UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
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CHICAGO, IL 60604-3590

BASF

FEB 12 1998

REPLY TO THE ATTENTION OF:

D-8J

US EPA RECORDS CENTER REGION 5
1004359

Mr. Bruce Roberts
BASF Corp.
1609 Biddle Street
Wyandotte, MI 48192-3729

Re: Region 5 RCRA Subtitle C Corrective Action Risk Assessment Guidance
BASF Corp.
MID 064 197 742

Dear Mr. Roberts:

The Region has evaluated the progress of Resource Conservation and Recovery Act (RCRA)-regulated facilities through the corrective action process. We are concerned about the progress of these efforts. This letter is an attempt to clarify our expectations in order to streamline the corrective action process. The Waste, Pesticides and Toxics Division of the United States Environmental Protection Agency (U.S. EPA), Region 5 is providing facilities undergoing a RCRA Facility Investigation (RFI) with the enclosed "Corrective Action Principles" guidance as well as several other available guidance documents. Our goal is to assist RCRA-regulated facilities with risk assessments performed during the corrective action process. We feel that this clarification will also be useful in the development of stabilization measures which we believe are an important way to mitigate environmental impacts. This effort is not intended to limit the requirements provided in RCRA Administrative Orders and Permits, nor does it constitute a request by Region 5 for additional work. The Region retains the right and authority to act at variance with the enclosed guidance based on site-specific conditions. The goal of the following is to provide additional information and clarification on the implementation of certain corrective action related concepts. The Region encourages facilities to consult with their State environmental regulatory agency to ensure that these concepts are implemented such that all State requirements are also satisfied.

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Land Use Planning and Assumptions

The *Advanced Notice of Proposed Rulemaking (ANPR)* for Corrective Action (Federal Register, Volume 61, Number 85, May 1, 1996) provides for consideration of current and future land use at RCRA facilities as a means of expediting the overall corrective action process. Land use assumptions and future land use options need to be developed as part of the conceptual site model early in the RFI process. The EPA directive *Land Use in the CERCLA Remedy Selection Process (OSWER 9355.7-04, May 25, 1995)* should be used to determine the types of information needed to support and justify assumptions regarding future land uses.

As suggested in the CERCLA directive, input from local citizens, local land use authorities, and facility owners should be elicited on future land use. These discussions should take place early in the RFI process and primarily focus on: 1) anticipated and desired future land uses; 2) environmental justice concerns; 3) ecological and/or natural resource concerns that would influence future land uses; and 4) the possibility of multiple future land uses at large facilities.

Future land use scenarios (e.g., designation as recreational land use) should be included in the baseline risk assessment in addition to current land use scenarios. Consideration of non-residential future land uses in the risk assessment may require the implementation of institutional controls and land use restrictions for part or all of a particular facility. EPA does not expect that institutional controls will often be the sole remedial action at a facility (*ANPR*). Potential benefits of permanent remediation include increased land value, lower maintenance costs, and the fact that costly long-term monitoring will not be required.

Risk-Based Screening Options

Chemical constituents in soil - The *ANPR* provides that individual chemical constituents present at a facility undergoing corrective action may be eliminated from further consideration by comparison of each site-specific constituent concentration to a pre-determined screening level. Effective site characterization for chemical constituents is the key factor which ensures that comparison of characterization results with pre-determined screening levels will result in accurate and protective decisions. The *Soil Screening Guidance: Users Guide* (OSWER Publication 9355.4-23, April 1996) and

the *Soil Screening Guidance: Technical Background Document* (EPA/540/R-95/128, May 1996) include tables of generic soil screening levels (SSLs) which were developed for the chemicals detected most frequently at Superfund sites. The calculated generic screening levels rely on specific risk-based assumptions and parameters that result in the following limitations:

1) The SSLs were calculated for approximately 110 chemicals. However, RCRA corrective action can include a much larger list of potential chemicals of concern. Therefore, many potential RCRA constituents are not included in the SSL guidance.

2) The SSLs were calculated using parameters that are based on residential land use. If non-residential land uses (e.g., industrial, agricultural, recreational) are proposed and appropriate, then screening levels based on the proposed non-residential uses must be developed.

3) The SSLs are based on default exposure pathways (direct soil ingestion and direct inhalation of contaminants or particulate matter) as well as modeled pathways (migration of chemicals from soil to ground water). If other exposure pathways (e.g., dermal exposure, food chain exposure) apply to a facility because of location, the type of chemicals of concern, or the potential receptors, then these additional pathways must be included in the development of the screening levels.

The EPA Soil Screening Guidance should be used for developing the necessary site-specific screening levels for soil contaminants. The SSL guidance provides methodologies that can be used to derive site-specific screening levels, although the derivation of screening levels may require extensive resources. An alternative to developing site-specific screening levels is to use the Preliminary Remediation Goal (PRG) values developed by U.S. EPA Region 9. The PRG values circumvent the limitations of the SSLs as follows:

1) PRGs were derived for over 200 RCRA constituents.

2) The Region 9 values were derived for both residential and industrial land use scenarios.

3) Development of the PRGs involved consideration of the most common exposure pathways incurred at sites (i.e., ingestion, inhalation, and dermal contact).

Chemical constituents in groundwater - EPA has a throughout-the-plume/unit boundary point of compliance policy for ground water and expects all usable groundwaters to be returned to their maximum beneficial uses wherever practicable. To the extent possible, Maximum Contaminant Levels (MCLs) should be used as target cleanup levels in order to return groundwater to the maximum beneficial use (i.e., cleanup levels and screening levels should always account for potential residential use of groundwater). Based upon the use of MCLs as cleanup levels, MCLs should also be considered as applicable screening levels. However, MCLs exist for less than 100 chemicals (*Drinking Water Regulations and Health Advisories; October 1996*). Chemicals which do not have a listed MCL should be sampled and screened against the Region 9 PRG values for drinking water.

The Role of CSGWPPs in EPA Remediation Programs (OSWER Directive 9283.1-09) allows for the use of Comprehensive State Ground Water Protection Programs (CSGWPP) for determining current and future groundwater uses in EPA remediation programs. EPA would defer to State and local policies, priorities, and standards if an approved CSGWPP exists for a particular State.

Evaluation of risk-based screening levels and procedures - Screening levels will be evaluated for appropriateness on a site-specific basis according to the following criteria:

1) The analytical detection limit/reporting limit for a constituent must be sufficient to demonstrate that the screening level can be achieved through field sampling and laboratory analysis. The purpose is to demonstrate that undetected constituents ("nondetects") could not actually be present above the proposed screening level. Consequently, a chemical constituent is a suitable candidate for screening if the detection limit for the chemical is low enough to ensure that the screening level can be attained during the sampling and analysis program. In order to select detection limits/reporting limits suitable for use in risk screening, it is suggested that facilities consult Region 5 RCRA Data Quality Levels.

2) Risk-based screening procedures must consider additive (cumulative) cancer and noncancer health impacts from the

presence of multiple chemicals. This is particularly important for facilities proposing to eliminate chemicals from a baseline risk assessment. The effect of eliminating multiple chemicals with potentially adverse human health endpoints may be to incorrectly dismiss a significant amount of risk. For this reason, target levels for screening of individual chemicals must be suitably conservative. As stated in the Soil Screening Guidance, this is accomplished by setting a "one-in-a-million" (1×10^{-6}) individual excess target risk for each carcinogenic chemical and a target hazard quotient (HQ) of 1.0 for each noncarcinogenic chemical. These target levels are based on the following rationale: 1) since the carcinogenic risk of multiple chemicals is additive, the 1×10^{-6} risk screening level for individual chemicals and pathways should lead to a cumulative cancer risk within the 1×10^{-6} to 1×10^{-4} range for the combination of chemicals usually found at RCRA sites; 2) an HQ of 1.0 corresponds to a threshold dose below which adverse health effects are not expected to occur. In general, HQs should only be added for chemicals which exhibit the same toxic endpoint and/or mechanism of action. If the results of a screening procedure indicate that there should be a significant concern for cumulative human health effects, the EPA may require further investigation of specific chemicals and areas at a given site. In addition, for the screening of chemical constituents in ground water, special consideration will be given to the use of MCLs. (For certain constituents, the MCL does not correspond to a 1×10^{-6} cancer risk level.)

Ecological Risk Concerns

Region 5 has a stated policy (*Ecological Assessments*, April 30, 1991 Memorandum) that ecological risk concerns and the preservation of ecological habitats must be considered at all RCRA facilities. This will require that at least a Screening Ecological Risk Assessment (SERA) be performed during the RFI.

Some important considerations for developing a SERA and for determining ecological screening levels (ESLs) include:

1) Field sampling to address both ecological and human health concerns may need to be performed at a RCRA facility.

2) The locations for field sampling to address ecological and human health concerns may be different.

3) Derivation of ESLs is more problematic than those for human health risk because ESLs may need to consider multiple sensitive species and variations in biological habitats.

4) Contaminant pathways and exposure to species will be unique to each facility and require a distinct conceptual model.

5) For specific chemicals, ESLs for soil could be lower than the corresponding human health soil screening levels.

EPA Project Managers and ecologists will work with facilities to determine the potential ecological risk concerns and to suggest appropriate ESLs.

Region 5 has developed Ecological Data Quality Levels (EDQLs) in order to assist facilities in the ecological risk screening process. The purpose of the EDQL values for each chemical and for each media is to provide conservative default values when a conceptual site model is lacking and representative species of concern have not been identified. When an indicator species is identified, the species-specific EDQL value can be applied.

Historical Data

Sampling data gathered during previous investigations may be used *in lieu* of new data collected as part of the RFI. The inclusion of historical sampling data in the RFI is appropriate as follows:

1) Historical data may be utilized if it meets the data quality objectives of the RFI.

2) Historical data may be used as a means of identifying potential chemicals of concern, suggesting the location of hazardous material releases, or estimating constituent concentrations that are present in a contaminated area.

3) Historical data may be used for comparison to risk-based screening levels, subject to approval by EPA. Additional sampling may be necessary to reduce the uncertainty when using historical data in this manner.

Enclosed with this letter is a list and copies of Regional risk guidance documents which may be useful in implementing corrective action at your facility. For copies of guidance documents that are not enclosed you can contact the RCRA Hotline at (1-800-424-9346) and you will be provided directions on how to obtain the document of interest. You may also contact your EPA Project Manager for assistance and further information.

Sincerely yours,

Norman R. Niedergang, Director
Waste, Pesticides and Toxics Division

Enclosures

ENCLOSURE

Reference List

The following list comprises risk guidance documents and other information, in chronological order, which may be useful in implementing corrective action pursuant to RCRA Sections 3004(u), 3004(v), and 3008(h). This list does not include every guidance document pertaining to work performed under corrective action.

"*Alternate Concentration Limit Guidance, Part 1: ACL Policy and Information Requirements,*" Interim Final, OSWER Directive 9481.00-6C, July 1987.

"*Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference Document,*" EPA 600/3-89/013, March 1989.

"*Interim Final RCRA Facility Investigation (RFI) Guidance,*" Volumes I-IV, EPA/530/SW-89-031, May 1989.

"*Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A),*" Interim Final, EPA/540/1-89/002, December 1989.

"*Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors,*" OSWER Directive 9285.6-03, March 25, 1991.

"*Framework for Ecological Risk Assessment,*" EPA/630/R-92/001, February 1991.

"*Final Guidance for Data Useability in Risk Assessment,*" (Parts A & B), OSWER Directive 9285.7-09A, April 1992.

"*Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration,*" OSWER Directive 9234.2-25, September 1993.

"*RCRA Corrective Action Plan,*" OSWER Directive 9902.3-2A, May 1994.

"*Ecological Risk Assessment Guidance for RCRA Corrective Action,*" U.S. EPA, Region 5, Interim Draft, October 1994.

"*Land Use in the CERCLA Remedy Selection Process,*" OSWER Directive 9355.7-04, May 25, 1995. **[Enclosed]**

"*Standard Guide for Risk Based Corrective Action Applied to Petroleum Release Sites,*" ASTM E-1739-95, November 1995. (Note: As approved by Region 5 guidance policy.)

"*Conducting Risk-Based Corrective Action for Federally-Regulated UST Petroleum Releases,*" U.S. EPA, Region 5, December 7, 1995. **[Enclosed]**

"*Sitting at the RCRA Data Quality Level Table, Update 1,*" U.S. EPA, Region 5, Memorandum, December 14, 1995. **[Enclosed]**

"*Soil Screening Guidance: Users Guide,*" OSWER Publication 9355.4-23, April 1996.

"*Soil Screening Guidance: Technical Background Document,*" EPA/540/R-95/128, May 1996.

"*Corrective Action for Releases From Solid Waste Management Units at Hazardous Waste Management Facilities,*" Advanced Notice of Proposed Rulemaking, 61 Fed. Reg. 19432, May 1, 1996.

"*Region 9 Preliminary Remediation Goals (PRGs) 1996,*" U.S. EPA, Region 9, Annual Update, August 1, 1996. **[Enclosed]**

"*EPA's Proposed Guidelines for Ecological Risk Assessment,*" 61 Fed. Reg. 47552, September 9, 1996. (Note: Final document to be released in early-1998.)

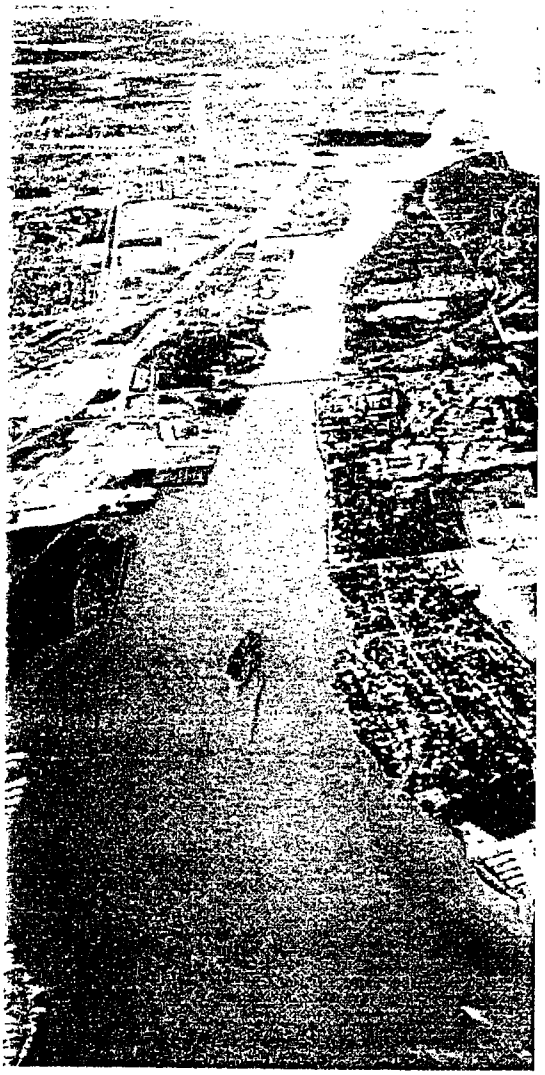
"*Corrective Action Principles,*" U.S. EPA, Region 5, Memorandum, November 19, 1996. **[Enclosed]**

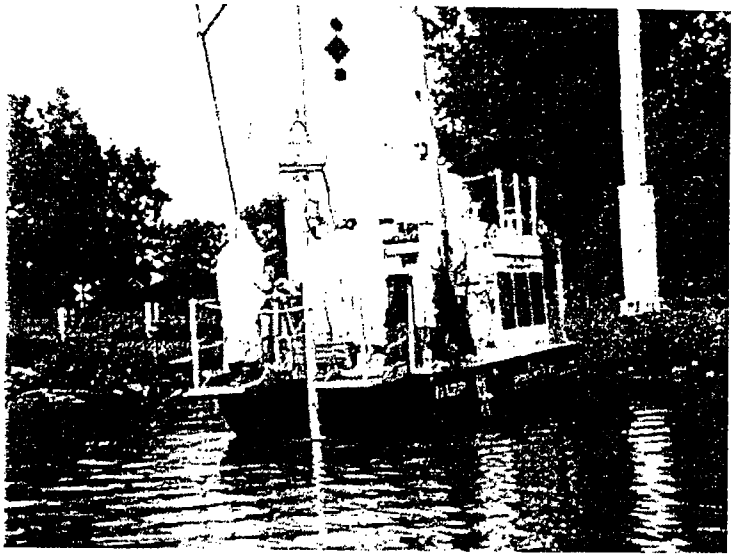
"*Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments,*" Interim Final, EPA/540/R-97/006, June 5, 1997.

"*Ecological Data Quality Levels, RCRA Appendix IX Hazardous Constituents,*" U.S. EPA, Region 5, Draft Report, August 18, 1997.

MI/DEQ/SWQ-97/084

Results of the Trenton Channel Project Sediment Surveys 1993-1996





July 1997

Arthur Ostaszewski
Michigan Department of Environmental Quality
Surface Water Quality Division
U.S. EPA-GLNPO Grant # GL-995960-02-0

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ABSTRACT

The Trenton Channel of the Detroit River has been identified in several studies as containing contaminated sediments that impair beneficial uses. From 1993 to 1996, the MDEQ and USEPA surveyed depositional areas of the Trenton Channel to determine horizontal and vertical distribution of contaminated sediments. Using the Rossfelder coring unit of the USEPA-GLNPO R/V Mudpuppy along with ponar and eckman dredges, 84 stations were sampled. Results show that 6 major areas harbor the bulk of contamination, an estimated 483,000 cubic yards. They are: Allied Fuel Oil Slip, Nicholson South Slip, Firestone Steel Area, Black Lagoon, Elizabeth Park North Canal, and Elizabeth Park South Canal-Inlet. Mercury, PCBs, PAHs, Heavy Metals, and Oil and Grease are the primary parameters of concern. Contamination is concentrated on the Michigan mainland side in depositional pockets primarily of fine sand and silt.

INTRODUCTION

The Trenton Channel is a 9 mile stretch of the lower Detroit River that is bound by the Michigan mainland on its western shore, and a series of islands of which Grosse Ile is the largest on the east. The Trenton Channel is defined as beginning at a line running west northwest from the head of Fighting Island to the Michigan mainland, and continuing downstream to Celeron Island. The top half of the Trenton Channel has a defined navigational channel that is dredged periodically for commercial shipping by the U. S. Army Corp of Engineers. All dredge material is sent to the Pt. Mouillee Confined Disposal Facility. The Michigan mainland (nearshore) area of the Trenton Channel has been industrially developed with several steel mills, chemical facilities, coal-generated power plants and landfill/disposal sites. Approximately half of the facilities that once operated with discharges to the river have been either abandoned or demolished.

Several municipalities are located along the Trenton Channel including the cities of Ecorse, Wyandotte, Riverview, Trenton, and the townships of Gibralter and Grosse Ile. The industrial nature of land use along the nearshore Trenton Channel has tended toward recreation. Today, these municipalities provide a multitude of public access points on the river, including walkways, fishing piers, parks, and boat launching facilities. There are also numerous private marinas, restaurants, apartment complexes and homes that line the Channel. In 1996, a public golf course was opened on the site of a former chemical alkali/resin facility.

The Trenton Channel has been identified as harboring the majority of contaminated sediments in the Detroit River Area of Concern (Michigan Department of Environmental Quality, 1987). The Michigan Department of Environmental Quality-Surface Water Quality Division (MDEQ-SWQD) with assistance from United States Environmental Protection Agency-Great Lakes National Program Office (USEPA-GLNPO), USEPA Region 5 Office of Water (R5), USEPA Large Lakes and Rivers Research Station (LLRS) and United States Army Corps of Engineers (USACE) conducted sediment surveys of the Trenton Channel, between 1993 and 1996 to further identify sediment depositional areas and delineate contaminated sediment zones in the Trenton Channel (Figure 1. Chronology).

Contaminated sediment sites have been identified in previous surveys (Fallon and Horvath 1985, MDEQ 1987, U.S. EPA and Env. Can 1988, Geisy et.al. 1988, Farara and Burt 1993), using primarily surficial (ponar, eckman) and shallow core techniques, (Table C. Known contaminated sites identified in the Trenton Channel). The Trenton Channel Project Surveys conducted for this report concentrated on determining the vertical and horizontal extent of contamination in known contaminated areas and characterization of unsurveyed depositional zones throughout the Channel.

Sediment assessment was a major part of the overall Trenton Channel Project. The Trenton Channel Project is a cooperative project between MDEQ and USEPA with the goal of applying innovative methods and procedures for addressing sediment contamination in large river systems. Other studies of the Trenton Channel Project include measurements of resuspension potential (Lick et.al., 1995), hydroacoustic profiling (Caulfield, 1985), response of dredging activities (Besser et.al., 1996), fish contaminant monitoring (USEPA Region 5, 1996 unpublished), low-level contaminant loading estimates (Froese et.al. 1996), data archive and retrieval (USEPA-FIELDS, unpublished) (MDEQ-SWQD DARTS, unpublished), bench-scale remedial technology evaluation (MDEQ ongoing), and full-scale remedial feasibility studies (MDEQ ongoing).

METHODS

Using the USEPA-GLNPO Research Vessel (R/V) Mudpuppy, 4 inch diameter sediment cores were taken using a Rossfelder Vibracoring Unit in depositional areas encompassing the entire portion of the Trenton Channel over a 3 year period, 1993-1996, (Figure 2, Map of Sample Areas). Cores were taken to refusal. MDEQ-SWQD also collected surfical petite ponar and eckman sediment samples in certain locations inaccessible to the 32' R/V Mudpuppy. Data from Michigan State University (Besser et. al., 1996) was also used. Depositional zones were determined by reviewing historical outfall and sampling records, and presurvey reconnaissance of soft sediments (fine sand and silt) using a petite ponar dredge and/or 12 ft. PVC poles.

To address trends in surficial depositing sediments, Michigan State University (Besser et.al., 1996), collected ponar sediment samples in a dredged portion of the Channel that included clean and contaminated reference sites. In 1994 and 1996, ponar and eckman dredge samples were taken at the same reference depositional sites by MDEQ to better characterize the trend contaminant levels in undisturbed surficial sediments.

The primary suite of parameters measured for all surveys included heavy metals, PCBs and PAHs. Depending on specific survey objectives (Figure 1. Chronology), analysis for TOC, Oil and Grease, Grain-size, Acid Volatile Sulfides-Simultaneously Extractable Metals, Density, Pesticides, Base Neutral Scans, and Mass Spec-Library Searches (Appendix A. Mass Spec-Library Search Interpretations) were also conducted. All lab analyses used standard USEPA methodology or ASTM protocol as identified in the Trenton Channel Sediment Assessment Quality Assurance Project Plan, (Ostaszewski and Benzie, 1993).

For comparing the results to established levels of high contamination to aquatic life, the Effects Range Median Guidelines (ERM - Long and Morgan, 1990), as outlined in the USEPA Sediment Classification Methods Compendium (USEPA, 1992) were used. For those parameters without established ERMs, results were compared to the Ontario Ministry of the Environments Severe Effect Levels (SEL - Persaud, 1993). For the bioaccumulative parameters PCBs and Mercury, we compared results to the quantification limit (QL) as outlined by the MDEQ-Environmental Response Division Target Method Detection Limit using respective EPA Analytical methods, (Table A. Parameters and Guidelines Used to Evaluate Trenton Channel Project Sediment Results). The magnitude of exceedances for bioaccumulatives (QL) and toxics (ERM/SEL) were summed and used in identifying those sites which were the most contaminated (Table B. Classification of Contaminated Sediment Sites as applied to the Trenton Channel Project Sediment Survey Results (1993-1996)), (Graph B (a). Classification and Distribution of Trenton Channel Project Sediment Results (annotated)). Dredging volumes for "extremely" contaminated areas where estimated taking the surface area of the depositional site, and depth of QL and/or ERM/SEL exceedances. Where QL and ERM/SELs were still exceeded at bottom intervals, professional judgment was used to determine depth of contamination (rate of decline). The volumes are based on in place measurements, and do not take into account percent solids.

RESULTS

From the period 1993 to 1996, a total of 84 sediment stations were surveyed in the Trenton Channel and vicinity under the auspices of Trenton Channel Project (Figure 2. Map of Sample Areas). The sediment surveys main objectives were to delineate known contaminated areas, characterize unsampled depositional zones, and depict the range of contamination present in the system, (Appendix B. Data Results) (DARTS-Date Archive and Retrieval Transfer System Compact-Disk, SWQD).

Upper Trenton Channel - Confluence of Rouge River to Ecorse Creek
Figure 3. Upper Trenton Channel Rouge River to Ecorse Creek

The Trenton Channel starts at a line cutting across the top of Fighting Island, west northwest to the Michigan shoreline. At the upstream end, it splits briefly between Mud and Grassy Islands, former Confined Disposal Facilities (CDFs) then joins together and continues downstream between Grosse Ile and the Michigan mainland.

Areas where sediments deposit in this upper area of the Trenton Channel begin with the Allied Fuel Oil Slip and include Nicholson South Slip, the area above Mud Island CDF, and the area below Mud Island CDF. Minor depositional zones include the marinas such as the Stenson Club slips and at the mouth of the Ecorse Creek. The area immediately between the Stenson Club and Ecorse Creek has fast current velocity (>2 feet per second) and a boardwalk/park along the mainland shore.

Sediment sampling for the Trenton Channel Project began upstream of the Channel in the Allied (a.k.a. Dana) Fuel Oil Slip and Nicholson Terminal-South Boat Slip. Sediments in the upstream portion of the Upper Trenton Channel showed varied levels of contamination, with the worst contamination beginning in both the Allied and Nicholson Boat Slips and continuing downstream primarily along the Michigan mainland side.

Heavy metals were present above QL and ERM/SEL levels at both the Allied and Nicholson Boat Slips, as well as the first depositional zone accessible downstream of them, (Stenson Club slip). Metals and Organics that exceeded QL or ERM/SEL values at Allied and/or Nicholson-South are presented below:

Allied/Nicholson South Slips Maximum
Metals (ppm-dw)
Cd=35 Cr=300 Cu=630 Fe=120,000 Hg=3.0 Mn=2090 Ni=240 Pb=580 Zn=1200

Organics (ppm-dw)
PCBs=12.7 PAHs=93 Oil and Grease=71,000

Figure 4. Upper Trenton Channel PCB levels
Figure 5. Upper Trenton Channel Oil and Grease levels

Downstream at the Stenson Club, PCBs on the surface decrease to 7.2 ppm. At the mouth of Ecorse Creek levels of PCBs decreased to 3.5 ppm on the surface.

PAHs were also above ERM levels at the Allied, Nicholson, and Stetson sites. Oil and Grease levels were extremely high (42,000 - 71,000 ppm) in the Allied and Nicholson Slips. Oil and Grease levels gradually diminish downstream from those 2 sites, though continued to exceed SEL levels down past Ecorse Creek (8000 ppm) along the mainland shoreline.

The pattern of contamination in the upstream portion of the upper Trenton Channel appears to be highest at the most upstream stations and decreases downstream. The contamination is also much greater for those stations along the Michigan shoreline. Allied and Nicholson Slips have the highest levels of most contaminants. Core samples at these two freighter slips show the vertical distribution of all contaminants to be variable with no discernible pattern. Contamination was present down to the bottom of the core, 218 cm.

Downstream at the Stenson Site, levels of Cd, Cr, Fe, Mn, Ni, Zn, PCBs and Oil and Grease are highest on the surface, and decrease down through the sediments. This is very clear with PCBs at the Stenson site. PCB levels on the surface (0-30cm) were at 7.2 ppm and decrease to 7.0 ppm (30-91cm), 5.6 ppm (91-152cm), 1.3 ppm (152-213cm) and 1.5 ppm (213-224cm). PCBs were also lower with depth at the Nicholson Slip Site.

Levels of Cu, Hg and PAHs showed an increase with depth to 213cm at the Stenson site, then decreased at the 213-224 cm interval. Just offshore at the three Mud Island CDF sample sites, contaminants were much lower. ERM/SEL guidelines were exceeded only for organic contaminants. The highest level around the CDF for PCBs was 1.6 ppm. Oil and Grease (2760 ppm) and PAHs (48 ppm) were highest for the west side of the island (nearest the mainland) than on the east side (Oil and Grease=1200ppm, PAHs=18.6 ppm).

Upper Trenton-Grassy Island to Pt. Hennepin

Figure 6. Upper Trenton Channel Grassy Island to Pt. Hennepin

There are few depositional zones in the area downstream from Ecorse Creek to the Grosse Ile Toll Bridge. Areas sampled in this stretch included five samples around Grassy Island (another former CDF), off the southern tip of BASF Northworks, in a boat slip of the Wyandotte Yacht Club, in the shallow region between Grassy Island and Pt. Hennepin, and off the west side of Fighting Island (also a former CDF).

Heavy Metals exceeded QL and ERM/SEL levels only at the BASF-Lower and/or Wyandotte Yacht Club sites. The highest values are presented below:

BASF-Lower/Wyandotte Yacht Club Maximum Values
Metals (ppm-dw)
Hg=1.5 Ni=67 Pb=150 Zn=330

Organics (ppm-dw)
PCBs=3.3 PAHs=88.7 Oil and Grease=11,000

Figure 7. PCBs in the Upper Trenton Channel
Figure 8. Hg in the Upper Trenton Channel

Levels of Cd, Cr, Cu, Fe and Mn did not exceed ERM/SEL levels as did sites upstream. Heavy metals were relatively low for the sites around Grassy Island and the one site off Fighting Island. PCBs continued to be elevated above QL levels, are greater at nearshore stations, and increase with depth,. At the BASF-Lower site, PCB concentrations ranged from 1.93 ppm near the surface (0-30 cm) , 1.3 (30-91cm), 0.42 ppm (91-152cm), and non-detected at lower depths (152-213cm) and (213-218cm) in the core.

PCBs exceeded QL levels at the upper easternmost Grassy Island station (0.67 ppm), and both downstream island stations (0.43-0.41 ppm), Other sites around Grassy Island and at Fighting Island were low or below detection for PCBs. PAHs only exceeded ERM levels in buried sediments (30-213cm) at the BASF-Lower site (37.2 to 88.7 ppm). Sites at the southern end of Grassy Island showed greater levels of PAHs than others around the island. Oil and Grease exceeded SEL levels at BASF-Lower (11,000 ppm), Wyandotte Yacht Club (9000 ppm), and the two stations at the south end of Grassy Island (eastside=220 ppm, westside=1900 ppm).

