Background, dissolved	**0.0000010**
Water	80948	Background, total	**0.0000011**
Water	80984	0-10 min, overflow, dissolved	**0.0000010**
Water	80985	10-20 min, overflow, dissolved	**0.0000011**
Water	80986	20-30 min, overflow, dissolved	**0.0000010**
Water	80949	0-10 min, overflow, total	**0.0000010**
Water	80950	10-20 min, overflow, total	**0.0000010**
Water	80951	20-30 min, overflow, total	**0.0000010**
Water	80987	0-10 min, non-overflow, dissolve	**0.0000010**
Water	80988	10-20 min, non-overflow, dissolve	**0.0000010**
Water	80989	20-30 min, non-overflow, dissolve	**0.0000010**
Water	80952	0-10 min, non-overflow, total	**0.0000010**
Water	80953	10-20 min, non-overflow, total	**0.0000010**
Water	80954	20-30 min, non-overflow, total	**0.0000010**
		Hopper Inflow Monitoring	
Water	81104	3& 6 min, dissolved	**0.0000010**
Water	81105	9&12 min, dissolved	**0.0000010**
Water	81106	15&18 min, dissolved	**0.0000010**
Water	81107	21&24 min, dissolved	**0.0000010**
Water	81108	27&30 min, dissolved	**0.0000010**
Water	80891	3& 6 min, total	0.0000015
Water	80892	9&12 min, total	0.0000034
Water	80893	15&18 min, total	0.0000020
Water	80894	21&24 min, total	0.0000019
Water	80895	27&30 min, total	**0.0000011**
		Hopper Overflow Monitoring	
Water	81109	2& 4 min, dissolved	**0.0000010**
Water	81110	6& 8 min, dissolved	**0.0000010**
Water	81111	10&12 min, dissolved	**0.0000010**
Water	81112	14&16 min, dissolved	**0.0000010**
Water	81113	18&20 min, dissolved	**0.0000010**
Water	80897	2& 4 min, total	**0.0000011**
Water	80898	6& 8 min, total	0.0000033
Water	80899	10&12 min, total	0.0000064
Water	80900	14&16 min, total	**0.0000011**
Water	80901	18&20 min, total	**0.0000010**
		Site Water	
Water	81603	Sample 1 Total	**0.0000010**
Water	81604	Sample 2 Total	**0.0000010**
Water	81605	Sample 3 Total	**0.0000010**
		Elutriate	
Water	81609	Sample 1 Dissolved	**0.0000010**
Water	81610	Sample 2 Dissolved	**0.0000010**
Water	81611	Sample 3 Dissolved	**0.0000010**
Water	81606	Sample 1 Total	**0.0000010**
Water	81607	Sample 2 Total	**0.0000010**
Water	81608	Sample 3 Total	**0.0000010**

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	PCB 200
		Detection Limit (mg/kg)	0.00077
		Insitu Sediment	
Sediment	81717	Sample #1	**0.00077**
Sediment	81718	Sample #2	**0.00077**
Sediment	81719	Sample #3	**0.00077**

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tssfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	TSS										TS	
		Detection Limit (mg/l)	4										Det Limit	4
		Plume Monitoring Background	10 min	20 min	30 min	40 min	50 min						Plume Monitoring Background	5710
Water	81224	TSS Top Depth	39	152	34	30	47							
Water	81225	TSS Mid-Depth	48	91	55	45	50							
Water	81226	TSS Bottom Depth	110	35	98	144	80							
		Plume Monitoring Non-Overflow	1 min	3 min	5 min	7 min	9 min	12 min	15 min	20 min	25 min	30 min	Plume Monitoring NOF	
Water	81269	TSS Top Depth	41	35	26	33	36	23	26	27	21	34	Sample 1	5860
Water	81270	TSS Mid-Depth	54	89	47	41	70	41	31	37	30	39	Sample 2	5740
Water	81271	TSS Bottom Depth	116	105	78	47	83	68	57	82	53	51	Sample 3	5490
		Plume Monitoring Overflow	1 min	3 min	5 min	7 min	9 min	12 min	15 min	20 min	25 min	30 min	Plume Monitoring OF	
Water	81239	TSS Top Depth	102	314	55	204	90	280	147	83	57	61	Sample 1	4310
Water	81240	TSS Mid-Depth	118	376	155	288	160	136	118	162	83	86	Sample 2	4200
Water	81241	TSS Bottom Depth	206	177	335	386	504	275	186	247	267	328	Sample 3	3862
		Hopper Inflow	3 min	6 min	9 min	12 min	15 min	18 min	21 min	24 min	27 min	30 min	Hopper Inflow	
Water	81324	TSS (mg/l)	1760	12860	3140	27767	43933	27900	7290	28867	83933	47967	Sample 1	30767
													Sample 2	84490
													Sample 3	127760
													Sample 4	37940
													Sample 5	151910
		Hopper Contents Beginning of Overflow	Location 1	Location 2	Location 3									
Water	81352	TSS Top Depth	93367	65267	69733									
Water	81353	TSS Mid-Depth	33233	55900	102433									
Water	81354	TSS Bottom Depth	127167	145200	119000									
		Hopper Contents End of Overflow	Location 1	Location 2	Location 3									
Water	81361	TSS Top Depth	71067	81233	29067									
Water	81362	TSS Mid-Depth	108533	52033	93267									
Water	81363	TSS Bottom Depth	60467	121533	138033									
		Hopper Overflow	0.5 min	1.0 min	1.5 min	2.0 min	2.5 min	3.0 min	3.5 min	4.0 min	4.5 min	5.0 min	Hopper Overflow	
Water	81044	TSS (mg/l)	64260	41733	95367	75333	57567	105900	110300	102600	72400	92800	Sample 1	154430
													Sample 2	145210
		Hopper Overflow	5.5 min	6.0 min	6.5 min	7.0 min	7.5 min	8.0 min	8.5 min	9.0 min	9.5 min	10.0 min	Sample 3	126670
Water	81054	TSS (mg/l)	117967	93833	66633	40233	56733	97167	44200	29233	50667	29233	Sample 4	167600
													Sample 5	170300
		Hopper Overflow	10.5 min	11.0 min	11.5 min	12.0 min	12.5 min	13.0 min	13.5 min	14.0 min	14.5 min	15.0 min		
Water	81064	TSS (mg/l)	46200	58000	15700	63700	78100	62400	27767	89033	41967	143333		
		Hopper Overflow	15.5 min	16.0 min	16.5 min	17.0 min	17.5 min	18.0 min	18.5 min	19.0 min	19.5 min	20.0 min		
Water	81074	TSS (mg/l)	52100	48267	137167	136467	79833	108600	159133	123700	128633	79167		
			TSS										TS	
		Site Water											Site Water	
Water	81675	Sample 1 Total	58										Sample 1 T	4744
Water	81676	Sample 2 Total	63										Sample 2 T	4328
Water	81677	Sample 3 Total	65										Sample 3 T	4386
		Elutriate											Elutriate	
Water	81681	Sample 1 Dissolved	8										Sample 1 D	4228
Water	81682	Sample 2 Dissolved	12										Sample 2 D	4370
Water	81683	Sample 3 Dissolved	11										Sample 3 D	4472
Water	81678	Sample 1 Total	304										Sample 1 T	4734
Water	81679	Sample 2 Total	282										Sample 2 T	4582
Water	81680	Sample 3 Total	292										Sample 3 T	4696

nutrfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	TOC
		Detection Limit (mg/l)	3.00
		Plume Monitoring	
Water	80969	Background, dissolved	6.12
Water	80927	Background, total	7.30
Water	80970	0-10 min, overflow, dissolved	3.07
Water	80971	10-20 min, overflow, dissolved	2.91
Water	80972	20-30 min, overflow, dissolved	2.74
Water	80928	0-10 min, overflow, total	10.70
Water	80923	10-20 min, overflow, total	11.30
Water	80930	20-30 min, overflow, total	8.09
Water	80973	0-10 min, non-overflow, dissolved	4.68
Water	80974	10-20 min, non-overflow, dissolved	6.35
Water	80975	20-30 min, non-overflow, dissolved	5.19
Water	80931	0-10 min, non-overflow, total	6.92
Water	80932	10-20 min, non-overflow, total	7.44
Water	80933	20-30 min, non-overflow, total	8.69
		Hopper Inflow Monitoring	
Water	81084	3& 6 min, dissolved	24.80
Water	81085	9&12 min, dissolved	47.30
Water	81086	15&18 min, dissolved	64.60
Water	81087	21&24 min, dissolved	19.00
Water	81088	27&30 min, dissolved	63.00
Water	80855	3& 6 min, total	1010.00
Water	80856	9&12 min, total	3300.00
Water	80857	15&18 min, total	6030.00
Water	80858	21&24 min, total	1170.00
Water	80859	27&30 min, total	6460.00
		Hopper Overflow Monitoring	
Water	81089	2& 4 min, dissolved	14.10
Water	81090	6& 8 min, dissolved	11.90
Water	81091	10&12 min, dissolved	72.30
Water	81092	14&16 min, dissolved	79.20
Water	81093	18&20 min, dissolved	21.40
Water	80861	2& 4 min, total	6660.00
Water	80862	6& 8 min, total	5930.00
Water	80863	10&12 min, total	5280.00
Water	80864	14&16 min, total	6800.00
Water	80865	18&20 min, total	7150.00
		Site Water	
Water	81693	Sample 1 Total	**3.00**
Water	81694	Sample 2 Total	**3.00**
Water	81695	Sample 3 Total	**3.00**
		Elutriate	
Water	81699	Sample 1 Dissolved	**3.00**
Water	81700	Sample 2 Dissolved	**3.00**
Water	81701	Sample 3 Dissolved	**3.00**
Water	81696	Sample 1 Total	1.48
Water	81697	Sample 2 Total	1.43
Water	81698	Sample 3 Total	1.92

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	TOC
		Detection Limit (mg/kg)	3.0
		Insitu Sediment	
Sediment	81723	Sample #1	8090.0
Sediment	81724	Sample #2	7200.0
Sediment	81725	Sample #3	7520.0

BOLD - less than values
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spgrfine

Delaware River Water Analysis (Fine-Grained Site)

SAMPLE TYPE	SAMPLE ID	DESCRIPTION	Sp. Gr.	%Moisture
		Insitu Sediment		
Sediment	81299	Sample #1	2.73	191.58%
Sediment	81300	Sample #2	2.75	254.93%
Sediment	81301	Sample #3	2.76	203.04%
Sediment	81302	Sample #4	2.74	181.93%
Sediment	81303	Sample #5	2.75	166.58%
Sediment	81304	Sample #6	2.72	117.93%
Sediment	81305	Sample #7	2.71	164.93%
Sediment	81306	Sample #8	2.72	108.57%
Sediment	81307	Sample #9	2.71	94.57%
Sediment	81308	Sample #10	2.73	103.87%
Sediment	81309	Sample #11	2.73	102.13%
Sediment	81310	Sample #12	2.73	130.69%
Sediment	81311	Sample #13	2.71	172.19%
Sediment	81312	Sample #14	2.72	156.47%
Sediment	81313	Sample #15	2.73	79.16%
		Average	2.73	148.57%

Appendix B
Plume Study Field Activities and Data Results

Preface

This section of the report describes field activities and data results from the relative acoustic backscatter channel cross sections with the OBS overlay. The investigators who participated in this part of the project were Messrs. Timothy L. Fagerburg, Howard A. Benson, and Terry N. Waller, U.S. Army Engineer Research and Development Center (ERDC), Coastal and Hydraulics Laboratory (CHL), Vicksburg, MS, and William H. Dulaney, ERDC, Geotechnical and Structures Laboratory (GSL).

This section of the report was written by Messrs. Benson and Fagerburg, with assistance in data processing from Messrs. Waller, Martin T. Hebler, Mses. Clara J. Coleman and Jane M. Vaughan, CHL, and Mr. Daryl P. Cook, DIMCO, Inc., Vicksburg, MS.

Field Procedure

Two test areas were selected for monitoring. Reach 1, was a coarse-grained material site located near the Brandywine Range, in lower Delaware Bay. Reach 2, was a fine-grained material site located at the Deepwater Point Range near New Castle, DE (Figure B1). Channel cross-sectional transects were conducted with the 1,200-kHz Broad-Band Acoustic Doppler Current Profiler (ADCP) and Optical Backscatterance (OBS) sensor at several predetermined transect lines in the test areas for nonoverflow and overflow dredge operations. Several transects were monitored prior to the dredge passing to establish background conditions. The dredge would then begin dredging operations and the transect boat would run continuous transects behind it to determine the extent and dispersion of the plume. The first set of transects at each test area was made during the hopper dredge's being filled with no overflow. The dredge would then proceed to the dumping area, empty the load, and return to the site for the second test.

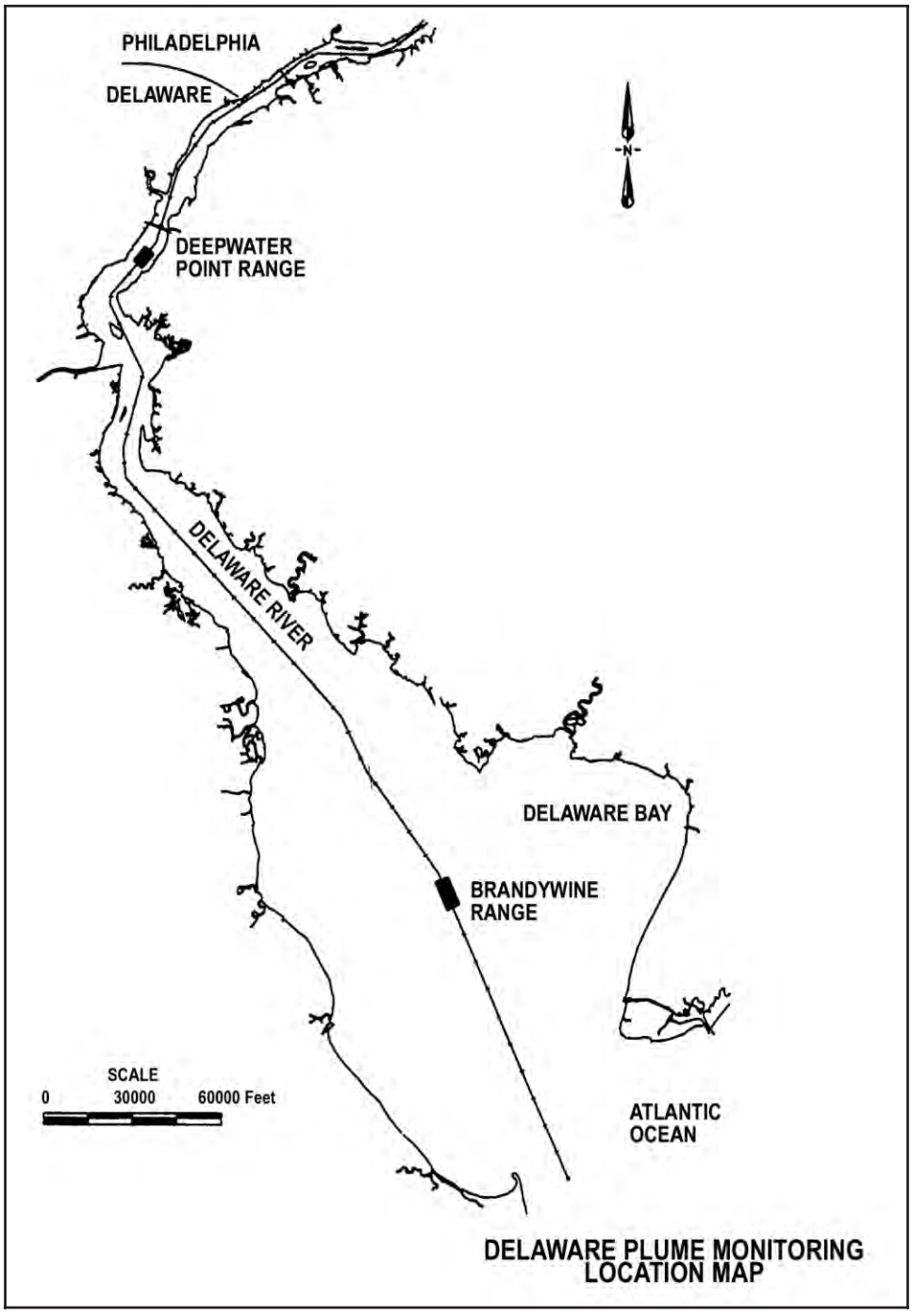

Figure B1. Delaware plume monitoring location map

Prior to the second test, data would be collected at several transect lines again to reestablish background conditions. The second dredging operation would include several minutes of hopper overflow while dredging. Again, the transect boat would run continuous transects behind it to determine the extent and dispersion of the plume.

Monitoring the sediment plume was accomplished using a boat-mounted RD Instruments 1200-kHz Broad-Band ADCP. The instrument collects velocity vectors in the water column together with backscatter levels to determine the position and relative intensity of the sediment plume. A detailed description of the ADCP is presented in the Equipment Description section.

Along with the ADCP, a MicroLite recording instrument with an OBS Sensor was towed by the vessel at a depth of 4.6 m (15 ft). The MicroLite recorded data at 0.5-sec intervals. A detailed description of the MicroLite is also presented in the Equipment Description section.

Navigation data for monitoring was obtained by a Starlink differential Global Positioning System (GPS). The GPS monitors the boat position from the starting and ending points along each transect. The manufacturer stated accuracy of the navigation system is ±1 m. The navigation data were recorded at 1-sec intervals for merging with the ADCP and OBS data.

In situ sediment samples were collected prior to the dredging tests at both sites. Bottom samples were collected using a grab-type sampling bucket detailed in the Equipment Description section. Water samples for pore-water and toxicity tests were obtained using a portable pump sampler also described in the Equipment Description section. Types of samples, and the tests and analyses of the samples, are reported elsewhere in the report.

Dredge Plume Monitoring

The data presented in Figures B2 through B15 represent a time-history of the changes in suspended material levels in the water column resulting from dredge operations within each test area. The relative backscatter intensity of the ADCP acoustic signal is described as the strength of the return acoustic signal as it is affected by material suspended in the water column. Changes in levels of suspended material affect the acoustic reflectivity properties of the water column and, in turn, have an effect on the strength of the return signal intensity (decibels). High levels of suspended material in the water column result in high levels of acoustic intensity. The ADCP acoustic intensity data were utilized to identify levels of suspended material in the water column before, during, and following dredging operations.

As stated previously, transects were monitored in each test area to obtain the background levels of suspended materials prior to any dredging activities. The background levels shown in Figures B2 and B5 and in B9 and B12 are for the two test areas, Brandywine Range (Reach 1) and Deepwater Point Range (Reach 2), respectively.