Portofino/Point Hennepin to Grosse Ile Toll Bridge

Figure 9. Upper Trenton Channel: Point Hennepin to Grosse Ile Toll Bridge

There are few depositional zones in the area between Point Hennepin downstream to the Grosse Ile Toll Bridge. The Grosse Ile side is primarily rock/rip rap, with the upper portion of the Island used formally for the landfilling of caustic soda and flyash. The mainland side is primarily concrete breakwall where the old BASF-Southworks and Pennwalt Chemical plants used to operate. The Trenton Channel Project sampled at the Portofino Restaurant Boat slip immediately above the old BASF plant, across from the Portofino Slip along the Grosse Ile shore, in the marshy area along the Grosse Ile side of the Channel above the Toll Bridge, and in the only other depositional zone in the upper Trenton, sediments off Firestone Steel/MPC (Materials Processing Corp) and Federal Marine Terminal.

Only Ni (50 ppm), Pb (288 ppm), and Zn (350 ppm) exceeded ERMs for heavy metals above the Firestone Steel site in the Trenton Channel. PCBs were non-detect along the Grosse Ile side, though a level of 1.9 ppm was recorded at the Portofino slip (0-30 cm). No sites exceeded PAH ERMs above Firestone, though Oil and Grease levels of 7000 ppm were found at the Portofino site. Levels of Oil and Grease along the Grosse Ile side ranged from non-detect to 367 ppm.

Firestone Steel Site-

The Firestone Steel site is the first large sheltered depositional area along the mainland side of the Trenton Channel downstream of Allied and Nicholson Slips. Compared with samples taken upstream, levels of contamination increase for all heavy metal parameters at the Firestone Steel site, with levels of Cd (19 ppm), Cr (260 ppm), Fe (44000 ppm), Hg (16 ppm), Ni (130 ppm), Pb (300 ppm), and Zn (790 ppm), exceeding QL and or ERM/SEL levels. Highest concentrations generally appear on the surface, though QL, ERM/SEL levels are exceeded as far down as 152-194cm.

Firestone Steel Site Maximums

Metals (ppm-dw)

Cd=19 Cr=260 Fe=44,000 Hg=16 Ni=130 Pb=300 Zn=790

Organics (ppm-dw)

PCBs=18.4 PAHs=204 Oil and Grease=21,000

Figure 10. Cd at Firestone Steel Site
Figure 11. Hg at Firestone Steel Site
Figure 12. PCBs at Firestone Steel Site
Figure 13. Oil and Grease at Firestone Steel Site

Besides having the highest Hg (16 ppm) of any Trenton Channel Project Site, Firestone Steel also had the highest levels of PCBs (18.4 ppm), and very high levels of PAHs (204 ppm) and Oil and Grease (21000 ppm). These high levels were on the surface. All samples at all depths at the Firestone Steel site were above the QL for PCBs. PAHs appeared concentrated at the downstream end of the site. Oil and Grease levels were above SELs at the surface and at depth.

Immediately downstream of Firestone Steel is the Federal Marine Terminal (BASF Landfill) Site. Sediments off this site had levels similar to the Firestone Steel site, with elevated levels of Cd (40 ppm), Cr (500 ppm), Fe (45,000 ppm), Hg (9.9 ppm), Ni (210 ppm), Pb (352 ppm), Zn (846 ppm), PCBs (11.2 ppm), and Oil and Grease (41,200 ppm).

Federal Marine Terminal (a.k.a. Monguagon Creek-Upstream) Site Maximums
Metals (ppm-dw)
Cd=40 Cr=500 Fe=45,000 Hg=9.9 Ni=210 Pb=352 Zn=846

Organics (ppm-dw)
PCBs=11.2 Oil and Grease=41,200

Figure 14. Federal Marine Terminal / Monguagon Creek Area Cd levels
Figure 15. Federal Marine Terminal / Monguagon Creek Area Hg levels

With the exception of cadmium, the highest levels of contaminants were found below the surface at the Federal Marine Terminal site, though surfical sediments still exceeded QL and ERM/SEL levels. Cadmium at this site was the highest of the survey (40 ppm) and located in the surface core interval (0-30cm).

Middle Trenton Channel - Monguagon Creek/Gross Ile Toll Bridge to Elizabeth Park-North
Figure 16. Middle Trenton Channel: Monguagon Creek to Elizabeth Park North Canal

There are 2 sediment depositional areas in the Middle Trenton Channel. Immediately downstream of the Grosse Ile Toll Bridge at the mouth of Monguagon Creek, sediments showed similar patterns of contamination as the Federal Marine Terminal Site, with QL and ERM/SEL levels exceeded for Cd (30 ppm), Cr (456 ppm), Fe (57,000), Hg, (3.9 ppm), Ni (251 ppm), Pb (424 ppm), Zn (1200 ppm), and PCBs (12.3 ppm). The mouth of Monguagon Creek showed high levels of PAHs (218 ppm) and Oil and Grease (9000 ppm).

Monguagon Creek Area Maximums
Metals (ppm-dw)
Cd=30 Cr=456 Fe=57,000 Hg=3.9 Ni=251 Pb=424 Zn=1200

Organics (ppm-dw)
PCBs=12.3 PAHs=218 Oil and Grease=9000

Figure 17. Pb in the Federal Marine Terminal / Monguagon Creek Area.
Figure 18. Zn in the Federal Marine Terminal / Monguagon Creek Area

One small depositional pocket along the Grosse Ile shoreline, downstream and across from Monguagon Creek, did not exceed any ERM/SEL levels for heavy metals. Only PCBs (0.6 ppm) exceeded QL levels.

Black Lagoon-
Downstream from the Monguagon Creek area, running the length of McLouth Steel-Trenton, the Trenton Channel constricts and no depositional zones exist for approximately 1 mile. Black Lagoon is a depositional zone below the former McLouth Steel-Trenton Plant (closed 1995). Sediments have historically been found to exceed QL and ERM/SEL levels (Pranckevicius, P.E. 1987, USEPA 1988, Farara and Burt 1993, MDEQ 1995). The Trenton Channel Project Sediment Surveys defined the horizontal and vertical extent of contamination in the Black Lagoon area. Metal levels of Cd (30 ppm), Cr (418), Fe (137,000 ppm), Hg (11.0 ppm), Mn (2060 ppm), Ni (206 ppm), Pb (547 ppm), and Zn (3320 ppm) all exceeded QL and ERM/SEL levels. Organic contaminants such as PCBs (6.5 ppm), PAHs (70.5 ppm), and Oil and Grease (19700 ppm) also exceeded QL and ERM/SEL levels.

Black Lagoon Maximums
Metals (ppm-dw)
Cd=30 Cr=418 Fe=137,000 Hg=11 Mn=2060 Ni=206 Pb=547 Zn=3320

Organics (ppm-dw)
PCBs=6.5 PAHs=70.5 Oil and Grease=19700

Figure 19. Black Lagoon Hg levels
Figure 20. Black Lagoon Zn levels
Figure 21. Black Lagoon Oil and Grease levels

Downstream of Black Lagoon there are only small pockets where sediments can deposit, due to the current velocity of the Trenton Channel and straight shoreline contour.

Approximately 300 feet downstream from Black Lagoon, a small depositional zone located at the foot of Riverside Hospital did not exceed heavy metal ERM/SEL levels except for Pb (130 ppm) and Zn (738 ppm). No exceedances were found for any organic parameter. Approximately 800 feet downstream from Black Lagoon, at a site along the mainland shore at the foot of the Trenton Towers Apartments, heavy metals exceeded QL and ERM/SEL levels for Cd (10 ppm), Cr (220 ppm), Fe (52, 000 ppm), Hg (6.4 ppm), Ni (88 ppm), Pb (261 ppm), and Zn (945 ppm). No Organic parameters exceeded QL or ERM/SEL levels. The area itself is very small (approximately 30 cu yards).

Trenton Towers Maximums
Metals (ppm-dw)
Cd=10 Cr=220 Fe=52,000 Hg=6.4 Ni=88 Pb=261 Zn=945

Organics (ppm-dw)
None

Figure 22. Trenton Towers Hg levels

Lower Trenton Channel: Elizabeth Park North to Celeron Island

Figure 23. Lower Trenton Channel: Elizabeth Park North Canal to Celeron Island

Downstream of the Trenton Towers, homes, marinas, and boat launches dot the mainland shoreline until the beginning of Elizabeth Park. Elizabeth Park is a 500 acre municipal park administered by the Wayne County Parks Department. It is actually an island, with a canal running the length of it. At the north end of the park a depositional zone known as Elizabeth Park-North Canal is located. Elizabeth Park-North Canal is bound by a Mobil Oil Terminal to the north, and the park itself on the South. The Trenton Channel flows to the east, and the canal constricts to pass around the island on the west.

Just upstream of the Mobil Oil Terminal, sediments were sampled in a small cove. Only Zn (683 ppm) exceeded ERM levels. No other metals or organics exceeded QL or ERM/ SEL levels. In Elizabeth Park-North Canal, Cd (15 ppm), Cr (270 ppm), Fe (48700 ppm), Hg (7.4 ppm), Ni (100 ppm), Pb (279 ppm), and Zn (842 ppm) exceeded ERM/SEL levels. Organics also exceed QL and ERM/SEL levels for PCBs (10.3 ppm), PAHs (57 ppm), and Oil and Grease (26,200 ppm).

Elizabeth Park-North Canal (EPNC) Maximums
Metals (ppm-dw)
Cd=15 Cr=270 Fe=48,700 Hg=7.4 Ni=100 Pb=279 Zn=842

Organics (ppm-dw)
PCBs=10.3 PAHs=57 Oil and Grease=26,200

Figure 24. EPNC Hg levels
Figure 25. EPNC PCB levels
Figure 26. EPNC PAH levels

With the exception of PAHs, levels of contamination were highest on the surface. Other contaminants decreased with depth down to 330 cm. At the eastern end of the Elizabeth Park-North Canal depositional zone, contaminants exceeded ERM levels for only Pb (129 ppm) and Zn (795 ppm), with no exceedances for organics.

Continuing along the canal, there are 5 small public bridges which cross its upper half. These bridges attach the park to the mainland. Surficial sediments were collected behind each bridge. Exceedances of QL and ERM/SEL levels are outlined as follows:

Bridge (Upstream to Downstream)
All values above ERM/SEL (ppm d.w.)

EPC-1					Pb=129	Zn=795	
EPC-2 no exceedances							
EPC-3			Hg=1.7		Pb=137	Zn=750	
EPC-4		Cr=146	Fe=43,000	Ni=75	Pb=189	Zn=870	PCBs=5.5
EPC-5	Cd=9.9		Fe=43,000		Pb=187	Zn=1020	PCBs=0.8

Downstream of EPC-2, there is an increase in contamination in the sediments. PCBs are found in the canal only below the area where dredge spoils from the Elizabeth Park Marina excavation were land deposited (EPC-4, Bridge 4).

Along the Trenton Channel length of Elizabeth Park, downstream of the Mobil Oil/North Canal area, there is rock riprap and no further area of deposition until the Elizabeth Park Marina. In 1993, a portion of the nearshore Trenton Channel along with a portion of upland area was dredged/excavated to build a 50 slip boat marina for the park. Being secluded from strong current and wave action and once having upland soils, the Trenton Channel Project used this marina as a study site to determine the quality of sediments depositing on the surface in the Lower Trenton Channel. In 1993, initial sediment chemistry, benthic community and toxicity were measured in relation to reference sites in the Trenton Channel, (Besser, 1996). Subsequent sediment chemistry sampling in 1994 and 1996 has tentatively shown levels of surficial contaminants decreasing, with Cd, Cr, PCBs, and PAHs falling below QL and ERM/SEL levels. Other heavy metal contaminant levels also fell in 1996 but continued to exceeded QL and ERM/SEL levels in the Marina for Fe (45,000 ppm), Hg (3.8 ppm), Ni (68 ppm), Pb (153 ppm), and Zn (782 ppm). (1997 MDEQ-SWQD, ongoing).

Elizabeth Park Marina 1996 Surface ERM/SEL Exceedances
Metals (ppm-dw)
Fe=45,000 Hg=3.8 Ni=68 Pb=153 Zn=782

Figure 27. Elizabeth Park Marina Zn levels

A station across the Marina on the Grosse Ile side of the channel had no QL and or ERM/SEL exceedances of any parameter.

Downstream of Elizabeth Park Marina and the Grosse Ile "Free" Bridge, the Detroit Edison-Trenton Coal Fired Power Plant dominates the mainland shoreline. The next zones of deposition occur in the south end of Elizabeth Park Canal and in sheltered areas along Monsanto Chemical Property.

QL and ERM/SEL sediment level exceedance in this region are concentrated primarily around the Monsanto Chemical Property. At the south end of Elizabeth Park Canal before it re-enters the Trenton Channel, at the foot of Monsanto's northern most outfall, heavy metals Cd (13 ppm), Cr (205 ppm), Fe (58,900 ppm), Hg (1.6 ppm), Pb (272 ppm), and Zn (1010 ppm) exceeded ERM/SEL levels. PCBs (0.8 ppm) were also above the ERM.

Monsanto Outfall (a.k.a. EPSC dock) Surface ERM/SEL Exceedances
Metals (ppm-dw)
Cd=13 Cr=205 Fe=58,000 Hg=1.6 Pb=272 Zn=1010

Organics (ppm-dw)
PCBs=0.8

Figure 28. EPSC Area Hg levels
Figure 29. EPSC Area Zn levels

Just downstream of where Elizabeth Park South Canal rejoins the Trenton Channel, Monsanto has an abandoned water intake inlet/slip. Contaminants in this inlet exceeded QL and ERM/SEL levels for Cd (13 ppm), Cr (225 ppm), Fe (82,700 ppm), Hg (5.1 ppm), Ni (102 ppm), Pb (347 ppm), Zn (1200 ppm), PCBs (2.4 ppm), PAHs (35 ppm), and Oil and Grease (10,000 ppm). The intake appears to have a solid base at approximately 88cm below the surface.

Elizabeth Park South Canal-Inlet: QL and ERM/SEL Exceedances
Metals (ppm-dw)
Cd=13 Cr=225 Fe=82,700 Hg=5.1 Ni=102 Pb=347 Zn=1200

Organics (ppm-dw)
PCBs=2.4 PAHs=35 Oil and Grease=10,000

Monsanto also has several lagoons along the nearshore bank, including one which is accessible from the Trenton Channel by boat. In the southern most lagoon, Cd (16 ppm), Cr (193 ppm), Fe (80200 ppm), Hg (3.9 ppm), Ni (89 ppm), Pb (246 ppm), Zn (996 ppm), and PCBs (0.9 ppm) exceeded QL and ERM/SEL levels.

Monsanto Lagoon ERM/SEL Exceedances
Metals (ppm-dw)
Cd=16 Cr=193 Fe=80,200 Hg=3.9 Ni=89 Pb=246 Zn=996

Organics (ppm-dw)
PCBs=0.9

Figure 30. Lower Trenton PCB levels
Figure 31. Lower Trenton Pb levels

In the Trenton Channel on the downstream side of the Monsanto Lagoons, along the Michigan mainland and in the vicinity of a Chrysler outfall, levels of Cr (150 ppm), Fe (66300 ppm), Hg (3.9 ppm), Ni (71 ppm), Pb (222 ppm), Zn (701 ppm), PCBs (2.4 ppm), and Oil and Grease (3010) exceed QL and ERM/SEL levels.

Sites sampled at the upper-inner end of Chrysler Bay, downstream of the Chrysler outfall, had exceedances for Fe (55,200 ppm), Ni (56 ppm), Zn (765 ppm), PCBs (1.4 ppm), and Oil and Grease (2000 ppm). This site also had high TOC (30.7%). Furthermore downstream in the bay, Ni (54 ppm), and Zn (661 ppm) exceeded ERMs at the site above Humbug Marina.

For the most downstream station along the Grosse Ile side of the Trenton Channel, at the north end of Swan Island, no QL or ERM/SEL exceedances occurred. The most downstream sediment site of the surveys was the middle bay of Celeron Island. Celeron Island is located at the fringe of Lake Erie, in the middle of the channel. Sediments here showed high % TOC and no QL or ERM/SEL exceedances.

DISCUSSION

As identified in the 1985 Upper Great Lakes Connecting Channel Studies (U.S. EPA, 1988), sediment contamination in the Trenton continues to show a distinct gradient across the channel. Contamination is primarily present only along the Michigan mainland shore where depositional areas exist. The Allied Fuel Oil Slip and Nicholson South Slip mark the beginning of sediment contamination in the Trenton Channel. Levels in these two areas are much higher than those in immediate depositional zones downstream. Organic contaminants PCBs and Oil and Grease show a distinct decreasing trend of contamination from upstream (Allied/Nicholson) down to Wyandotte Yacht Club (3.5 miles).

Downstream of the Ecorse Creek mouth and out from shore lies the closed CDF (now a National Wildlife Refuge), Grassy Island. The contaminants Hg, PAHs and O&G are elevated at the south end of Grassy Island compared to north and west island sites. The closed CDF is currently the subject of study, (Manny, 1997).

There is no major depositional area along the Michigan Mainland shore from the Wyandotte Yacht Club to the site of the former Firestone Steel, now operating as the warehouse of Materials Processing Corp (MPC), a distance of 2.5 miles. A substantial increase in contamination begins at Firestone Steel and continues downstream to Monguagon Creek. The Firestone Steel Area is a large depositional area of heavy metals, PCBs, Hg, and Oil and Grease. Highest concentrations are found primarily on the surface, suggesting recent or continuing sources. The depositional area continuing downstream of Firestone Steel shows extreme contamination though less elevated, with the highest contamination found primarily below the surface, though surficial concentrations also exceeding QL and ERM/SEL levels.

Cadmium levels were generally low upstream of Firestone Steel (non-detect to 13 ppm). Just downstream of Firestone Steel at the Federal Marine Terminal station, levels increase to 40 ppm and were found highest on the surface. Cadmium levels continue to be predominantly higher on the surface and decrease downstream from the Federal Marine Terminal Area to Lake Erie.

The distribution of contaminants (2-4 DTP) from Monguagon Creek to the Lower Trenton Channel and Lake Erie has been well documented (Carter and Hites, 1992). In Trenton Channel Project sediments surveys, the mouth of Monguagon Creek had increased levels of PAHs and Oil and Grease compared to surrounding sites. Monguagon Creek is now in the process of remediation (Conestoga, 1996). This action will prevent Monguagon Creek from further being a primary source of PAHs and Oil and Grease to the sediments of the Lower Trenton Channel. The size of the large contaminated zone in the middle Trenton extends from Firestone Steel to the Upper McLouth Property, encompassing the Federal Marine Terminal site and mouth of Monguagon Creek.

The swift laminar current in the Trenton Channel has kept sediment contamination in a tight lens along the Michigan mainland and has also kept it from crossing over to the Grosse Ile side. Transect sediment core sampling (3 stations-nearshore, midshore, offshore) across from the upper property area of McLouth Steel shows the contamination to be in a band extending from the mainland to the west bank of the navigation channel, basically hugging the shore. The highest contaminant levels in this area downstream of Monguagon creek are found now in a lens hugging the mainland shore with the greatest concentrations below surficial layered sediments.

Downstream of Monguagon Creek, the next area of contamination is below the former McLouth Steel-Trenton facility, the depositional area known as Black Lagoon. Our sediment surveys have determined that contamination in Black Lagoon is bound by the shoreline and a shoal area. Depth of contamination extends to approximately 230cm, where clean native clays are found. The surficial sediments of Black Lagoon have been surveyed for over 10 years. Contamination on the surface has decreased, though still above ERM/SEL levels. The cause of this decrease is most likely due to resuspension of sediments and subsequent redeposition of new material (thus dilution).

Horizontally, contaminant distribution in Black Lagoon is bound on the north, west and south by the shoreline. To the east of Black Lagoon, a shoal runs the length of the depositional zone with the effect of creating a quasi-breakwall. Levels of contamination along the shoal did not exceed any QL or ERM/SEL for either metals or organics. The shoreline and the shoal effectively bound the contaminated area of Black Lagoon.

Vertically, contamination varied within Black Lagoon. Sample sites located deeper in the lagoon generally had the greatest level of contaminants buried at depths from 30 to 210 cm. Samples in the south region had higher contamination on the surface. Below 210cm, contaminant levels did not exceed QL or ERM/SEL levels except for Hg (1.4 ppm) and Oil and Grease (2970 ppm). The estimated volume of contaminated sediments in Black Lagoon is 20,000 cu. yards.

Downstream of Black Lagoon, the next major depositional area is Elizabeth Park North Canal. Elizabeth Park North Canal is a contaminated depositional zone bound by the shoreline to the north, east and south. Deposition is bound to the east by the flow velocity and scour of the Trenton Channel. Contamination was primarily greatest on the surface at this site, though extended below 330 cm. Surficial samples from 1996 were generally less contaminated than surficial core samples collected in 1993 and 1994 at Elizabeth Park North Canal. Highest PAHs levels (57 ppm) were found buried in cores.

At Elizabeth Park Marina, 3 years of surficial sediment sampling show depositional rates in the lower Trenton to be on the order 1-3 cm/yr. (Kreis, 1996). Surficial contaminant levels have declined but still exceeded QL and ERM/SEL levels for Fe, Hg, Ni. Pb, and Zn in the Marina.

Below Elizabeth Park Marina and the Grosse Ile "Free" Bridge, the Trenton Channel begins to widen and velocities decrease. Several islands dot this area as it opens up to Lake Erie. Wind and waves play a predominant role in moving the sediments. Sand predominates in this region in contrast to silt in upstream sheltered areas. The Lower Trenton is a dynamic area with waves reaching much higher peak heights than upstream. It is also more prevalent to partial reverse flow seiche effects from Lake Erie that happen with sustained east winds (Quinn, 1976).

At Celeron Island, Pb was found highest on the surface. Also, Hg and PAHs were found only on the surface interval of sediment cores and not detected below the surface. Resuspension of upstream contaminants are one of the mechanisms of how contaminants relocate to the Western Basin of Lake Erie (Schloesser, 1995).

Conclusions-

In two separate prioritization rankings of contaminated sediment sites in the Trenton Channel and Detroit River, the Firestone/Monguagon/McLouth area, along with Black Lagoon and Elizabeth Park North Canal ranked "Severely Contaminated" (Kreis, 1989) and "Severely Contaminated and Impacted" (Farara and Burt, 1993). These areas had exhibited degraded bethos, high toxicity, and exceed highly polluted sediment guidelines. These and other previous sediment sites studied compare well to Trenton Channel Project sediment results. (Table C. Known contaminated sites identified in the Trenton Channel with Comparisons to 1993-1996 Sampling Results).

The results of the Trenton Channel Project sediments sampling 1993-1996 has led to the conclusion that six major depositional areas are extremely contaminated in the Trenton Channel. Several minor areas are also extremely contaminated. Due to current velocity and navigational channel morphology, these depositional zones are horizontally defined in the Trenton Channel. Core sampling and/or hydroacoustic profiling (Caulfield, 1995) has determined the depth of contamination in these zones.

The six major depositional zones are, (with estimated volumes* CY=cubic yards):

Site	Surface Area (yards)	Depth of Contamination* (yards)	Volume
Allied Fuel Oil Slip	730x120	2.75	241,000 CY
Nicholson Terminal South Slip	365x85	2.75	85,000 CY
Firestone Steel Area-primary	42x530	2.75	61,200 CY
Area in front of Monguagon Creek-secondary	42x660	2.10	58,000 CY
Black Lagoon	50x150	2.75	20,600 CY
Elizabeth Park North Canal	65x65	3.80	16,000 CY
Elizabeth Park South Canal	75x12	1.25	1100 CY
Total			483,000 CY

* Where QL or ERM/SELs were still exceeded at bottom intervals, professional judgment was used to determine depth of contamination. Note-these volumes are based on in place measurements, and do not take into account % solids.

Smaller depositional zones (<1000 CY) that are extremely contaminated include:

Site	Surface Area (yards)	Depth of Contamination* (yards)	Volume
Stenson Club	15x20	2.75	825 CY
Trenton Towers	10x10	0.30	30 CY
Total			855 CY

Sediment QL and ERM/SEL exceedances in these zones (and throughout the study area) were predominantly found only on the grain size of sediments consisting of fine sands or silt. Native clay lines the sides and bottom of the Channel. This was observed at the base of several cores in contaminated areas (Black Lagoon, Elizabeth Park North Canal), on our anchors during sampling near the navigational channel, and during hydroacoustic profiling (strong signal reflectivity). The clays are non contaminated and appear to make a suitable physical cleanup standard for future remediation.

The east shore of the Trenton Channel along Grosse Ile is relatively free of contamination. The depositititional areas along the Michigan mainland shore that exceed QL and ERM/SEL sediment guidelines contain the largest mass of contaminants in the Detroit River AOC (Detroit River RAP Biennial Report, 1995). These sediments present the most likely route of bioaccumulative and toxic contaminant exposure to biota and the ecosystem.

With assessment complete, the focus of the Trenton Channel Project now shifts towards remediation. The next steps include examining remedial options for the six zones of the Trenton Channel determined to be extremely contaminated. With the Sediment Treatability Study nearing completion (Snell Environmental and MDEQ-SWQD, 1996), the feasibility of applying treatment technologies will be investigated alongside more conventional disposal techniques.

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TABLE A. Parameters and Guideline Levels Used to Evaluate Trenton Channel Project Sediment Results.

Bioaccumulative Parameters	Symbol	QL (ppm d.w.)		Note
Mercury	Hg	0.1		EPA Method 245.1/7470.7471
Polychlorinated Biphenols	PCBs	0.33		EPA Method 608/8081
Toxic Parameters		Aquatic Life Guidelines (ppm d.w.)		
Parameter	Symbol	ERM	SEL	Note
Arsenic	As	85		
Cadmium	Cd	9.6		
Chromium	Cr	145		
Copper	Cu	390		
Iron	Fe	.	40000	
Nickel	Ni	50		
Manganese	Mn		1100	
Lead	Pb	110		
Zinc	Zn	270		
Oil and Grease	O&G		1500	
Polyaromatic Hydrocarbons	PAHs	35		Sum of 12 PAH's

TABLE B. Classifications of Contaminated Sediment Sites as applied to the Trenton Channel Project Sediment Survey Results (1993-1996).

Not Impacted

Summed Toxic ERM/SEL and Bioaccumulative QL exeedances less than one, (<1)

Impacted

Summed Toxic ERM/SEL and Bioaccumulative QL exeedances between 1 and 15

Moderately Impacted

Summed Toxic ERM/SEL and Bioaccumulative QL exeedances between 15 and 30

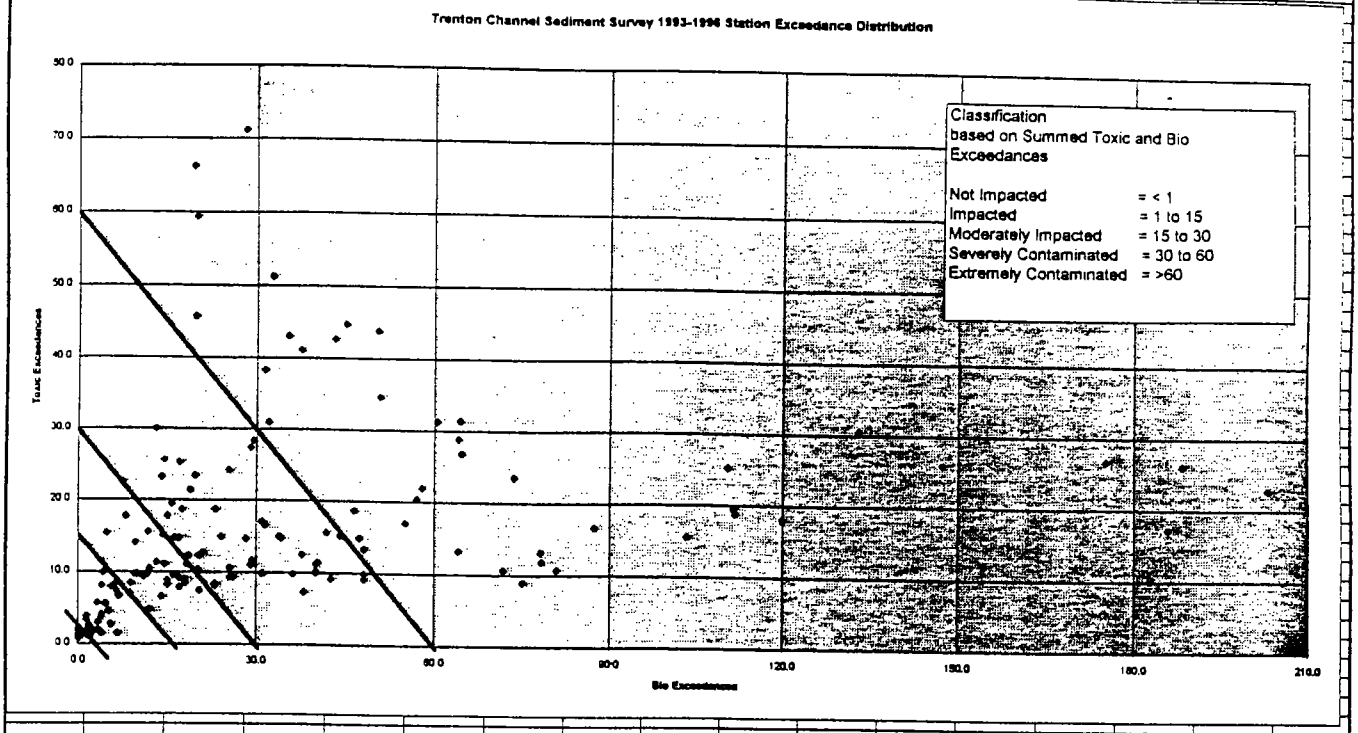
Severely Contaminated

Summed Toxic ERM/SEL and Bioaccumulative QL exeedances between 30 and 60

Extremely Contaminated

Summed Toxic ERM/SEL and Bioaccumulative QL exceedances greater than sixty, (> 60)

Graph B. Classification and Distribution of Trenton Channel Project Sediment Results



Graph B (a). Classification and Distribution of Trenton Channel Project Sediment Results (annotated).

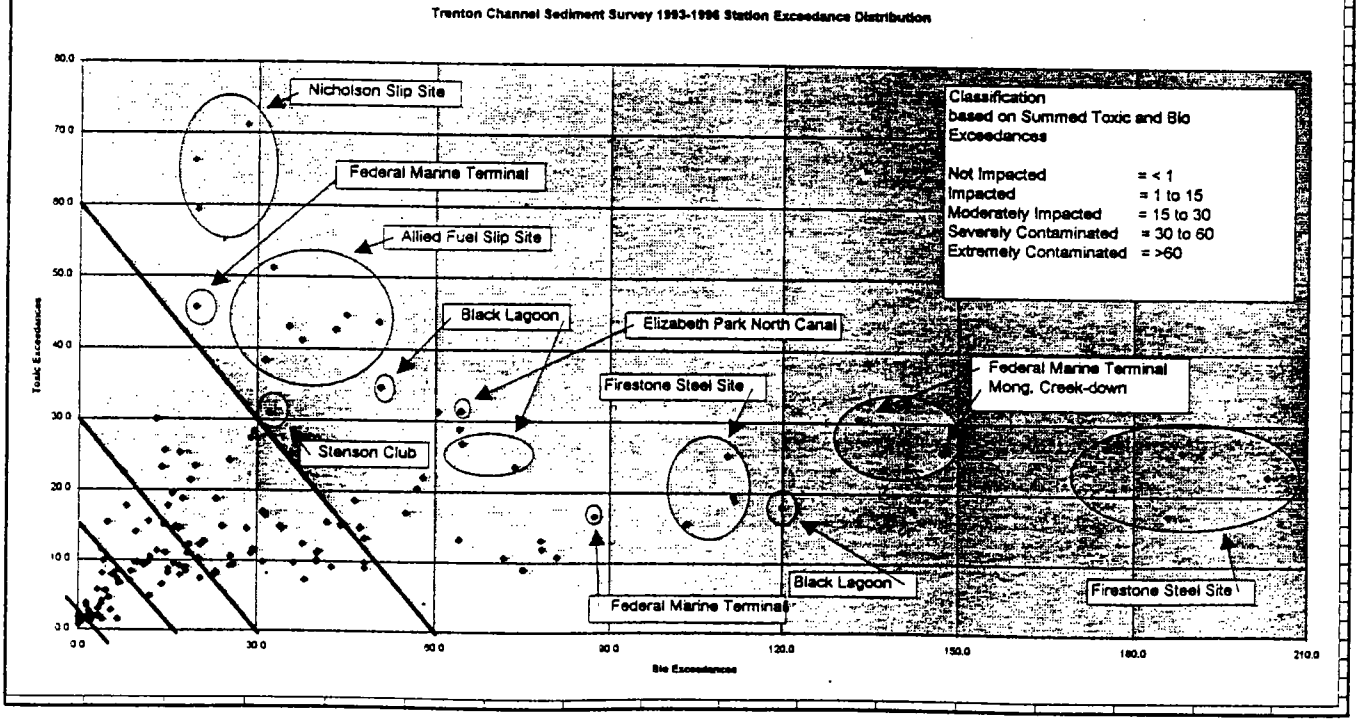


TABLE C.

Known Contaminated Sites identified the Trenton Channel with Comparisons to 1993-1996 Sampling Results

	Fallon and Horvath , 1983			
	Criteria:	Sediment Chemistry	1993-1996	Trenton Channel Project Classification
			Criteria:	Sediment Guideline Exceedances
Location	Results			(see Table B. Classification of Sites)
Mud Island	First Priority Station		Impacted	
Upper Grassy Island	First Priority Station		Impacted	
Pt. Hennepin	First Priority Station		Impacted	
Elizabeth Park North Canal	First Priority Station		Extremely Contaminated	
Stag Island	First Priority Station		Impacted	
Swan Island	First Priority Station		Impacted	
East Celeron Island	First Priority Station		Impacted	
Gibralter Bay	First Priority Station		Not Specifically Sampled	
	Roseu, Giesy and Kreis, 1989			
	Criteria:	C. tentans Bioassay		
Location	Results		1993-1996	Trenton Channel Project Classification
Wyandotte	> 25 % reduction in weight Bioassay		Not specifically Sampled, areas nearby were Severely Contaminated	
Pt. Hennepin	> 25 % reduction in weight Bioassay		Impacted	
Monguagon Creek Mouth	> 25 % reduction in weight Bioassay		Extremely Contaminated	
North Marsh Area	> 25 % reduction in weight Bioassay		Impacted	
Black Lagoon	> 25 % reduction in weight Bioassay		Extremely Contaminated	
Chrysler Bay Outer	> 25 % reduction in weight Bioassay		Extremely Contaminated	
Gibralter Bay	> 25 % reduction in weight Bioassay		Not Specifically Sampled	
Lake Erie State Park	> 25 % reduction in weight Bioassay		Not Specifically Sampled	
	Kreis, 1989			
	Criteria:	Sediment Chemistry, Toxicity, Resuspension Potential, Mutagenicity		
Location	Results		1993-1996	Trenton Channel Project Classification
Firestone Steel	Severe Degradation		Extremely Contaminated	
Above Monguagon Creek	Severe Degradation		Extremely Contaminated	
Monguagon Creek	Severe Degradation		Extremely Contaminated	
Below Monguagon Cr	Severe Degradation		Extremely Contaminated	
Black Lagoon	Severe Degradation		Extremely Contaminated	
Trenton Towers	Severe Degradation		Extremely Contaminated	
Deadhead cove	Severe Degradation		Impacted	
Elizabeth Park North Canal	Severe Degradation		Extremely Contaminated	
	Farara and Burt , 1993			
	Criteria:	Sediment Chemistry, Benthic Communities		
Location	Results		1993-1996	Trenton Channel Project Classification
Off Great Lakes Steel	Severely Impacted		Site is not significantly depositional, nearby sites=Extremely Contaminat	
Off E.C. Levy	Severely Impacted		Site is not significantly depositional, nearby sites=Extremely Contaminat	
Ecorse River Mouth	Severely Impacted		Moderately Contaminated	
Downstream of Ecorse River mouth	Severely Impacted		Site is not significantly depositional, nearby sites=Extremely Contaminat	
Wyandotte	Severely Impacted		Site is not significantly depositional, nearby sites=Extremely Contaminat	
Firestone Steel	Severely Impacted		Extremely Contaminated	
Downstream of Monguagon Creek	Severely Impacted		Extremely Contaminated	
Black Lagoon	Severely Impacted		Extremely Contaminated	
Across Channel from McLouth Steel	Severely Impacted		Impacted	
Monsanto Bay	Severely Impacted		Severely Contaminated	
East of Horse Island	Severely Impacted		Not Sampled, Lake Erie	

Newly Identified Extremely Contaminated Sediment Sites in the Trenton Channel

	1993-1996	Trenton Channel Project
	Criteria:	Sediment Guideline Exceedances
Location		(see figure B. Classification of Sites)
Allied Fuel Oil Slip	Extremely Contaminated	
Nicholson South Slip	Extremely Contaminated	
Stenson Club	Extremely Contaminated	
Trenton Towers	Extremely Contaminated	
Elizabeth Park Marina	Extremely Contaminated	
Elizabeth Park South Canal	Extremely Contaminated	

Classification of Contaminated Sediment Sites as applied to the Trenton Channel Sediment Survey Results 1993-1996 (Table B:)

Not-impacted <1 < Impacted < 15 < Moderately Impacted < 30 < Severely Contaminated < 60 < Extremely Contaminated

Figure 1. Trenton Channel Project: Sediment Survey Chronology

October 1993 (GLNPO/SWQD/UCSB)

Primary Objectives	Vertical and horizontal hotspot delineation Contaminant distribution in Lower TC
Secondary Objectives	Resuspension measurements

November 1993 (GLNPO/SWQD/MSU)

Primary Objective	Elizabeth Park Marina study

April 1994 (GLNPO/LLRS/SWQD)

Primary Objective	Vertical and horizontal hotspot delineation
Secondary Objective	Baseline data for hydroacoustic profiling

May 1994 (SWQD)

Primary Objective	Surficial contaminant distribution in mid and lower Trenton Channel

June 1994 (GLNPO/LLRS/SWQD)

Primary Objective	Hydroacoustic profiling-Trenton Channel (Caulfield Eng.)

November 1994 (SWQD)

Primary Objective	Elizabeth Park Marina surfical contaminant trends

April 1996 (LLRS)

Primary objective	Elizabeth Park Marina depositional rates

May 1996 (GLNPO/SWQD)

Primary Objective	Hotspot delineation and characterization of Upper TC Sediments
Secondary Objective	Support of Grassy Island NWR study

June 1996 (SWQD)

Primary Objectives	Ponar sediment sampling at tributaries to the Detroit River Confirmation of RAP hotspots

December 1996 (SWQD)

Primary Objective	Elizabeth Park Marina surfical contaminant trends

Figure 2. Map of Sample Areas

Note- All Sample Sites (84) are not individually identified on this map, (i.e... there were 2 individual sites off the immediate vicinity of Ecorse Creek Mouth.) Please see Appendix B, or DARTS for individual specific site locations including Latitude and Longitude.