Figures B2 through B4 illustrate the residence time of the sediment plume resulting from nonoverflow dredging operation in the Reach 1. The background levels are shown in Figure B2. Figure B3 shows the vertical

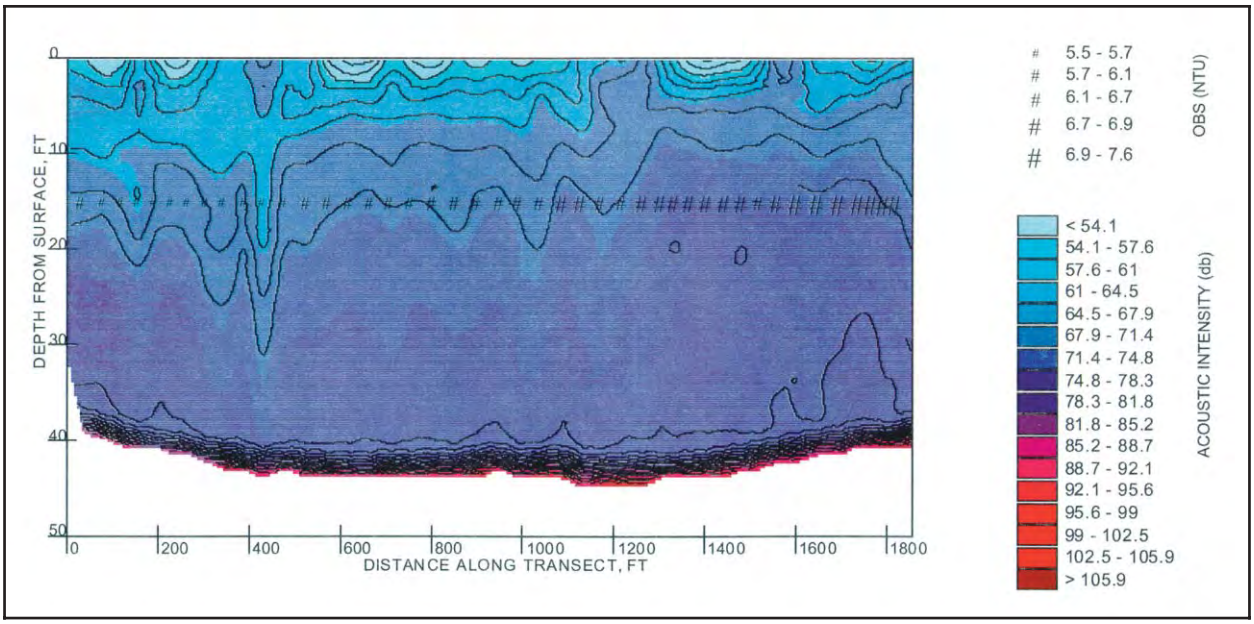

Figure B2. Relative acoustic intensity and OBS readings, Line 3, 1509 EST, Brandywine Range - Reach 1, 09/15/98

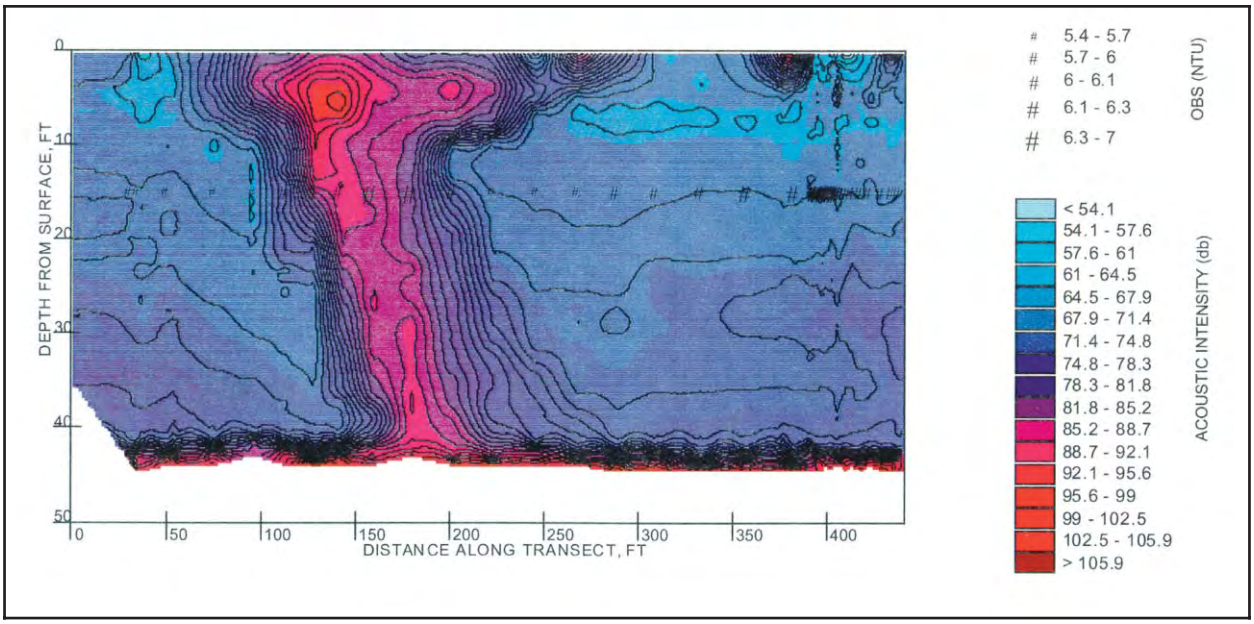

Figure B3. Relative acoustic intensity and OBS readings, Line 305, 1633 EST, Brandywine Range - Reach 1, 09/15/98

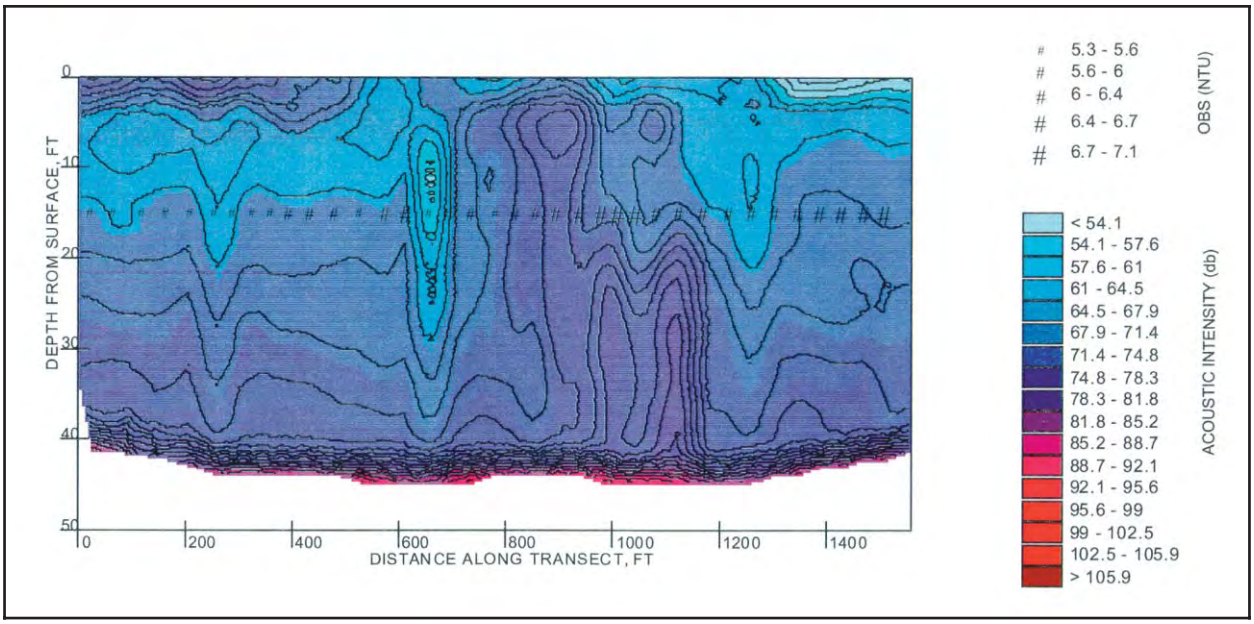

Figure B4. Relative acoustic intensity and OBS readings, Line 303, 1641 EST, Brandywine Range - Reach 1, 09/15/98

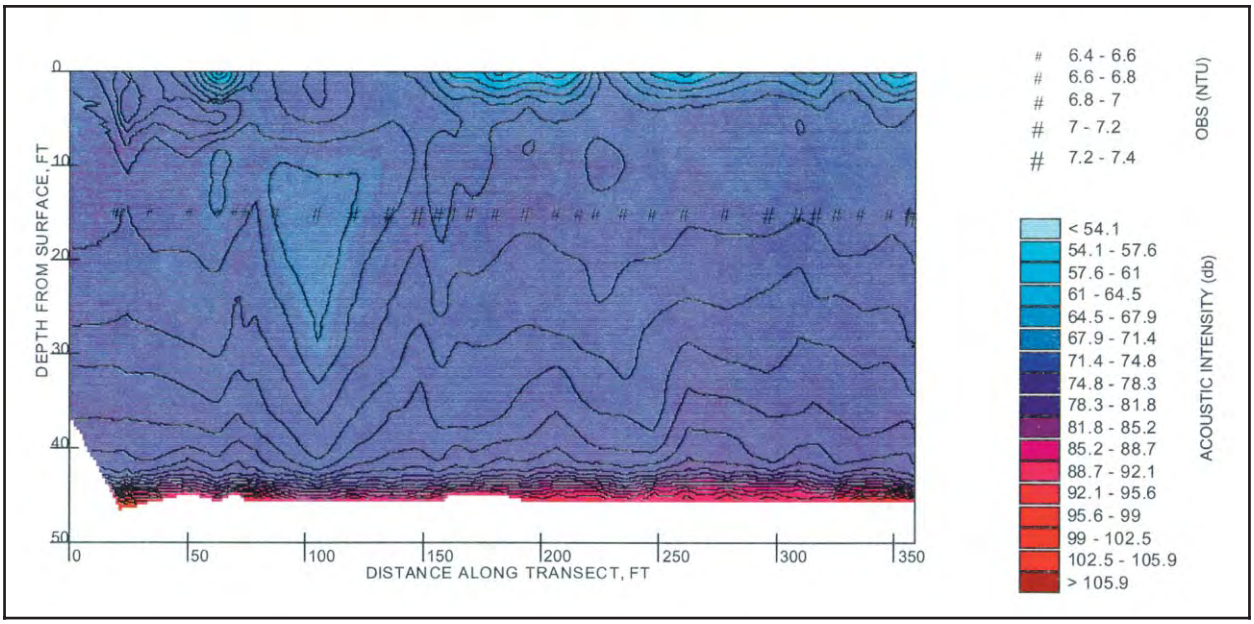

Figure B5. Relative acoustic intensity and OBS readings, Line 113, 1938 EST, Brandywine Range - Reach 1, 09/15/98

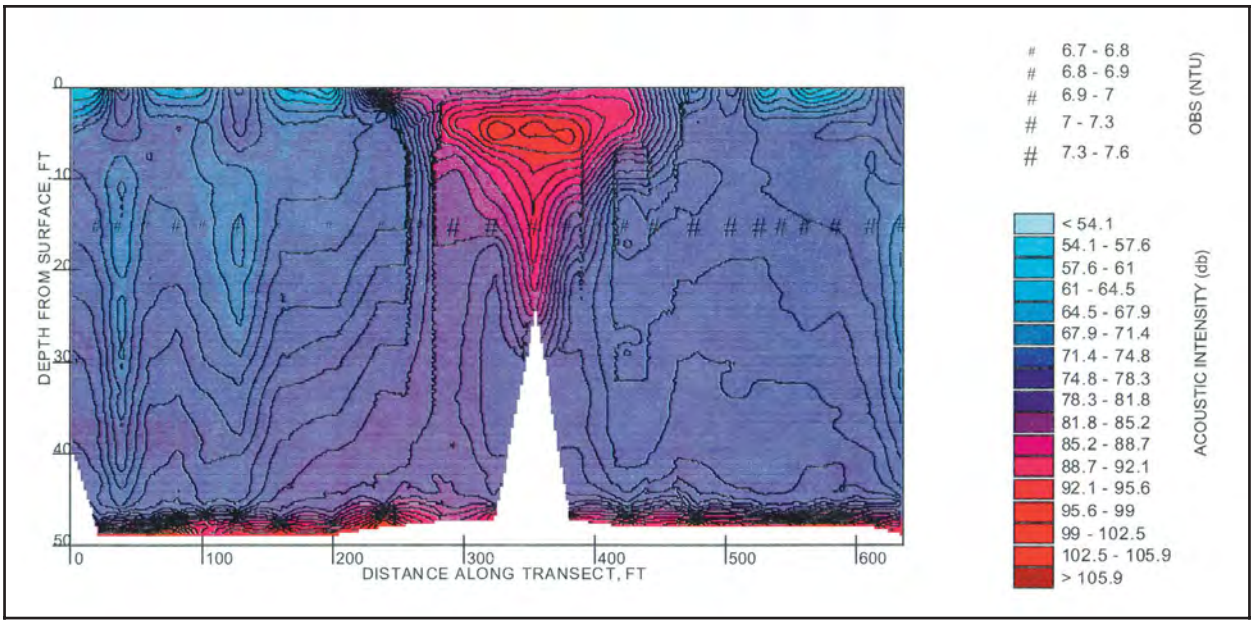

Figure B6. Relative acoustic intensity and OBS readings, Line 217, 1953 EST, Brandywine Range - Reach 1, 09/15/98

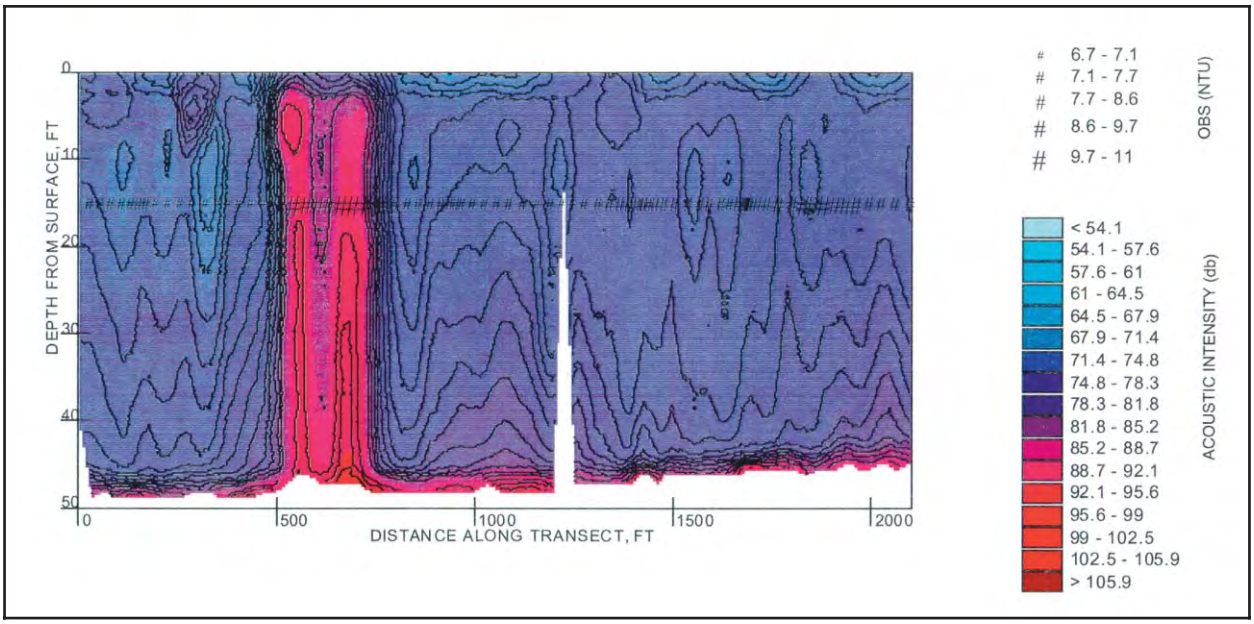

Figure B7. Relative acoustic intensity and OBS readings, Line 119, 1957 EST, Brandywine Range - Reach 1, 09/15/98

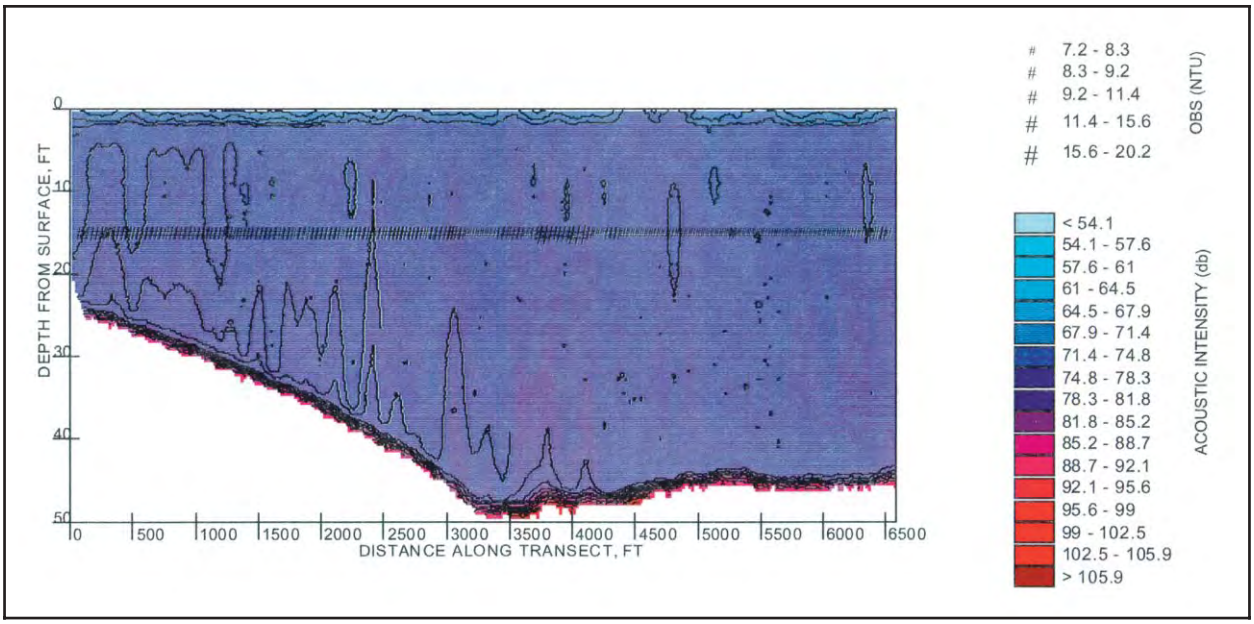

Figure B8. Relative acoustic intensity and OBS readings, Line 115, 2050 EST, Brandywine Range - Reach 1, 09/15/98