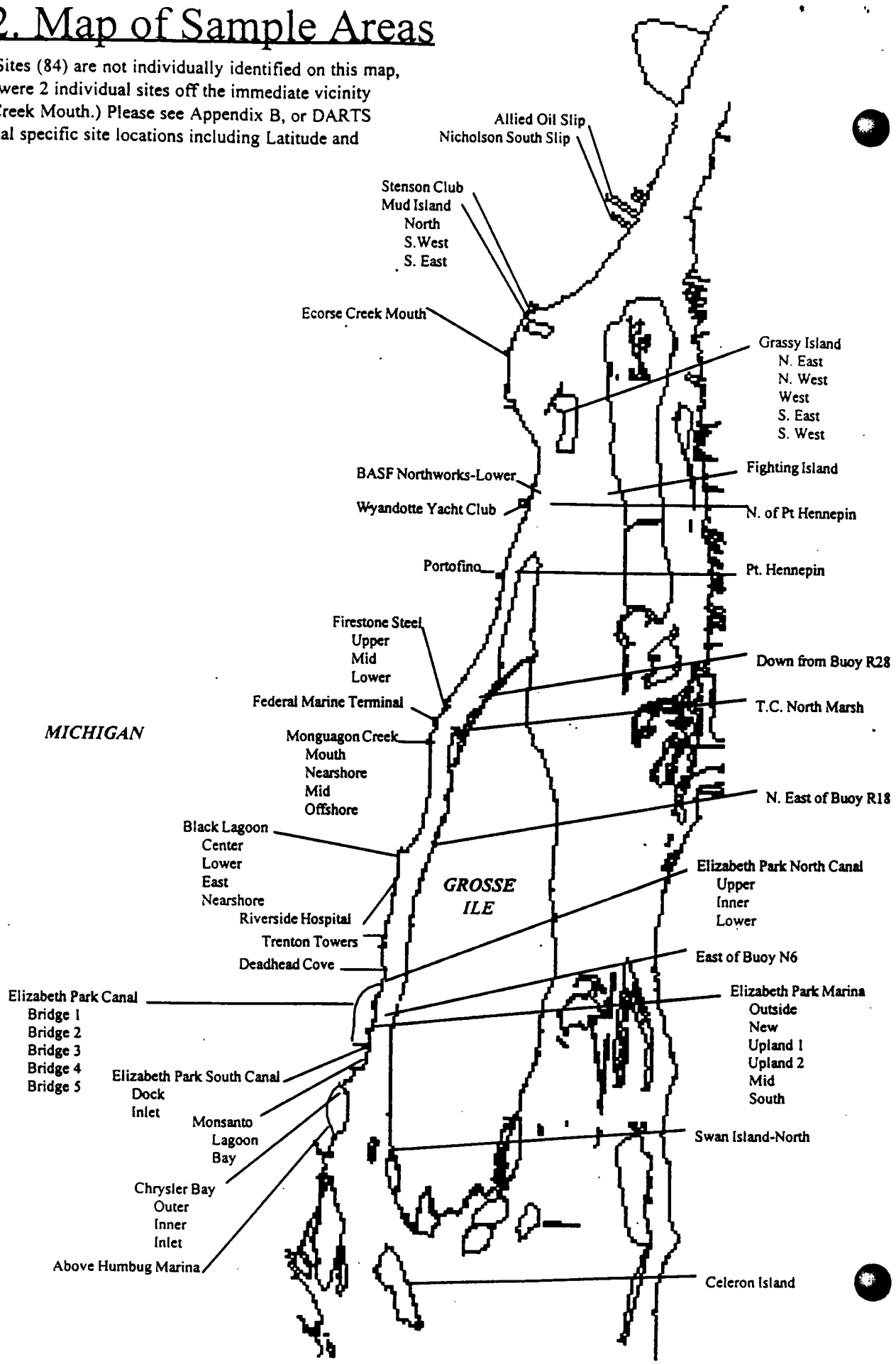


Figure 3. Upper Trenton Channel
Rouge River to EcorseCreek

TOTAL PCBS

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals

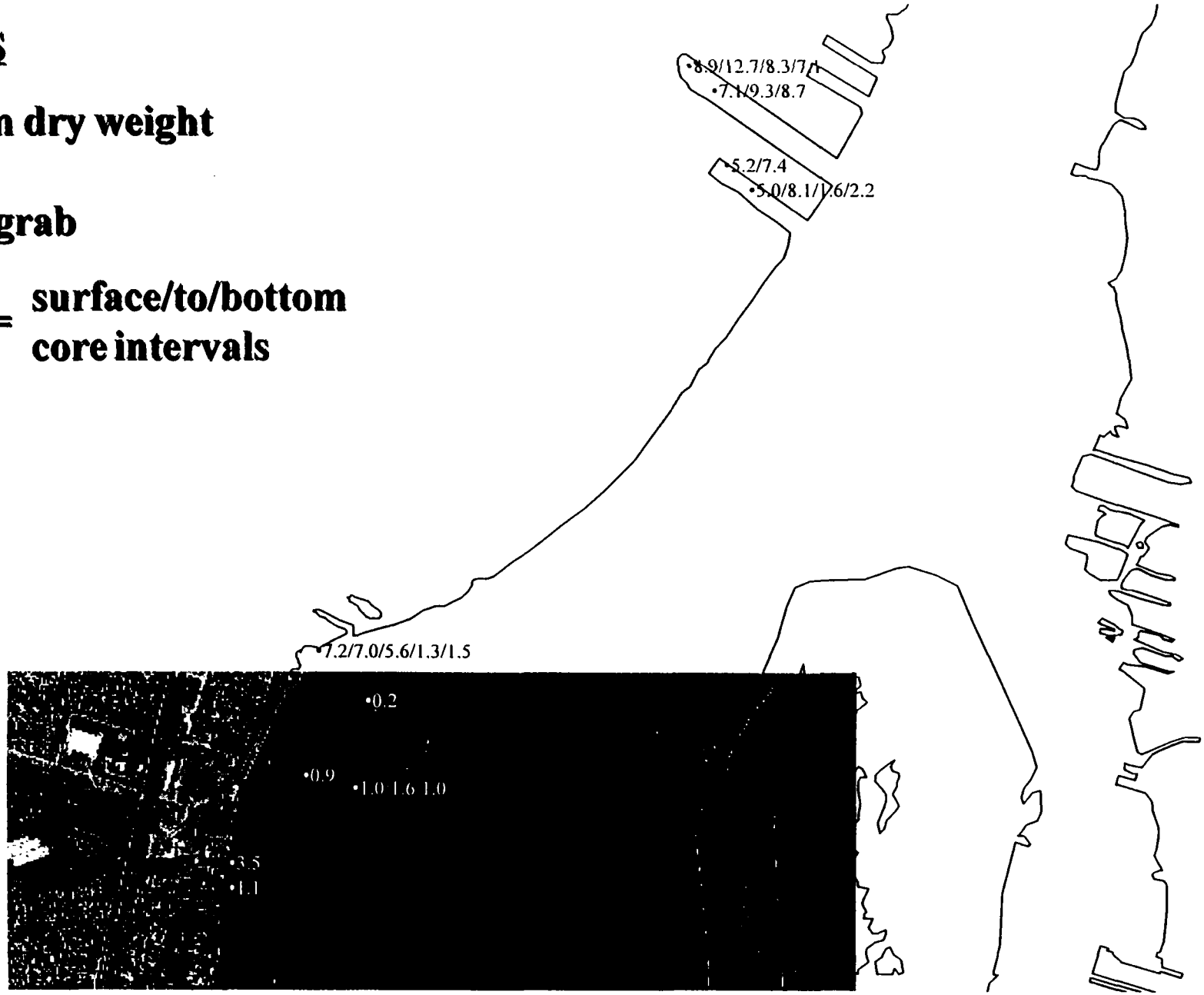


Figure 4. Upper Trenton Channel
Rouge River to EcorseCreek

OIL and GREASE

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals

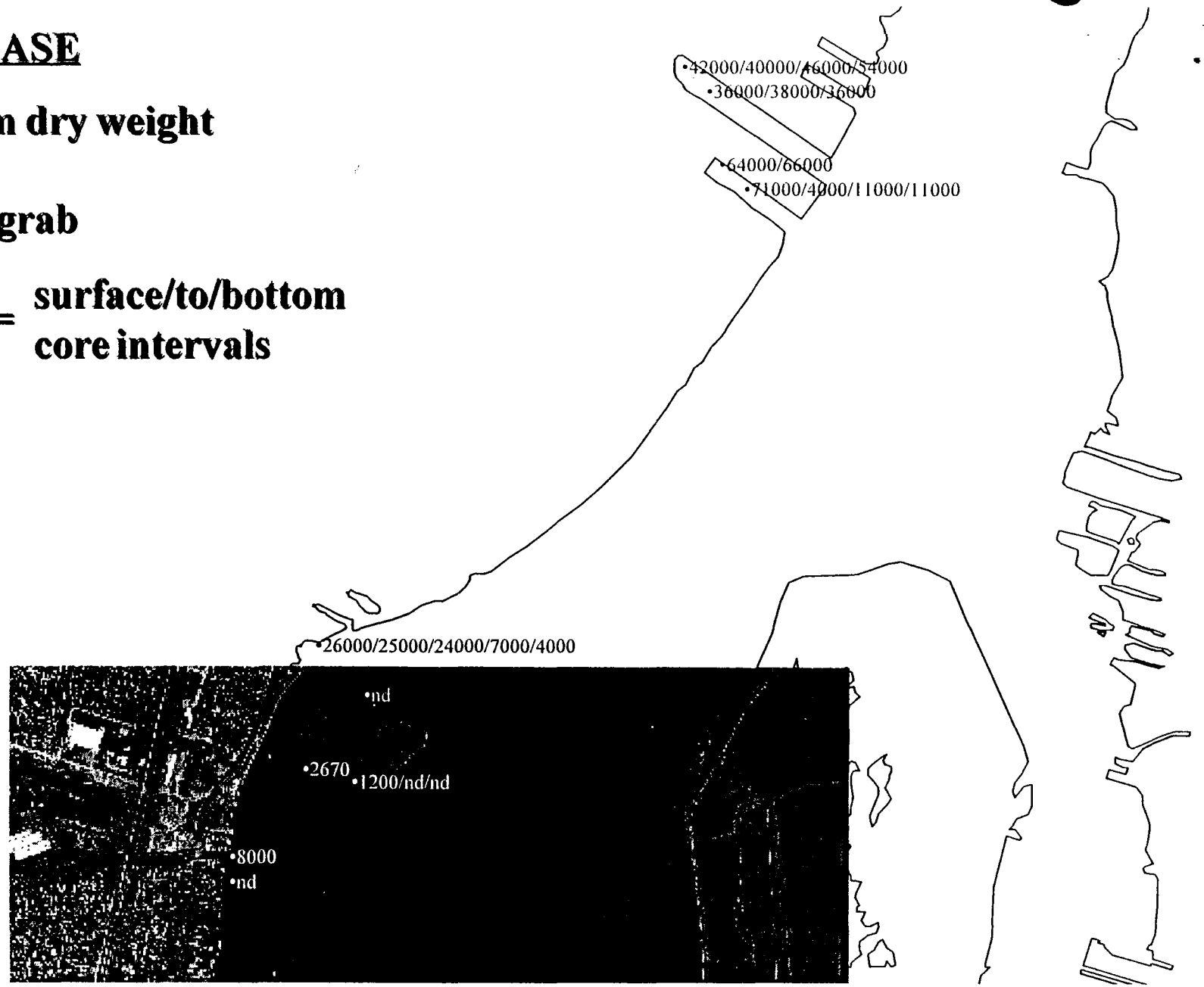


Figure 5. Upper Trenton Channel
Rouge River to EcorseCreek

Figure 6. Upper Trenton Channel
Grassy Island toPt. Hennepin

TOTAL PCBS

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals

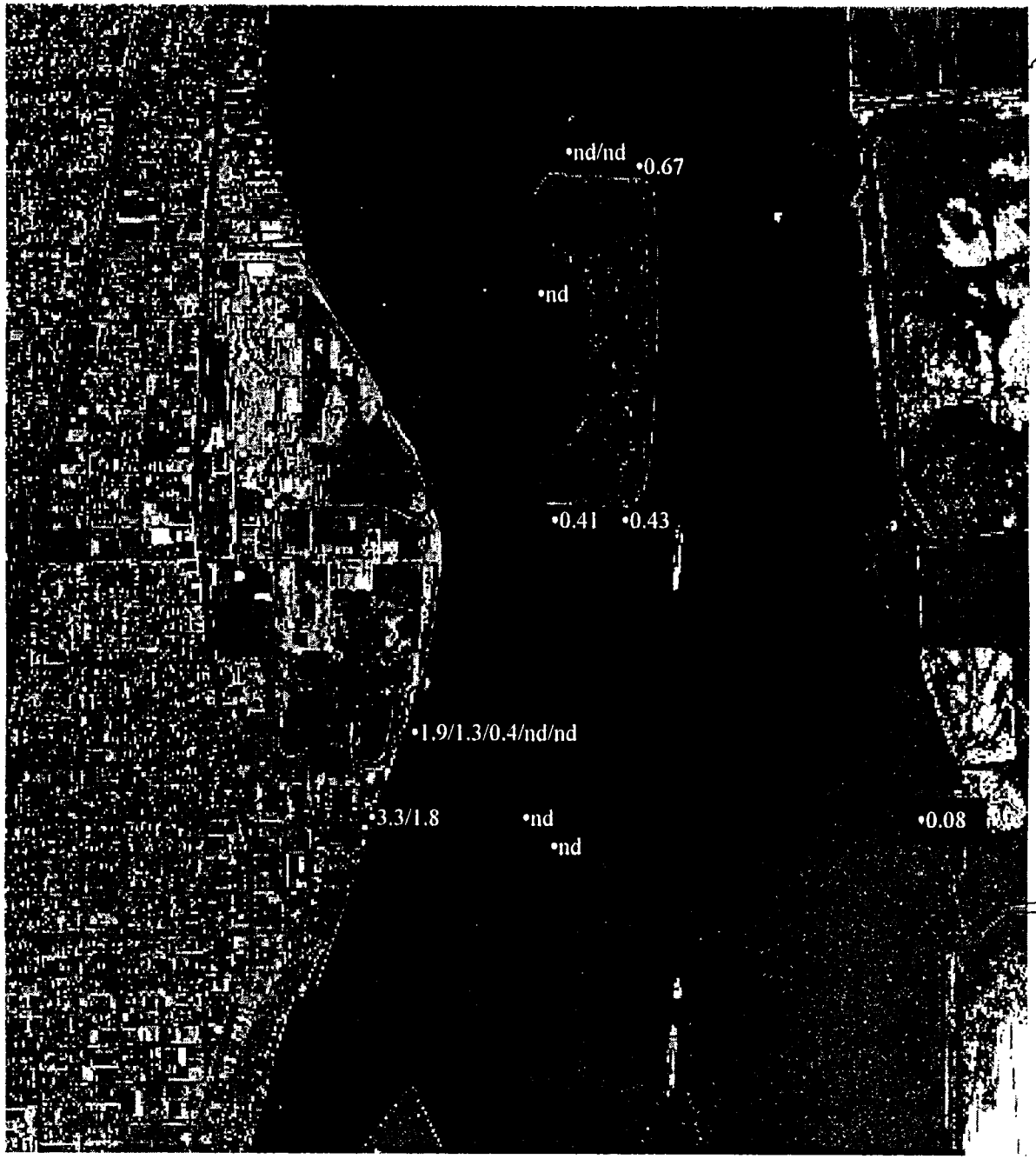


Figure 7. Upper Trenton Channel
Grassy Island toPt. Hennepin

MERCURY

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals

Figure 8. Upper Trenton Channel
Grassy Island to Ft. Hennepin

Figure 9. Upper Trenton Channel
Pt. Hennepin to Grosse Ile Toll Bridge

CADMIUM

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals

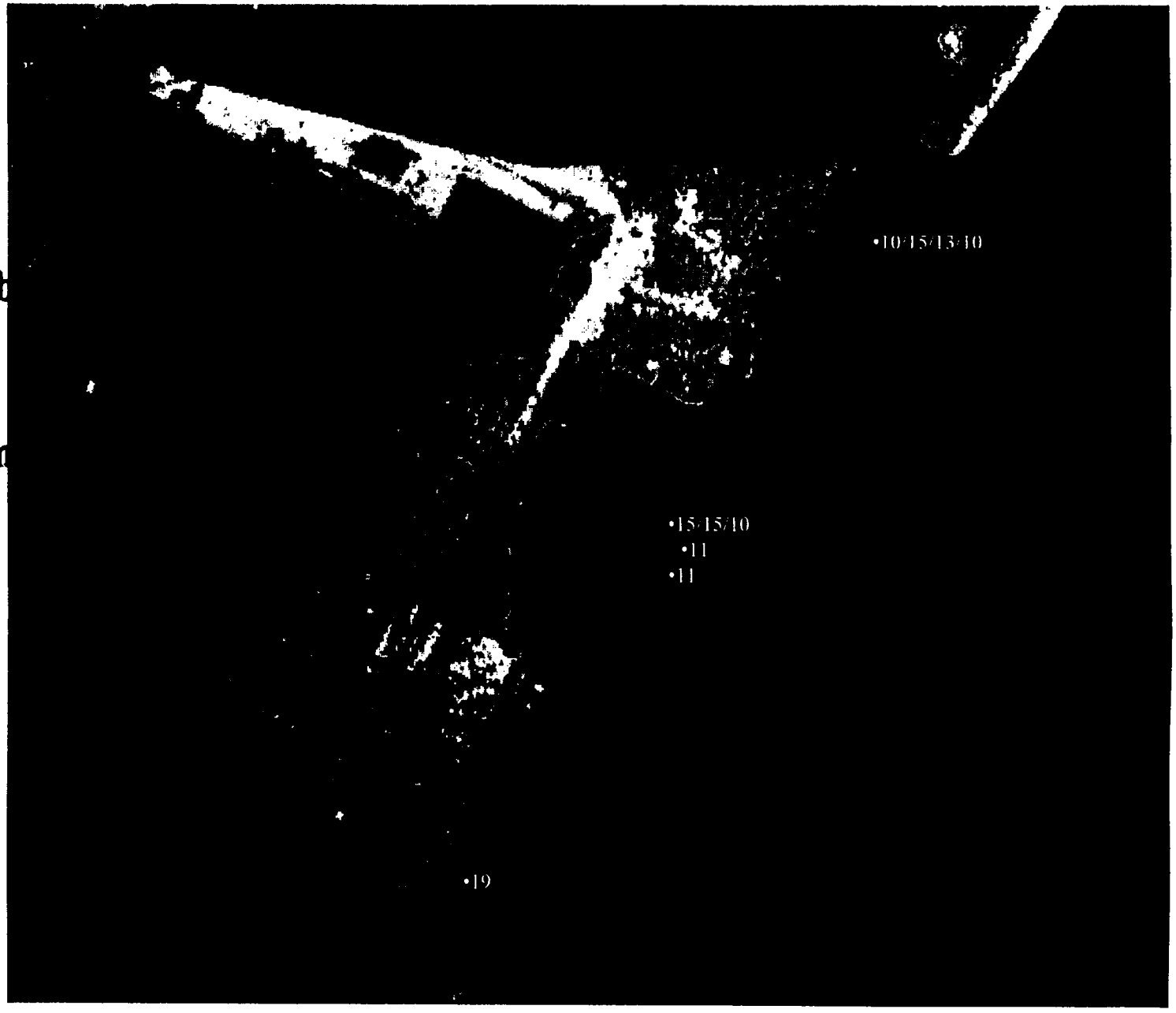


Figure 10. Firestone Steel Site

MERCURY

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals

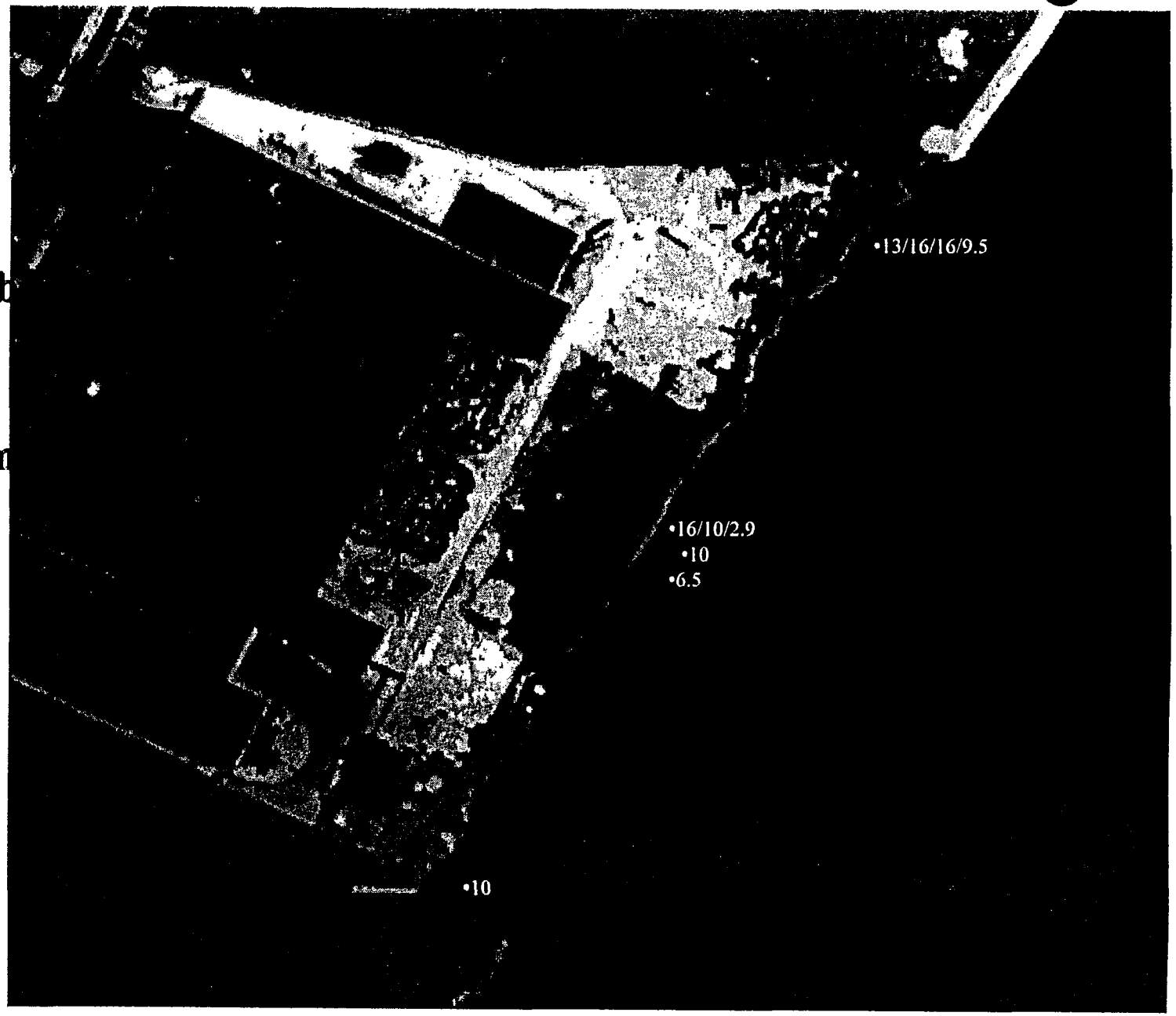


Figure 11. Firestone Steel Site

TOTAL PCBS

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals

Figure 12. Firestone Steel Site

OIL and GREAS

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals

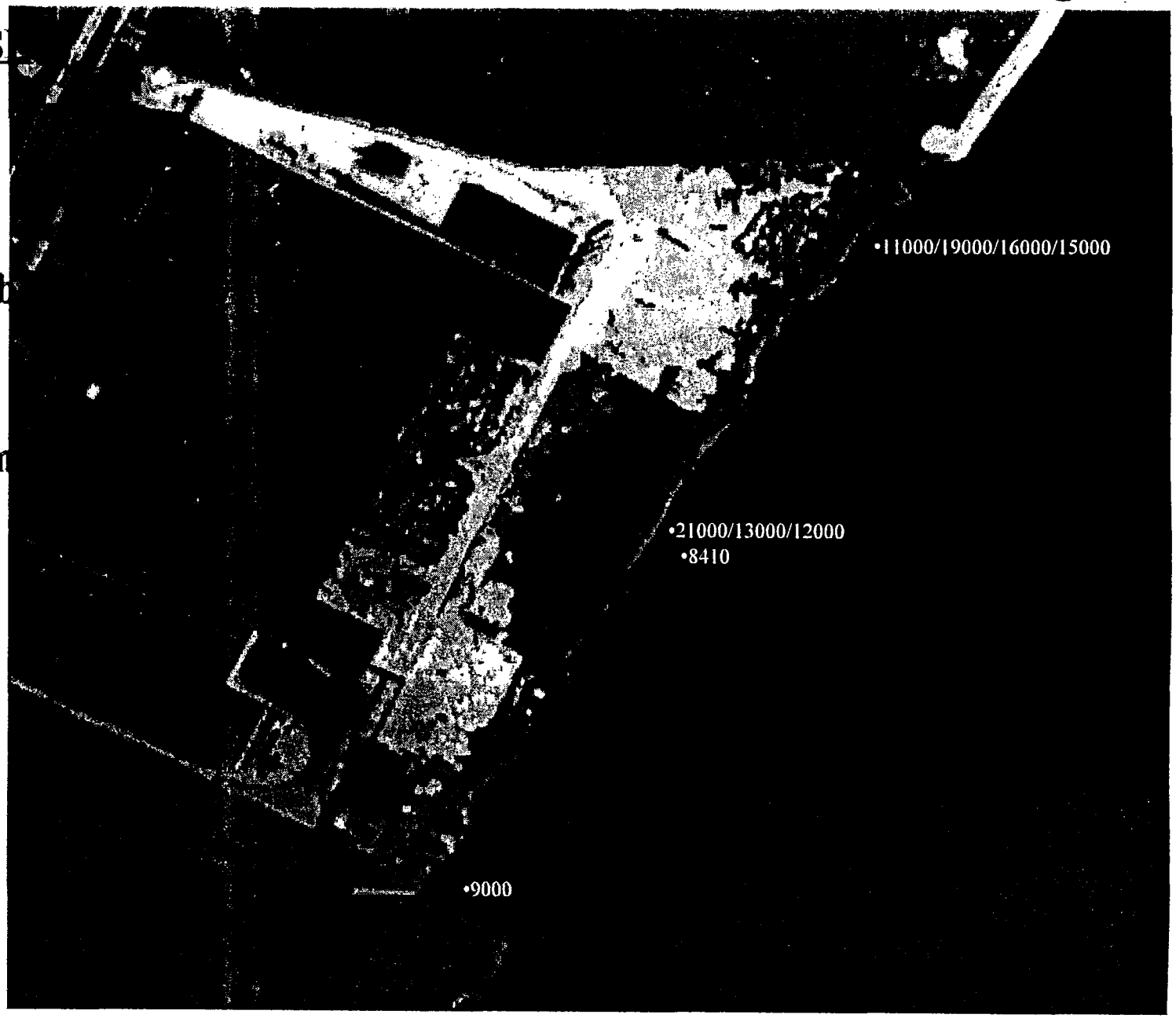


Figure 13. Firestone Steel Site

CADMIUM

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals

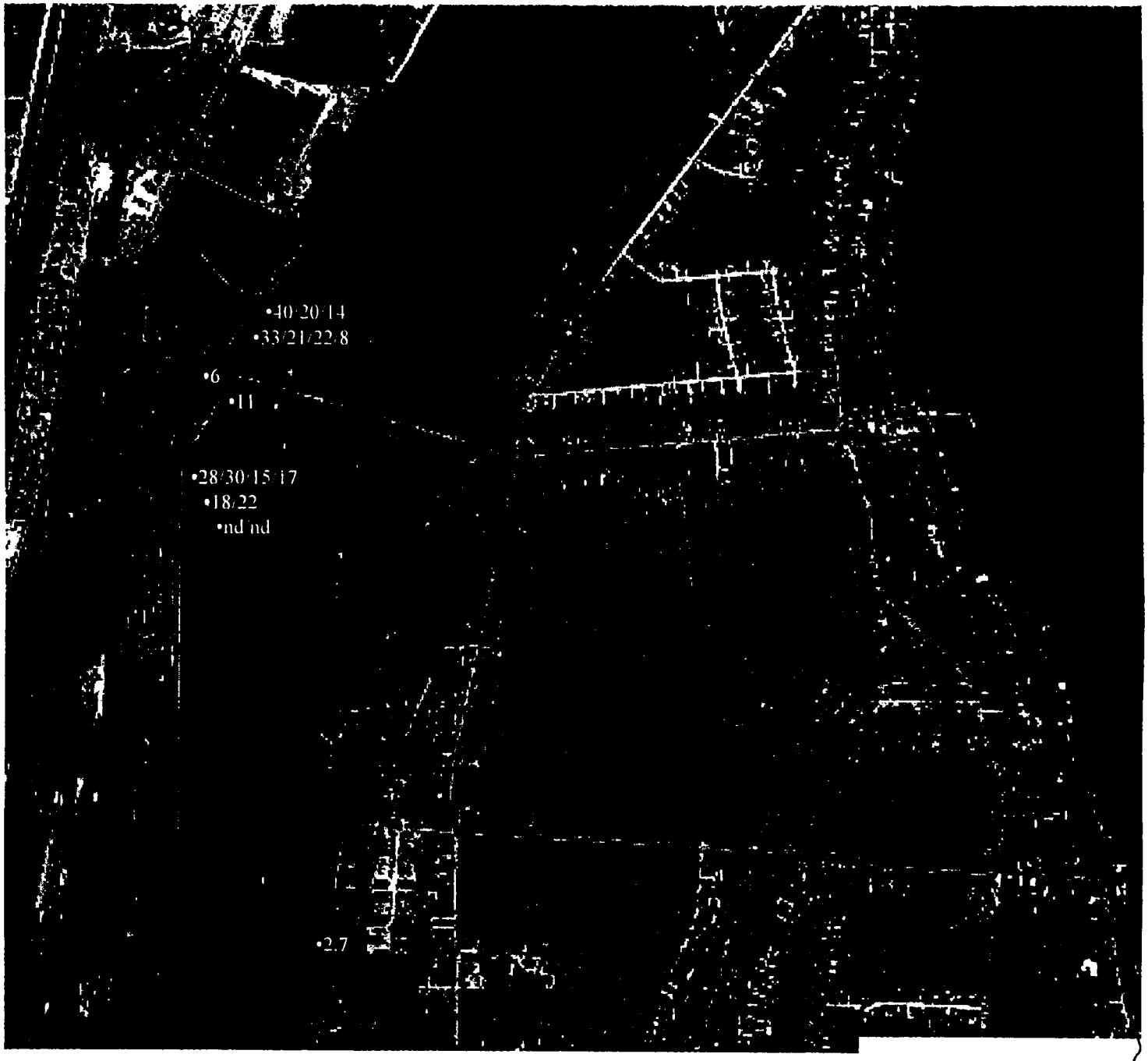


Figure 14. Federal Marine Terminal /Monguagon Creek Area

MERCURY

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals

Figure 15. Federal Marine Terminal /Monguagon Creek Area

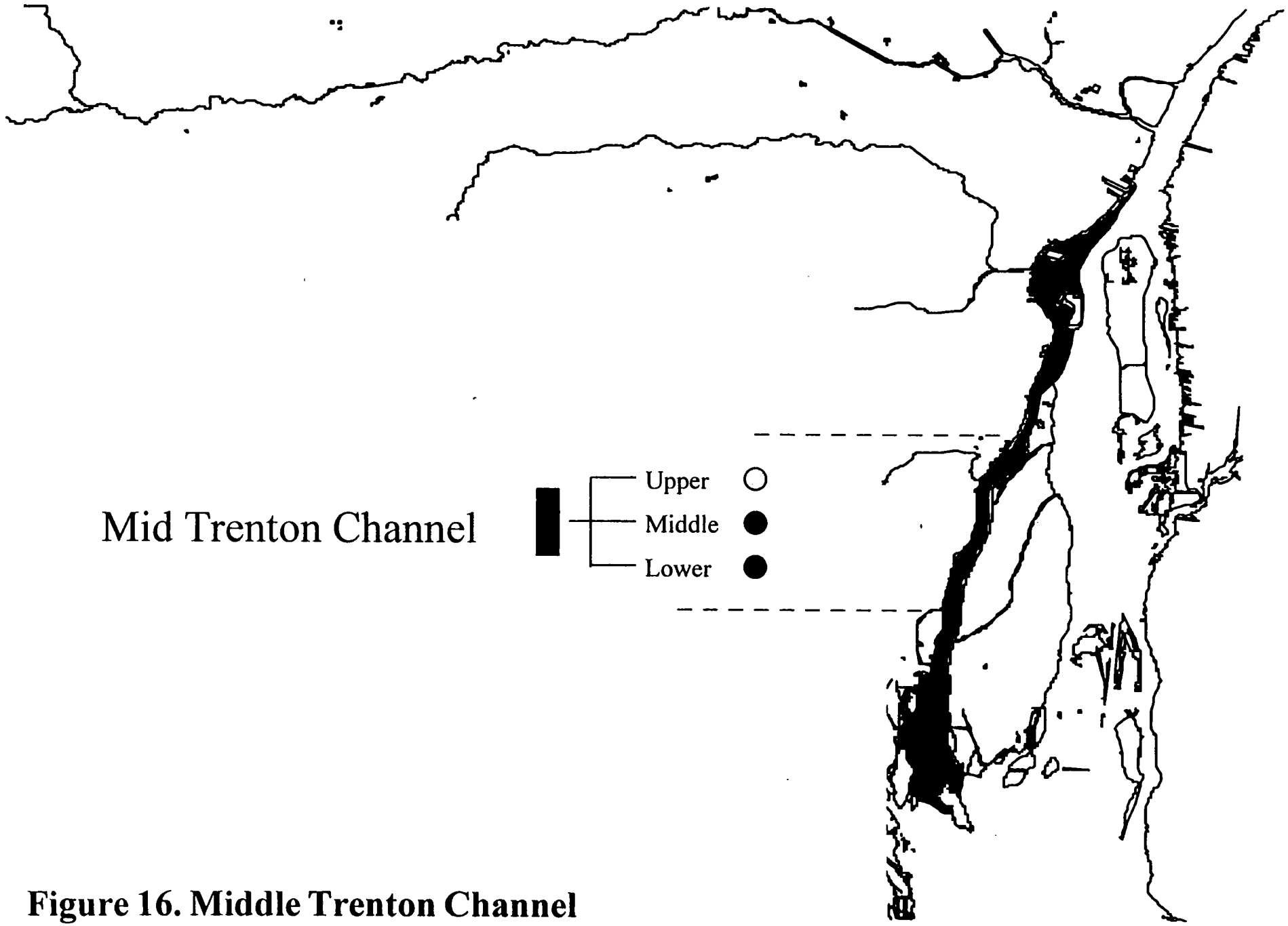


Figure 16. Middle Trenton Channel
Monguagon Creek to Elizabeth Park North Canal

LEAD

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals

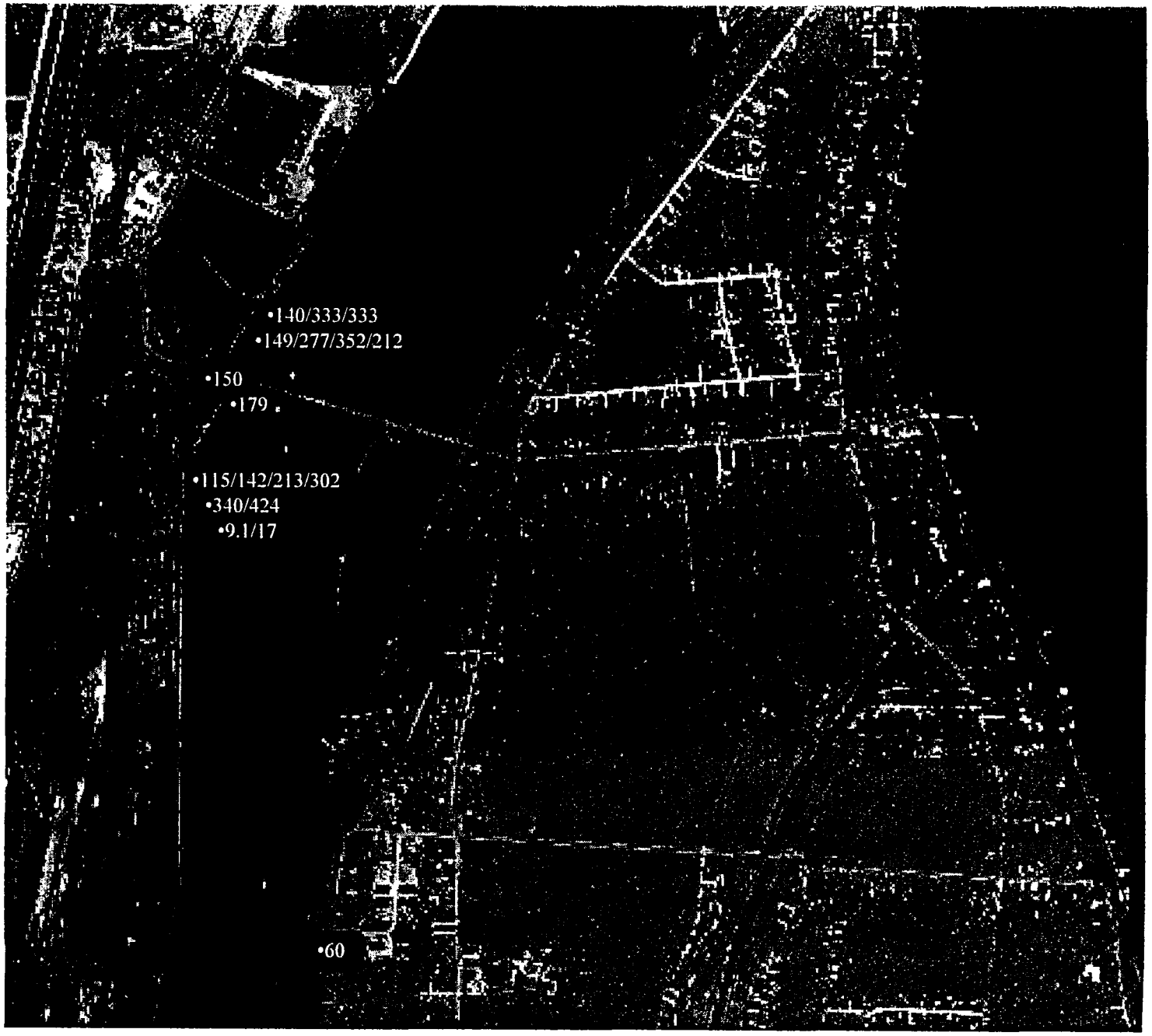


Figure 17. Federal Marine Terminal /Monguagon Creek Area

ZINC

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals

Figure 18. Federal Marine Terminal /Monguagon Creek Area

MERCURY

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals

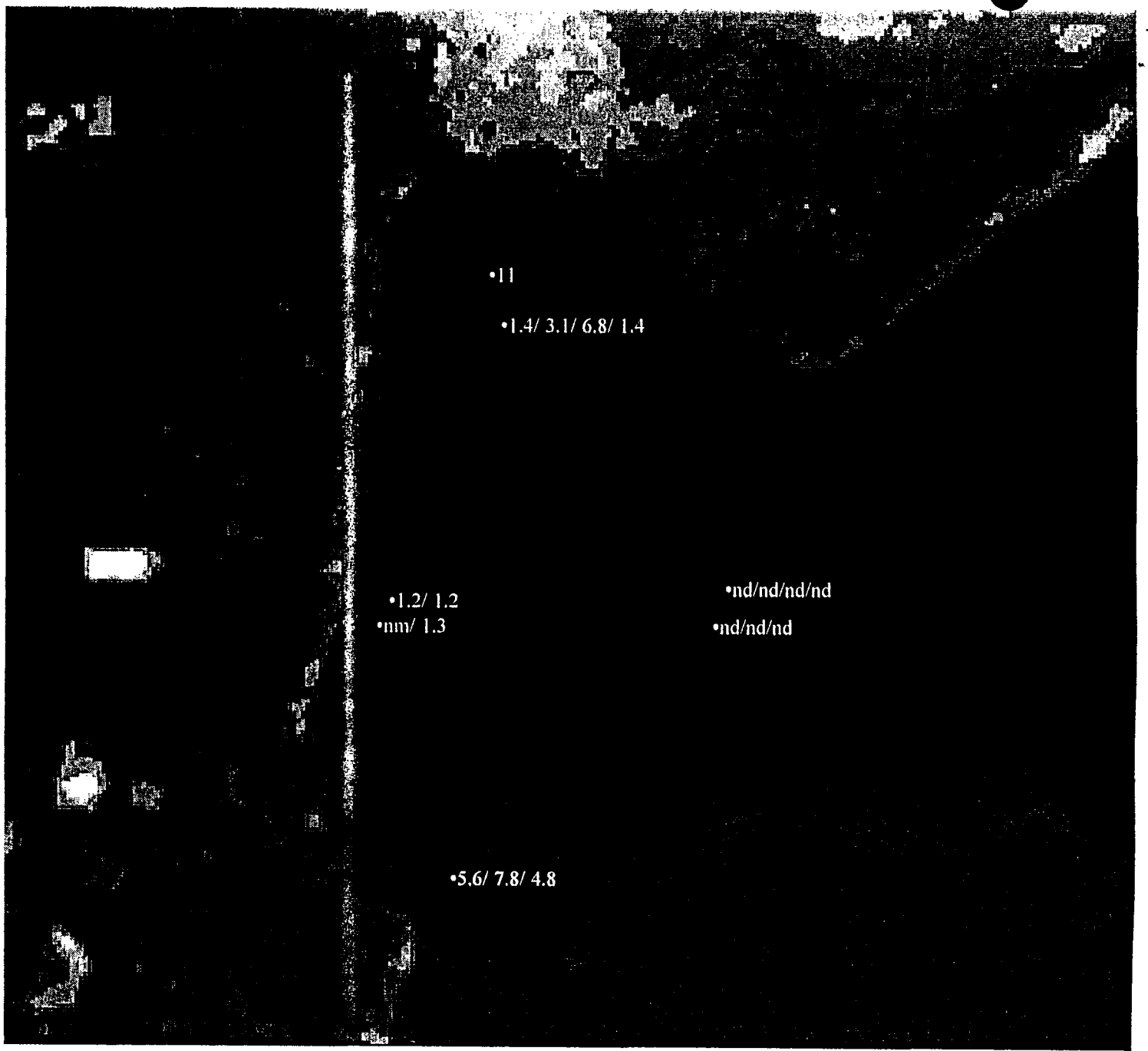


Figure 19. Black Lagoon

ZINC

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals

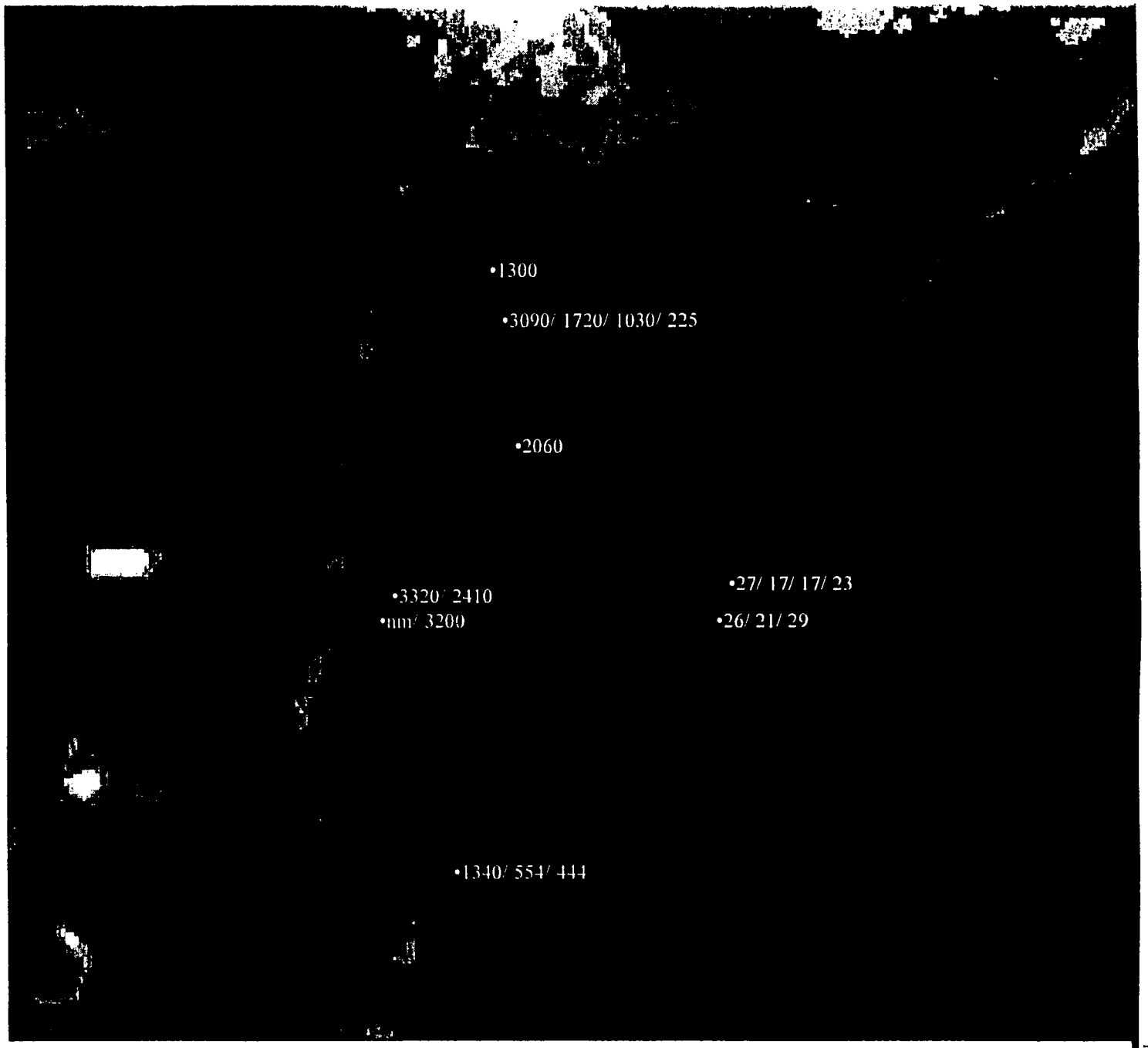


Figure 20. Black Lagoon

OIL and GREASE

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals

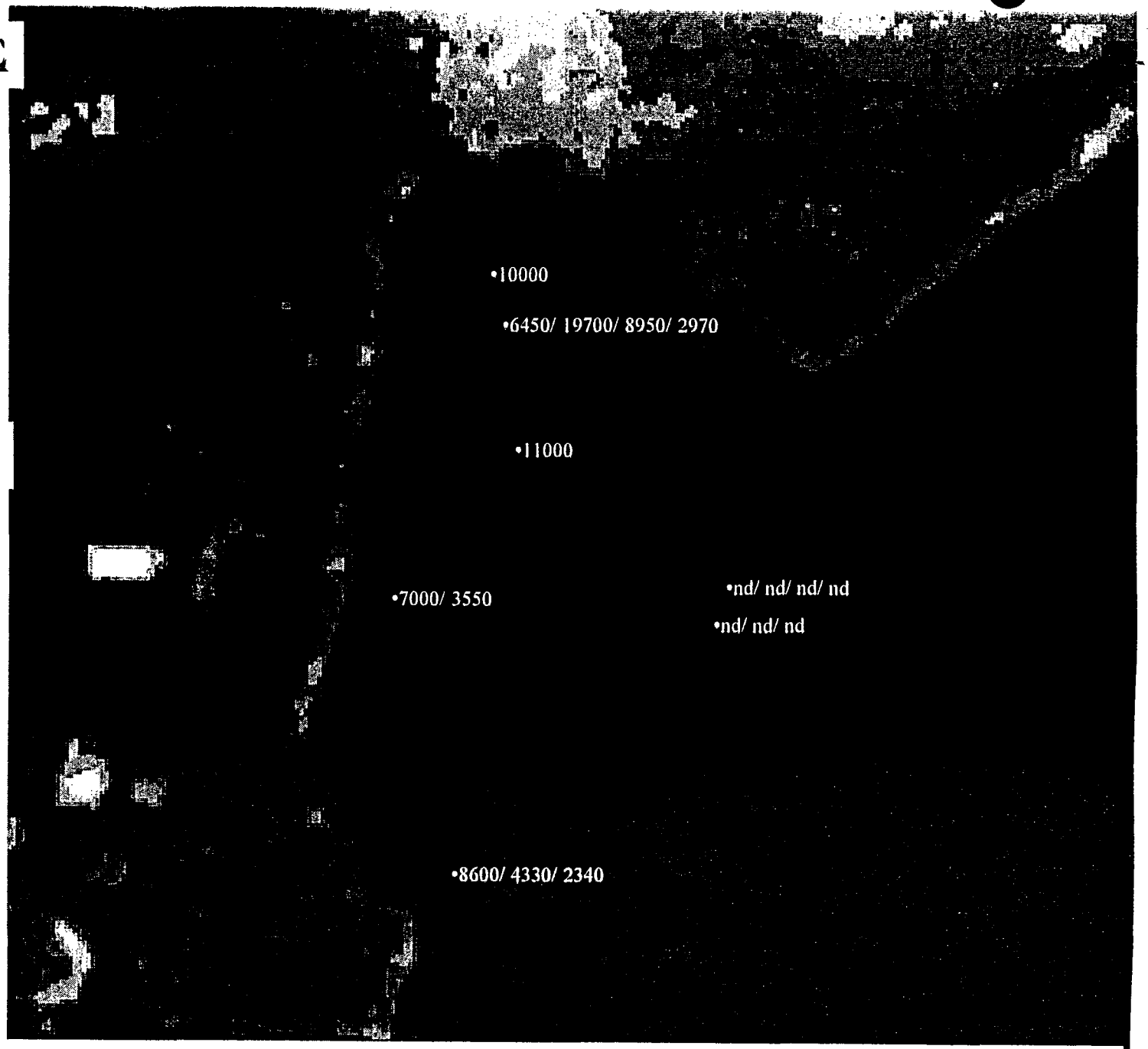


Figure 21. Black Lagoon

MERCURY

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals

Trenton Towers

Figure 22. Trenton Towers

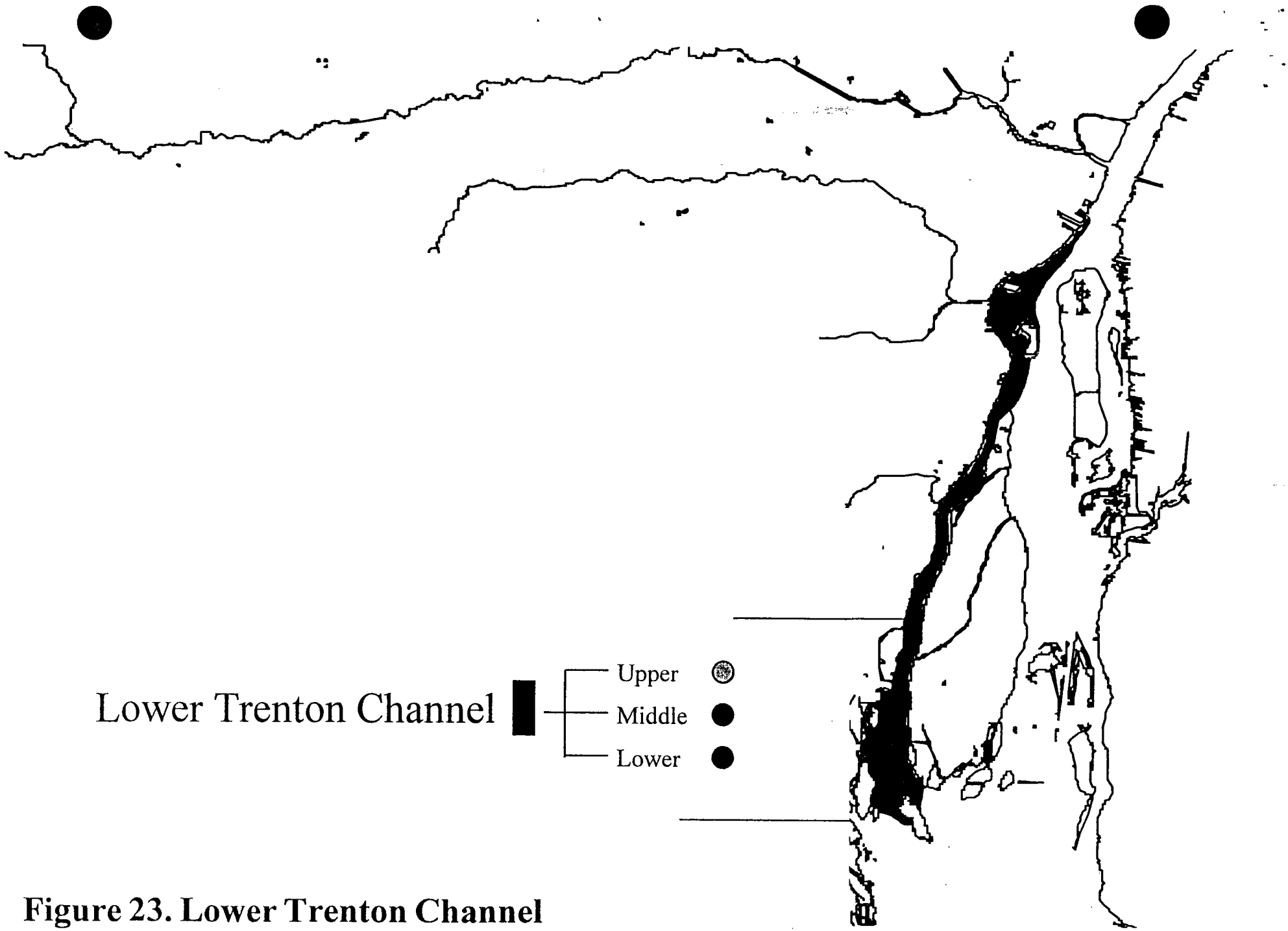


Figure 23. Lower Trenton Channel
Elizabeth Park North Canal to Celeron Island

MERCURY

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals

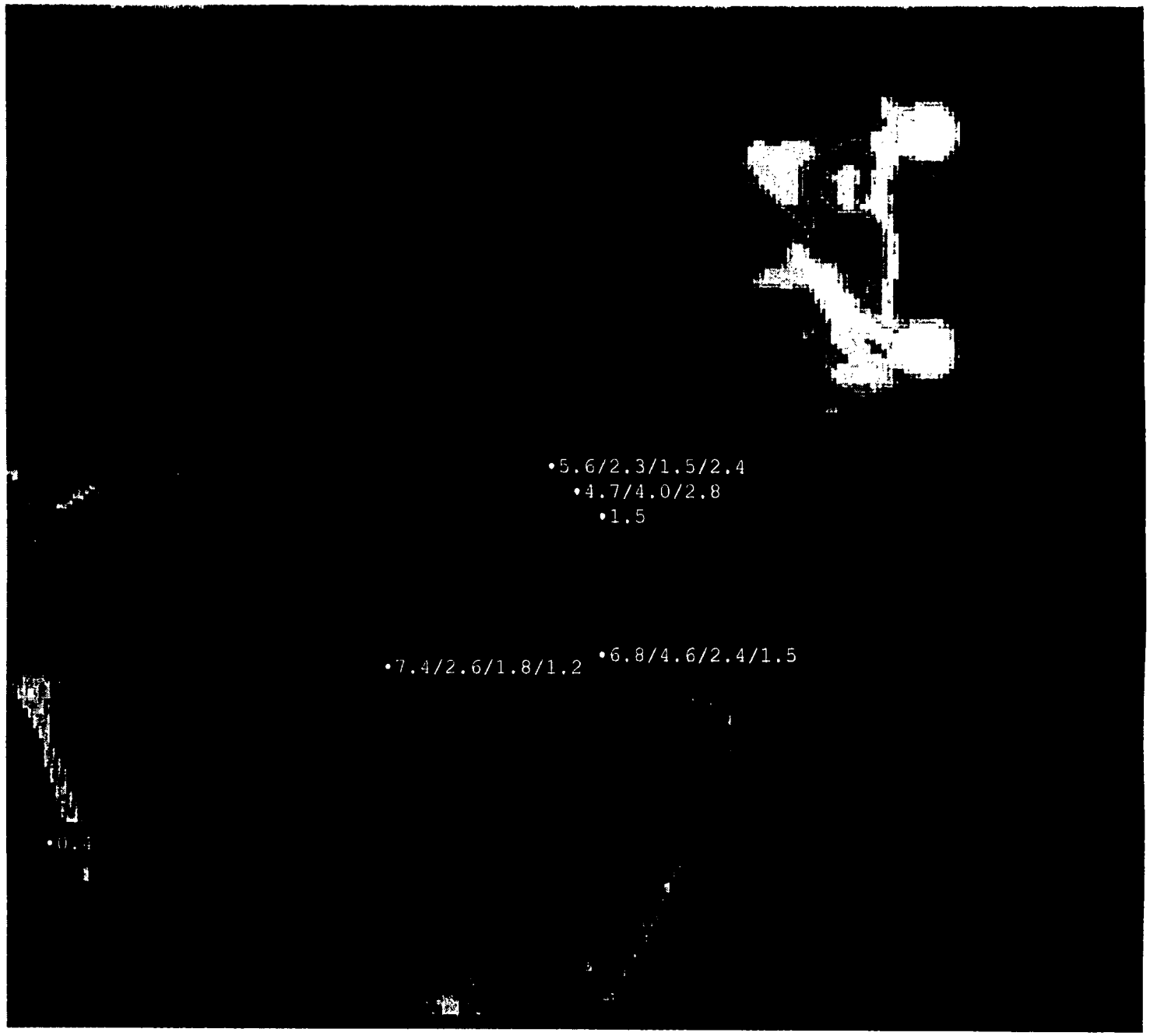


Figure 24. Elizabeth Park North Canal

TOTAL PCBS

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals

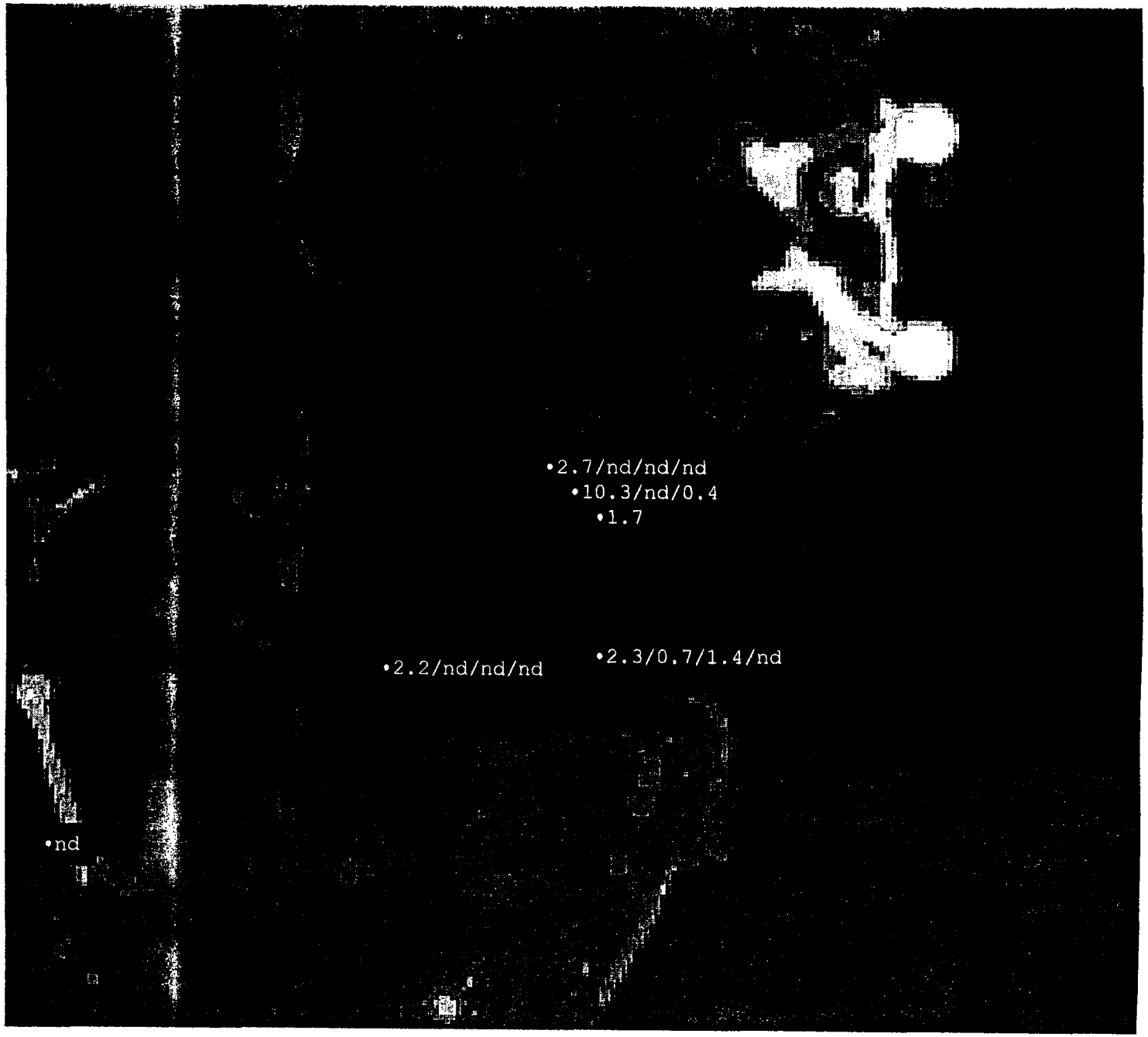


Figure 25. Elizabeth Park North Canal

TOTAL PAHS

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals

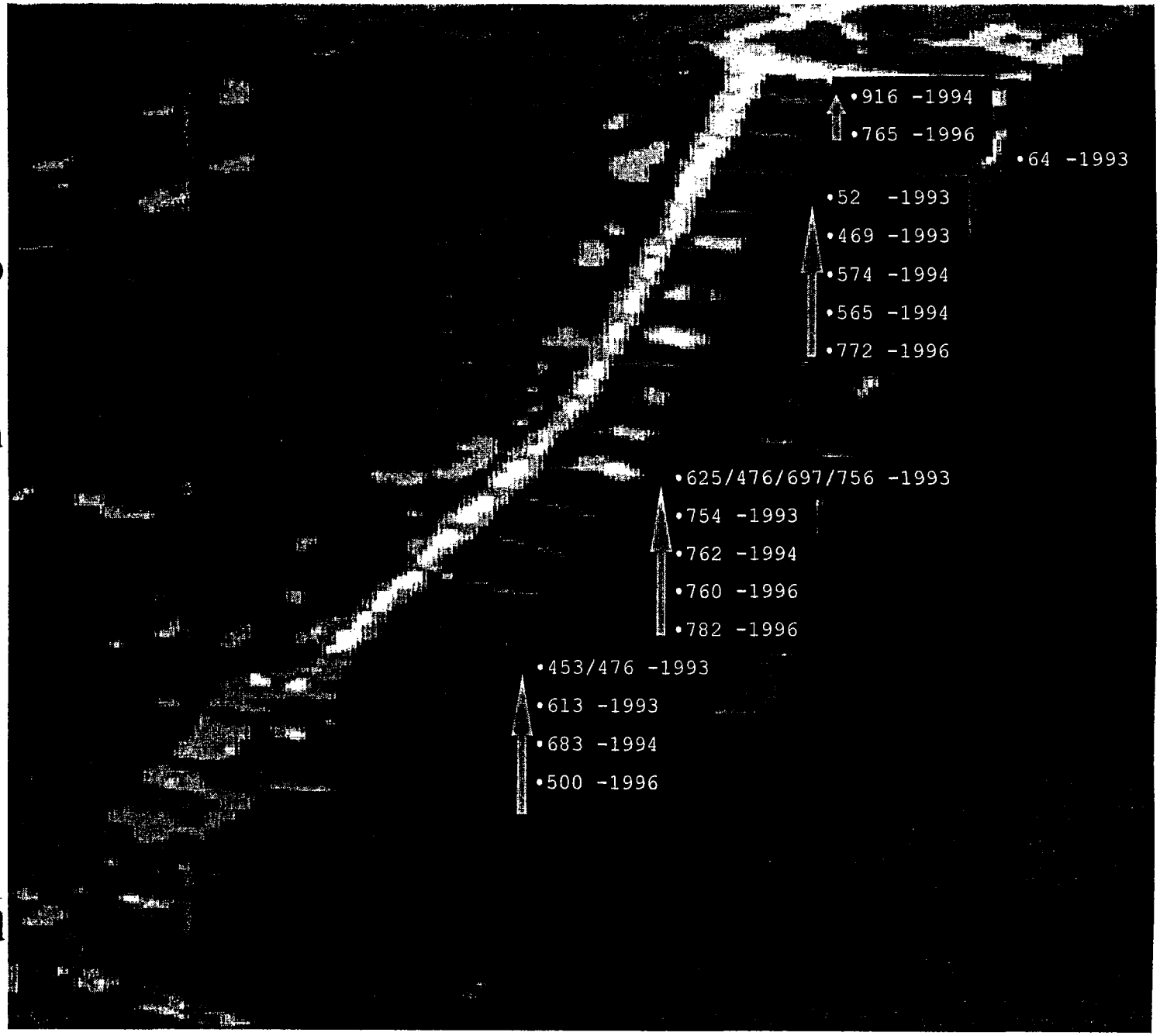
Figure 26. Elizabeth Park North Canal

ZINC

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals



↑ -Site location

-1993 **Year sampled**

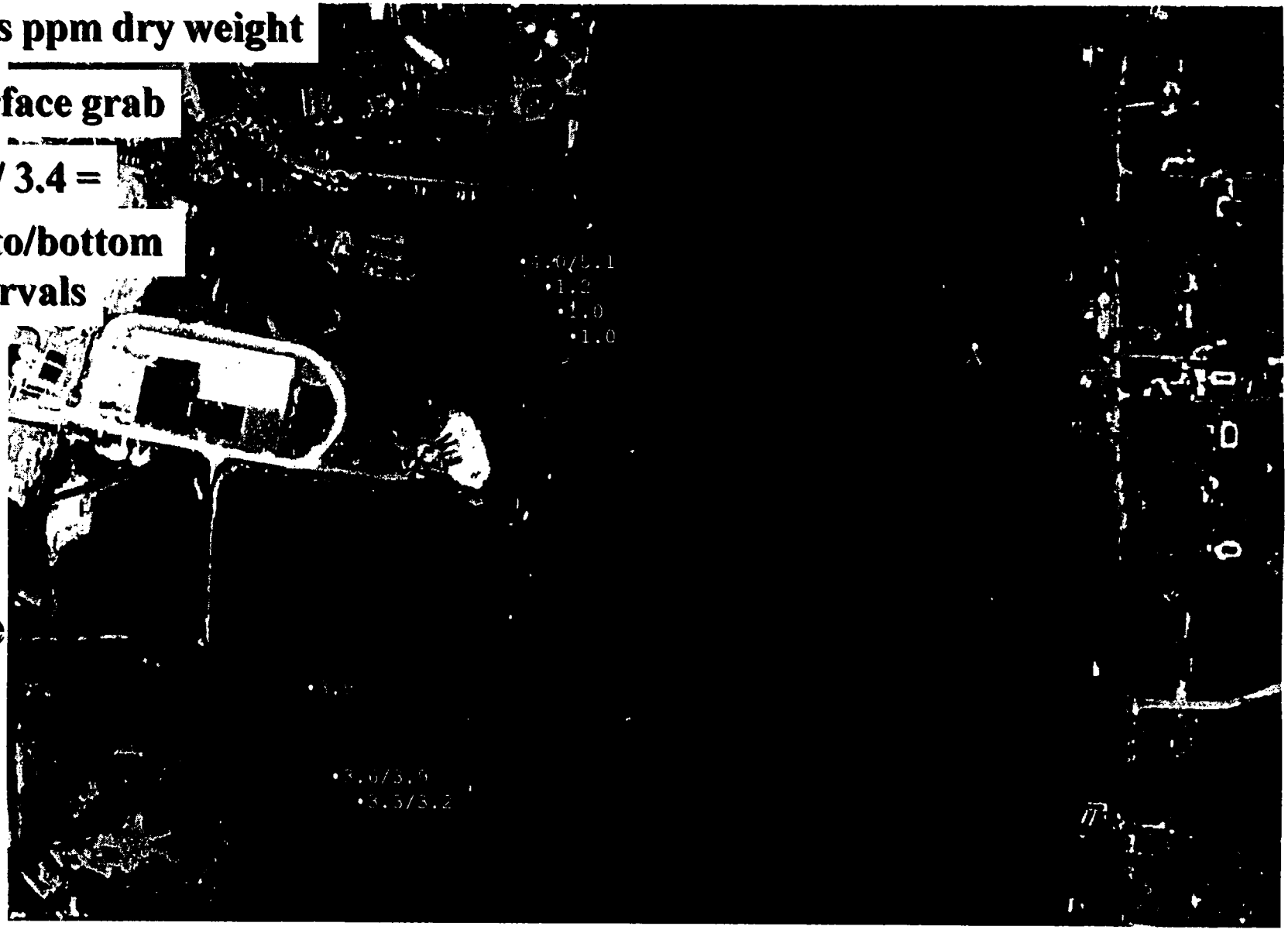
Figure 27. Elizabeth Park Marina

MERCURY

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals



Sample Site

Figure 28. Elizabeth Park South Canal Area

ZINC

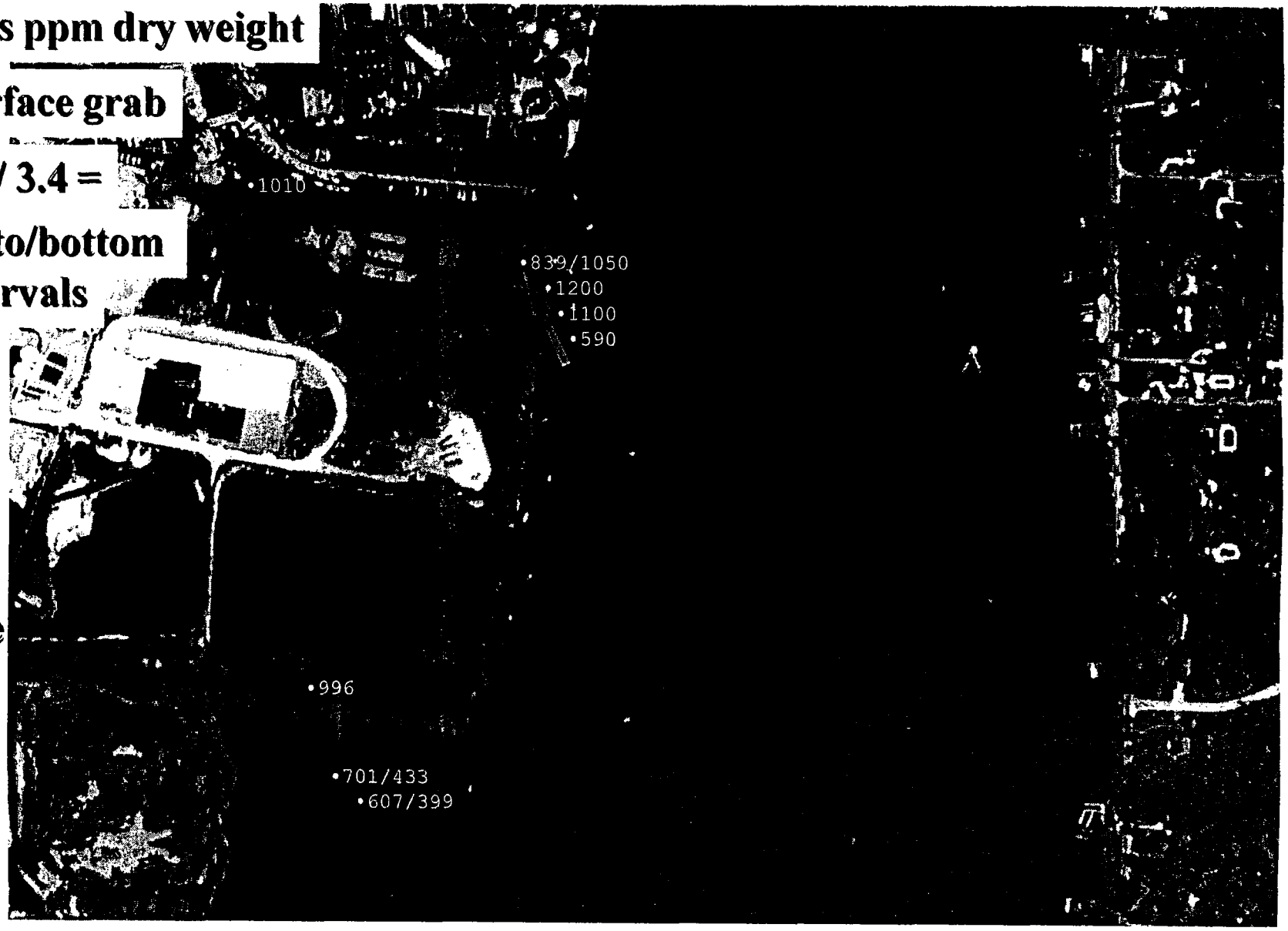


Figure 29. Elizabeth Park South Canal Area

TOTAL PCBS

all values ppm dry weight

3.4 = surface grab

1.2 / 2.3 / 3.4 = surface/to/bottom core intervals

Figure 30. Lower Trenton Channel

Appendix A. Mass Spec-Library Search Interpretations

The following is a brief overview and analysis of a number of identified constituents of the several sediment samples collected from the Trenton Channel. On generalization, it appears the numerous chemicals identified may occur as constituents of heavy oils and lubricants, components of naturally occurring substances such as fats and oils or as possible components of plasticizers, rubber, nylon or other similar synthetic compounds.

1. Polycyclic Aromatic Hydrocarbons (PAHs) and Cresol:

   1,4,6-Trimethyl-naphthalene
   1,6,7-Trimethyl-naphthalene
   1,2,3-Trimethyl-naphthalene
   methyl phenanthrene
   methyl anthracene
   4-methyl phenol (p-cresol)