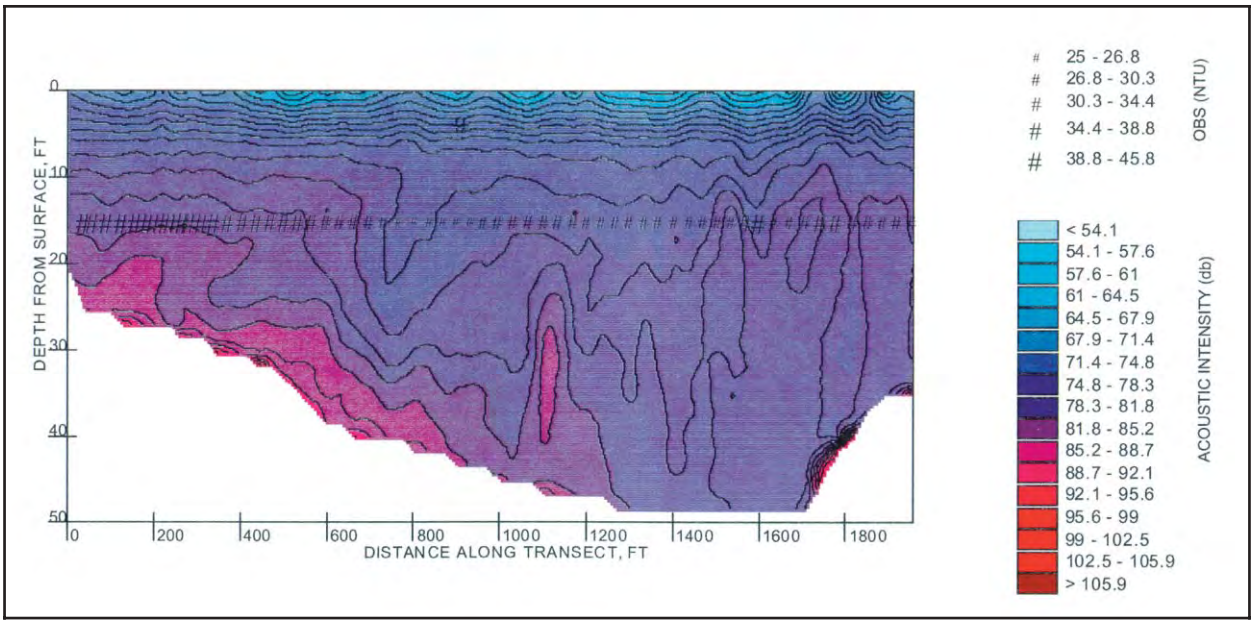

Figure B9. Relative acoustic intensity and OBS readings, Line 18, 1404 EST, Deepwater Point Range - Reach 2, 09/16/98

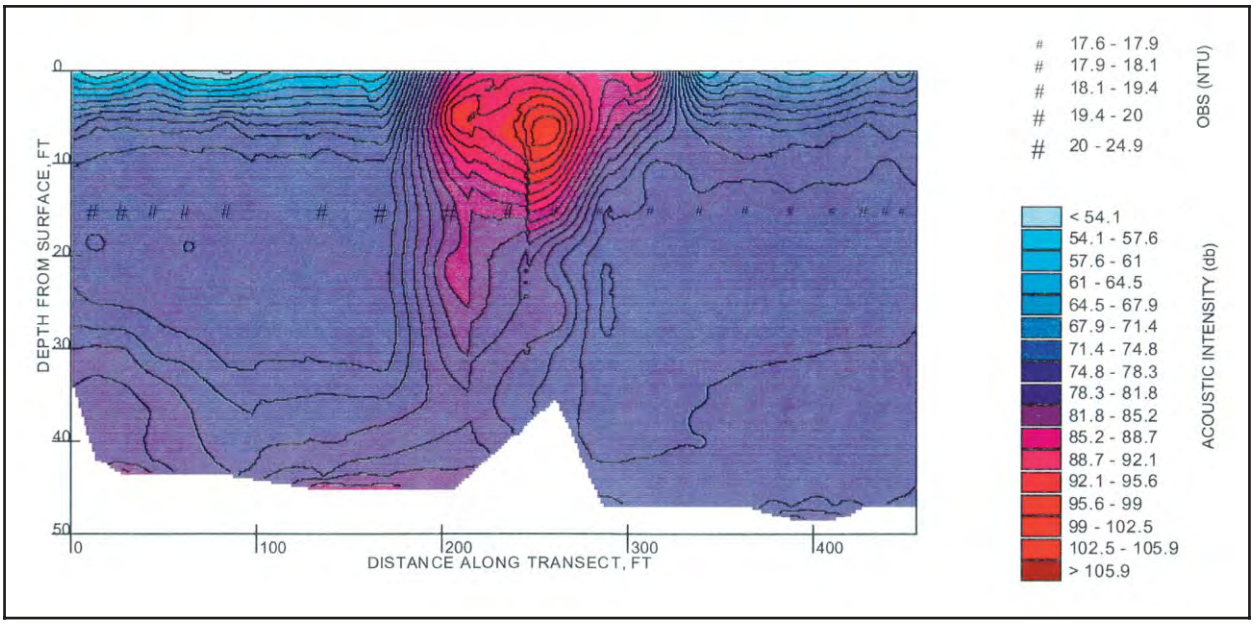

Figure B10. Relative acoustic intensity and OBS readings, Line 118, 1459 EST, Deepwater Point Range - Reach 2, 09/16/98

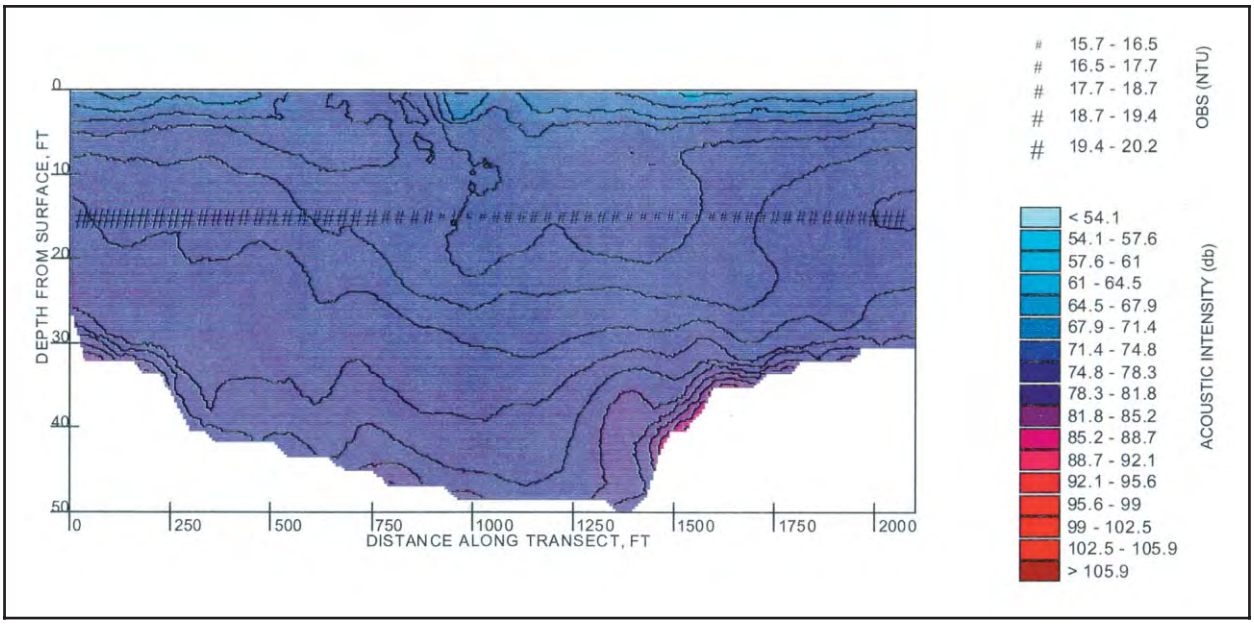

Figure B11. Relative acoustic intensity and OBS readings, Line 224, 1518 EST, Deepwater Point Range - Reach 2, 09/16/98

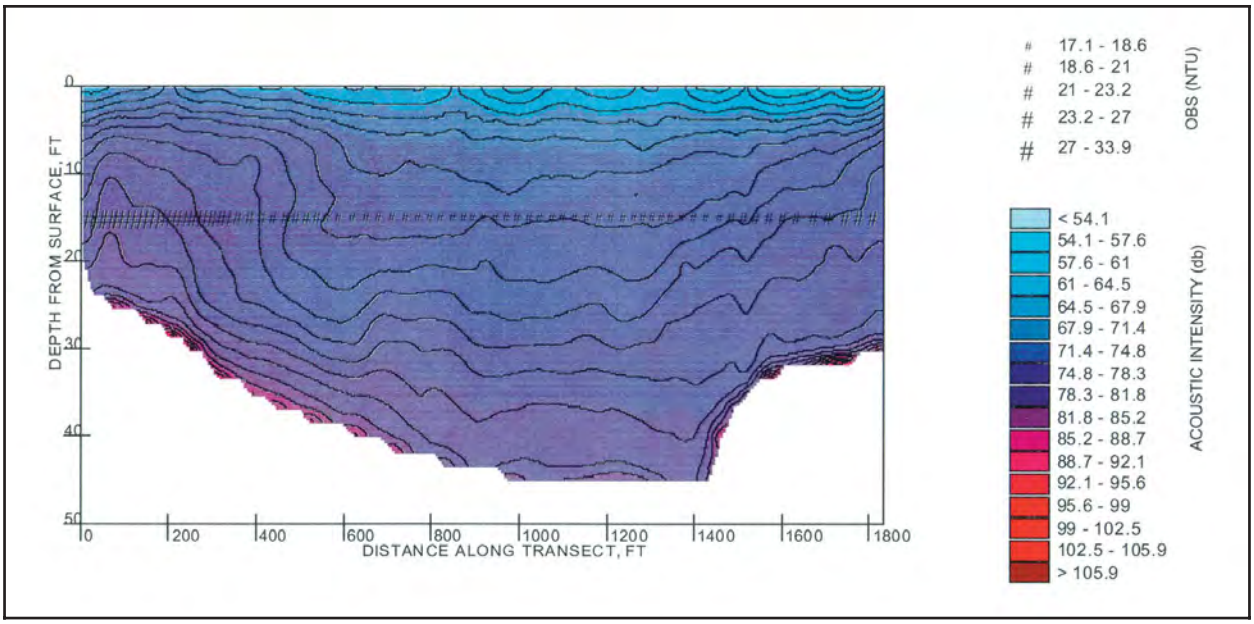

Figure B12. Relative acoustic intensity and OBS readings, Line 14, 1730 EST, Deepwater Point Range - Reach 2, 09/16/98

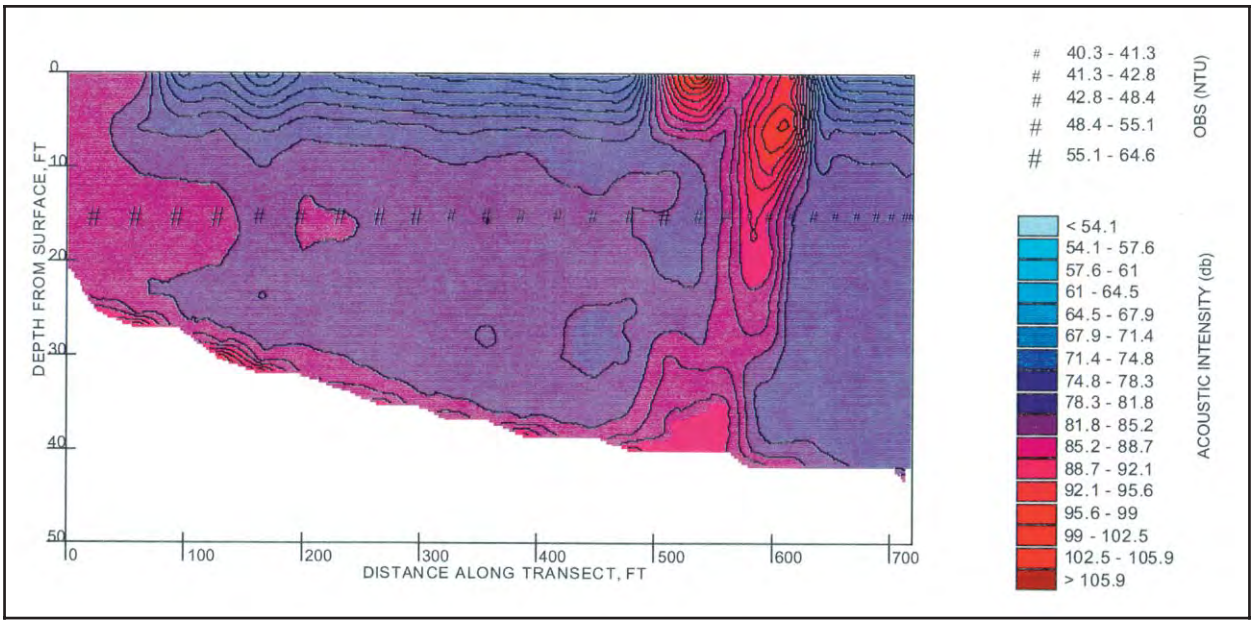

Figure B13. Relative acoustic intensity and OBS readings, Line 9, 1818 EST, Deepwater Point Range - Reach 2, 09/16/98

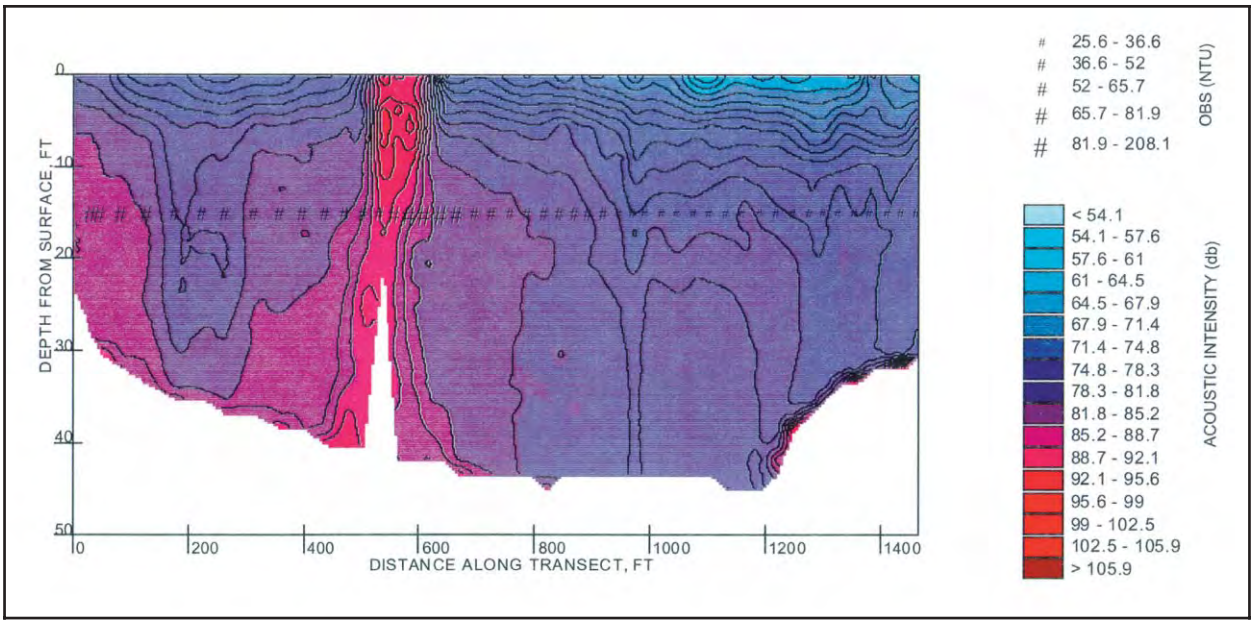

Figure B14. Relative acoustic intensity and OBS readings, Line 15, 1832 EST, Deepwater Point Range - Reach 2, 09/16/98

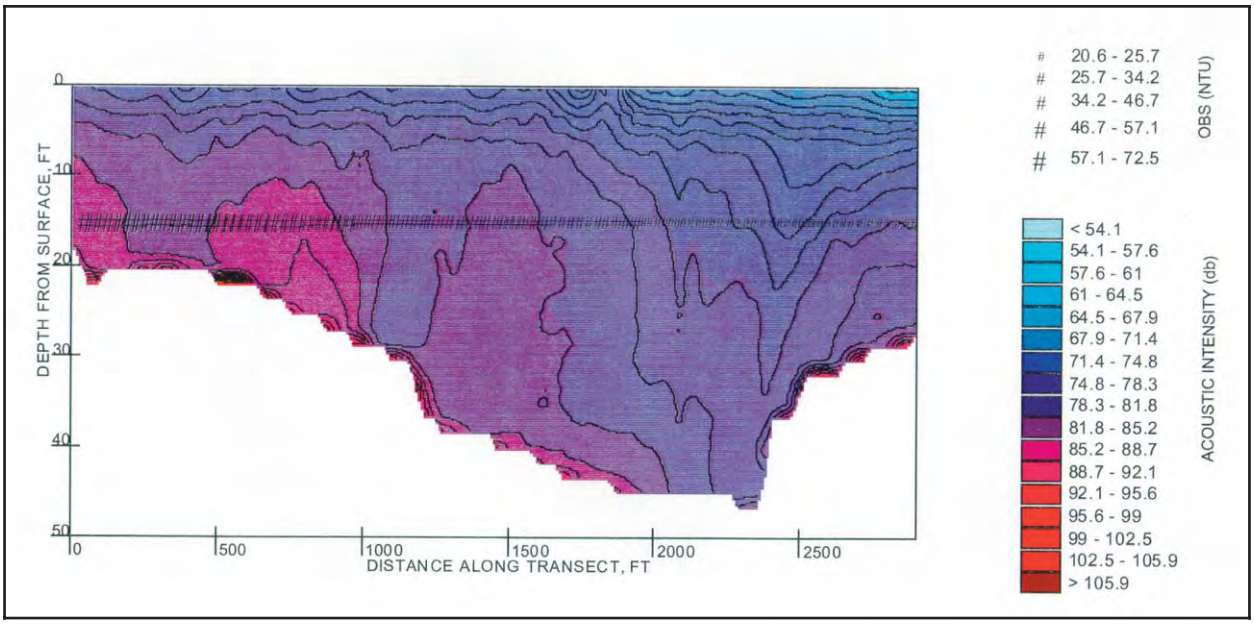

Figure B15. Relative acoustic intensity and OBS readings, Line 324, 2020 EST, Deepwater Point Range - Reach 2, 09/16/98

and horizontal dimensions of the sediment plume immediately behind the dredge. Figure B4 shows the level of suspended material in the water column 8 min following the dredge's passing, indicating that background levels of suspended material are returning to the site. No lateral dispersion of the plume out of channel was observed during the nonoverflow dredging operation.

Figures B5 through B8 illustrate the residence time of the sediment plume created with hopper-overflow conditions during dredging operations in Reach 1. Background levels of suspended materials prior to the dredging operations are shown in Figure B5. The vertical and horizontal dimensions of the sediment plume immediately behind the dredge while hopper over-flow conditions are occurring are shown in Figure B6. Plume dimensions 4 min after the dredge passed are shown in Figure B7. A wider transect was performed, as seen in the horizontal distance scale, to determine the lateral extent of the plume. No significant change above background levels could be detected. At 1 hr elapsed time following the end of the overflow dredging operation, the levels of suspended material had returned to background conditions as shown in Figure B8. Again, no lateral dispersion of the plume out of the channel area was observed.

Figures B9 through B11 illustrate the residence time of the sediment plume created from nonoverflow conditions during dredging operations in the Reach 2 area. At the beginning of the dredging operations, background suspended material levels are shown in Figure B9. The plume dimensions in the lateral and vertical directions immediately behind the dredge at the start of dredging operations are shown in Figure B10. After an elapsed time of 19 min (Figure B11), following the end of dredging operations, the levels of suspended material had returned to background conditions. During this dredging operation, the tidal flow in the dredging area had reversed from flood flow to ebb flow conditions. This accounts for the relative change in background levels seen between Figure B9 and Figure B11. Despite the changes in background levels resulting from the change in direction of flow in the dredging area, no lateral movement of the plume beyond the channel limits was observed.

Figures B12 through B15 illustrate the residence time of the dredge plume resulting from hopper overflow dredging conditions in the Reach 2 area. Background levels prior to dredging operations are shown in Figure B12. The sediment plume dimensions immediately behind the dredge prior to overflow conditions can be seen in Figure B13. Note the increase in the suspended material levels within the first 400 ft of the transect. The increase in these levels can be attributed to the increase in the ebb flow velocities and the resulting disturbance of bottom materials from near bottom velocities and not dredge plume dispersion. When hopper-overflow conditions began, another transect was performed located immediately behind the dredge as shown in Figure B14. The width of the transect was also increased, as indicated in the length of the horizontal distance scale, to observe the lateral extent of the dispersion of the dredge plume. After an elapsed time of 1 hr following the completion of the overflow dredging

operation, Figure B15 indicates that the levels of suspended materials had returned to background conditions. Note the increase in sediment disturbance near the bottom in the shallow portions of the transect which are due to the increase in the velocities during the ebb cycle of the tide. As in the previous dredge operations, no lateral dispersion of the dredge plume beyond the channel limits was observed.

The OBS data shown in Figures B2 through B15 were used to see if there is a correlation between the relative acoustic backscatter from the ADCP with different levels of turbidity for the OBS sensor. The figures indicate a fairly good correlation as increases in the ADCP relative acoustic intensities correspond to similar increases in the turbidity levels from the OBS sensor. Since the OBS sensor was deployed at a fixed depth, relative changes in turbidity throughout the water column were not measured.

Equipment Description

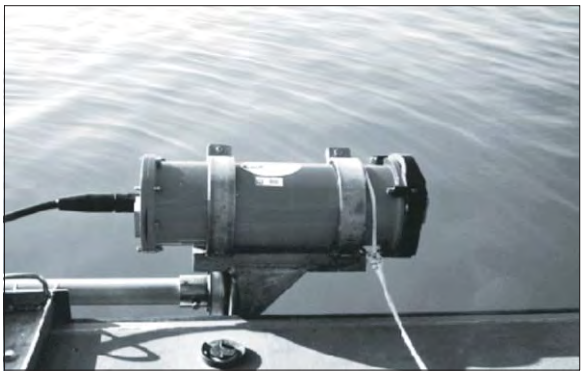

Figure B16. Acoustic Doppler Current Profiler

Acoustic Doppler Current Profiler (ADCP)

Acoustic techniques are used to obtain current velocity and direction measurements for fast and accurate profiling in the field. The equipment used was a boat-mounted RD Instruments BroadBand Acoustic Doppler Current Profiler (ADCP) as shown in Figure B16. The RD instruments operating frequency was 1,200 kHz. The equipment can be mounted over the side of boat with the acoustic transducers submerged and data is collected while the vessel is underarey as shown in Figure B17.

Figure B17. Vessel-mounted ADCP

The ADCP transmits sound bursts into the water column which are scattered back to the instrument by particulate matter suspended in the flowing water. The ADCP sensors listen for the returning signal and assigns depths and velocity to the received signal based on the change in the frequency caused by the moving particles. This change in frequency is referred to as a Doppler shift.

The ADCP is also capable of measuring vessel direction, current direction, water temperature, and bottom depth. Communication with the instrument for setup and data recording are performed with a portable computer using manufacturer supplied software, hardware, and communication cables. The manufacturer stated accuracies for current speed measurement ±0.2 cm/sec; for vessel direction, ±2 deg; and for temperature, ±5 °F.

OBS Sensors

The OBS sensor, a product of D&A Instruments and Engineering, is a type of nephelometer for measuring turbidity and solids concentrations by detecting scattered infrared light from suspended matter. It consists of a high-intensity infrared emitting diode (IRED), a series of silicon photodiodes as detector and linear solid state temperature transducer. The IRED emits a beam at angles 50 deg in the axial plane and 30 deg in the radial plane to detect suspended particles by sensing the radiation they scatter, as shown in Figure B18. Scattering by particles is a strong function of the angle between the path of radiation from the sensor through the water and the signal return to the detector. OBS sensors detect only radiation scattered at angles greater than 140 deg. As with other optical turbidity sensors, the response of the OBS sensor depends on the size distribution, composition, and shape of particles suspended in the medium being monitored. For this reason, sensors must be calibrated with suspended solids from the waters being monitored. The OBS sensor is interfaced with Coastal Leasing, Inc., MicroLite solid-state microprocessor that controls samples, averaging, and data storage. The MicroLite uses Wizard portable PC software to provide user-friendly control of the instrument.

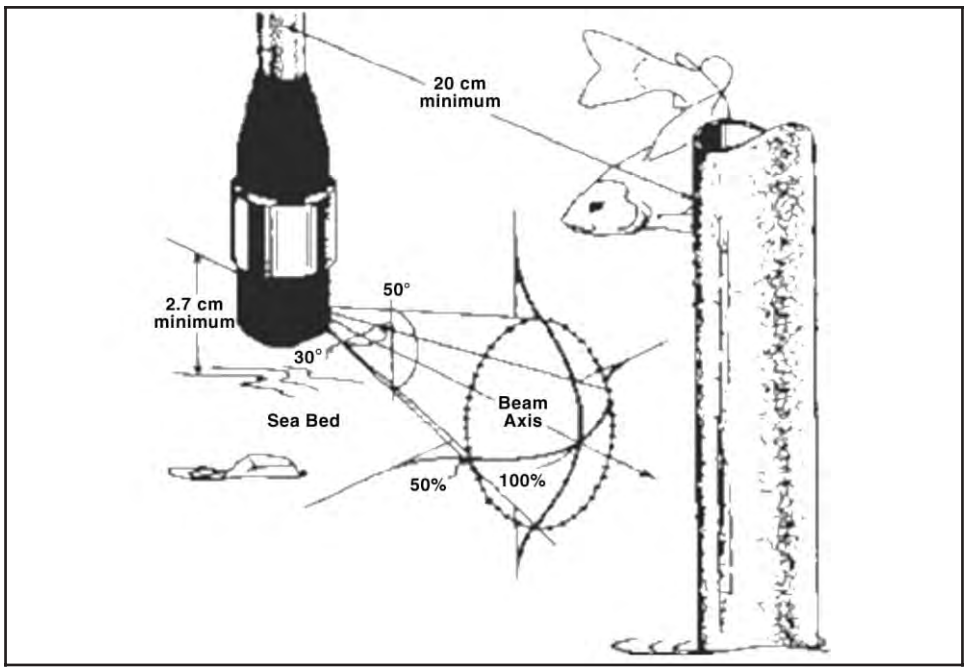

Figure B18. OBS sensor beam pattern

Tethered-drag sampler

The Tethered-drag sampler is basically a 76-mm- (3-in.-) diam pipe cut on a 45-deg angle with a shackle mounted on one side. The sampler is thrown over the side and dragged along the bottom. The sample accumulates inside the pipe. Samples are removed, inspected, and packaged in plastic bags or jars for further analysis once returned to ERDC. The Tethered-drag sampler is displayed in Figure B19.

Figure B19. Tethered-drag sampler

Pumped water samples

Water samples are obtained by pumping the sample from the desired depth to the surface collection point via a portable sampling pump. The pumping system consists of a 6-mm- (1/4-in.-) ID plastic tubing attached to a weighted "fish" for support. The weight is lowered by cable from a winch with a depth indicator. The opening of the sampling tubing is attached to a solid suspension bar above the weight and is pointed into the flow. A 12-V DC pump is used to move the water through the tubing to the deck of the boat where each sample is then collected in appropriate glass or plastic containers. The pump and tubing are flushed for approximately 1 min at each depth before collecting the sample.

Appendix C
Detection of Short-Term Sedimentation During Hopper Dredging Operations in Delaware Bay and the Delaware River[1]

US Army Corps of Engineers
Waterways Experiment Station
Vicksburg, MS 39180

February 1999

Detection of Short-Term Sedimentation During Hopper Dredging Operations in Delaware Bay and the Delaware River

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[1] Adapted from unpublished draft report, Robert J. Diaz and Douglas G. Clarke, February 1999, R. J. Diaz and Daughters, Ware Neck, VA, and Coastal Ecology Branch, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS

Introduction

Navigation channel maintenance dredging projects employing hopper dredges can produce substantial water-column turbidity when in situ sediments contain a high proportion of fines and overflow practices are used. Most of the sediment resuspended during overflow operations has been shown to settle within several hundred meters of the channel (Nichols, Diaz, and Schaffner 1990; Clarke et al. 1990). It has been hypothesized that even short-term pulses in sedimentation rates induced by overflow operations could negatively impact sensitive living resources, such as oyster beds, in the vicinity of dredged channels.

Detection and measurement of recently deposited thin layers of dredged material can be a severe technical challenge. Sediment overburdens with thicknesses on the scale of several millimeters can potentially raise concern for biological impacts. Precision bathymetry methods using acoustic technologies lack the sensitivity to detect low-density thin overburdens less than 5 to 10 cm thick, at best. However, direct in situ observations of very thin layers have effectively been done with sediment profile imaging (SPI). Nichols, Diaz, and Schaffner (1990) demonstrated that SPI techniques could detect thin layers of sediment deposited from hopper dredge overflow operations in the Chesapeake Bay. SPI has also proven to be very effective in mapping the distribution of thin layers resulting from open-water dredged material disposal operations in Mobile Bay (Diaz, Schafffner, and Kiley 1987a; Diaz and Schaffner 1988; Clarke and Miller-Way 1992), Mississippi Sound (Diaz, Schafffner, and Kiley 1987b), and Long Island Sound (Morton, Parker, and Richmond 1985).

The primary focus of this study was to determine if short-term sedimentation of dredged material occurred as a consequence of resuspension by the dragheads or during overflow from the hopper dredge. A secondary objective, should sedimentation be detected in sediment profile images, was to determine the distances from the navigation channel at which measurable sedimentation occurred. Two areas were selected by the U.S. Army Engineer District, Philadelphia (CENAP), for conduct of the hopper dredging operations tests (Figure C1). These locations represent a relatively open-water site in the Delaware bay, designated the Lower Study site (LS), and a more riverine site in the Delaware River, designated the Upper Study site (US).

Materials and Methods

Field methods

On 15 and 16 September 1998, sediment profile images were collected at a series of stations at the two predetermined locations in Delaware Bay

and the Delaware River (LS and US, respectively). SPI data were successfully collected at stations in the LS site (Figure C2) and stations in the US site (Figure C3). At each station a Hulcher Model Wrenn sediment profile camera was deployed. During each deployment the profile camera obtained two images (Fujichrome 100P 35-mm slides) at 5 and 15 sec after bottom contact. The two-image sequence helps to ensure that when deployment occurs in soft, unconsolidated sediments the sediment-water interface is captured in the image before the camera prism optical window descends too deeply into the substrate.

Stations were located based on considerations of prevailing wind, river discharge, and/or tidal flow conditions at the time of each hopper dredge test. At both study locations data were collected first while the dredge was operating without overflow, followed by a second test with overflow. Sampling proceeded for up to 2 hr after dredging ceased.

Image analysis

The sediment profile images were first analyzed visually by projecting the images and recording all features seen into a preformatted, standardized spread sheet file. The images were then digitized using a Polaroid Sprint Scan 35 Plus scanner and analyzed using Adobe Photoshop and NTIS Image programs. Steps in the computer analysis of each image were standardized consistent with procedures described in Viles and Diaz (1991). Data from each image were sequentially saved to a spread sheet file for later analysis. Details of how these data were obtained can be found in Diaz and Schaffner (1988) and Rhoads and Germano (1986), and in the standardized image analysis procedures of Viles and Diaz (1991).

Results and DIscussion

SPI images from a total of 14 stations were analyzed from the LS site (Figure C2) and 41 stations from the US site (Figure C3). The approximate location of the hopper dredge in proximity to the sampling stations is shown in Figures C2 and C3. The LS site was sampled on 15 September from 1958 to 2208 hr. Tidal flows were flooding during the sampling period and winds were approximately 24 to 32 kph (15 to 20 mph) out of the east. Sea conditions were marginal for successful deployment of the camera system, with approximate wave heights of 0.6 to 0.9 m (2 to 3 ft). The US site was sampled on 16 September 1998 from 1507 to 2102 hr. This reach of the Delaware River is influenced by tidal currents, which were ebbing during the sampling period. Sea conditions were mild with wave heights less than 0.6 m (2 ft) throughout the sampling period.

Presented below are explanations of each of the parameters produced from analysis of SPI images and an overview of observations of physical and biological features at the two study sites. Complete listings of visual

and computer analysis data for each study site are given in Tables C1 and C2.

Prism penetration

This parameter provided a geotechnical estimate of sediment compaction, with the profile camera prism acting as a dead weight penetrometer. The depth of prism penetration is therefore related to the "softness" or degree of sediment compaction or water content. Penetration was simply measured as the distance the sediment interface moved up the 23-cm length of the prism optical window as captured by the 15-sec image. The weight of the camera frame was kept constant at 43 kg (95 lb) in order to allow comparisons of relative sediment compaction between stations.

Sand bottoms typical of the LS site had comparatively shallow penetration depths, ranging from 0.0 to 10.9 cm (Table C1). When sandy sediments are poorly sorted, as was the case at channel station LS-09 (Figure C4), prism penetration was deeper. Silty-clay sediments prominent at the US site had comparatively deep penetration (loosely compacted) values, ranging from 9.8 to 25.0 cm (Table C2). Compacted clay sediments, as indicated by very shallow penetration, can be seen in the image from station US-14 (Figure C5).

Surface relief

Surface relief or boundary roughness was measured as the difference between the maximum and minimum distance (relative to the sediment-water interface) the prism penetrated and provided qualitative and quantitative data on habitat characteristics useful for evaluating existing conditions. Small-scale bed roughness on the order of the width (15 cm) of the prism optical window can be estimated from the images. Factors contributing to observed roughness can often be inferred from visual analysis of the images.

In the open-water setting of the sandy LS site, physical factors (e.g., water current and wave generated turbulence) obviously dominated local sediment processes. Surface relief was typically present as small bed forms (e.g., LS-13, Figure C6) that ranged from 0.6 to 2.0 cm (Table C1). In contrast, the muddy habitats of the US site were primarily influenced by biological features, including mounds, pits, and tubes formed from the biogenic activity of benthic organisms (e.g., US-35, Figure C7). Here surface relief values ranged from 0.4 to 3.5 cm (Table C2).

Apparent color redox potential discontinuity layer

This parameter has been determined to be an important estimator of benthic habitat quality (Rhoads and Germano 1986, Diaz and Schaffner 1988), providing an estimate of the depth to which sediments are oxidized. The

term “apparent” is used in describing this parameter because no direct chemical measurement is made of the redox potential. Rather an assumption is made that, given the complexities of iron and sulfate reduction-oxidation chemistry, reddish/greenish-brown sediment color tones (Diaz and Schaffner 1988) are indicative of oxic sediments, whereas reduced sediments have gray to black color tones. This is in accordance with the classical concept of redox potential discontinuity (RPD) depth, which associates RPD with sediment color (Fenchel 1969, Vismann 1991).

The depth of the apparent color RPD was defined as the area of all the pixels in the image discerned as being oxidized divided by the width of the digitized image. The area of the image with oxic sediment was obtained by digitally manipulating the image to enhance characteristics associated with oxic sediment (reddish/greenish-brown color tones). The enhanced area was then measured from a density slice of the image.

The apparent color RPD has been a very useful parameter in assessing the quality of a benthic habitat for infauna and epifauna from both physical and biological perspectives. Rhoads and Germano (1986); Revelas, Rhoads, and Germano (1987); Day, Schaffner, and Diaz (1988); Diaz and Schaffner (1988); Valente et al. (1992); and Bonsdorff et al. (1996) all found the depth of the RPD from profile images to be directly correlated to the quality of the benthic habitat in polyhaline and mesohaline estuarine zones. Controlling for differences in sediment type, habitats with relatively thin (<5 mm) RPD layers tend to be associated with some type of environmental stress. In contrast, habitats with relatively deep RPD values (>2 cm) usually have flourishing infaunal and epifaunal communities.

Porous sandy sediments (e.g., LS-09, Figure C4) and silty-clay sediments with evidence of high levels of biological activity (e.g., US-11, Figure C8) had the deepest RPD measurements in this study. Shallowest RPD measurements were associated with images that had signs of physical disturbance, possibly dredging related (e.g., LS-06, Figure C9), or were compact clays (e.g., US-33, Figure C10). In the LS site, average RPD depth ranged from 0.7 to 5.3 cm, and from 0.1 to 6.6 cm in the US site (Tables C1 and C2).

Sediment grain size

Grain size is an important parameter for determining the nature of the physical forces acting on a sedimentary habitat. Grain size is also a major factor in determining benthic community structure (Rhoads 1974). The sediment type descriptors used for image analysis follow the Wentworth classification as described in Folk (1974) and represent the major modal class for each image. Grain size was determined by comparison of collected images with a set of standard images for which mean grain size had been determined in the laboratory.

Grain size ranged from medium-sand gravel (e.g., US-21, Figure C11) to clay (e.g., US-35, Figure C7). Traces of sand were also seen at a few fine-grained stations (e.g., US-29, Figure C12) and traces of fines at coarse-grained stations (e.g., US-32, Figure C13). Within study site variation in sediment type for the LS site was low, with the modal grain size being fine-medium-sand (e.g., LS-03, Figure C14). Shell hash was a major component of sediments in the LS site, particularly in the navigation channel (e.g., LS-06, Figure C9) (Table C1). In the US site sediments were more variable with the modal grain size being clay (e.g., US-09, Figure C4), which was closely followed by silty-clay (e.g., US-09, Figure C15). In addition to having finer sediments than the LS site, there was little evidence of shell hash in US site sediments (Table C2).

Near-bottom turbidity

The sediment profiling camera is also able to image water column turbidity immediately above the sediment-water interface. Light from the camera prism's internal strobe illuminates suspended sediment particles and allows qualitative estimation of turbidity. Turbidity was categorized as low (if the water column was clear with little or no suspended sediment, e.g., LS-02, Figure C16), moderate (e.g., US-09, Figure C15), and high (e.g., US-14, Figure C5). If plumes of resuspended sediment derived from either of the dragheads of overflow were present at the sampling station, the camera would capture the near-bottom turbidity. Such turbidity can be distinguished from other sources, such as that frequently caused by camera frame contact with the substrate, by color tones. Dredge-induced turbidity has a gray color because the bulk of the sediments dredged are from the anoxic zone and in a reduced redox chemical state. Reduced iron and manganese sulfide compounds are dark gray to black in color which contrasts well with the reddish to brown color tones of their oxidized compounds. Background turbidity or that caused by the camera frame landing on the bottom would be brown in color because the suspended sediments were disturbed from the uppermost few millimeters of surficial sediments, which are typically in an oxic redox state.