   common constituents of coal tar and heavy oils (bunker C or #6 Fuel Oil)

2. Hexadecanoic acid (palmitic acid):

   A saturated fatty acid which occurs in natural fats and oils and in "tall oil" (see below). It has been used commercially in soaps, lubricating oils, waterproofing and in food grade additives.

   Note: tall oil is a mixture of rosin acids, fatty acids and other materials obtained from pulping pine wood. Tall oil fatty acids consist of the following: palmitic 0.1%, stearic 2.1%, oleic 48.5%, linoleic 35.3% and eicosenoic 1.1%. Some of the use of tall oil is in vehicle paints, alkyl resins, soaps, cutting oils and emulsifiers, lubricants and greases, asphalt derivatives, rubber reclaiming, synthesis of cortisone and sex hormones, chemical intermediates, etc.

3. Hexane dioic acid (adipic acid) mono (ethyl hexyl) ester:

90% of adipic acid esters are commercially used as plasticizers. 10% are used commercially as high performance lubricants. 2-ethyl hexyl adipates are reported to be excellent low temperature lubricants. They also offer low temperature flexibility in PVC formulations.

4. Isopentane/Isoprene, Terpene and Steroid Type Compounds

Many chemical components/compounds of plants and animals have the common characteristic of their carbon skeletons being evenly divisible into iso-C_5 units, i.e. isoprene or isopentane units. These units may be joined in regular sequences head-to-tail, or, in head-to-tail groupings that are joined tail-to-tail. Many of these compounds or fragments of compounds were detected in the sediment analysis.

a. isopentane sequencing:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Dodecane
Pentadecane
Hexadecane
eicosane

chemicals identified in this grouping include:

2-methyl eicosane
2,6,10 and 2,6,11-trimethyl dodecanes
1,6,10,14 and 2,6,10,14-tetramethylpentadecanes (pristane)
2,6,10,14 tetramethylhexadecane (phytane)

Both pristane and phytane are found in rock specimens 2.5-3 billion years old, are derivatives of chlorophyll and are commonly used as biomakers in identifying particular crude oils. Because of these compounds ability to withstand heat and pressure, commercial uses of these compounds have been as precision lubricants, chromatographic oil and as anticorrosive agents.

Eicosane and eicosanoic acid are used in refining, rubber manufacturing, paper processing, cosmetics, lubricants, plasticizers and in organic synthesis.

b. isoprene sequencing

The isoprene unit is a common natural building block of more complex biological compounds. It occurs in a wide variety of compounds isolated from plant and animals, including natural rubber. Exudates from conifers and oils from citus fruits and eucalyptus trees have abundant $C_{10}H_{16}$ alicyclic hydrocarbon composition. The term terpene (turpentine tree) has commonly been applied to these compounds. Triterpenes (C_{30}) are widely distributed in nature, especially in plants. Trans-squalene has been identified as the precursor in the biosynthesis of all triterpenes through a series of cyclization and rearrangement. Squalene is an intermediate in the biosynthesis of cholesterol and other steroids (see attached) via the intermediate, lanosterol (note: wool fat or lanolin contains cholesterol esters of higher fatty acids). Cholestane is a steroid of the same ring structure as cholesterol (and cortisone and the sex hormones) and has also been identified with wool fat. There was no identified occurrence or use for 4,5 epoxy (alpha, alpha) cholestane noted in the literature reviewed, however, there was note of 5 alpha cholestanol identified as a member of the cholestane group related to the common saturated sterols. Sterols are solid alcohols having from 27-29 carbons (steroid means sterol-like). Sterols are widely distributed in plants and animals both in the free form and esterified to fatty acids. Coprostanol, 5 beta-cholestan-3 beta ol, is a cholestanol produced in the intestines of mammals by microbial reduction of cholesterol and excreted along with cholesterol. This sterol has been identified as a sediment contaminant at concentrations up to 500 ppb.

Squalene is a common naturally occurring substance that is also used as a commercial chemical intermediate in steroid production. Lanolin (containing sterols including lanosterol which may be derived from squalene) is used in ointments, soaps, face and hand creams, suntan preparations, hair-sets and leather finishing.