Two stations in the LS site (LS-07 and LS-12, Figures C17 and C18) had grayish colored suspended material. Station LS-07 was located on the edge of the navigation channel and could have been affected by passage of the dragheads. This station was occupied prior to initiation of overflow. LS-12 was located in the channel and appeared to have been recently disturbed. All other LS images had brownish suspended materials (Table C2).

The relative amount of suspended material showed no pattern relative to the dredging operation at either LS or US site. In the US site, high levels of turbidity seemed associated with shoal areas (<5.5 m (<18 ft) deep) to the northwest of the channel (Figure C3). The four channel stations in the US site had low turbidity levels (Table C2). Only one of the four channel stations in the LS site had moderate turbidity, while the remaining three had low turbidities (Table C1).

Current scour

While sitting on the bottom, the prism and camera housing assembly present an obstruction to bottom currents. Deflection of currents can erode the sediment-water interface at the edges of the prism. This erosion can be seen in SPI images as small dips in the sediment-water interface at the edges of the image. When these dips occur, it is reasonable to assume that bottom currents at the time the image was taken were >10 cm/sec.

Evidence of scour was seen at three of the four channel stations in the LS site (e.g., LS-12, Figure C18) and one shoal station (LS-03, Figure C14) (Table C1). In the US site only one of the 41 stations (US-31, on the channel edge, Figure C19) showed evidence of scour (Table C2). Scour patterns indicated that bottom currents are likely stronger in the LS site relative to the US site.

Dredged material

When recently deposited, dredged sediments from hopper overflow or open-water disposal are distinct in color from background sediments (Diaz and Schaffner 1988; Nichols, Diaz, and Schaffner 1990), being grayer than background sediments. This is the result of in general, the more advanced diagenic state of deep sediments being dredged (Rhoads, SAIC, personal communication, as discussed in section on Near-Bottom Turbidity).

SPI images from three of the four channel stations in the LS site appear to be recently disturbed and likely dredged material (e.g., LS-06, Figure C9) (Table C1). The channel sediments are sands with shell hash that contain little fine sediment. It is not likely that the surface sediments are from hopper overflow, but more likely associated with disturbance from the dragheads. In addition, the test dredging and overflow were not of sufficient quantity or duration to produce extensive layering from sands.

No station from the US site appeared to have recently deposited dredged material. Sediments at all US site stations appeared to be undisturbed and representative of background conditions.

Sediment layering

Sediment layering as indicated by color or grain-size changes are readily seen in SPI images. The presence of layers is indicative of physical disturbances or episodic events. Sediment layering is characteristic of hopper overflow and open-water disposal operations and can be readily seen in SPI images (Diaz and Schaffner 1988; Nichols, Diaz, and Schaffner 1990).

In the LS site four stations had evidence of layering from grain-size changes (Table C1). Station LS-06 (Figure C9), in the channel, had a shell hash layer at 1.6 cm from the sediment surface. The other three stations,

LS-11 (Figure C20) and LS-13 (Figure C6) on the edge of the channel and LS-10 (Figure C21) on the shoal near the channel, all had thin layers of sandy sediments overlaying silty sediments. Each case seemed indicative of recently deposited sediments, possibly from the dragheads or current induced transport of surface sands. The sediments were not likely from hopper overflow operations since little sand-size sediment would have been discharged from the hopper during a single loading process.

In the US site about half of the stations had sediment layers (Table C2). However, none of the four stations in the channel had sediment layering. About half of the stations (8 of 17) on the edge of the channel had layers, three with color layering and five with grain-size layering. All five of the grain-size layered channel edge stations had sands on the surface overlying clayey sediments. Since the sediments in the channel were fine silts and clays, it is unlikely that layers observed in these images were attributable to the dredging operations or overflow, which contained little or no sand. In addition, grain-size layered channel edge stations US-22 (Figure C22), US-23 (Figure C23), and US-33 (Figure C10) had amphipod and/or worm tubes which could not have reestablished living positions in the approximately 1-hr interval between dredging operations and sampling. Color layering was represented by varying hues of grays and was found deeper in the sediments, ranging from 2.5 to 9.0 cm from the surface (Table C2). These deeper color layers are not likely a result of recent dredging operations and may represent episodic events such as seasonal high river discharges or storm deposits. Detritus appeared to be mixed into the uppermost sediment layer at shoal stations US-09 (Figure C15), US-10 (Figure C24), and US-11 (Figure C8).

Surface features

Surface features include a variety of physical and biological parameters, each providing different information on the type of habitat and its quality for supporting benthic species. The presence of certain features is indicative of the overall nature of a habitat. For example, bed forms are always associated with physically dominated habitats, whereas the presence of worm tubes or feeding pits would be indicative of a more biologically accommodated habitat (Rhoads and Germano 1986, Diaz and Schaffner 1988). Surface features were visually evaluated from each image and compiled by type and frequency of occurrence.

The sediment surface at stations in the LS site was dominated by bed forms and shell hash (Table C1). In the US site, biogenic pits and mounds were the dominant surface features (Table C2). No epifauna were seen in either area. Flock layers, thin layers of unconsolidated sediments, occurred at six shoal stations (e.g., US-09, Figure C15) and one channel edge station (US-34, Figure C25) in the US site (Table C2). All flock layers appeared to be composed of background sediments and not dredged material, as evidenced by their respective color tones.

Tubes were seen at only one of the LS site stations (LS-11, Figure C20). At the US site stations, worm or amphipod tubes occurred at 12 of 41 stations (Table C2). Amphipod tube mats occurred at US-05 (Figure C26), US-06 (Figure C27), and US-22 (Figure C22), which were channel and channel edge stations.

Subsurface features

These parameters include a wide variety of features and provide insights into physical and biological processes influencing the bottom. For example, the presence of methane gas voids has been an indication of anaerobic metabolism (Rhoads and Germano 1986) and associated with high rates of bacterial activity. Muddy habitats with large amounts of methane gas are generally associated with areas of oxygen stress or high organic loading. On the other hand, habitats with burrows, infaunal feeding voids, and/or actual infauna visible in SPI images are generally more biologically accommodated and considered "healthy" (Rhoads and Germano 1986, Diaz and Schaffner 1988, Valente et al. 1992). Subsurface features were visually evaluated from each image and compiled by type and frequency of occurrence.

No infauna, burrows, or voids were seen at the LS site stations (Table C1). This was the result, in part, of the prevalence of coarse sediments, which are not generally associated with fauna that form burrows or voids, and by shallow camera prism penetration.

In the US site, 4 stations had infaunal organisms, 12 had active burrows, 2 had active feeding voids, and 3 had anaerobic voids (Table C2). Gas filled voids occurred at nine stations and were abundant at most of these stations (e.g., US-26, Figure C28), indicating relatively high concentrations of organic matter in the sediments. Evidence of hydrocarbon contamination was seen at station US-03 (Figure C29) in the form of "oil spots." Diaz et al. (1993) found that sediments containing high concentrations of hydrocarbons had a unique signature in the SPI images and that this signature was significantly related to the occurrence of hydrocarbons.

Summary and Conclusions

The LS site was more physically accommodated than the US site which was more biologically accommodated (Table C3). Sediments in the LS site were coarser and had more shell hash than the US site which was characterized by finer sediments and more biologically reworked.

There was evidence that recent physical disturbance had occurred at several of the LS stations (LS-06, LS-09, LS-12), possibly a result of the dredging operations. Gray colored suspended material, indicative of hopper overflow material, was also observed at two stations (LS-07, LS-12).

However, since this gray suspended material was also associated with recently disturbed sediments at LS-12, it could also have resulted from draghead activity. This leaves LS-07 as the station with the clearest signature of hopper overflow, but this was in the form of turbidity and not accumulation of overflow material on the sediment surface. Four LS stations had layering from grain-size changes. Station LS-06, in the channel, had a shell hash layer at 1.6 cm from the sediment surface. The other stations, LS-11 and LS-13 on the edge of the channel and LS-10 on the shoal near the channel, all had thin layers of sandy sediments overlying silty sediments. Although such layers are indicative of recently deposited sediments, those seen in the SPI images are likely the result of normal sediment transport processes rather than hopper overflow operations. Little sand would be discharged from overflow in a single pass of the hopper dredge.

In the US site, no evidence of recent physical disturbance was detected at any of the stations, but material that could have come from the hopper overflow was observed at one station (US-33). About half of the US stations had sediment layers, but none of the stations in the channel had sediment layers. About half of the stations on the edge of the channel had layers, three with color layering and five with grain-size layering. All five of the sediment layered channel edge stations had sands on the surface overlaying clayey sediments. Since the sediments in the channel were finer silts and clays, it was unlikely that the layers at the channel edge stations were the result of the dredging operations. In addition, sediment layered channel edge stations US-22, US-23, and US-33 had amphipod and/or worm tubes which could not have reestablished living position in the short interval between dredging and sampling. Flocculent sediment layers, thin layers of unconsolidated surface sediments, occurred at six shoal stations and one channel edge station in the US site. Based on their color tones, all flock layers appeared to be composed of background sediments and not hopper overflow or dredged material. Evidence of hydrocarbon contamination was seen at station US-03 in the form of “oil spots.”

No indication of newly deposited dredged material was observed at stations outside the edge of the navigation channel at either study site. Although the sampling station coverage was not extensive, given the relatively short duration of the tests, the risk of significant sedimentation as a consequence of the hopper dredging operations appears largely restricted to the bottom and slide slopes of the channel.

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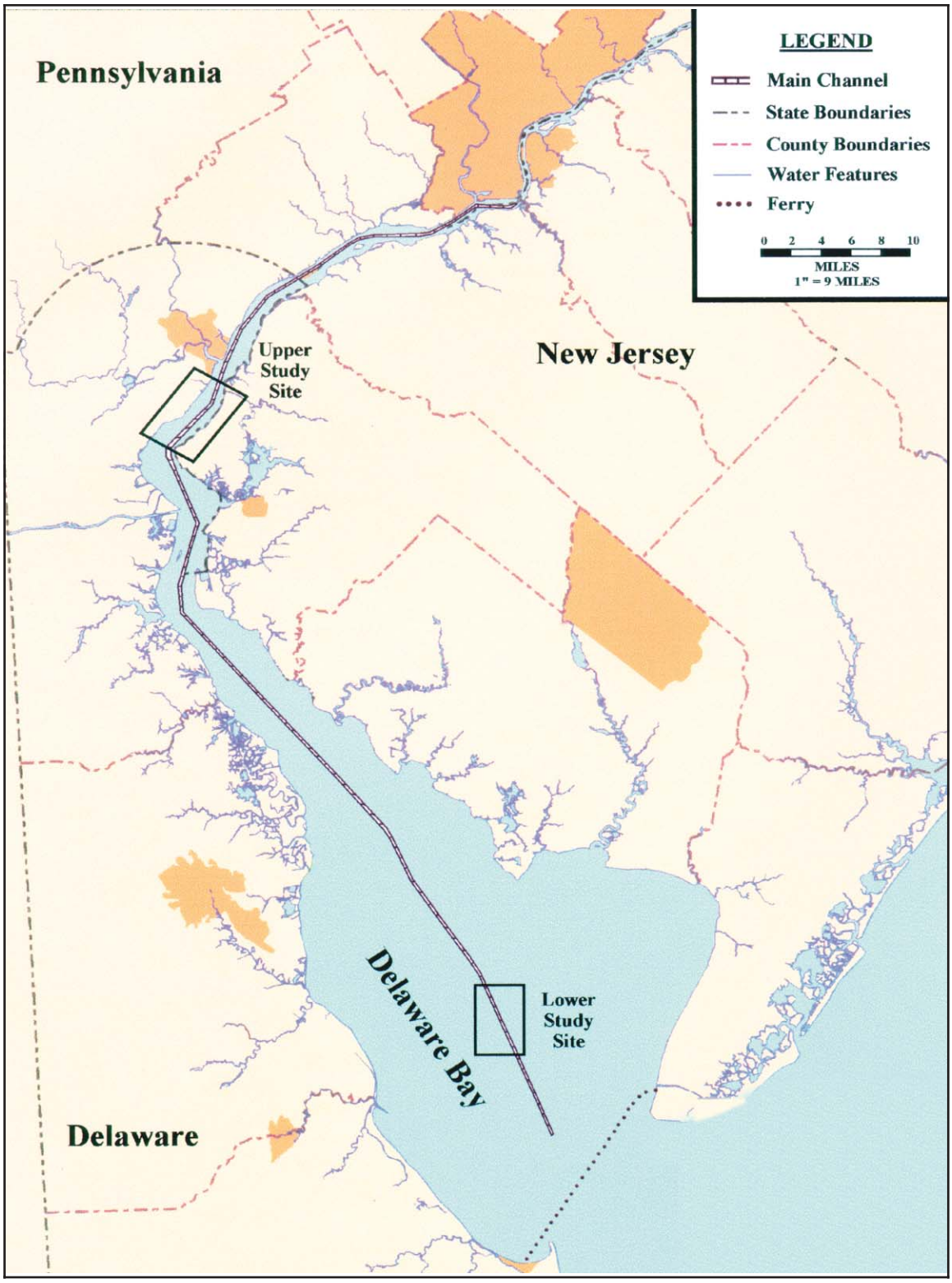

Figure C1. Locations of the lower and upper hopper dredge overflow test study sties

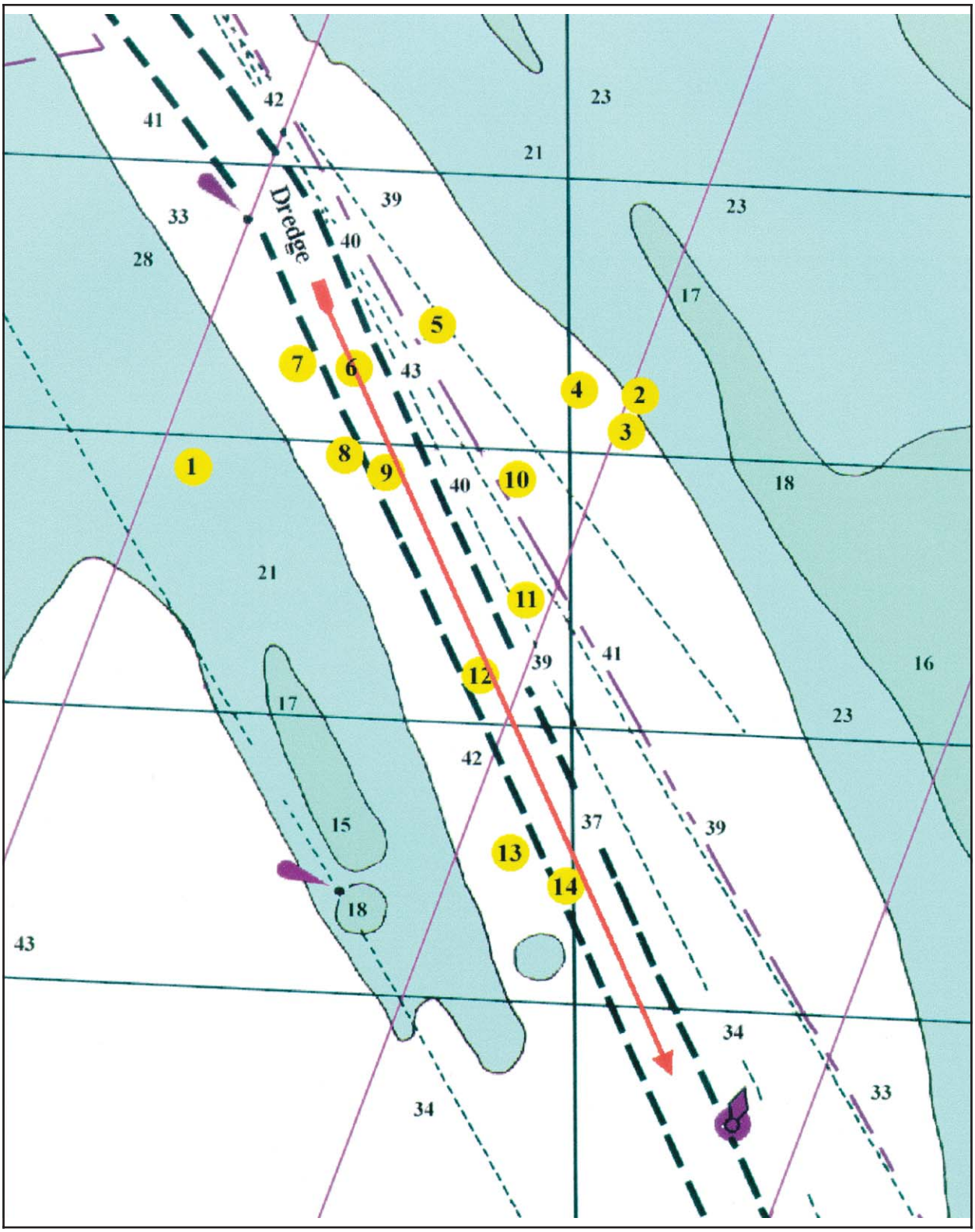

Figure C2. Sediment profiling imagery stations occupied during hopper dredge loading and overflow tests at the LS site. The figure has been modified from a NOAA navigaition chart with depths indicated in feet. Approximate start and end of test locations of the dredge are indicated by the red arrow

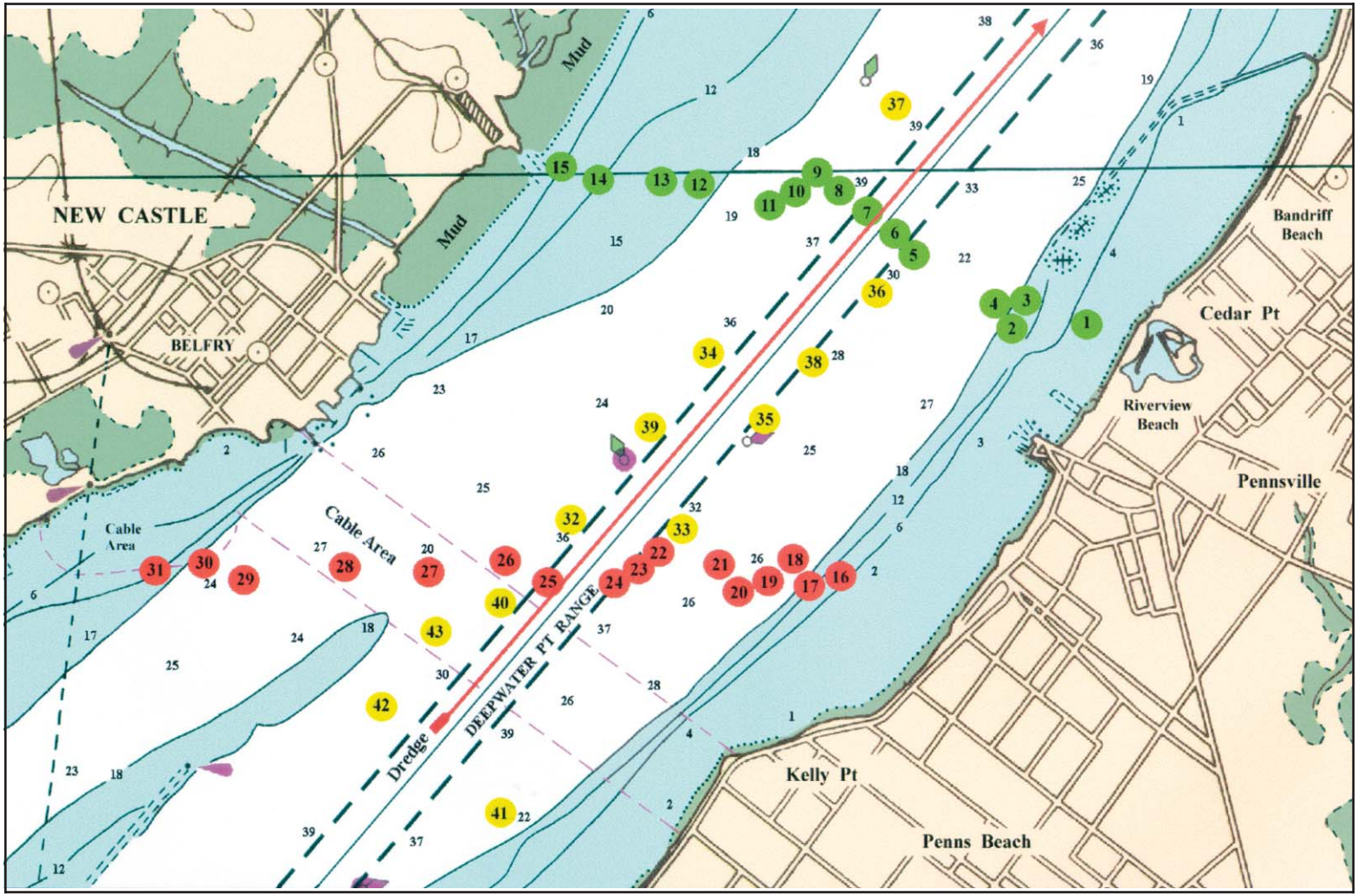

Figure C3. Sediment profiling imagery stations occupied during hopper dredge loading and overflow tests at the upper study site. Green stations (1-15) are predredging stations, red stations (16-31) are during-dredging without overflow stations, and yellow stations (32-43) are during and postoverflow stations. The figure has been modified from a NOAA navigation chart with depths indicated in feet. Approximate start and end of test locations of the dredge are indicated by the red arrow