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Appendix B. Sediment Survey Results-Data Tables

- Metals
- PCBs
- PAHs
- Oil and Grease
- Grain Size
- Acid Volatile Sulfides
- TOC, Density
- Lat-Long
- Classification A: Upstream to Downstream
- Classification B: Most Contaminated to Least Contaminated

TRENTON CHANNEL PROJECT		HEAVY METALS mg/kg										
SEDIMENT CHEMISTRY RESULTS	Core											
	Length											
SITE DESCRIPTION	in cm	SOLIDS	TOT. As	TOT Cd	TOT. Cr	TOT. Cu	TOT. Fe	TOT. Pb	TOT. Mn	TOT. Hg	TOT. Ni	TOT. Zn
EPM Long and Morgan, 1990)			85	9.6	145	390		110		1.3	50	270
SEL Persuad et. al. OME, 1993)							40000		1100			
Quantification Level EPA Method 245.1/7470.7471)										0.1		
55C1 Allied Oil Slip NW	000-030	43	10	15	260	230	48000	340	620	1.3	120	930
	030-091	48	14	17	280	280	53000	350	590	1.2	96	1100
	091-152	52	16	16	220	270	50000	360	590	1	79	88
	152-213	54	16	16	210	270	50000	340	490	1.1	72	710
55C2 Allied Oil Slip NW - dup	000-030	43	9.2	12	180	160	43000	350	690	0.99	84	670
	030-091	48	12	16	260	250	48000	390	620	1.5	110	1200
	091-147	50	15	16	280	280	52000	350	550	1.1	100	960
56C1 Nickelson South Slip	000-030	36	19	21	170	360	99000	250	1400	0.41	140	720
	030-043	42	41	35	300	630	120000	580	2000	0.56	240	710
56C2 Nickelson South Slip -dup	000-030	37	26	25	210	450	100000	310	1500	0.42	160	740
	030-091	45	29	27	300	410	94000	520	1400	0.07	170	960
	091-152	56	9	10	90	120	26000	200	480	0.7	35	440
	152-201	57	11	18	110	190	39000	330	490	0.91	42	730
59C1 Stenson Club	000-030	44	6.3	10	170	130	32000	160	740	0.73	91	600
	030-091	52	7.9	12	180	190	34000	210	690	0.83	87	600
	091-152	54	10	13	190	250	33000	230	540	1.5	110	650
	152-213	53	14	3.6	47	300	18000	250	410	3	19	390
	213-224	57	13	2.5	28	160	14000	130	290	2.1	16	210
64P Mud Island Northside	Ponar	66	3.4	3.3	28	23	23000	22	250	0.08	24	97
65P Mud Island SW	Ponar	64	4.1	7.1	54	71	38000	71	500	0.33	35	250
60C1 Mud Island -South side	000-030	59	2.5	2	17	18	13000	12	190	0.23	13	48
	030-091	61	2.9	1.9	15	15	13000	10	250	0.17	15	50
	091-137	65	2.4	2.1	16	14	14000	9	320	0.08	14	35
53C1 Grassy Island NW	000-030	38	4.5	3.3	29	35	17000	31	350	0.33	44	100
	030-071	77	4	1.4	13	14	9400	9.1	230	0.031	18	38
54C1 Grassy Island NE	000-034	55	4.6	2.2	18	20	13000	20	260	0.16	21	61
63P Grassy Island W	Ponar	66	2.6	2.3	22	27	15000	20	180	0.14	26	73
61P Grassy Island SW	Ponar	60	5.3	3.3	24	44	14000	39	350	0.39	18	120
62P Grassy Island SE	Ponar	57	4.5	3.4	93	32	16000	33	260	0.33	49	110
57P Mouth of Ecorse Creek	Ponar	34	7.1	5.6	57	66	30000	81	590	0.4	37	270
58C1 Mouth of Ecorse Creek	000-030	72	3.1	1.9	16	25	13000	11	160	<0.1	39	45
52C1 BASF Northworks lower	000-030	54	9.9	9.4	120	120	30000	120	420	0.84	67	290
	030-091	51	15	10	110	160	30000	110	460	1.3	59	320
	091-152	56	15	13	77	130	27000	140	420	1.5	44	360
	152-213	59	7.4	4	23	74	13000	90	280	0.89	17	180
59C1 Wyandotte Yatch Club	000-030	43	9.2	5.9	85	120	19000	150	260	1.1	44	330
	030-066	53	8.5	5.5	68	110	19000	150	250	1.5	35	310
68P N of Pt. Hennepin	Ponar	76	5.2	1.2	12	10	8800	9	120	0.07	8.5	37
68E N of Pt. Hennepin	Eckman	76	2.1	1.3	12	10	8800	14	150	0.08	10	49
67C1 Portofino	000-030	45	7.5	5.7	68	83	22000	220	310	0.75	39	350
43P Portofino Slip	PONAR	56	5.3	2.9	40	49	25900	143	455	0.32	27	245
42P Pt. Hennepin	PONAR	58	4.9	1.5	20	24	14300	27	183	0.22	17	106
15 C1 T.C. North Marsh	000-022	63	2.4	0.43	20	21	21600	19	161	<0.1	27	78
15 C1	022-062	73	2.6	0.12	17	24	21600	13	158	<0.1	25	62
15 C1	062-100	70	3.2	<0.05	22	20	26000	12	183	<0.1	31	83

TRENTON CHANNEL PROJECT		HEAVY METALS mg/kg										
SEDIMENT CHEMISTRY RESULTS	Core											
	Length											
SITE DESCRIPTION	in cm	SOLIDS	TOT. As	TOT Cd	TOT. Cr	TOT. Cu	TOT. Fe	TOT. Pb	TOT. Mn	TOT. Hg	TOT. Ni	TOT. Zn
EPM (Long and Morgan, 1990)			85	9.6	145	390		110		1.3	50	270
SEL (Persuad et. al. OME, 1993)							40000		1100			
Quantification Level (EPA Method 245.1/7470,7471)										0.1		
51 C 1 Firestone upper	000-030	43	9.4	10	150	140	30000	200	410	13	80	490
	030-091	53	13	15	230	300	32000	300	470	16	100	660
	091-152	51	12	13	190	250	26000	260	430	16	84	570
	152-194	48	13	10	140	190	25000	180	410	9.5	70	460
66C1 Firestone Steel -Mid (SP site)	000-030	43	12	15	260	300	31000	240	550	16	100	590
	030-091	54	11	15	140	210	25000	190	420	10	67	520
	091-104	57	8.2	10	58	190	18000	160	310	2.9	39	430
45P Firestone Steel	PONAR	45	7.6	11	165	199	44000	180	733	10	76	592
	PONAR	47	13	11	166	221	41000	211	574	6.5	36.8	662
50P Firestone lower	Ponar	42	9.4	19	250	150	35000	260	500	10	130	790
MONGUAGON CREEK-UPSTREAM	000-030	41	8.5	40	118	140	37500	140	590	2.4	68	563
MONGUAGON CREEK-UPSTREAM	030-104	47	9.9	20	467	246	44100	333	551	1.2	210	864
MONGUAGON CREEK-UPSTREAM	104-142	53	11	14	303	217	41500	333	520	9.9	160	721
MONGUAGON CREEK-UPSTREAM	000-030	41	7.8	33	109	118	38800	149	569	2.5	70	458
MONGUAGON CREEK-UPSTREAM	030-076	43	8.1	21	248	183	45900	277	546	3.4	160	625
MONGUAGON CREEK-UPSTREAM	076-150	47	8.9	22	500	255	42900	352	554	3.1	160	625
MONGUAGON CREEK-UPSTREAM	150-190	60	12	7.6	170	122	24400	212	476	5.7	73	377
48E Monguagon Creek	Eckman	48	7.4	6.2	77	70	22000	150	440	0.29	64	2300
S5 - Monguagon Creek	Ponar	58	nm	11.2	178	123	45900	179	655	<0.1	103	850
FI - Fighting Island	Ponar	33	nm	nd	21	14	14200	nd	236	<0.1	17	32
25 C1 MNCK DNS-Nearshore	000-027	70	6.1	29	78	91	27700	115	429	1.1	46	412
25 C1	027-051	61	6.5	30	99	101	28900	142	484	0.95	56	449
25 C1	051-095	58	6.7	15	167	131	35700	213	486	1.5	90	648
25 C1	095-132	71	8	17	405	239	48300	302	542	1.4	251	887
21 C1 MNCK DNS-Offshore	000-027	80	3.5	<0.05	9.2	14	14100	9.1	251	<0.1	15	34
21 C1	027-051	84	3.9	<0.05	13	15	14900	17	285	0.23	17	50
MONGUAGON CREEK-DOWN	000-150	48	8.5	18	437	252	42000	340	556	3.9	200	878
MONGUAGON CREEK-DOWN	150-168	50	10	22	456	281	51700	424	632	11	210	1200
BLACK LAGOON-CENTER	000-030	38	6.5	14	102	99	53200	193	746	1.4	49	3090
BLACK LAGOON-CENTER	030-120	34	9	17	345	218	70100	449	1070	3.1	160	1720
BLACK LAGOON-CENTER	120-210	40	22	11	162	236	112000	439	1640	6.8	90	1030
BLACK LAGOON-CENTER	210-229	75	4.9	3.7	45	99	19800	76	330	1.4	41	225
BLACK LAGOON-LOWER	000-060	42	24	12	191	226	137000	574	2060	5.6	100	1340
BLACK LAGOON-LOWER	060-152	51	10	11	183	247	35800	187	488	7.8	72	554
BLACK LAGOON-LOWER	152-203	54	10	9.8	121	166	29000	118	397	4.8	56	444
BLACK LAGOON-EAST	000-055	81	8.1	<0.050	9.8	5.2	7430	3.9	148	<0.1	8.5	27
BLACK LAGOON-EAST	055-103	80	1.9	<0.050	8.6	3.7	8150	3.4	173	<0.1	7.1	17
BLACK LAGOON-EAST	103-166	79	2.3	<0.050	9.6	5.6	7260	4.1	162	<0.1	7.9	17
BLACK LAGOON-EAST	166-229	80	2.6	0.067	9.7	7	7480	3.9	175	<0.1	8.6	23
BLACK LAGOON-EAST	000-035	80	1.8	<0.050	9	4.7	6840	3.6	128	<0.1	7.6	26
BLACK LAGOON-EAST	035-133	77	1.9	<0.050	9.3	4.2	7190	3.6	161	<0.1	7.9	21
BLACK LAGOON-EAST	133-182	76	3.2	<0.050	11	8.6	8380	4	201	<0.1	9.5	29
24 C1 BLLG-Nearshore	000-030	40	7.1	16	121	110	53300	218	743	1.2	58	3320
24 C1 (WWES Lab)	030-075	32	7.3	11	315	200	57000	337	827	1.2	144	2410
24 C1 BLLG-Nearshore	030-075	32	12	30	418	233	76500	468	1100	1.3	206	3200
(MDNR Lab)												
47E BLLG	Eckman	35	7	9.9	88	96	43000	160	620	11	52	1300
S7 - Black Lagoon	Ponar	55	nm	9.7	156	111	73000	254	873	<0.1	71	2060

TRENTON CHANNEL PROJECT		HEAVY METALS mg/kg										
SEDIMENT CHEMISTRY RESULTS	Core											
	Length											
SITE DESCRIPTION	in cm	SOLIDS	TOT. As	TOT Cd	TOT. Cr	TOT. Cu	TOT. Fe	TOT. Pb	TOT. Mn	TOT. Hg	TOT. Ni	TOT. Zn
ERM (Long and Morgan, 1990)			85	9.6	145	390		110		1.3	50	270
SEL (Persuad et. al. CME, 1993)							40000		1100			
Quantification Level (EPA Method 245.1/7470,7471)										0.1		
40P East of Bouy N "6"	PONAR	48.1	4.7	<2	31	35	15500	36	270	0.13	25	130
41P NE of Bouy R "19"	PONAR	36	4.7	2.7	40	39	23400	60	403	0.23	30	221
44P ONS from Bouy R "23"	PONAR	23.9	13	3.5	62	32.5	37000	298	580	0.65	50	290
26P Riverside Hospital	PONAR	59.5	5.5	4.5	77	67.8	33000	130	545	0.56	44	738
27P Trenton Towers	PONAR	37.1	13	10	220	290	52000	261	760	6.4	99	945
28P Deadhead Cove	PONAR	36.9	6	3.5	60	57.9	39000	97.5	549	0.7	35	683
29PC2	PONAR	38.8	5.9	3.5	58	59.5	37000	98.5	530	0.67	36	680
ELIZABETH PARK CANAL	000-079	47	9.8	14	270	224	45700	279	610	5.6	100	842
ELIZABETH PARK CANAL	079-180	53	9.4	15	147	197	36500	218	510	2.3	48	711
ELIZABETH PARK CANAL	180-260	51	6.3	6.9	82	214	22000	183	400	1.5	36	537
ELIZABETH PARK CANAL	260-330	53	7.1	4.5	59	326	24700	279	369	2.4	33	742
16 C1 EPNC-Upper	000-080	54	11	8.9	167	164	48700	195	544	4.7	81	693
16 C1	080-120	49	11	14	172	196	26600	169	334	4	46	571
16 C1	120-157	56	12	15	124	201	35700	200	453	2.8	46	682
17 C1 EPNC-Inner	000-040	50	10	10	148	186	31000	164	328	7.4	62	552
17 C1	040-080	50	9.6	11	98	173	31300	154	375	2.6	38	554
17 C1	080-140	58	8.1	5.1	39	190	20300	162	274	1.8	31	534
17 C1	140-175	60	8.7	0.88	19	110	19100	100	239	1.2	24	305
18 C1 EPNC-Lower	000-055	44	9	5.8	129	159	23000	139	336	6.8	51	437
18 C1	055-125	47	9.8	12	163	194	25800	171	359	4.6	67	572
18 C1	125-170	52	7.5	8.3	102	167	24400	156	360	2.4	40	496
18 C1	170-217	59	5.3	2.1	24	170	16200	139	235	1.5	22	415
46E EPNC	Eckman	50	5.6	9.5	110	81	44000	120	650	1.5	70	460
29P EPC Bridge 1	PONAR	18.4	9	7	72	107	39000	129	580	0.4	43	795
30P EPC Bridge 2	PONAR	41.2	5.3	<0.05	27	27	13600	31	190	0.18	19	160
31P EPC Bridge 3	PONAR	36.8	7.9	4.5	73	68.5	38000	137	595	1.7	43	750
32P EPC Bridge 4	PONAR	25.7	8.2	9	146	114	43000	189	545	0.88	74.5	870
33P EPC Bridge 5	PONAR	54.4	9.9	9.9	100	106	43000	177	639	0.91	8.4	1020
EP MARINA - OUTSIDE	000-020	85	4	<0.050	20	17	15600	8.9	353	<0.1	21	54
EP MARINA - UPLAND	000-006	86	4.5	0.091	19	14	16000	6.4	333	<0.1	20	52
EP MARINA - RIVER BED UP.	000-010	59	6.2	7.4	220	113	37900	191	620	3	87	625
EP MARINA - RIVER BED UP.	010-020	60	7.3	9	276	148	51300	240	479	4.2	74	476
EP MARINA - RIVER BED UP.	020-028	57	7.5	9.3	279	125	39000	245	564	5.2	103	597
EP MARINA - RIVER BED UP.	028-038	58	6.5	10	304	144	47900	247	640	4.3	113	756
EP MARINA - RIVER BED DN.	000-013	68	5.9	4.1	125	70	36000	132	564	4	64	453
EP MARINA - RIVER BED DN.	013-018	71	5.3	4.2	134	72	47200	146	638	4	62	476
EP1 - Upland (S11)	Ponar	49	nm	6.5	131	108	38500	172	557	<0.1	66	469
EP2 - Mid Marina (S12)	Ponar	43	nm	7.7	188	102	56000	179	672	<0.1	99	754
EP3 - South Marina (S13)	Ponar	31	nm	5.1	149	77	79200	177	806	<0.1	87	613

TRENTON CHANNEL PROJECT		HEAVY METALS mg/kg										
SEDIMENT CHEMISTRY RESULTS	Core											
	Length											
SITE DESCRIPTION	in cm	SOLIDS	TOT. As	TOT Cd	TOT. Cr	TOT. Cu	TOT. Fe	TOT. Pb	TOT. Mn	TOT. Hg	TOT. Ni	TOT. Zn
ERM (Long and Morgan, 1990)			85	9.6	145	390		110		1.3	50	270
SEL (Persuad et al. OME, 1993)							40000		1100			
Quantification Level (EPA Method 245.1/7470.7471)										0.1		
EPN (new site)	Ponar		12	13	340	167	47000	258	723	4.4	148	916
EPM-N	Eckman	24	10	5.5	110	147	43000	141	575	1.5	60.5	765
S11-EPM Upland	Ponar		12	6.9	114	116	36000	149	589	2.3	62.4	574
S11D- EPM Upland Dup.	Ponar		12	7	113	117	36000	139	600	2.3	62	565
EPM-1 (S11-EPM Upland)	Eckman	32	10	5.9	112	137	43000	153	589	1.8	60.9	772
S12-EPM Mid	Ponar		10	8.4	187	125	40000	175	649	2.9	30.6	762
EPM-2 (S12-EPM Mid)	Eckman	36	10	6	121	139	45000	147	670	1.6	68.5	760
EPM2-dup (S12- EPM Upland)	Eckman	36	11	5.9	117	136	43000	149	653	1.7	67.9	782
S13-EPM South	Ponar		13	7.4	128	129	45000	177	718	3.1	64.4	683
EPM-3 (S13-EPM South)	Eckman	54	9.1	2.5	64	65	41000	100	695	3.8	49	500
34P EPSC DOCK	PONAR	42.4	12	13	205	165	58900	272	777	1.6	8.4	1010
35P EPSC-Inlet	PONAR	44.9	11	11	100	126	49000	149	658	1.2	8.4	1200
35PC2	PONAR	44.9	8.4	9.5	93	118	47000	139	660	1	8.5	1100
20 C1 EPSC-Inlet	000-083	53	13	13	225	160	58700	273	658	4	102	939
20 C1	083-088	55	22	11	186	153	82700	347	942	5.1	86	1050
49E EPSC	Eckman	20	7.6	7.2	71	100	34000	100	530	0.96	48	590
36P Monsanto Lagoon	PONAR	42	23	16	193	194	80200	246	1080	3.9	89	996
19 C1 Monsanto Bay	000-053	52	8.8	8.2	150	165	59100	222	736	3.6	71	701
19 C1	053-085	63	3.8	3.6	86	125	66300	148	729	3.9	55	433
19 C2 Monsanto Bay	000-051	51	9.3	7.6	135	145	44300	201	622	3.3	63	607
19 C2	051-085	65	8.9	3.4	77	113	59800	139	709	3.2	49	399
CHRYSLER BAY-INNER	000-030	15	3.6	0.55	7.1	17	7930	10	80	0.2	11	88
CHRYSLER BAY-INNER	030-058	69	3.6	0.15	15	29	13700	13	75	<0.10	21	72
CHRYSLER BAY-INNER	058-079	78	7.7	<0.05	12	17	19800	13	123	<0.10	23	88
CHRYSLER BAY-OUTER	000-013	65	5.9	4.4	78	82	27100	105	508	1.5	53	523
CHRYSLER BAY-OUTER	013-061	70	7.1	0.28	14	19	16100	11	350	<0.10	27	67
37P Chry Bay Marsh Inlet	PONAR	52.8	4.9	<0.05	28.5	33	17300	31	310	0.18	25	250
39P Swan Island-North	PONAR	41	4.3	3.2	37	46	17700	44	286	0.38	29	178
38P Above Humbug Marina	PONAR	25	4.6	7.4	73	94	25200	87	349	0.87	54	661
S9 - Chrysler Bay	Ponar	73	nm	4.2	77	61	55200	95	620	<0.1	56	765
CELERON ISLAND	000-043	51	4.1	0.3	9.7	34	10600	22	162	0.16	16	68
CELERON ISLAND	043-074	72	4.3	0.22	15	23	14500	12	100	<0.10	22	76
CELERON ISLAND	074-107	80	7.1	0.12	5.1	18	17500	7.1	359	<0.10	19	61

TRENTON CHANNEL PROJECT									
SEDIMENT CHEMISTRY RESULTS			PCBs SCAN						
	Core Length		mg/kg d.w.						
SITE DESCRIPTION	in cm	TOT. PCB	PCB-1016	PCB-1221	PCB-1232	PCB-1242	PCB-1248	PCB-1254	PCB-1260
ERM (Long and Morgan, 1990)		0.4							
Quantification Level (EPA Method 608/8081)		0.33							
55C1 Allied Oil Slip NW	000-030	8.87					4.24	2.71	1.92
	030-091	12.65					6.89	4.05	1.71
	091-152	8.32					3.07	3.9	1.35
	152-218	7.10					1.86	5.24	<0.33
55C2 Allied Oil Slip NW - dup	000-030	7.06					3.11	3.95	<0.33
	030-091	9.25					5.21	4.04	<0.33
	091-147	8.70					3.75	4.95	<0.33
56C1 Nickelson South Slip	000-030	5.17					1.77	1.79	1.61
	030-043	7.39					2.39	2.27	2.73
56C2 Nickelson South Slip -dup	000-030	4.98					1.53	1.61	1.84
	030-091	8.11					4.44	2.33	1.34
	091-152	1.57					0.61	0.66	0.3
	152-201	2.18					0.58	0.63	0.97
59C1 Stenson Club	000-030	7.15					2.71	2.08	2.36
	030-091	6.98					3.29	1.99	1.7
	091-152	5.61					2.97	1.67	0.97
	152-213	1.25					0.68	0.57	< 0.33
	213-224	1.45					0.77	0.68	< 0.33
64P Mud Island Northside	Ponar	0.17					0.17	< 0.33	< 0.33
65P Mud Island SW	Ponar	0.91					0.37	0.29	0.26
60C1 Mud Island -South side	000-030	1.04					0.54	0.5	< 0.33
	030-091	1.61					0.65	0.53	0.43
	091-137	1.03					0.54	0.49	< 0.33
53C1 Grassy Island NW	000-030	< 0.33							
	030-071	< 0.33							
54C1 Grassy Island NE	000-034	0.61					0.37	0.24	< 0.33
63P Grassy Island W	Ponar	0.00					< 0.33	< 0.33	< 0.33
61P Grassy Isalnd SW	Ponar	0.41					0.19	0.22	< 0.33
62P Grassy Island SE	Ponar	0.43					0.25	0.18	< 0.33
57P Mouth of Ecorse Creek	Ponar	3.49					1.3	1.1	1.09
58C1 Mouth of Ecorse Creek	000-030	1.11					0.58	0.53	< 0.33
52C1 BASF Northworks lower	000-030	1.93					0.74	0.75	0.44
	030-091	1.30					0.36	0.66	0.28
	091-152	0.42					0.18	0.24	< 0.33
	152-213	0.00					< 0.33	< 0.33	< 0.33
	213-218	0.00					< 0.33	< 0.33	< 0.33
69C1 Wyandotte Yacht Club	000-030	3.29					1.62	1.05	0.62
	030-066	1.77					0.65	0.59	0.53
68P N of Pt. Hennepin	Ponar	< 0.33							
68E N of Pt. Hennepin	Eckman	< 0.33							
67C1 Portofino	000-030	1.98					0.66	0.62	0.5
43P Portofino Slip	PONAR		<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
42P Pt. Hennepin	PONAR		<0.33	<0.46	<0.33	<0.33	<0.33	<0.33	<0.33

TRENTON CHANNEL PROJECT									
SEDIMENT CHEMISTRY RESULTS			PCBs SCAN						
	Core Length		mg/kg d.w.						
SITE DESCRIPTION	in cm	TOT. PCB	PCB-1016	PCB-1221	PCB-1232	PCB-1242	PCB-1248	PCB-1254	PCB-1260
ERM (Long and Morgan, 1990)		0.1							
Quantification Level (EPA Method 608/8081)		0.33							
15 C1 T.C. North Marsh	000-022		<0.33	<0.42	<0.33	<0.33	<0.33	<0.33	<0.33
15 C1	022-062		<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
15 C1	062-100		<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
51 C 1 Firestone Upper	000-030	18.40					3.2	1.8	13.4
	030-091	9.31					4.39	1.95	2.97
	091-152	14.20					4.55	2.6	7.05
	152-194	5.39					2.96	2.43	< 0.33
66C1 Firestone Steel -Mid (45P s1	000-030	4.99					1.36	1.36	1.67
	030-091	3.85					1.31	0.89	1.65
	091-104	0.65					< 0.33	0.18	0.47
45P Firestone Steel	PONAR	1.10	<4.4	<1.2	<4.4	<4.4	<4.4	<0.33	1.10
	PONAR	2.20	<1.1	<1.1	<1.1	<1.1	<1.1	2.20	<1.1
45PC2	PONAR	2.56	<1.1	<1.1	<1.1	<1.1	<1.1	1.70	0.97
50P Firestone lower	Ponar	3.43					1.26	1.31	0.86
MONGUAGON CREEK-UPSTREAM	000-030	2.4	<2.0	<1.3	<1.3	<2.0	<2.0	<2.6	2.4
MONGUAGON CREEK-UPSTREAM	030-104	2.5	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	2.5
MONGUAGON CREEK-UPSTREAM	104-142	11.2	<1.3	<1.3	<1.3	<1.3	5.7	5.5	<1.3
MONGUAGON CREEK-UPSTREAM	000-030	2.1	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	2.1
MONGUAGON CREEK-UPSTREAM	030-076	9.9	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	9.9
MONGUAGON CREEK-UPSTREAM	076-150	9.7	<2.8	<5.6	<2.8	<2.8	4.9	<4.8	4.8
MONGUAGON CREEK-UPSTREAM	150-180	10	<2.2	<4.4	<2.2	<2.2	5.7	4.3	<3.9
48E Monguagon Creek	Eckman	1.52							1.52
S5 - Monguagon Creek	Ponar	6.18							
FI - Fighting Island	Ponar	0.08							
25 C1 MNCK DNS-Nearshore	000-027		<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
25 C1	027-051		<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
25 C1	051-095	1.08	<0.33	<0.33	<0.33	<0.33	0.36	<0.33	0.72
25 C1	095-132	1.15	<0.33	<0.33	<0.33	<0.33	0.58	<0.33	0.57
21 C1 MNCK DNS-Offshore	000-027		<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
21 C1	027-051		<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
MONGUAGON CREEK-DOWN	000-150	5.9	<0.33	<2.8	<0.33	<0.33	2.3	<5.5	3.6
MONGUAGON CREEK-DOWN	150-168	12.3	<0.33	<5.3	<0.33	<0.33	9.6	<7.2	2.7
BLACK LAGOON-CENTER	000-030	0	<8.91	<8.91	<8.91	<8.91	<8.91	<8.91	<8.91
BLACK LAGOON-CENTER	030-120	6.5	<2.0	<2.0	<2.0	<2.0	2.4	<3.9	4.1
BLACK LAGOON-CENTER	120-210	1.8	<1.1	<1.1	<1.1	<1.1	<1.1	1.8	<1.1
BLACK LAGOON-CENTER	210-229	0	<0.44	<1.3	<0.44	<0.44	<0.44	<0.44	<0.44
BLACK LAGOON-LOWER	000-060	2.8	<3.2	<3.2	<3.2	<3.2	<3.2	2.8	<1.3
BLACK LAGOON-LOWER	060-152	0	<4.0	<5.2	<4.0	<4.0	<4.0	<2.7	<1.3
BLACK LAGOON-LOWER	152-203	0	<1.7	<1.7	<2.5	<1.7	<1.7	<1.7	<0.81
BLACK LAGOON-EAST	000-055	0	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
BLACK LAGOON-EAST	055-103	0	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
BLACK LAGOON-EAST	103-166	0	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
BLACK LAGOON-EAST	166-229	0	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
BLACK LAGOON-EAST	000-035	0	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
BLACK LAGOON-EAST	035-133	0	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
BLACK LAGOON-EAST	133-182	0	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
24 C1 BLLG-Nearshore	000-030	1.64	<0.42	<2.8	<0.42	0.81	<0.42	0.83	<0.42
24 C1 (WWES Lab)	030-075	2.50	<0.51	<0.51	<0.51	<0.51	1.10	<0.51	1.40
24 C1 BLLG-Nearshore (MDNR Lab)	030-075								
47E BLLG	Eckman	3.27					1.2	0.92	1.15
S7 - Black Lagoon	Ponar	4.75							

TRENTON CHANNEL PROJECT									
SEDIMENT CHEMISTRY RESULTS			PCBs SCAN						
	Core Length		mg/kg d.w.						
SITE DESCRIPTION	cm	TOT. PCB	PCB-1016	PCB-1221	PCB-1232	PCB-1242	PCB-1248	PCB-1254	PCB-1260
ERM (Long and Morgan, 1990)		0.4							
Quantification Level EPA Method 608/8081		0.33							
40P East of Bouy N "36"	PONAR		<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
41P NE of Bouy R "18"	PONAR	0.56	<1.1	<1.1	<1.1	<1.1	<1.1	<0.37	0.56
44P ONS from Bouy R "38"	PONAR		<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
26P Riverside Hospital	PONAR		<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
27P Trenton Towers	PONAR		<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
28P Deadhead Cove	PONAR		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
28PC2	PONAR		<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
ELIZABETH PARK CANAL	000-079	2.72	<0.71	<1.4	<0.71	<0.71	1.8	<0.71	0.92
ELIZABETH PARK CANAL	079-130	0	<0.33	<0.33	<0.33	<0.33	<0.56	<0.33	<0.33
ELIZABETH PARK CANAL	130-250	0	<0.52	<0.52	<0.65	<0.33	<0.33	<0.33	<0.33
ELIZABETH PARK CANAL	250-330								
16 C1 EPNC-Upper	000-080	10.30	<2.4	<2.4	<2.4	6.90	<2.4	3.40	<0.61
16 C1	080-120		<0.68	<2.7	<0.68	<0.68	<0.68	<0.68	<0.68
16 C1	120-157	0.41	<0.34	<3.57	<0.34	<0.34	<0.34	0.41	<0.34
17 C1 EPNC-Inner	000-040	2.24	<0.66	<2.64	<0.66	<0.66	<0.66	2.24	<0.66
17 C1	040-080		<2.8	<2.1	<2.8	<2.8	<2.8	<0.65	<0.65
17 C1	080-140		<0.33	<0.46	<0.33	<0.33	<0.33	<0.33	<0.33
17 C1	140-175		<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
18 C1 EPNC-Lower	000-055	2.30	<.4	<1.5	<0.4	<0.4	<0.4	2.30	<0.4
18 C1	055-125	0.66	<.71	<1.4	<0.71	<0.71	<0.71	0.66	<0.35
18 C1	125-170	1.40	<1.4	<2.1	<1.4	<1.4	<1.4	1.40	<1.4
18 C1	170-217		<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
46E EPNC	Eckman	1.71					0.58	0.47	0.66
29P EPC Bridge 1	PONAR	0.00	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2
30P EPC Bridge 2	PONAR	0.00	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75
31P EPC Bridge 3	PONAR	0.00	<1	<1	<1	<1.0	<1.0	<1.0	<1.0
32P EPC Bridge 4	PONAR	5.50	<1.7	<1.7	<1.7	2.30	<1.7	1.50	1.70
33P EPC Bridge 5	PONAR	0.84	<0.95	<0.95	<0.95	<0.95	<0.95	0.84	<0.95
EP MARINA - OUTSIDE	000-020	0	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
EP MARINA-UPLAnd	000-006	0	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
EP MARINA-RIVER BED UP.	000-010	1.37	<0.33	<0.45	<0.33	<0.33	0.82	<0.33	0.55
EP MARINA-RIVER BED UP.	010-020	1.43	<0.55	<1.7	<0.55	<0.55	0.96	<0.55	0.47
EP MARINA-RIVER BED UP.	020-029	1.94	<0.58	<0.58	<0.58	<0.58	1.4	<0.66	0.54
EP MARINA-RIVER BED UP.	029-038	1.68	<0.23	<0.45	<0.45	<0.45	1.3	<0.49	0.38
EP MARINA-RIVER BED DN.	000-013	0	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
EP MARINA-RIVER BED DN.	013-018	0	<1.8	<1.8	<1.8	<1.8	<1.8	<0.33	<0.33
EP1 - North Marina	Ponar	1.27							
EP2 - Mid Marina	Ponar	2.63							
EP3 - South Marina	Ponar	1.39							
EPN (new site)	Ponar	0							
EPM-N	Eckman	< 0.33							