Figure C4. SPI image of Lower Study Site Station LS-09

Figure C5. SPI image of Upper Study Site Station US-14

Figure C6. SPI image of Lower Study Site Station LS-13

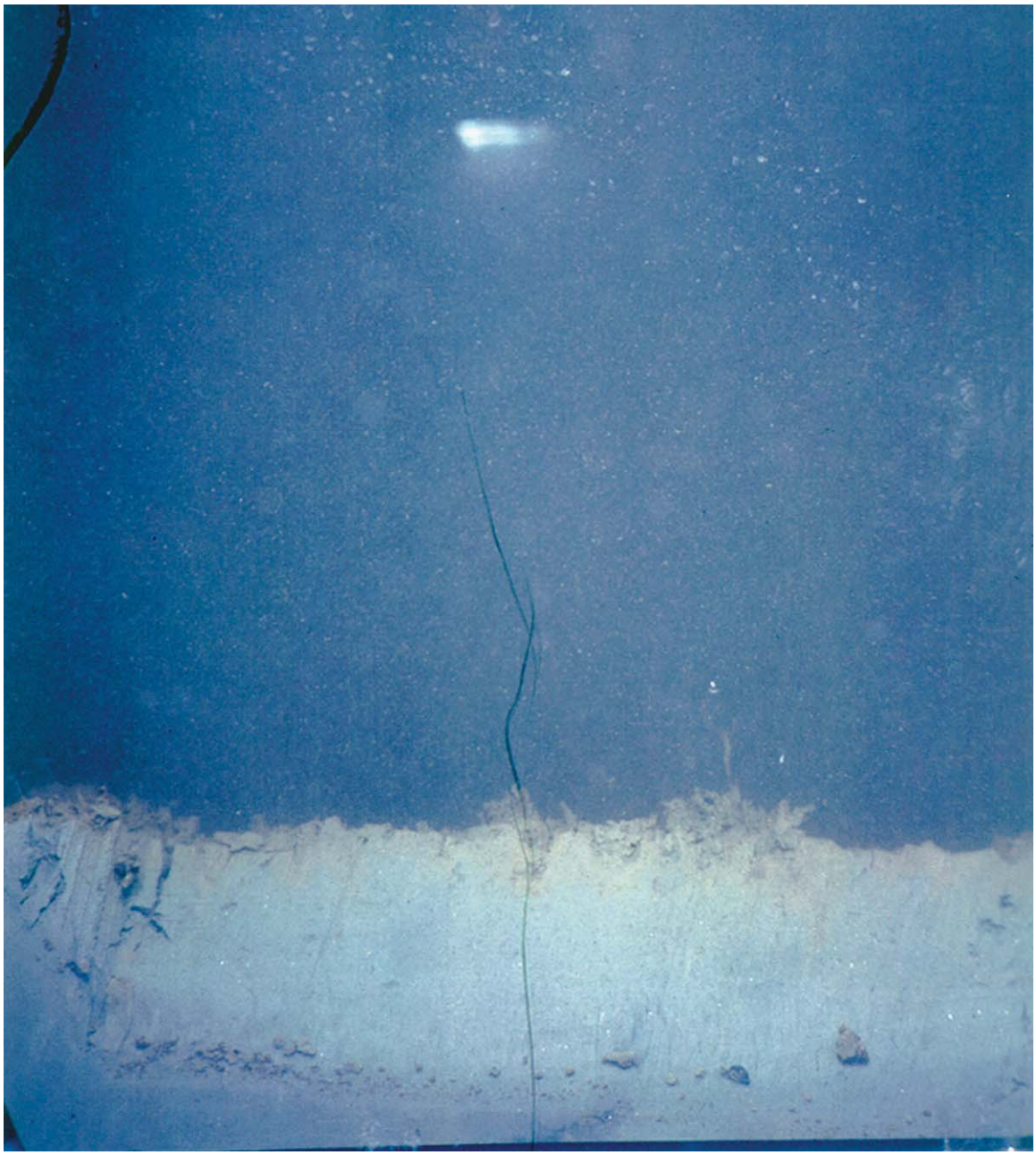

Figure C7. SPI image of Upper Study Site Station US-35

Figure C8. SPI image of Upper Study Site Station US-11

Figure C9. SPI image of Lower Study Site Station LS-06

Figure C10. SPI image of Upper Study Site Station US-33

Figure C11. SPI image of Upper Study Site Station US-21

Figure C12. SPI image of Upper Study Site Station US-29

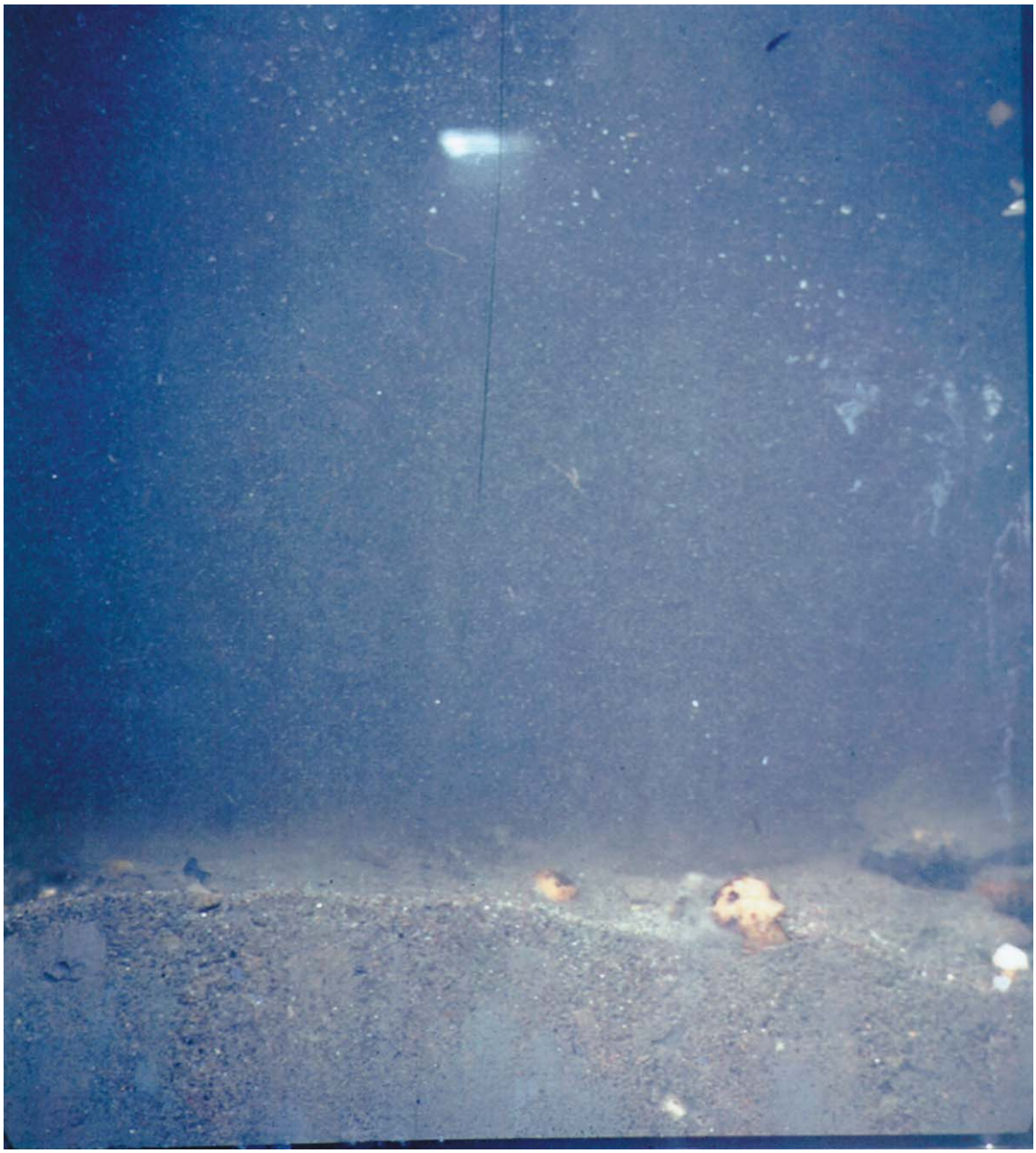

Figure C13. SPI image of Upper Study Site Station US-32

Figure C14. SPI image of Lower Study Site Station LS-03

Figure C15. SPI image of Upper Study Site Station US-09

Figure C16. SPI image of Lower Study Site Station LS-02

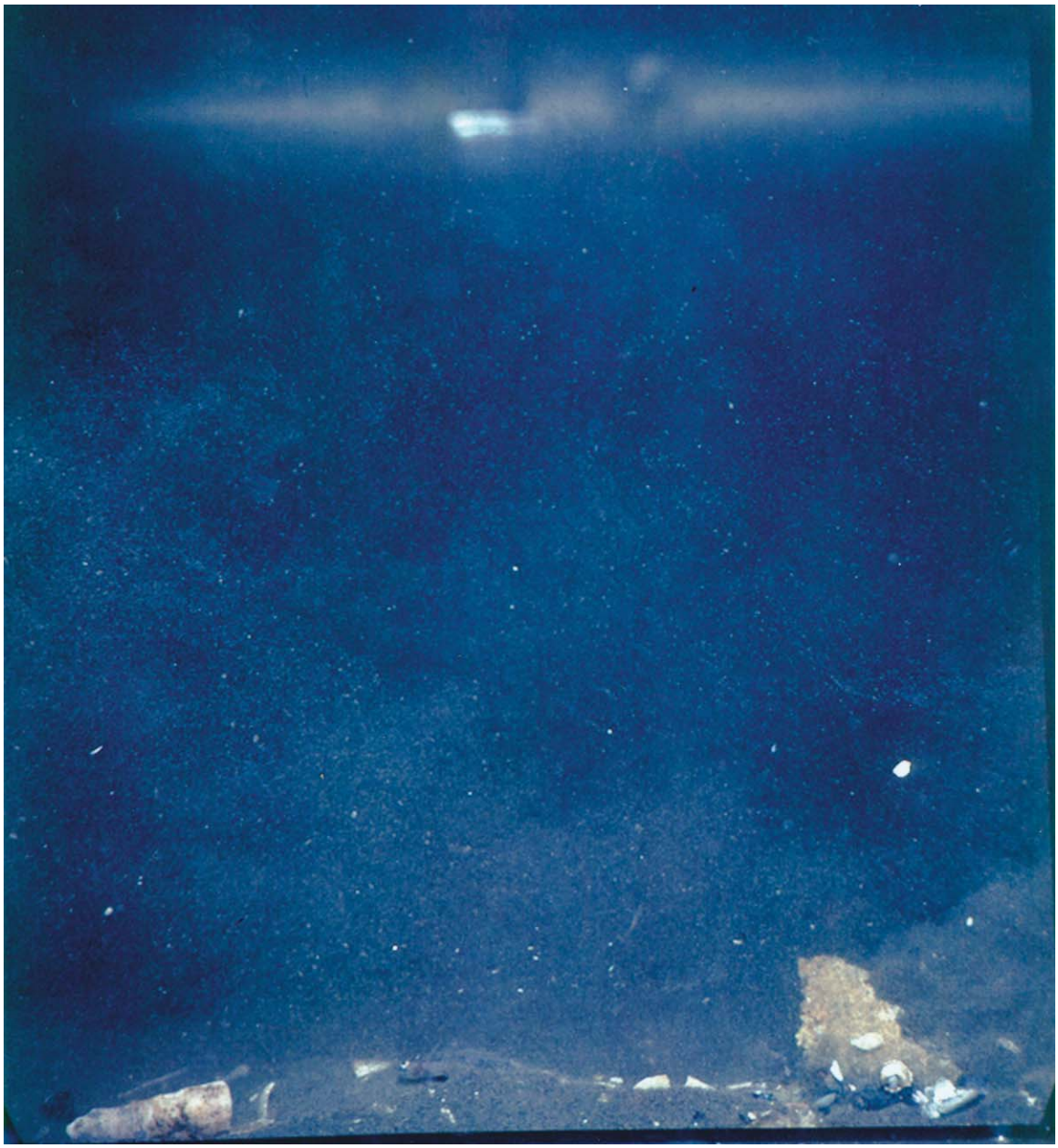

Figure C17. SPI image of Lower Study Site Station LS-07

Figure C18. SPI image of Lower Study Site Station LS-12

Figure C19. SPI image of Upper Study Site Station US-31

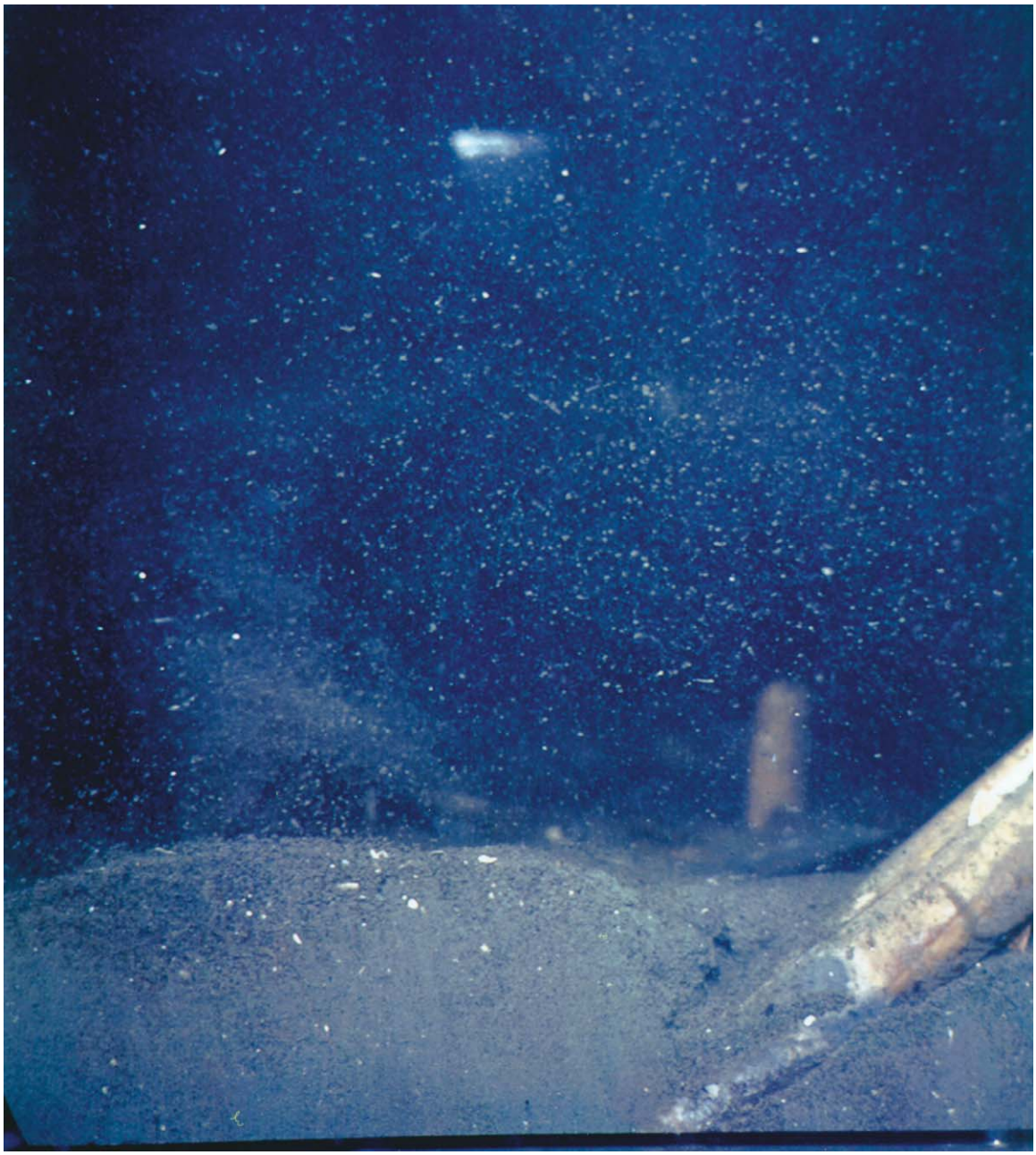

Figure C20. SPI image of Lower Study Site Station LS-11

Figure C21. SPI image of Lower Study Site Station LS-10

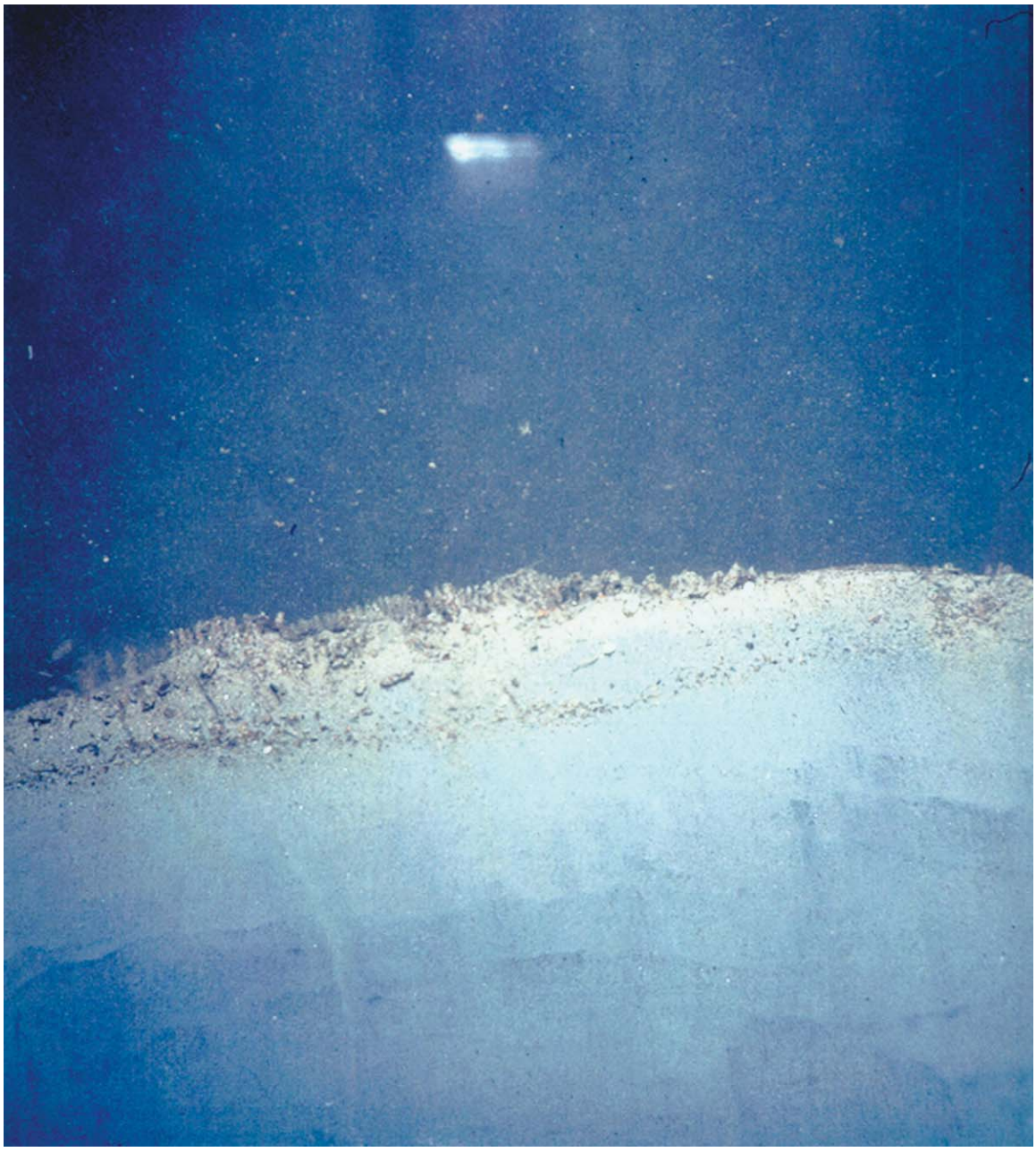

Figure C22. SPI image of Upper Study Site Station US-22

Figure C23. SPI image of Upper Study Site Station US-23

Figure C24. SPI image of Upper Study Site Station US-10

Figure C25. SPI image of Upper Study Site Station US-34

Figure C26. SPI image of Upper Study Site Station US-05

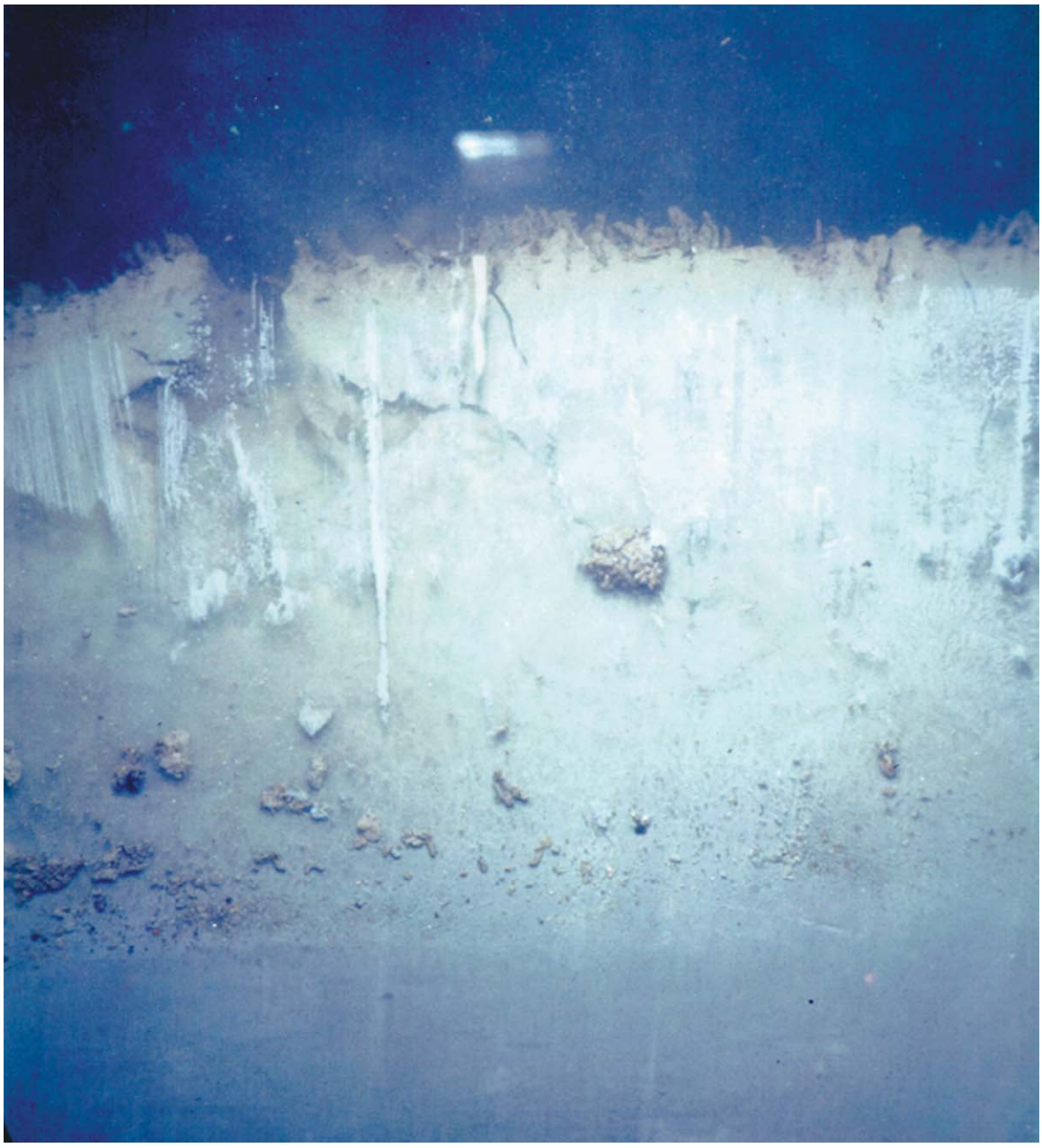

Figure C27. SPI image of Upper Study Site Station US-06

Figure C28. SPI image of Upper Study Site Station US-26

Figure C29. SPI image of Upper Study Site Station US-03

Table C1
SPI Data from the Lower Study (LS) Site in Delaware Bay, September 1998

Sta	Descriptor	Penetration (cm)			Surface Relief cm	Ave RPD Depth cm	Sediment Type	Turbidity	Suspended Sediment Color	Current Scour	Dredged Material	Sediment Layers	Surface Features	Tubes	Worms	Burrows	Voids
		Min	Max	Ave													
1	Shoal	0.8	1.7	1.3	0.9	>1.3	FSMS	Little	Brown	No	No	0	BED,SH	None	0	0	0
2	Shoal	3.3	4.1	3.7	0.8	>3.6	FSMS	Little	Brown	No	No	0	BED,SH	None	0	0	0
3	Shoal	6.1	8.0	7.0	1.8	2.9	FSMS	Moderate	Brown	Yes	No	0	BED,SH	None	0	0	0
4	Shoal	2.5	4.1	3.3	1.6	1.6	FS	Moderate	Brown	No	No	0	BED,SH	None	0	0	0
5	Shoal	0.0	0.0	0.0	0.0	-	FS	Little	Brown	No	No	-	BED,SH	None	-	-	-
6	Channel	5.7	6.3	6.0	0.6	0.7	FSMSSH	Moderate	Brown	Yes	Yes	1	SH,DIST	None	0	0	0
7	Edge	0.0	1.3	0.7	1.3	>0.7	FSSH	Low	Gray	No	No	-	BED,SH	None	-	-	-
8	Edge	1.6	2.5	2.0	0.8	>2.0	FSMSSH	Low	Brown	No	No	0	BED,SH	Some	0	0	0
9	Channel	9.8	11.9	10.9	2.0	5.3	FSMSSH	Low	Brown	Yes	Yes	0	SCOUR	None	0	0	0
10	Shoal	2.6	3.2	2.9	0.6	0.8	FS/SI	Low	Brown	No	No	1	BED,MD,SH	None	0	0	0
11	Edge	2.5	4.4	3.4	2.0	2.7	FSMS/SI	Low	Brown	No	No	1	BED,MD,SH	Few	0	0	0
12	Channel	3.3	4.1	3.7	0.8	2.9	FSMSSH	Low	Gray	Yes	Yes	0	SH	None	0	0	0
13	Edge	1.6	2.5	2.0	0.8	>2.0	FSMS/SI	Moderate	Brown	No	No	1	BED,SH	None	0	0	0
14	Channel	1.1	2.0	1.6	1.0	>1.6	FSMS	Low	Brown	No	No	0	BED,SH	None	0	0	0

Sta = Station, Descriptor = Location of station relative to navigation channel, CL = Clay, FS = Fine sand, FSMS = Fine to medium sand, GR = Gravel, SH = Shell hash, SI = Silt, SICL = Fine sand-silt-clay, SIFS = Silty fine sand, MSGR = Medium sand and gravel, / indicates sediments are layered, BED = Bedform, DIST = Disturbed, EVEN = Uniform flat surface, FLOC = Loose flocculent layer at surface, MD = Biogenic mound, PIT = Biogenic pit, FEW = 1 to 6, SOME = 7 to 24, MANY = >24, MAT = Tube mat

Table C2
SPI Data from the Upper Study (US) Site in the Delaware River, September 1998

Sta	Descriptor	Penetration (cm)			Surface Relief cm	Ave RPD Depth cm	Sediment Type	Turbidity	Suspended Sediment Color	Current Scour	Dredged Material	Sediment Layers	Surface Features	Tubes	Worms	Burrows	Feeding/ Gas Voids
		Min	Max	Ave													
1	Shoal	12.3	12.6	12.5	0.3	0.7	SI	Low	Brown	No	No	1	EVEN	None	0	4	1/8
2	Shoal	7.4	7.6	7.5	0.2	1.4	SI	Low	Brown	No	No	0	MD	None	0	5	0
3	Shoal	6.6	7.3	6.9	0.7	1.0	SI	Low	Brown	No	No	1	MD	None	2	3	0
4	Shoal	12.2	12.5	12.4	0.3	2.5	SI	High	Brown	No	No	2	MD	None	0	2	0
5	Edge	9.6	10.8	10.2	1.2	0.2	CL	Low	Brown	No	No	0	MD	Mat	0	0	0
6	Channel	12.3	13.4	12.9	1.1	0.4	CL	Low	Brown	No	No	0	MD	Mat	0	0	0
7	Channel	16.0	17.2	16.6	1.2	0.2	SICL	Low	Brown	No	No	0	PIT	None	0	0	0/4
8	Edge	20.2	21.6	20.9	1.5	-	SICL	High	Brown	No	No	0	PIT	None	0	0	0/1
9	Shoal	16.1	16.4	16.2	0.3	4.9	SICL	Moderate	Brown	No	No	1	FLOC	None	0	0	0/15
10	Shoal	9.2	10.3	9.8	1.1	2.3	SICL	Low	Brown	No	No	1	FLOC	None	0	0	0
11	Shoal	13.1	13.5	13.3	0.4	6.6	SICL	Moderate	Brown	No	No	1	FLOC	None	0	0	1/0
12	Shoal	9.0	9.3	9.2	0.3	0.7	CL	Low	Brown	No	No	1	MD	None	0	0	0
13	Shoal	2.5	6.6	4.5	4.1	-	CL	High	Brown	No	No	0	DIST	None	0	0	0
14	Shoal	1.5	3.0	2.2	1.5	0.3	CL	High	Brown	No	No	0	PB	None	0	1	0
15	Shoal	24.8	25.2	25.0	0.4	1.2	SICL	Moderate	Brown	No	No	1	PIT	None	1	0	0
16	Shoal	6.3	6.6	6.5	0.3	2.2	SI	High	Brown	No	No	1	PIT	None	0	0	0
17	Shoal	7.8	8.4	8.1	0.6	3.1	SI	Moderate	Brown	No	No	1	MD	None	0	2	0
18	Shoal	4.9	6.0	5.5	1.1	0.3	SIFS	High	Brown	No	No	1	PIT	None	1	5	0
19	Shoal	11.5	11.7	11.6	0.2	2.6	SI	Moderate	Brown	No	No	1	FLOC	None	0	2	1/0
20	Shoal	17.2	18.0	17.6	0.8	4.5	SI	High	Brown	No	No	2	FLOC	None	0	1	0
21	Shoal	14.8	18.3	16.5	3.5	2.5	MSGR/CL	Low	Brown	No	No	1	GR	Some	0	0	2/0

(Continued)

Sta = Station, Descriptor = Location of station relative to navigation channel, CL = Clay, FS = Fine sand, FSMS = Fine to medium sand, GR = Gravel, SH = Shell hash, SI = Silt, SICL = Fine sand-silt-clay, SIFS = Silty fine sand, MSGR = Medium sand and gravel, / indicates sediments are layered, BED = Bedform, DIST = Disturbed, EVEN = Uniform flat surface, FLOC = Loose flocculent layer at surface, MD = Biogenic mound, PIT = Biogenic pit, FEW = 1 to 6, SOME = 7 to 24, MANY = >24, MAT = Tube mat

Table C2 (Concluded)

Sta	Descriptor	Penetration (cm)			Surface Relief cm	Ave RPD Depth cm	Sediment Type	Turbidity	Sus-pended Sediment Color	Current Scour	Dredged Material	Sediment Layers	Surface Features	Tubes	Worms	Burrows	Feeding/ Gas Voids
		Min	Max	Ave													
22	Edge	6.2	8.0	7.1	1.8	0.6	FS/CL	Low	Brown	No	No	1	EVEN	Mat	0	0	0
23	Edge	9.5	11.1	10.3	1.6	0.7	FS/CL	Moderate	Brown	No	No	1	MD	Some	0	0	0
24	Channel	15.0	17.4	16.2	2.4	0.2	CL	Low	Brown	No	No	0	PIT	None	0	0	0
25	Channel	11.8	12.7	12.3	0.9	0.2	CL	Low	Brown	No	No	0	MD	FEW	0	0	0/25
26	Edge	14.5	15.0	14.8	0.5	0.2	SI	High	Brown	No	No	1	MD	None	1	3	0/40
27	Shoal																
28	Shoal																
29	Shoal	5.0	5.7	5.4	0.7	0.2	CL	High	Brown	No	No	0	PIT	None	0	0	0
30	Shoal	12.0	13.0	12.5	0.9	-	SI	High	Brown	No	No	2	DIST	None	0	0	0
31	Shoal	11.3	13.1	12.2	1.8	1.2	SICL	High	Brown	Yes	No	2	FLOC	None	0	0	1/10
32	Edge	2.3	3.9	3.1	1.6	>3.1	MS	Moderate	Brown	No	No	0	DED,GR	None	0	0	0
33	Edge	3.3	6.2	4.8	3.0	0.1	FS/CL	Moderate	Gray	No	No	1	MD	Many	0	0	0
34	Edge	6.4	8.2	7.3	1.8	0.4	SI	High	Brown	No	No	1	FLOC	None	0	0	0
35	Edge	3.8	4.8	4.3	1.1	0.2	CL	Low	Brown	No	No	0	MD	Many	0	0	0
36	Edge	8.2	12.5	10.4	4.3	0.7	CL	Low	Brown	No	No	0	DIST	Many	0	0	0
37	Edge	20.5	21.0	20.7	0.5	-	CL	Low	Brown	No	No	0	IND	None	0	0	0
38	Edge	5.7	10.3	8.0	4.6	0.2	CL	Low	Brown	No	No	0	DIST	Some	0	0	0
39	Edge	20.9	21.3	21.1	0.4	-	SICL	High	Brown	No	No	0	EVEN	None	0	0	0/1
40	Edge	12.7	13.1	12.9	0.4	0.2	SI	High	Brown	No	No	2	EVEN	None	0	2	0/17
41	Edge	0.7	1.1	0.9	0.4	0.2	FS/CL	Moderate	Brown	No	No	1	BED,DIST	None	0	0	0
42	Edge	12.3	13.2	12.7	0.9	0.8	MS/CL	Moderate	Brown	No	No	1	BED	None	0	1	0
43	Edge	11.8	12.1	12.0	0.3	0.9	SI	High	Brown	No	No	0	EVEN	None	0	0	0

Table C3
General Comparison of Sediment Profile Image Data from the Lower Study Site (LS, Delaware Bay) and Upper Study Site (US, Delaware River) Sampled During Hopper Dredge Loading and Overflow Tests

Feature	Location	
	Lower Study Site	Upper Study Site
Sediments	Homogeneous, Sands	Heterogeneous, Mainly Clays and Silt-Clays
Sediment Layering	Sediment Grain Size Changes	Color and Sediment Grain Size Changes
Prism Penetration	Shallow	Deep
Surface Relief	Physical Bed Forms	Biogenic Pits and Mounds
Suspended Material	Mostly Background Sediments	Mostly Background Sediments
Dredged Material	Detected at 3 Stations	Not Detected
Hopper Overflow	Detected at 1 Station	Detected at 1 Station
Hydrocarbon Contamination	Not Detected	Detected at 1 Station
Epifauna	Not Detected	Not Detected
Amphipod or Worm Tubes	Scarce	Common
Infauna	Not Detected	Common

Appendix D
Summary of Technical Findings: 96-hr Bioassay with *Mysidopsis bahia* and *Menidia beryllina*

CEWES-ES-F (70-1r) 17 Nov 98

MEMORANDUM FOR: Mr. Jerry Miller, (CEWES-EE-A)

Thru:
Dr. Todd Bridges, (CEWES-ES-F)

SUBJECT: Narrative Summary of Technical Findings of a 96-hr Bioassay with Delaware River Sediment and Water.