TRENTON CHANNEL PROJECT									
SEDIMENT CHEMISTRY RESULTS			PCBs SCAN						
	Core Length		mg/kg d.w.						
SITE DESCRIPTION	in cm	TOT. PCB	PCB-1016	PCB-1221	PCB-1232	PCB-1242	PCB-1248	PCB-1254	PCB-1260
ERM Long and Morgan, 1990)		0.4							
Quantification Level (EPA Method 608/8081)		0.33							
S11-EPM Upland	Ponar	0							
S11D- EPM Upland Dup.	Ponar	0							
EPM-1 (S11-EPM Upland)	Eckman	< 0.33							
S12-EPM Mid	Ponar	0							
EPM-2 (S12-EPM Mid)	Eckman	< 0.33							
EPM2-dup (S12- EPM Upland)	Eckman	0							
S13-EPM South	Ponar	0							
EPM-3 (S13-EPM South)	Eckman	< 0.33							
34P EPSC DOCK	PONAR	0.83	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	0.83
35P EPSC-Inlet	PONAR	0.00	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
35PC2	PONAR	0.00	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
20 C1 EPSC-Inlet	000-083	2.40	<0.33	<0.33	<0.33	<0.33	1.30	1.10	<0.33
20 C1	083-088	1.33	<0.33	<0.33	<0.33	<0.33	0.54	0.79	<0.33
49E EPSC	Eckman	0							
36P Monsanto Lagoon	PONAR	0.90	<0.33	<0.33	<0.33	<0.33	0.57	<0.33	0.33
19 C1 Monsanto Bay	000-053	0.54	<0.33	<0.33	<0.33	<0.33	<0.33	0.54	<0.33
19 C1	053-085	1.15	<0.3	<1.0	<0.33	<0.33	0.36	0.79	<0.33
19 C2 Monsanto Bay	000-051	2.40	<0.33	<0.33	<0.33	<0.33	1.10	1.30	<0.33
19 C2	051-085	1.37	<0.33	<0.33	<0.33	<0.33	0.42	0.95	<0.33
CHRYSLER BAY-INNER	000-030	0	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
CHRYSLER BAY-INNER	030-058	0	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
CHRYSLER BAY-INNER	058-079	0	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
CHRYSLER BAY-OUTER	000-013	1.79	<0.41	<0.81	<0.41	<0.41	0.98	0.81	<0.41
CHRYSLER BAY-OUTER	013-061	0	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
37P Chry Bay Marsh Inlet	PONAR	0.00	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
39P Swan Island-North	PONAR	0.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
38P Above Humbug Marina	PONAR	0.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
S9 - Chrysler Bay	Ponar	1.39							
CELERON ISLAnd	000-043	0	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
CELERON ISLAnd	043-074	0	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
CELERON ISLAnd	074-107	0	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33

			acenapnthene			benzo(a)anthracene			chrysene			indendo(1 2,3-cd)pyrene					
TRENTON CHANNEL PROJECT				acenaphthylene		benzo(b&k)fluoranthene			dibenzo(a,h)anthracene			napthalene					
SEDIMENT CHEMISTRY RESULTS					anthracene		benzo(a)pyrene			fluoranthene			phenanthrene				
								benzo(g,h,i)perylene			fluorene					pyrene	
ERM (Long and Morgan, 1990)		35															
			PAH SCAN														
SITE DESCRIPTION	Core Length		mg/kg d.w.														
	cm	TOT PAHS	A1	A2	A3	B1	B2	B3	B4	C1	D1	F1	F2	I1	N1	P1	P2
55C1 Allied Oil Slip NW	000-030	68.3			3.3	6.3	9.9	5.3	2.1	8.7		6		2.4	2.6	8.7	14
	030-091	53.2			2.7	4.5	6.3	3.7	2	4.9		4.6	1.6	2.3	2.1	7.6	11
	091-152	48.12	1.3	0.7	4.4	3.3	4	2.4	1.7	3.7		3.5	3	1.6	1.4	8.4	8.1
	152-213	93.2	2.9	1.1	9.3	7.9	6.5	4.6	2	5.6		4	8.6	1.7	2.2	16	11
55C2 Allied Oil Slip NW - d	000-030	77.63	1.33	1.2	3.2	7.3	9.8	6.5	3.7	9.3	1.1	6.6	1.8	3.4	2.8	8	12
	030-091	39.22	0.73		1.9	3.8	4.4	2.6	2.2	4.4		3.3	0.73	1.5	1.3	5.2	7.2
	091-147	73.19	1.4	0.9	4.3	6.3	7.1	4.4	7.9	5	0.72	5.7	4.4	2.2	1.9	10	11
56C1 Nickelson South Slip	000-030	24.45				2.1	4.1	2	1	2.9		3.4		1		2.1	8
	030-043	62.2			1.8	4.1	6.9	3.9	2.3	5.3		12				11	15
56C2 Nickelson South Slip -d	000-030	28.7				2.1	3	2	2	2.7		4.1		1.1		3.5	8.2
	030-091	92.97	1.5	0.8	3.1	6.2	9.5	5.2	3.9	7.2		18	2.5	2.3	1.8	16	15
	091-152	32.67			1.2	2.9	4.3	2.3	1.7	3.3		4.4	1.2	0.87	1.2	4.5	4.8
	152-201	31.2			1.1	2.9	4.5	2.5	1.6	3.5		4.3		1.1	1.7	3	5
59C1 Stenson Club	000-030	22.49				2.2	3.5	2.1	1.7	2.3		2.7		0.9	1	2.9	3.1
	030-091	44.49	0.79		2.2	3.9	5.7	3.4	1.8	4.5		5.2	1	1.1	1.3	6.7	6.9
	091-152	123.3	2.5	1.4	6.9	9.5	12	8.3	3.9	9.9		18	6	2.3	2.9	23	17
	152-213	131.98	2.2	1	7.1	11	13	9.1	5.3	11	0.86	20	3.5	2.9	4.5	22	19
	213-224	94.79	2.6	0.9	5.4	8.1	8.5	6.6	3.9	7.7		14	3.3	1.9	3.1	17	12
64P Mud Island Northside	Ponar	47.82	0.53	0.6	1.6	4.4	7.3	4.5	2.5	4.8	0.87	7.4	0.96	2.6	2.9	4.4	2.5
65P Mud Island SW	Ponar	47.69		0.5	1.6	4.4	7.3	4.8	2.5	4.8	0.73	5.8	0.79	2.6	2.1	4	5.7
60C1 Mud Island -South side	000-030	18.6			1.1	2.1	0.7	2.1	1	2		2.6		0.95	0.7	2.4	3
	030-091	0.56															0.56
	091-137																
53C1 Grassy Island NW	000-030	1.99										0.89					1.1
	030-071	5.33				0.65	0.7	0.6		0.8		0.89				0.71	1
54C1 Grassy Island NE	000-034	8.62				0.85	0.9	0.9		0.8		1.1				0.76	1.3
63P Grassy Island W	Ponar	16.07			0.7	1.6	2.7	1.8	0.7	1.8		2.5		0.72		1.4	2.2
61P Grassy Island SW	Ponar	23.1			0.86	2.2	3.5	2.3	0.9	2.4		3.5		0.99	1.1	2	3.4
62P Grassy Island SE	Ponar	32.1			1.1	2.9	5.3	3.5	1.5	3.3		4.3		1.5	2	2.8	3.9
57P Mouth of Ecorse Creek	Ponar	25.9				2	4.4	2.3	1.9	2.6		3.7		1.2	1.4	2.9	3.5
58C1 Mouth of Ecorse Creek	000-030	< 0.33															
52C1 BASF Northworks lower	000-030	32.1			1.5	2.8	3.6	2.4	1.7	3.2		3.2	0.66	1.5	2.6	4.6	4.3
	030-091	37.24			1.9	3.2	3.9	2.5	1.5	3.7	0.67	3.5	0.67	1.9	3.1	5.3	5.4
	091-152	88.1	1	1.3	5.2	7.6	9.2	6	3.2	7.5	1.1	8.2	3	3.6	4.2	13	14
	152-213	37.7	0.9	1.8	5.2	7.6	8.7	5.6	2.2	7.5	1.1	8.1	3.8	3.4	5.8	14	12
	213-238	6.38										0.95			3.4	1.3	0.73

TRENTON CHANNEL PROJECT SEDIMENT CHEMISTRY RESULTS			acenaphthene acenaphthylene anthracene			benzo(a)anthracene benzo(b&k)fluoranthene benzo(a)pyrene			chrysene dibenzo(a,h)anthracene benzo(g,h,i)perylene			fluoranthene fluorene		indendo(1,2,3-cd)pyrene napthalene		phenanthrene pyrene	
ERM (Long and Morgan, 1990)		35															
SITE DESCRIPTION	ore Length in cm	mg/kg d.w. TOT PAHS	PAH SCAN A1	A2	A3	B1	B2	B3	B4	C1	D1	F1	F2	I1	N1	P1	P2
69C1 Wyandotte Yatch Club	000-030	33.44			0.94	2.8	4.7	2.4	1.6	3.4		5.3		1.6	1.2	3.8	5.7
	030-066	32.14			0.87	2.8	4.6	2.4	1.4	3.3		5.1		1.6	1.2	3.4	5.5
68P N of Pt. Hennepin	Ponar	12.29				1	1.8	1.1	0.7	1.2		1.8		0.72	0.68	1.3	2
68E N of Pt. Hennepin	Eckman	4.86				0.68		0.6		0.7		1.1				0.69	1.1
67C1 Portofino	000-030	14.3				1.2	2.5	1.3	1	1.6		2.1		1		1.3	2.3
43P Portofino Slip	PONAR	6.99	<0.33	<0.33	<0.33	0.61	1.3	<0.33	<0.3	0.8	<0.33	1.5	<0.33	0.42	<0.33	0.96	1.4
42P Pt. Hennepin	PONAR	1.14	<0.33	<0.33	<0.33	<0.33	0.3	<0.33	<0.3	<0.3	<0.33	<0.33	<0.33	<0.33	<0.33	0.44	0.7
15 C1 T.C. North Marsh	000-022	0	<0.33	<0.33	<0.33	<0.33	0.3	<0.33	<0.3	<0.3	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
15 C1	022-062	0	<0.33	<0.33	<0.33	<0.33	0.3	<0.33	<0.3	<0.3	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
15 C1	062-100	0	<0.33	<0.33	<0.33	<0.33	0.3	<0.33	<0.3	<0.3	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
51 C 1 Firestone upper	000-030	34.36			1.8	2.6	3.6	2.1	1.2	3.1		4.1	0.85	1.4	3	5.8	4.8
	030-091	36.69			1.5	2.6	3.5	1.9	1.1	2.9		3.5	0.85	1.2	6.5	4.9	6.2
	091-152	53.5	0.9		2.5	3.9	5.5	2.9	1.1	4.2		4.5	1.7	1.5	8.4	8	8.4
	152-194	38.85			1.4	3.2	4.5	2.4	1.3	3.4		3.1	0.85	1.4	5.9	4.8	6.6
66C1 Firestone Steel -Mid (	000-030	28.5			1.2	2.5	2.7	1.8	0.8	3.1		4.4	0.8	0.91	2.1	3.7	4.5
	030-091	34.66			1.4	2.9	4.3	2.4	1	3.4		5	1.1	1.1	2.7	4.6	4.8
	091-104	85.51	0.73	1	3.6	8.6	11	7.6	3.5	9.3	0.92	11	1.2	2.7	2.4	9.3	13
50P Firestone lower	Ponar	204.2	2.9		4.3	17	28	12	4.6	18	1.9	38	2.7	7.9	2.1	32	35
MONGUAGON CREEK-UPSTREAM	000-030	13.4	<0.41	<0.41	<0.41	1.1	2.1	1.1	1	1.5	<0.41	2	<0.41	0.71	0.52	1.3	2.1
MONGUAGON CREEK-UPSTREAM	030-104	5.8	<0.36	<0.36	<0.36	0.51	0.8	0.4	0.4	0.7	<0.36	0.97	<0.36	<0.36	<0.36	0.81	1.1
MONGUAGON CREEK-UPSTREAM	104-142	7.3	<0.33	<0.33	<0.33	0.59	0.8	0.4	0.3	0.8	<0.33	1.2	<0.33	<0.33	0.54	1.2	1.4
MONGUAGON CREEK-UPSTREAM	000-030	8.8	<0.41	<0.41	<0.41	0.91	1.5	0.9	0.7	1	<0.41	1.3	<0.41	0.51	<0.41	0.81	1.3
MONGUAGON CREEK-UPSTREAM	030-076	9.1	<0.39	<0.39	<0.39	0.87	1.4	0.8	0.6	1	<0.39	1.5	<0.39	0.47	<0.39	0.98	1.5
MONGUAGON CREEK-UPSTREAM	076-150	2.7	<0.36	<0.36	<0.36	<0.36	0.5	<0.36	<0.3	0.4	<0.36	0.61	<0.36	<0.36	<0.36	0.5	0.85
MONGUAGON CREEK-UPSTREAM	150-190	3.4	<0.33	<0.33	<0.33	0.33	0.6	<0.33	<0.3	0.5	<0.33	0.66	<0.33	<0.33	<0.33	0.69	0.67
48E Monguagon Creek	Eckman	100.37		1.1	2.9	11	19	9.3	2.7	9.4	1.3	14	0.97	4.9	3.1	6.3	15
S5 - Monguagon Creek	Ponar	218.4															
FI - Fighting Island	Ponar	0															
25 C1 MNCK DNS-Nearshore	000-027	7.82	<0.33	<0.33	<0.33	0.77	0.8	0.9	0.5	0.9	<0.33	1.4	<0.33	0.47	<0.33	0.85	1.3
25 C1	027-051	8.39	<0.33	<0.33	<0.33	0.75	1.3	0.8	0.5	0.9	<0.33	1.5	<0.33	0.41	<0.33	0.85	1.4
25 C1	051-095	5.31	<0.33	<0.33	<0.33	0.62	0.9	0.6	0.4	0.7	<0.33	1.2	<0.33	<0.33	<0.33	0.73	1.2
25 C1	095-132	3.58	<0.33	<0.33	<0.33	0.39	0.4	<0.33	<0.3	0.4	<0.33	0.83	<0.33	<0.33	<0.33	0.53	0.99
21 C1 MNCK DNS-Offshore	000-027	0	<0.33	<0.33	<0.33	<0.33	0.3	<0.33	<0.3	<0.3	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
21 C1	027-051	0	<0.33	<0.33	<0.33	<0.33	0.3	<0.33	<0.3	<0.3	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
MONGUAGON CREEK-DOWN	000-150	9.1	<0.35	<0.35	<0.35	0.71	1.2	0.6	0.4	1	<0.35	1.5	<0.35	<0.35	0.53	1.4	1.7
MONGUAGON CREEK-DOWN	150-168	4.2	<0.33	<0.33	<0.33	0.36	0.6	<0.33	<0.3	0.5	<0.33	0.78	<0.33	<0.33	0.34	0.84	0.82
BLACK LAGOON-CENTER	000-030	7.5	<0.44	<0.44	<0.44	0.73	1.3	0.7	0.7	1	<0.44	1.2	<0.44	<0.44	<0.44	0.85	1.3
BLACK LAGOON-CENTER	030-120	10.9	<0.49	<0.49	<0.49	0.95	1.5	0.7	0.7	1.5	<0.49	1.8	< 49	<0.49	<0.49	1.8	2
BLACK LAGOON-CENTER	120-210	19.1	<0.42	<0.42	0.58	1.4	1.8	0.9	0.7	2.1	<0.42	3.1	0.63	0.48	0.8	3.2	3.5
BLACK LAGOON-CENTER	210-229	15.1	<0.33	<0.33	0.51	1.7	2.1	1.3	0.8	1.7	<0.33	2.4	<0.33	0.63	<0.33	1.4	2.6

			acenaphthene			benzo(a)anthracene			chrysene				indeno(1,2,3-cd)pyrene			
TRENTON CHANNEL PROJECT				acenaphthylene			benzo(b&k)fluoranthene			dibenzo(a,h)anthracene				naphthalene		
SEDIMENT CHEMISTRY RESULTS					anthracene			benzo(a)pyrene			fluoranthene				phenanthrene	
									benzo(g,h,i)perylene			fluorene				pyrene
EPM (Long and Morgan, 1990)		35														
			PAH SCAN													
SITE DESCRIPTION	Core Length		mg/kg d.w.													
	in cm	TOT PAHS	A1	A2	A3	B1	B2	B3	B4	C1	D1	F1	F2	I1	N1	P1	P2
BLACK LAGOON-LOWER	000-060	5.0	<0.40	<0.4	<0.4	0.46	0.7	<0.4	<0.4	0.7	<0.4	1.1	<0.4	<0.4	<0.4	1	1.1
BLACK LAGOON-LOWER	060-152	20.0	<0.33	<0.33	0.74	1.6	2.2	1.1	0.8	2.2	<0.33	3.3	0.51	0.65	0.8	2.6	3.5
BLACK LAGOON-LOWER	152-203	8.1	<0.33	<0.33	<0.33	0.69	1	0.5	0.4	1	<0.33	1.4	<0.33	<0.33	0.49	1	1.8
BLACK LAGOON-EAST	000-055	0.0	<0.33	<0.33	<0.33	<0.33	0.3	<0.33	<0.3	<0.3	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
BLACK LAGOON-EAST	055-103	0.0	<0.33	<0.33	<0.33	<0.33	0.3	<0.33	<0.3	<0.3	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
BLACK LAGOON-EAST	103-166	0.0	<0.33	<0.33	<0.33	<0.33	0.3	<0.33	<0.3	<0.3	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
BLACK LAGOON-EAST	166-229	0.0	<0.33	<0.33	<0.33	<0.33	0.3	<0.33	<0.3	<0.3	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
BLACK LAGOON-EAST	000-035	0.0	<0.33	<0.33	<0.33	<0.33	0.3	<0.33	<0.3	<0.3	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
BLACK LAGOON-EAST	035-133	0.0	<0.33	<0.33	<0.33	<0.33	0.3	<0.33	<0.3	<0.3	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
BLACK LAGOON-EAST	133-182	0.0	<0.33	<0.33	<0.33	<0.33	0.3	<0.33	<0.3	<0.3	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
24 C1 BLLG-Nearshore	000-030	9.09	<0.82	<0.82	<0.82	0.95	1.7	<0.82	0.8	1.2	<0.82	1.8	<0.82	<0.82	<0.82	0.92	1.7
24 C1 (WWES Lab)	030-075	3.24	<0.51	<0.51	<0.51	<0.51	0.7	<0.51	<0.5	<0.5	<0.51	0.94	<0.51	<0.51	<0.51	0.6	0.96
24 C1 BLLG-Nearshore (MDNR Lab)	030-075	3.02	<0.79	<0.78	<0.78	<0.78	<1.6	<1.6	<3.9	0.8	<3.9	1.1	<0.78	<3.9	<0.78	1.1	<0.78
47E BLLG	Eckman	14.97				1.4	2.3	1.5	1	1.7		1.9		1		1.4	2.8
S7 - Black Lagoon	Ponar	70.5															
40P East of Bouy N "6"	PONAR	7.38	<0.45	<0.45	<0.45	0.82	1.1	1.8	<2.3	1	<2.3	1.1	<0.45	<2.3	<0.45	0.5	1.1
41P NE of Bouy R "18"	PONAR	10.38	<0.46	<0.46	<0.46	0.91	1.8	1	0.6	1	<0.46	1.9	<0.46	0.5	<0.46	1.1	1.6
26P Riverside Hospital	PONAR	19.02	<0.4	<0.4	0.42	1.9	2.4	3.9	<2.0	2.6	<2.0	4.2	<0.4	1.7	<0.4	2	<0.4
27P Trenton Towers	PONAR	9	<0.65	<0.65	<0.65	1	<1.3	<1.3	<3.3	1.2	<3.3	1.2	<0.65	<3.3	<0.65	1.4	1.2
28P Deadhead Cove	PONAR	7.24	<0.5	<0.5	<0.5	1.1	<1	<1.0	<0.2	1.3	<2.5	1.7	<0.5	<2.5	0.44	1.2	1.5
28PC2	PONAR	8.54	<0.45	<0.45	<0.45	0.82	<.9	1.7	<2.3	1.6	<2.3	1.2	<0.45	<2.3	0.46	0.8	<0.45
ELIZABETH PARK CANAL	000-079	20.0	<0.363	0.36	0.42	2	1.9	1.2	0.8	2.8	<0.36	3.5	0.48	0.58	0.48	2.5	3.3
ELIZABETH PARK CANAL	079-180	31.9	<0.33	<0.33	1.1	3	3.8	2.2	1.4	3.8	<0.33	5.7	0.66	1	0.83	4	4.4
ELIZABETH PARK CANAL	180-260	51.5	0.42	<0.33	2.7	4.5	5.2	3.6	1.9	4.9	<0.33	8.6	1.3	1.4	1	8	7.8
ELIZABETH PARK CANAL	260-330	56.8	<1.65	<1.65	3	5.4	6	4	2.6	6.2	<1.65	8	1.7	1.9	<1.65	8	10
15 C1 EPNC-Upper	000-080	23.24	0.36	<0.33	0.58	3.1	2.5	<0.33	<0.3	5.2	<0.33	3.4	<0.33	<0.33	<0.33	2.8	5.3
16 C1	080-120	20.62	0.35	<0.34	0.83	2.1	2	<0.34	<0.3	2.4	<0.34	3.9	0.37	0.5	0.77	3.2	4.2
16 C1	120-157	34.99	0.39	<0.33	1	3.8	3.4	2.3	<0.3	4.6	<0.33	5.1	<0.33	0.99	0.61	5.8	7
17 C1 EPNC-Inner	000-040	27.87	<0.33	<0.33	0.7	3.5	2.7	2.2	1.1	5.7	<0.33	3.3	<0.33	0.77	<0.33	2.1	5.8
17 C1	040-080	31.8	<0.33	<0.33	1.3	3.8	4	1.9	1.6	4	<0.33	5.3	<0.33	1.2	<0.33	3.1	5.6
17 C1	080-140	49.62	0.51	<0.33	2.5	6.1	6.2	2.7	<0.3	5.9	<0.33	7.7	0.61	1.8	<0.33	5.6	10
17 C1	140-175	33.83	0.33	<0.33	2.1	2.8	3.6	1.6	1.4	3.2	<0.33	5.2	<0.33	1	<0.33	5.9	8
18 C1 EPNC-Lower	000-055	28.29	<0.38	<0.38	0.82	2.9	2.7	1.9	0.9	3.8	0.38	4.5	0.41	0.82	0.47	3.3	5.4
18 C1	055-125	12.86	<0.35	<0.35	<0.35	1.4	1.3	0.8	0.5	1.7	<0.35	2.3	<0.35	0.36	0.35	1.6	2.6
18 C1	125-170	29.39	<0.33	<0.33	0.82	3.1	3.3	2.3	1.3	3.6	0.44	4.6	0.38	1	0.35	3.1	5.1
18 C1	170-217	45.23	<0.33	<0.33	2	5.5	4.3	3.8	1.8	5.3	0.58	8.3	0.45	1.4	<0.33	4.3	9.5
46E EPNC	Eckman	27.17			0.67	2.3	4.6	2.4	1	3.1		3.1		1.6	1.1	2.8	4.5
29P EPC Bridge 1	PONAR	0	<1.1	<1.1	<1.1	<1.1	<2.2	<2.2	<5.5	<1.1	<5.5	<1.1	<1.1	<5.5	<1.1	<1.1	<1.1
30P EPC Bridge 2	PONAR	0.64	<0.38	<0.38	<0.38	<0.38	0.7	<0.75	<1.9	<0.3	<1.9	0.34	<0.38	<1.9	<0.38	<0.38	0.3

TRENTON CHANNEL PROJECT			acenaphthene			benzo(a)anthracene			chrysene				indendo(1,2,3-cd)pyrene			
SEDIMENT CHEMISTRY RESULTS			acenaphthylene			benzo(b&k)fluoranthene			dibenzo(a,h)anthracene				napthalene			
					anthracene			benzo(a)pyrene			fluoranthene				phenanthrene	
EPM (Long and Morgan, 1990)		35							benzo(g,h,i)perylene			fluorene				pyrene
			PAH SCAN													
SITE DESCRIPTION	core Length		mg/kg d.w.													
	in cm	TOT PAHS	A1	A2	A3	B1	B2	B3	B4	C1	D1	F1	F2	I1	N1	P1	P2
31P EPC Bridge 3	PONAR	10.3	<0.5	<0.5	<0.5	2	<1	<1.0	<2.5	3.4	<2.5	1.7	<0.5	<2.5	<0.5	1	2.2
32P EPC Bridge 4	PONAR	8.1	<0.83	<0.83	<0.83	1.3	<1.7	<1.7	<.41	1.9	<4.1	1.9	< 83	<4.1	<0.83	1.1	1.9
33P EPC Bridge 5	PONAR	14.8	<0.48	<0.48	0.42	2.4	<.95	<0.95	<2.4	3.1	<2.4	3.4	<0.48	<2.4	<0.48	2	3.2
EP MARINA-OUTSIDE	000-020	0.0	<0.33	<0.33	<0.33	<0.33	0.3	<0.33	<0.3	<0.3	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
EP MARINA-UPLAnd	000-006	0.0	<0.33	<0.33	<0.33	<0.33	0.3	<0.33	<0.3	<0.3	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
EP MARINA-RIVER BED UP.	000-010	8.3	<1.65	<1.65	<1.65	<1.65	2	<1.65	<1.6	2	<1.65	2	<1.65	<1.65	<1.65	<1.65	2.3
EP MARINA-RIVER BED UP.	010-020	19.7	<0.33	<0.33	0.44	2.2	2.6	1.6	1.3	3.6	<0.33	2.8	0.46	0.49	0.59	<0.33	3.6
EP MARINA-RIVER BED UP.	020-028	18.2	<0.33	<0.33	0.76	1.9	2.2	1.3	1.1	2.7	<0.33	2.7	<0.33	0.58	<0.33	2	3
EP MARINA-RIVER BED UP.	028-038	6.2	<0.66	<0.66	<0.66	0.66	1.1	<0.66	<0.6	1.1	<0.66	1.1	<0.66	<0.66	<0.66	0.98	1.3
EP MARINA-RIVER BED DN.	000-013	38.5	<0.66	<0.66	0.74	3.6	7.1	4.3	3.2	5.2	<0.66	4.5	<0.66	2.5	<0.66	2.2	5.2
EP MARINA-RIVER BED DN.	013-018	35.3	<0.66	<0.66	0.67	3.5	6.5	4	3	4.3	<0.66	3.8	<0.66	2.3	<0.66	2	4.6
EP1 - North Marina	Ponar	45.4															
EP2 - Mid Marina	Ponar	35.8															
EP3 - South Marina	Ponar	66.1															
EPN (new site)	Ponar	12.62				1.4	1.5	2.3		2		1.8				1.9	1.7
EPM-N	Eckman	3.02								1		0.92					1.1
S11-EPM Upland	Ponar	9.16				1.1	1.1	1.6		1.6		1.2				0.95	1.6
S11D- EPM Upland Dup.	Ponar	8.36				0.98	1	1.4		1.4		1.2				0.94	1.4
EPM-1 (S11-EPM Upland)	Eckman	2.19								0.7		0.69					0.81
S12-EPM Mid	Ponar	20.73			0.53	2.6	2.7	4.1		3.8		2.4				2	2.6
EPM-2 (S12-EPM Mid)	Eckman	14.54				1.2	2.6	1.6	1.2	1.8		1.8		0.94		1.2	2.2
S13-EPM South	Ponar	18.19			0.42	2.2	2.1	2.9	1.5	3.7		1.6				1.5	2.3
EPM-3 (S13-EPM South)	Eckman	33.11			0.56	2.8	6.4	4.4	3.3	3.7	0.67	2.7		2.8	0.48	1.6	3.7
34P EPSC DOCK	PONAR	13	<0.6	<0.6	<0.6	2	<1.2	3.2	<3.0	2.8	<3.0	3	<0.6	<3.0	<0.6	2	<0.6
35P EPSC-Inlet	PONAR	13.3	<0.55	<0.55	<0.55	1.9	<1.1	3.5	<2.8	2.6	<2.8	2.8	<0.55	<2.8	0.8	1.9	<0.55
35PC2	PONAR	13.84	<0.5	<0.5	<0.5	2	<1.0	3.8	<2.5	2.6	<2.5	3.2	<0.5	<2.5	0.54	1.7	<0.5
20 C1 EPSC-Inlet	000-083	22.21	<0.33	<0.33	<0.33	2.6	2.6	2	1.4	4.3	0.45	2.4	<0.33	0.66	<0.33	1.8	4
20 C1	083-088	34.75	<0.33	<0.33	0.48	4.5	3.7	3	2	6.7	<0.33	3.8	0.46	0.91	<0.33	2.9	6.3
49E EPSC	Eckman	15.5					3.1	1.8		2.5		2.6				1.9	3.6
36P Monsanto Lagoon	PONAR	8.35	<0.39	<0.39	<0.39	1	1.2	0.9	0.6	1.9	<0.39	1.1	<0.39	<0.39	<0.39	<0.39	1.7
19 C1 Monsanto Bay	000-053	15.57	<0.33	<0.33	<0.33	2	1.9	1.4	0.8	2.7	<0.33	2.3	<0.33	0.5	<0.33	1.1	3
19 C1	053-086	17.22	<0.33	<0.33	0.49	1.9	2.5	1.7	1.2	2.3	<0.33	2.5	<0.33	0.83	<0.33	1.2	2.6
19 C2 Monsanto Bay	000-051	13.64	<0.33	<0.33	<0.33	1.5	1.7	1.1	0.9	2.2	<0.33	2	<0.33	0.49	<0.33	1.2	2.52
19 C2	051-095	22.4	<0.33	<0.33	0.75	2.2	2.7	1.9	1.3	2.8	0.41	3.5	<0.33	0.94	<0.33	2.1	3.8
CHRYSLER BAY-INNER	000-030	0.0	<0.66	<0.66	<0.66	<0.66	0.6	<0.66	<0.6	<0.6	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66
CHRYSLER BAY-INNER	030-058	0.0	<0.33	<0.33	<0.33	<0.33	0.3	<0.33	<0.3	<0.3	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
CHRYSLER BAY-INNER	058-079	0.0	<0.33	<0.33	<0.33	<0.33	0.3	<0.33	<0.3	<0.3	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
CHRYSLER BAY-OUTER	000-013	29.9	<0.33	<0.33	0.64	4	5.7	3.1	1.1	3	0.89	3.6	<0.33	2	<0.33	1.9	4
CHRYSLER BAY-OUTER	013-061	0.0	<0.33	<0.33	<0.33	<0.33	0.3	<0.33	<0.3	<0.3	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
37P Chry Bay Marsh Inlet	PONAR	0	<0.4	<0.4	<0.4	<0.4	<0.8	<0.8	<2.0	<0.4	<2.0	<0.4	<0.4	<2.0	<0.4	<0.4	<0.4
38P Swan Island-North	PONAR	9.9	<0.40	<0.40	<0.40	0.98	1.9	1.4	0.8	1.1	<0.40	1.4	<0.40	0.84	<0.40	0.42	1.3
38P Above Humbug Marina	PONAR	0	<0.66	<0.66	<0.66	<0.66	0.6	<0.66	<0.6	<0.6	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66
39 - Chrysler Bay	Ponar	24.3															
CELERON ISLAnd	000-043	3.0	<0.33	<0.33	<0.33	0.46	0.7	0.5	<0.3	0.4	<0.33	0.44	<0.33	<0.33	<0.33	<0.33	0.56
CELERON ISLAnd	043-074	0.0	<0.33	<0.33	<0.33	<0.33	0.3	<0.33	<0.3	<0.3	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
CELERON ISLAnd	074-157	0.0	<0.33	<0.33	<0.33	<0.33	0.3	<0.33	<0.3	<0.3	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33