1. Please find enclosed a letter report summarizing the results of bioassays conducted with *Mysidopsis bahia* and *Menidia beryllina* exposed to concentrations of filtered elutriate.

2. If you have any questions please call me at (601) 634-4027 or Dr. Todd Bridges at (601) 634-3626.

ALFREDA GIBSON
Research Biologist
CEWES-ES-F

Summary of Technical Findings: 96-hr bioassay with *Mysidopsis bahia* and *Menidia beryllina*

1. Background: As part of an effort to determine the possible biological effects of water column exposure to Delaware River sediment, Mr. Jerry Miller (EED) requested that the Aquatic Biological Effects Team (ABET) conduct acute 96-hr elutriate bioassays on the material with survival being the observed endpoint. The two species used were *Mysidopsis bahia* and *Menidia beryllina*. This report summarizes the results of that study.

2. Technical Approach: 96-hr elutriate bioassays using the mysid shrimp *Mysidopsis bahia* and the inland silverside *Menidia beryllina* were conducted according to methods described in the CE/EPA Inland Testing Manual (1998) (Tables D1 and D2). Four treatments were evaluated: 1) *Mysidopsis bahia* exposed in R1-HO-TOX (coarse-grained material at 30 o/oo) (Table D3); *Mysidopsis bahia* exposed to R2-HO-TOX (fine-grained material at 6 o/oo) (Table D4); *Menidia beryllina* exposed to R2-HO-TOX (fine-grained material at 6 o/oo) (Table D5); and *Menidia beryllina* exposed to R1-HO-TOX (coarse-grained material at 30 o/oo) (Table D6). The filtered elutriate was diluted with our standard laboratory control water 40 fathoms (6 o/oo and 30 o/oo) to yield the following concentrations: 0; 6.25; 12.5; 25; 50; and 100% elutriate. Each treatment was replicated five times. The test was conducted using Mysidopsis bahia that were 5 days old and *Menidia beryllina* that were 9 days old. *Mysidopsis bahi*a were fed newly hatched brine shrimp daily (0.2 mg) and *Menidia beryllin*a were fed newly hatched brine shrimp on day 2 of the test (0.2 mg). Each beaker was provided trickle-flow aeration and covered with a watch glass to minimize evaporation.

3. Results: 96-hr survival of Mysidopsis bahia in the R1-HO-TOX (30 o/oo, coarse-grained material) exposures survival ranged from 100 to 88% (Table D1). Survival in R2-HO-TOX (6 o/oo fine-grained material) ranged from 90 to 0% with 0% survival in the 50 and 100% elutriate treatments (Table D1). 96-hr survival of *Menidia beryllina* in R1-HO-TOX (30 o/oo coarse-grained material) survival ranged from 88% -68%. Survival in R2-HO-TOX (6 o/oo fine-grained material) with ranged from 98 to 0% with 4% - 0% survival in the 50 and 100% exposures (Table D2). The trimmed spearman-karber method was used to calculate LC_{50} values (Hamilton et al. 1978). *Mysidopsis bahia* in R2-HO-TOX (6 o/oo) had an LC_{50} value of 30.04% (23.44 - 38.50 lower - upper confidence limit). *Menidia beryllina* in R2-HO-TOX (6 o/oo) had an LC_{50} value of 31.66 % (27.54 - 36.40 lower -upper confidence limits). An LC_{50} value could not be calculated for *Mysidopsis bahia* or *Menidia beryllina* in R1-HO-TOX treatments because neither had mortality values greater than 50%.

Survival met or exceeded the test acceptability criterion of 90% in the 6 o/oo and 30 o/oo *Mysidopsis bahia* controls, and also in the 6 o/oo *Menidia beryllina* control. Survival in the 30 o/oo *Menidia beryllina* control

was slightly below the criterion at 88% but is not considered to render the test invalid.

Water quality data are presented in Tables D7 through D10. The pH, dissolved oxygen, and temperature levels were within an acceptable range for conducting toxicity studies with the two test species. Ammonia levels (NH3) were exceedingly higher than the LC_{50} of 1.00 mg/L for 5-day old *Mysidopsis bahia* or the LC_{50} of 1.24 mg/L for 9-days old Menidia beryllina (USEPA 1989).

In conclusion, R1-HO-TOX exposures did not adversely affect survival of either test species, whereas the mortality observed in R2-HO-TOX at 6 o/oo with both species can be attributed to the high level of NH_3.

4. References:

Hamilton, M.A., Russo, R.C., and Thurston, R.V. (1978). "Trimmed Spearman-Karber Method for estimating median lethal concentration in toxicity bioassays," *Environ. Sci. Tech*. 12(4): 417.

USEPA. (1989). "Ambient water quality criteria for ammonia (Saltwater)-1989," Office of Water Regulations and Standards, Criteria and Standards Division, EPA 440/5-88-004, Washington, DC.

USEPA and USACE. (1998). "Evaluation of dredged material proposed for discharge in waters of the U.S. -Testing manual," EPA-823-B-98-004, Washington, DC.

Table D1
Summary Survival Data for *Mysidopsis bahia* Exposed to Delaware River Elutriates

Treatment	Elutriate Concentration	Mean Percent Survival, standard deviation
R1-HO-TOX (30 o/oo)	0	100 (0.00)
	6	88 (0.84)
	12	96 (0.55)
	25	92 (0.84)
	50	90 (1.22)
	100	92 (0.45)
R2-HO-TOX (6 o/oo)	0	90 (0.00)
	6	76 (1.67)
	12	66 (2.30)
	25	82 (1.30)
	50	0 (0.00)
	100	0 (0.00)

Table D2
Summary Survival Data for *Menidia beryllina* Exposed to Delaware River Elutriates

Treatment	Elutriate Concentration	Mean Percent Survival, standard deviation
R1-HO-TOX (30 o/oo)	0	88 (0.84)
	6	70 (1.58)
	12	68 (1.64)
	25	78 (1.79)
	50	80 (1.22)
	100	74 (1.82)
R2-HO-TOX (6 o/oo)	0	90 (0.71)
	6	68 (0.45)
	12	98 (0.45)
	25	78 (1.64)
	50	4 (0.89)
	100	0 (0.00)

Table D3
96-hr Survival Data for *Mysidopsis bahia* Exposed to R1-HO-TOX (coarse-grained material) Elutriates at 30 o/oo

Treatment, %	Replicate	Total Number Alive
Control	1	10
Control	2	10
Control	3	10
Control	4	10
Control	5	10
6	1	8
6	2	10
6	3	9
6	4	9
6	5	8
12	1	10
12	2	9
12	3	9
12	4	10
12	5	10
25	1	9
25	2	9
25	3	8
25	4	10
25	5	10
50	1	9
50	2	9
50	3	10
50	4	7
50	5	10
100	1	9
100	2	10
100	3	9
100	4	9
100	5	9

Table D4
96-hr Survival Data for *Mysidopsis bahia* Exposed to R2-HO-TOX (fine-grained material) Elutriates at 6 o/oo

Treatment , %	Replicate	Total Number Alive
Control	1	9
Control	2	9
Control	3	9
Control	4	9
Control	5	9
6	1	8
6	2	9
6	3	7
6	4	9
6	5	5
12	1	8
12	2	6
12	3	9
12	4	7
12	5	3
25	1	7
25	2	7
25	3	9
25	4	8
25	5	10
50	1	0
50	2	0
50	3	0
50	4	0
50	5	0
100	1	0
100	2	0
100	3	0
100	4	0
100	5	0

Table D5
96-hr Survival Data for *Menidia beryllina* Exposed to R2-HO-TOX (fine-grained material) Elutriates at 6 o/oo

Treatment, %	Replicate	Total Number Alive
Control	1	9
Control	2	9
Control	3	9
Control	4	8
Control	5	10
6	1	7
6	2	7
6	3	7
6	4	6
6	5	7
12	1	10
12	2	10
12	3	9
12	4	10
12	5	10
25	1	10
25	2	7
25	3	9
25	4	7
25	5	6
50	1	0
50	2	0
50	3	0
50	4	0
50	5	2
100	1	0
100	2	0
100	3	0
100	4	0
100	5	0

Table D6
96-hr Survival Data for *Menidia beryllina* Exposed to Elutriates Made from R1-HO-TOX (coarse-grained material) at 30 o/oo

Treatment, %	Replicate	Total Number Alive
Control	1	9
Control	2	8
Control	3	10
Control	4	8
Control	5	9
6	1	6
6	2	9
6	3	8
6	4	5
6	5	7
12	1	8
12	2	7
12	3	8
12	4	4
12	5	7
25	1	9
25	2	10
25	3	8
25	4	6
25	5	6
50	1	8
50	2	10
50	3	7
50	4	7
50	5	8
100	1	7
100	2	7
100	3	10
100	4	8
100	5	5

Table D7
Water Quality Parameters for *Mysidopsis bahia* Exposed to R1-HO-TOX Elutriates at 30 o/oo

Treatment	Replicate	D.O. mg/L	pH	Salinity, ppt	Temp. °C	NH_3, mg/L composite
Control (initial)	1	5.50	7.85	30	21.7	
(final)		5.84	7.83	30	22.8	1.00
(initial)	3	5.98	7.85	30	21.7	
(final)		6.10	7.80	30	22.8	
(initial)	5	6.11	7.85	30	22.1	
(final)		6.20	7.80	30	22.8	
6 % (initial)	1	5.87	7.89	30	22.1	
(final)		6.08	7.88	30	22.8	1.38
(initial)	3	5.86	7.87	30	21.7	
(final)		6.10	7.87	30	22.7	
(initial)	5	5.85	7.86	30	21.5	
(final)		6.10	7.87	30	22.8	
12 % (initial)	1	6.00	7.85	30	23.1	
(final)		6.92	7.86	30	22.8	1.81
(initial)	3	6.15	7.89	30	22.0	
(final)		6.83	7.88	30	22.9	
(initial)	5	6.00	7.87	30	22.0	
(final)		6.22	7.86	30	23.0	
25 % (initial)	1	6.10	7.85	30	21.8	
(final)		6.19	7.85	30	22.7	1.32
(initial)	3	6.00	7.83	30	21.8	
(final)		6.30	7.84	30	22.7	
(initial)	5	5.98	7.80	30	21.8	
(final)		6.10	7.83	30	22.7	

(Continued)

Table D7 (Concluded)

Treatment	Replicate	D.O. mg/L	pH	Salinity, ppt	Temp. °C	NH_3, mg/L composite
50 % (initial)	1	6.10	7.80	30	21.7	
(final)		6.20	7.80	30	22.7	0.67
(initial)	3	5.95	7.82	30	21.7	
(final)		5.99	7.81	30	22.0	
(initial)	5	5.97	7.70	30	21.7	
(final)		6.10	7.79	30	22.0	
100 % (initial)	1	5.97	7.65	28	21.7	
(final)		6.10	7.70	28	22.0	1.53
(initial)	3	5.96	7.69	28	22.7	
(final)		6.10	7.70	28	22.8	
(initial)	5	5.94	7.64	28	22.7	
(final)		6.05	7.69	28	22.8	

Table D8
Water Quality Parameters for *Mysidopsis bahia* Exposed to R2-HO-TOX Elutriates at 6 o/oo

Treatment	Replicate	D.O. mg/L	pH	Salinity, ppt	Temp. °C	NH_3, mg/L composite
Control (initial)	1	6.10	7.34	6	22.0	
(final)		5.98	7.80	6	23.0	1.20
(initial)	3	6.08	7.29	6	22.0	
(final)		6.00	7.70	6	23.1	
(initial)	5	6.06	7.30	6	22.0	
(final)		6.00	7.77	6	23.0	
6 % (initial)	1	6.13	7.50	6	21.7	
(final)		5.35	7.83	6	23.0	3.63
(initial)	3	6.13	7.55	6	21.7	
(final)		5.29	7.84	6	23.0	
(initial)	5	6.19	7.55	6	21.7	
(final)		5.30	7.82	6	23.0	
12 % (initial)	1	6.21	7.53	6	21.6	
(final)		5.20	7.96	6	23.1	5.04
(initial)	3	6.20	7.55	6	21.6	
(final)		5.30	7.97	6	23.0	
(initial)	5	6.21	7.57	6	21.6	
(final)		5.75	7.97	6	23.0	
25 % (initial)	1	6.11	7.62	6	21.6	
(final)		5.30	8.10	6	23.0	7.33
(initial)	3	6.10	7.60	6	21.6	
(final)		5.29	8.09	6	23.0	
(initial)	5	6.10	7.64	6	21.6	
(final)		5.30	8.13	6	23.1	

(Continued)

Table D8 (Concluded)						
Treatment	Replicate	D.O. mg/L	pH	Salinity ppt	Temp. °C	NH_3, mg/L composite
50 % (initial)	1	6.00	7.65	5	21.7	
(final)		5.20	8.13	5	23.1	12.4
(initial)	3	6.05	7.66	5	21.7	
(final)		5.40	8.15	5	23.0	
(initial)	5	6.00	7.60	5	21.7	
(final)		5.30	8.16	5	23.0	
100 % (initial)	1	5.35	7.60	6	22.0	
(final)		5.50	8.20	6	23.0	21.2
(initial)	3	5.45	7.67	6	22.0	
(final)		5.39	8.17	6	23.0	
(initial)	5	5.39	7.67	6	21.9	
(final)		5.40	8.17	6	23.1	

Table D9
Water Quality Parameters for *Menidia beryllina* Exposed to R1-HO-TOX Elutriates at 30 o/oo

Treatment	Replicate	D.O. mg/L	pH	Salinity ppt	Temp. °C	NH_3, mg/L composite
Control (initial)	1	5.45	7.83	30	21.7	
(final)		7.10	7.73	30	23.1	1.05
(initial)	3	5.98	7.84	30	21.7	
(final)		7.06	7.67	30	23.1	
(initial)	5	6.17	7.85	30	21.7	
(final)		7.08	7.74	30	23.0	
6 % (initial)	1	5.85	7.85	30	21.7	1.22
(final)		7.23	7.86	30	23.1	
(initial)	3	5.88	7.85	30	21.5	
(final)		7.20	7.84	30	23.1	
(initial)	5	5.93	7.86	30	21.6	
(final)		7.23	7.86	30	23.1	
12 % (initial)	1	5.98	7.85	30	22.0	
(final)		7.32	7.87	30	23.1	1.36
(initial)	3	6.13	7.85	30	21.9	
(final)		6.95	7.88	30	23.1	
(initial)	5	5.89	7.85	30	21.9	
(final)		6.65	7.87	30	23.1	
25 % (initial)	1	6.03	7.85	30	21.8	
(final)		6.07	7.91	30	23.1	1.27
(initial)	3	5.95	7.83	30	21.8	
(final)		6.25	7.91	30	23.0	
(initial)	5	6.02	7.80	30	21.8	
(final)		6.03	7.88	30	23.1	

(Continued)

Table D9 (Concluded)						
Treatment	Replicate	D.O. mg/L	pH	Salinity ppt	Temp. °C	NH_3, mg/L composite
50 % (initial)	1	5.59	7.70	30	21.8	
(final)		5.88	7.93	30	23.1	1.22
(initial)	3	5.95	7.80	30	21.8	
(final)		6.11	7.92	30	23.1	
(initial)	5	5.85	7.80	30	21.7	
(final)		5.64	7.97	30	23.1	
100 % (initial)	1	5.95	7.64	30	21.7	
(final)		5.58	7.97	30	23.1	1.45
(initial)	3	5.96	7.64	30	21.7	
(final)		5.54	7.96	30	23.1	
(initial)	5	5.93	7.63	30	21.7	
(final)		5.69	7.95	30	23.1	

Table D10
Water Quality Parameters for *Menidia beryllina* Exposed to R2-HO-TOX Elutriates at 6 o/oo

Treatment	Replicate	D.O. mg/L	pH	Salinity ppt	Temp. °C	NH_3, mg/L composite
Control (initial)	1	6.10	7.24	6	22.2	
(final)		5.08	7.65	6	23.1	1.81
(initial)	3	6.10	7.26	6	22.2	
(final)		5.38	7.57	6	23.1	
(initial)	5	6.06	7.30	6	22.2	
(final)		5.33	7.66	6	23.1	
6 % (initial)	1	6.13	7.47	6	21.7	
(final)		5.21	7.86	6	23.0	4.62
(initial)	3	6.14	7.54	6	21.7	
(final)		5.30	7.84	6	23.1	
(initial)	5	6.21	7.55	6	21.7	
(final)		5.25	7.86	6	23.1	
12 % (initial)	1	6.20	7.50	6	21.4	
(final)		5.00	7.97	6	23.0	6.20
(initial)	3	6.25	7.55	6	21.4	
(final)		5.00	8.00	6	23.0	
(initial)	5	6.20	7.55	6	21.4	
(final)		5.25	7.95	6	23.0	
25 % (initial)	1	6.10	7.63	6	21.7	
(final)		5.23	8.21	6	23.0	5.95
(initial)	3	6.00	7.63	6	21.7	
(final)		5.00	8.20	6	23.1	
(initial)	5	6.10	7.64	6	21.7	
(final)		5.25	8.16	6	23.1	

(Continued)

Table D10 (Concluded)

Treatment	Replicate	D.O. mg/L	pH	Salinity ppt	Temp. °C	NH_3, mg/L composite
50 % (initial)	1	6.00	7.65	6	21.4	
(final)		5.10	8.43	6	23.0	12.4
(initial)	3	6.00	7.66	6	21.4	
(final)		5.01	8.44	6	23.0	
(initial)	5	6.00	7.66	6	21.5	
(final)		5.00	8.46	6	23.0	
100 % (initial)	1	5.30	7.66	6	21.5	
(final)		5.00	8.75	6	23.1	22.3
(initial)	3	5.31	7.67	6	21.5	
(final)		5.08	8.75	6	23.0	
(initial)	5	5.23	7.67	6	21.7	
(final)		5.01	8.71	6	23.0	

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14. ABSTRACT

Hopper dredges are often loaded past the point of overflow for economic reasons. As the hopper is filled, dredged material is stored in the hopper until overflow begins. The density of the hopper contents is increased by allowing the low-density supernatant to overflow back into the waterway. As the low-density supernatant overflows, the average density of the hopper contents increases. Thus, more material can be transported per trip to the disposal site or facility resulting in an economical loading.

There is normally a tradeoff between the potential economic benefits and potential environmental effects. Overflow results in increased water column turbidity, and supernatant solids may be redeposited near the dredge site. Also, if sediments are contaminated, the overflow may result in some release of contaminants to the water column. Therefore, the relationship between dredge production, density of the hopper load, and the rate of material overflow are important variables in maximizing the efficiency of the dredging operation while minimizing harmful contaminant release.

(Continued)

15. SUBJECT TERMS
Dredge production Dredged material Dredging Hopper dredges Overflow

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14. ABSTRACT (Concluded).

A field study was conducted during hopper dredging operations in the Delaware River and Delaware Bay area to quantify the potential load gains realized by overflow, the degree of suspended solids and contaminant release generated by overflow, and the dispersion of the overflow plume. Monitoring was conducted at two sites, one of predominately fine-grained material in the Delaware River, and the other of predominately coarse-grained material in Delaware Bay. This report summarizes the results of the study and describes the potential economic and environmental considerations for overflow at these sites.