TRENTON CHANNEL PROJECT			
SEDIMENT CHEMISTRY RESULTS			
SEL (Persaud et. al. OME, 1993)		1500	
SITE DESCRIPTION	CORE LENGTH	OIL & GREASE	
	cm	mg/kg d.w.	
55C1 Allied Oil Slip NW	000-030	42000	
	030-091	40000	
	091-152	46000	
	152-218	54000	
55C2 Allied Oil Slip NW	000-030	36000	
	030-091	38000	
	091-147	36000	
56C1 Nickelson South Sli	000-030	64000	
	030-043	66000	
56C2 Nickelson South Slip	000-030	71000	
	030-091	<50	
	091-152	11000	
	152-201	11000	
59C1 Stenson Club	000-030	26000	
	030-091	25000	
	091-152	24000	
	152-213	7000	
	213-224	4000	
64P Mud Island Northside	Ponar	<50	
65P Mud Island SW	Ponar	2760	
60C1 Mud Island -South s	000-030	1200	
	030-091	<50	
	091-137	<50	
53C1 Grassy Island NW	000-030	<50	
	030-071	<50	
54C1 Grassy Island NE	000-034	<50	
63P Grassy Island W	Ponar	1400	
61P Grassy Isalnd SW	Ponar	2200	
62P Grassy Island SE	Ponar	1900	
57P Mouth of Ecorse Cree	Ponar	8000	
58C1 Mouth of Ecorse Cre	000-030	<50	
52C1 BASF Northworks lowe	000-030	11000	
	030-091	10000	
	091-152	8000	
	152-213	4000	
	213-218	0	

TRENTON CHANNEL PROJECT			
SEDIMENT CHEMISTRY RESULTS			
SEL (Persaud et. al. OME, 1993)		1500	
SITE DESCRIPTION	CORE LENGTH	OIL & GREASE	
	cm	mg/kg d.w.	
69C1 Wyandotte Yatch Cl	000-030	9000	
	030-066	9000	
68P N of Pt. Hennepin	Ponar	<50	
68E N of Pt. Hennepin	Eckman	<50	
67C1 Portofino	000-030	7000	
43P Portofino Slip	PONAR	1390	
42P Pt. Hennepin	PONAR	367	
15 C1 T.C. North Marsh	000-022	<50	
15 C1	022-062	<50	
15 C1	062-100	<50	
51 C 1 Firestone upper	000-030	11000	
	030-091	19000	
	091-152	16000	
	152-194	15000	
66C1 Firestone Steel -M	000-030	21000	
	030-091	13000	
	091-104	12000	
45P Firestone Steel	PONAR	8410	
	PONAR		
50P Firestone lower	Ponar	9000	
MONGUAGON CREEK-UPSTREAM	000-030	7290	
MONGUAGON CREEK-UPSTREAM	030-104	41200	
MONGUAGON CREEK-UPSTREAM	104-142	23500	
MONGUAGON CREEK-UPSTREAM	000-030	3630	
MONGUAGON CREEK-UPSTREAM	030-076	21600	
MONGUAGON CREEK-UPSTREAM	076-150	21600	
MONGUAGON CREEK-UPSTREAM	150-180	12400	
48E Monguagon Creek	Eckman	9000	
S5 - Monguagon Creek	Ponar	5800	
FI - Fighting Island	Ponar	200	
25 C1 MNCK DNS-Nearshor	000-027	1110	
25 C1	027-051	120	
25 C1	051-095	444	
25 C1	095-132	887	
21 C1 MNCK DNS-Offshore	000-027	<50	
21 C1	027-051	<50	
MONGUAGON CREEK-DOWN	000-150	3930	
MONGUAGON CREEK-DOWN	150-168	7640	
BLACK LAGOON-CENTER	000-030	6450	
BLACK LAGOON-CENTER	030-120	19700	
BLACK LAGOON-CENTER	120-210	8950	
BLACK LAGOON-CENTER	210-229	2970	

TRENTON CHANNEL PROJECT		
SEDIMENT CHEMISTRY RESULTS		
SEL (Persaud et. al. OME, 1993)		1500
SITE DESCRIPTION	CORE LENGTH	OIL & GREASE
	cm	mg/kg d.w.
BLACK LAGOON-LOWER	000-060	8600
BLACK LAGOON-LOWER	060-152	4330
BLACK LAGOON-LOWER	152-203	2340
BLACK LAGOON-EAST	000-055	<50
BLACK LAGOON-EAST	055-103	<50
BLACK LAGOON-EAST	103-166	<50
BLACK LAGOON-EAST	166-229	<50
BLACK LAGOON-EAST	000-035	<50
BLACK LAGOON-EAST	035-133	<50
BLACK LAGOON-EAST	133-182	<50
24 C1 BLLG-Nearshore	000-030	7000
24 C1 (WWES Lab)	030-075	3550
47E BLLG	Eckman	10000
S7 - Black Lagoon	Ponar	11000
40P East of Bouy N "6"	PONAR	nm
41P NE of Bouy R "18"	PONAR	367
44P DNS from Bouy R "28"	PONAR	nm
26P Riverside Hospital	PONAR	nm
27P Trenton Towers	PONAR	nm
28P Deadhead Cove	PONAR	nm
28PC2	PONAR	nm
ELIZABETH PARK CANAL	000-079	26200
ELIZABETH PARK CANAL	079-180	11500
ELIZABETH PARK CANAL	180-260	13700
ELIZABETH PARK CANAL	260-330	6890
16 C1 EPNC-Upper	000-080	1360
16 C1	080-120	1240
16 C1	120-157	1490
17 C1 EPNC-Inner	000-040	2180
17 C1	040-080	1120
17 C1	080-140	1380
17 C1	140-175	116
18 C1 EPNC-Lower	000-055	2040
18 C1	055-125	813
18 C1	125-170	10100
18 C1	170-217	3290
46E EPNC	Eckman	2400
29P EPC Bridge 1	PONAR	nm
30P EPC Bridge 2	PONAR	nm

TRENTON CHANNEL PROJECT			
SEDIMENT CHEMISTRY RESULTS			
SEL (Persaud et. al. OME, 1993)		1500	
SITE DESCRIPTION	CORE LENGTH	OIL & GREASE	
	cm	mg/kg d.w	
31P EPC Bridge 3	PONAR	nm	
32P EPC Bridge 4	PONAR	nm	
33P EPC Bridge 5	PONAR	nm	
EP MARINA - OUTSIDE	000-020	<50	
EP MARINA-UPLAnd	000-006	<50	
EP MARINA-RIVER BED UP.	000-010	6850	
EP MARINA-RIVER BED UP.	010-020	11500	
EP MARINA-RIVER BED UP.	020-028	14700	
EP MARINA-RIVER BED UP.	028-038	772	
EP MARINA-RIVER BED DN.	000-013	4480	
EP MARINA-RIVER BED DN.	013-018	1990	
EP1 - North Marina	Ponar	3300	
EP2 - Mid Marina	Ponar	8900	
EP3 - South Marina	Ponar	5100	
EPN (new site)	Ponar	nm	
EPM-N	Eckman	nm	
S11-EPM Upland	Ponar	nm	
S11D- EPM Upland Dup.	Ponar	nm	
EPM-1 (S11-EPM Upland)	Eckman	nm	
S12-EPM Mid	Ponar	nm	
EPM-2 (S12-EPM Mid)	Eckman	nm	
EPM2-dup (S12- EPM Upla	Eckman	nm	
S13-EPM South	Ponar	nm	
EPM-3 (S13-EPM South)	Eckman	nm	
34P EPSC DOCK	PONAR	nm	
35P EPSC-Inlet	PONAR	nm	
35PC2	PONAR	nm	
20 C1 EPSC-Inlet	000-083	1620	
20 C1	083-088	1890	
49E EPSC	Eckman	10000	
36P Monsanto Lagoon	PONAR	1320	
19 C1 Monsanto Bay	000-053	2150	
19 C1	053-085	1380	
19 C2 Monsanto Bay	000-051	2780	
19 C2	051-085	3010	
CHRYSLER BAY-INNER	000-030	<50	
CHRYSLER BAY-INNER	030-058	<50	
CHRYSLER BAY-INNER	058-079	<50	
CHRYSLER BAY-OUTER	000-013	348	
CHRYSLER BAY-OUTER	013-061	<50	
37P Chry Bay Marsh Inlet	PONAR	nm	
39P Swan Island-North	PONAR	454	
38P Above Humbug Marina	PONAR	238	
S9 - Chrysler Bay	Ponar	2000	
CELERON Island	000-043	<50	
CELERON Island	043-074	<50	
CELERON Island	074-107	<50	

grain size

TRENTON CHANNEL PROJECT		SIEVE						HYDROMETER			ATTERBERG LIMITS		
SEDIMENT CHEMISTRY RESULTS		% PASSING						%PASSING	FINE				
SITE DESCRIPTION	Core length	GRAVEL	GRAVEL	MED SAND	FINE SAND	FINE SAND	VF SAND	SILT	SILT	CLAY			
	cm	4.75mm	2	0.5	0.25	0.125	0.075	0.05	0.005	0.002	LIQUID LIM	PLASTIC LIM	PLASTICITY INDEX
43P Portofino Slip	PONAR	67.5	60.2	50.3	44.3	41.9	19.5	12.8					
42P Pt Hennepin	PONAR	30.3	54.9	42.5	33.5	30	13.8	10					
15 C1 T.C. North Marsh	000-022	98.1	95.7	86.6	79.4	77.1	41	28.8					
15 C1	022-062	99.2	98.8	98	96.7	94.5	51	38.5					
15 C1	062-100	99	97.6	95	93	90	59	53.5					
45P Firestone Steel	PONAR	34.3	30.5	79.7	59.7	54.5	20.5	12.5					
MONGUAGON CREEK-UPSTREAM	000-030	100	100	99.9	98.7	94.6	34.7	73.5	29.5	16.1	63.1	33.1	30.1
MONGUAGON CREEK-UPSTREAM	030-104	100	99.5	95.5	94.8	92.7	59.3	65	43.5	27.2	67.4	40.7	26.7
MONGUAGON CREEK-UPSTREAM	104-142	97	94.3	90.7	59.1	56.9	84.3	80	45	26	63.9	36.3	27.6
MONGUAGON CREEK-UPSTREAM	000-030	100	99.8	98.5	97.4	91.8	78.3	67.2	24.5	14.5	59.7	33	26.6
MONGUAGON CREEK-UPSTREAM	030-076	100	99.9	99	97.8	92.4	84.4	72.2	25.5	14.2	63.1	33	63.5
MONGUAGON CREEK-UPSTREAM	076-150	100	99.8	98.5	98	96.9	94.9	90.9	45.9	22	70.5	37	33.4
MONGUAGON CREEK-UPSTREAM	150-180	59	56.2	42.1	39.1	36.8	35.1	30.5	10.9	6	62.5	36.2	26.3
25 C1 MNCK DNS-Nearshore	000-027	99.5	98.6	95.4	37.7	64.7	60.7	50.6					
25 C1	027-051	100	99.3	97.1	31.9	73.8	68.8	57.7					
25 C1	051-095	99.8	99.2	96.8	90.9	73	82.8	51.7					
25 C1	095-132	99.5	99.4	98.4	95.3	87.6	60.4	49.1					
21 C1 MNCK DNS-Offshore	000-027	94.6	77.9	68.8	63.5	58.9	33.8	22.5					
21 C1	027-051	50.3	71	60.4	54	50	27	19					
MONGUAGON CREEK-DOWN	000-150	100	100	99.7	99.4	98	95.8	90.1	45.5	28	71.4	37.4	34
MONGUAGON CREEK-DOWN	150-168	100	100	99.6	99.3	98.1	95.5	88.5	46.9	26.9	68.4	38.5	29.9
BLACK LAGOON-CENTER	000-030	100	99.9	98.9	98.2	96.9	93	86.1	14.2	5.5	62.5	37.6	24.9
BLACK LAGOON-CENTER	030-120	100	99.9	83.9	82.3	82.1	81.9	68	13	3.5	73.7	50.6	23.1
BLACK LAGOON-CENTER	120-210	100	100	93.9	93.5	93.3	92.7	84.5	18.5	4	67.7	45	22.7
BLACK LAGOON-CENTER	210-229	99.9	99.6	89.7	76.5	45.6	39	29	13.5	7			NONPLASTIC
BLACK LAGOON-LOWER	000-060	100	100	98.3	95.7	94.5	90.7	78.1	14.5	4	58.7	43.5	15.2
BLACK LAGOON-LOWER	060-152	100	100	99.9	99.7	98	93.9	81	34.5	16	59	39.5	19.5
BLACK LAGOON-LOWER	152-203	100	100	98.5	96.9	93.4	87.5	84.2	47.8	23	54.5	42.5	12
BLACK LAGOON-EAST	000-055	99.7	99.2	92.8	57.7	53.8	34.5	25.5	7.5	4.1			NONPLASTIC
BLACK LAGOON-EAST	055-103	100	99.8	97.6	59.9	50	28.7	23.5	7.2	6			NONPLASTIC
BLACK LAGOON-EAST	103-166	99.6	99.3	97.7	94.2	62.1	34.7	25	9.8	6.5			NONPLASTIC
BLACK LAGOON-EAST	166-229	99.9	99.7	98.6	94	55.6	35.9	25.5	10.5	7.5			NONPLASTIC
BLACK LAGOON-EAST	000-035	99.3	98.6	97.3	93.4	58	38	27	8.9	6.9			
BLACK LAGOON-EAST	035-133	99.9	99.6	97.6	91.6	55.6	32.3	23	9	7.5			NONPLASTIC
BLACK LAGOON-EAST	133-182	100	99.9	99.6	96.4	49	32.9	25	7.9	5.9			NONPLASTIC
24 C1 BLLG-Nearshore	000-030	98.5	97.8	96.5	93.5	86.5	17.9	10					NONPLASTIC
24 C1 (WWES Lab)	030-075	99.7	99.6	99.5	99.3	52	19	6.5					
41P NE of Bouy R "18"	PONAR	97.5	35.2	59.4	75.2	70	22.5	12.2					

grain size

TRENTON CHANNEL PROJECT		SIEVE					HYDROMETER				ATTERBERG LIMITS		
SEDIMENT CHEMISTRY RESULTS		% PASSING						%PASSING FINE					
SITE DESCRIPTION	Core length	GRAVEL	GRAVEL	MED SAND	FINE SAND	FINE SAND	VF SAND	SILT	SILT	CLAY			
	cm	4.75mm	2	0.5	0.25	0.125	0.075	0.05	0.005	0.002	LIQUID LIM.	PLASTIC LIM.	PLASTICITY INDE
ELIZABETH PARK CANAL	000-079	99.8	99.7	99.1	98.5	96.6	93.3	88.5	42	23	63.1	39.6	23.5
ELIZABETH PARK CANAL	079-160	100	100	99.7	99.4	98.4	95.5	89	40.8	21.5	55.4	35.5	20
ELIZABETH PARK CANAL	150-260	100	100	99.9	99.7	99.4	98	94	45.5	27	59.4	38.6	20.7
ELIZABETH PARK CANAL	260-330	100	100	99.9	99.9	99.8	98.9	95	39.5	25	58.5	38.4	20.1
16 C1 EPNC-Upper	000-080	98.1	96.3	59.7	78.9	71.8	27	14.8					
16 C1	080-120	94.5	93.1	90.5	86.9	82	30	15					
16 C1	120-157	99.1	98.5	97.4	95.7	90	33.5	15					
17 C1 EPNC-Inner	000-040	94.9	94.1	92.1	86.1	82	33.9	17					
17 C1	040-080	99.2	98.3	96.5	92	82	27	14.6					
17 C1	080-140	98.8	98.2	96.8	93.9	86	28	11.9					
17 C1	140-175	98.1	97.4	96.5	95	87.5	41.5	27.5					
18 C1 EPNC-Lower	000-055	98.7	97.2	92.2	85.6	79.1	31.9	16.7					
18 C1	055-125	98	97	94.7	91.5	84.8	36.2	20.2					
18 C1	125-170	99	96.6	91	81.5	73.2	28.5	17					
18 C1	170-217	99.2	97.6	92.7	84.4	77.5	29.2	19					
20 C1 EPSC-Inlet	000-083	99.3	97.8	95.1	90.8	83.5	23	11					
20 C1	083-088												
36P Monsanto Lagoon	PONAR	96	92.3	86.7	82.4	77.5	8.2	5.9					
19 C1 Monsanto Bay	000-053	97.3	94.9	90.1	82	70.8	14.2	5.8					
19 C1	053-085	98.5	94.5	78.2	54.2	39	8.5	3.8					
19 C2 Monsanto Bay	000-051	95.6	93	88.1	80	68.9	15	5.5					
19 C2	051-085	98.1	93.4	75.5	51.6	34	7	2.9					
CHRYSLER BAY-INNER	000-030												
CHRYSLER BAY-INNER	030-058	99.3	98.3	94.4	88.1	77.4	70.6	63.9	43.5	33.1	45.3	19.7	25.6
CHRYSLER BAY-INNER	058-079	98.7	96.8	92.2	84.9	73.3	56	59.5	38	28.9	34.7	16.1	18.6
CHRYSLER BAY-OUTER	000-013												
CHRYSLER BAY-OUTER	013-061	96.7	95.1	90	84.7	77.1	72.6	68.5	45.5	38	43.9	19.1	24.9
39P Swan Island-North	PONAR	98.6	96.6	88.5	70.7	64.2	21	12.5					
38P Above Humbug Marina	PONAR	95.2	91	84.3	76.8	65.5	13.5	7.9					
CELERON ISLAND	000-043	98.2	96.1	84.7	51.1	48.8	46.8	41.5	17.9	12.9			NONPLASTIC
CELERON ISLAND	043-074	97.3	94.6	88	74.4	62.2	58	53.1	37.1	31.1	51	22.7	28.3
CELERON ISLAND	074-107	88.4	84.5	76.7	68.2	57.2	52.1	51.5	24.5	19	30.3	15.3	15

TRENTON CHANNEL PROJECT				SEM:AVS>1	
SEDIMENT CHEMISTRY RESULTS				Metals	Sulfide
		AVS/SEM ANALYSIS		Presumed	bufferring
SITE DESCRIPTION				Available	capacity
	Core				
	length	umol/g	umol/g		umol/g
	in cm	TOTAL METALS	SULFIDE	SEM:AVS	AVS-SEM
43P Portofino Slip	PONAR	100.6	5.5	18.3	
42P Pt. Hennepin	PONAR	49.8	6	8.3	
15 C1 T.C. North Marsh	000-022	88.3	3.8	23.2	
15 C1	022-062	93.7	<0.05		
15 C1	062-100	118.9	<0.05		
45P Firestone Steel	PONAR	302.4	73	4.1	
MONGUAGON CREEK-UPSTREAM	000-030	12.3	356.8	0.03	344.5
MONGUAGON CREEK-UPSTREAM	030-104	34.8	448.9	0.08	414.1
MONGUAGON CREEK-UPSTREAM	104-142	21.8	349.0	0.06	327.2
MONGUAGON CREEK-UPSTREAM	000-030	10.9	299.1	0.04	288.2
MONGUAGON CREEK-UPSTREAM	030-076	16.3	316.9	0.05	300.6
MONGUAGON CREEK-UPSTREAM	076-150	30.0	236.1	0.13	206.1
MONGUAGON CREEK-UPSTREAM	150-180	10.9	215.5	0.05	204.6
S5 - Monguagon Creek	Ponar	11.59	10.8	1.07	
FI - Fighting Island	Ponar	1.02	0.39	2.61	
25 C1 MNCK DNS-Nearshore	000-027	145.05	7	20.7	
25 C1	027-051	175.83	4.3	40.9	
25 C1	051-095	225.12	9.7	23.2	
25 C1	095-132	386.88	6	64.5	
21 C1 MNCK DNS-Offshore	000-027	94	<0.05		
21 C1	027-051	64.7	0.97	66.7	
MONGUAGON CREEK-DOWN	000-150	29.3	211.9	0.14	182.6
MONGUAGON CREEK-DOWN	150-168	33.0	142.5	0.23	109.5
BLACK LAGOON-CENTER	000-030	43.5	1189.0	0.04	1145.5
BLACK LAGOON-CENTER	030-120	31.3	719.1	0.04	687.8
BLACK LAGOON-CENTER	120-210	23.3	234.5	0.10	211.2
BLACK LAGOON-CENTER	210-229	5.4	88.6	0.06	83.2
BLACK LAGOON-LOWER	000-060	32.1	136.4	0.24	104.3
BLACK LAGOON-LOWER	060-152	16.1	128.4	0.13	112.3
BLACK LAGOON-LOWER	152-203	12.8	138.1	0.09	125.3
BLACK LAGOON-EAST	000-055	0.8	8.5	0.09	7.7
BLACK LAGOON-EAST	055-103	0.4	8.8	0.05	8.4
BLACK LAGOON-EAST	103-166	0.5	8.8	0.06	8.3
BLACK LAGOON-EAST	166-229	0.5	0.4	1.25	-0.1
BLACK LAGOON-EAST	000-035	0.5	7.3	0.07	6.8
BLACK LAGOON-EAST	035-133	0.5	4.7	0.11	4.2
BLACK LAGOON-EAST	133-182	0.5	1.3	0.38	0.8
24 C1 BLLG-Nearshore	000-030	252.8	55	4.6	
24 C1 (WWES Lab)	030-075	646.7	409	1.6	
S7 - Black Lagoon	Ponar	20.16	18.1	1.11	

TRENTON CHANNEL PROJECT				SEM:AVS>1	
SEDIMENT CHEMISTRY RESULTS				Metals	Sulfide
		AVS/SEM ANALYSIS		Presumed	buffering
SITE DESCRIPTION				Available	capacity
	Core				
	length	umol/g	umol/g		umol/g
	in cm	TOTAL METALS	SULFIDE	SEM:AVS	AVS-SEM
41P NE of Bouy R "18"	PONAR	82.6	25	3.3	
ELIZABETH PARK CANAL	000-079	19.2	470.2	0.04	451.0
ELIZABETH PARK CANAL	079-180	17.0	135.5	0.13	118.5
ELIZABETH PARK CANAL	180-260	10.8	131.7	0.08	120.9
ELIZABETH PARK CANAL	260-330	14.1	167.5	0.08	153.4
16 C1 EPNC-Upper	000-080	200.4	11	18.2	
16 C1	080-120	171.3	30	5.7	
16 C1	120-157	296.4	5.9	50.2	
17 C1 EPNC-Inner	000-040	169.3	9.7	17.5	
17 C1	040-080	182.5	14	13.0	
17 C1	080-140	180	6.6	27.3	
17 C1	140-175	111.3	6.9	16.1	
18 C1 EPNC-Lower	000-055	198.5	8.6	23.1	
18 C1	055-125	169.6	7.5	22.6	
18 C1	125-170	170.5	12	14.2	
18 C1	170-217	109.1	5.2	21.0	
EP1 - North Marina	Ponar	7.31	4.4	1.66	
EP2 - Mid Marina	Ponar	11.25	6.04	1.84	
EP3 - South Marina	Ponar	8.79	4.19	2.1	
20 C1 EPSC-Inlet	000-083	253.68	16	15.9	
20 C1	083-088				
36P Monsanto Lagoon	PONAR	318.2	4.8	66.3	
19 C1 Monsanto Bay	000-053	277.8	12	221.9	
19 C1	053-085	201.1	7.9	25.5	
19 C2 Monsanto Bay	000-051	274.6	11	25.0	
19 C2	051-085	217.5	8.2	26.5	
CHRYSLER BAY-INNER	000-030	7.7	30.0	0.26	22.3
CHRYSLER BAY-INNER	030-058	1.5	1.1	1.36	-0.4
CHRYSLER BAY-INNER	058-079	1.5	2.3	0.65	0.8
CHRYSLER BAY-OUTER	000-013				
CHRYSLER BAY-OUTER	013-061	1.6	7.7	0.21	6.1
39P Swan Island-North	PONAR	59.4	12	5.0	
38P Above Humbug Marina	PONAR	70.3	11	6.4	
S9 - Chrysler Bay	Ponar	11.87	2.37	5.01	
CELERON ISLAND	000-043	3.7	49.5	0.07	45.8
CELERON ISLAND	043-074	1.1	1.9	0.58	0.8
CELERON ISLAND	074-107	1.1	1.4	0.79	0.3

TRENTON CHANNEL PROJECT		%TOTAL ORG.	DENSITY	DENSITY
SEDIMENT CHEMISTRY RESUL	Core length	CARBON	LB/FT3	LB/FT3
	cm	DRY BASIS	WET	DRY
SEL (Persaud et. al. OME, 1993)		10		
55C1 Allied Oil Slip NW	000-030	2.9		
	030-091	3.2		
	091-152	3.4		
	152-218	2		
55C2 Allied Oil Slip NW	000-030	3		
	030-091	2.1		
	091-147	2.1		
56C1 Nickelson South Sl	000-030	2		
	030-043	1.7		
56C2 Nickelson South Sli	000-030	3		
	030-091	1.9		
	091-152	1.9		
	152-201	1.7		
59C1 Stenson Club	000-030	3.4		
	030-091	2.6		
	091-152	2.2		
	152-213	2.7		
	213-224	2		
64P Mud Island Northsid	Ponar	2.2		
65P Mud Island SW	Ponar	1.7		
60C1 Mud Island -South	000-030	2.2		
	030-091	2.3		
	091-137	2		
53C1 Grassy Island NW	000-030	3		
	030-071	0.74		
54C1 Grassy Island NE	000-034	1.8		
63P Grassy Island W	Ponar	2		
61P Grassy Isalnd SW	Ponar	1.6		
62P Grassy Island SE	Ponar	2.5		
57P Mouth of Ecorse Cre	Ponar	3		
58C1 Mouth of Ecorse Cr	000-030	1.1		
52C1 BASF Northworks low	000-030	1.3		
	030-091	1.6		
	091-152	3.2		
	152-213	1		
	213-218	0.9		

toc, density

TRENTON CHANNEL PROJECT		%TOTAL ORG.	DENSITY	DENSITY
SEDIMENT CHEMISTRY RESUL	Core length	CARBON	LB/FT3	LB/FT3
	cm	DRY BASIS	WET	DRY
SEL (Persaud et. al. OME, 1993)		10		
69C1 Wyandotte Yacht Cl	000-030	2.2		
	030-066	2.5		
68P N of Pt. Hennepin	Ponar	1.2		
68E N of Pt. Hennepin	Eckman	1		
67C1 Portofino	000-030	2.1		
43P Portofino Slip	PONAR	3.66	86.3	78.6
42P Pt. Hennepin	PONAR	1.69	94.2	88.7
15 C1 T.C. North Marsh	000-022	3.11	99.9	99.6
15 C1	022-062	2.33	100	100
15 C1	062-100	1.06	100	100
51 C 1 Firestone upper	000-030	2.5		
	030-091	2.6		
	091-152	2.6		
	152-194	2.1		
66C1 Firestone Steel -M	000-030	3		
	030-091	2.1		
	091-104	1.8		
45P Firestone Steel	PONAR	5.6	98.5	97.6
	PONAR			
50P Firestone lower	Ponar	4		
MONGUAGON CREEK-UPSTR	000-030	5.95	104.6	43.6
MONGUAGON CREEK-UPSTR	030-104	6.55	96.1	44.9
MONGUAGON CREEK-UPSTR	104-142	5.78	107.7	60.1
MONGUAGON CREEK-UPSTR	000-030	5.67	89.9	36.4
MONGUAGON CREEK-UPSTR	030-076	6.09	102.6	44
MONGUAGON CREEK-UPSTR	076-150	6.71	98.7	45
MONGUAGON CREEK-UPSTR	150-180	3.88	133	86.2
48E Monguagon Creek	Eckman	1.3		
S5 - Monguagon Creek	Ponar	5.1		
FI - Fighting Island	Ponar	1	NA	
25 C1 MNCK DNS-Nearshore	000-027	5.82	100	100
25 C1	027-051	3.77	100	100
25 C1	051-095	4.96	100	100
25 C1	095-132	5.88	100	100

TRENTON CHANNEL PROJECT		%TOTAL ORG.	DENSITY	DENSITY
SEDIMENT CHEMISTRY RESUL	Core length	CARBON	LB/FT3	LB/FT3
	cm	DRY BASIS	WET	DRY
SEL (Persaud et. al. OME, 1993)		10		
21 C1 MNCK DNS-Offshore	000-027	1.18	95.9	92
21 C1	027-051	0.85	94.2	90.9
MONGUAGON CREEK-DOWN	000-150	6.58	100.8	48.8
MONGUAGON CREEK-DOWN	150-168	7.11	107.3	53.9
BLACK LAGOON-CENTER	000-030	5.22	141.7	55.4
BLACK LAGOON-CENTER	030-120	6.88	104.3	35.3
BLACK LAGOON-CENTER	120-210	6.94	113.6	45.8
BLACK LAGOON-CENTER	210-229	3.88	115.6	81.3
BLACK LAGOON-LOWER	000-060	6.96	92.9	39.7
BLACK LAGOON-LOWER	060-152	5.34	107.6	54.6
BLACK LAGOON-LOWER	152-203	4.84	102.2	52.2
BLACK LAGOON-EAST	000-055	0.82	128.2	102.5
BLACK LAGOON-EAST	055-103	0.57	119.5	94.3
BLACK LAGOON-EAST	103-166	0.6	118.9	92.5
BLACK LAGOON-EAST	166-229	1.18	116.1	90.8
BLACK LAGOON-EAST	000-035	0.7	171.3	137.2
BLACK LAGOON-EAST	035-133	0.66	116.4	91.5
BLACK LAGOON-EAST	133-182	0.94	115.4	89.9
24 C1 BLLG-Nearshore	000-030	4.64	100	100
24 C1 (WWES Lab)	030-075	4.87	100	99.9
47E BLLG	Eckman	4		
S7 - Black Lagoon	Ponar	5.1		
40P East of Bouy N "6"	PONAR			
41P NE of Bouy R "18"	PONAR	4.11	100	99.7
ELIZABETH PARK CANAL	000-079	5.93	94.6	46.4
ELIZABETH PARK CANAL	079-180	4.81	86.8	46.5
ELIZABETH PARK CANAL	180-260	5.79	72.9	37.6
ELIZABETH PARK CANAL	260-330	3.91	124.7	66.8
16 C1 EPNC-Upper	000-080	4.19	100	99.7
16 C1	080-120	4.77	100	100
16 C1	120-157	4.29	100	99.9
17 C1 EPNC-Inner	000-040	4.6	97.3	97.2
17 C1	040-080	3.83	100	100
17 C1	080-140	2.91	99.9	99.9
17 C1	140-175	4.63	100	99.4
18 C1 EPNC-Lower	000-055	3.95	100	99.8
18 C1	055-125	4.44	100	100
18 C1	125-170	3.81	100	100
18 C1	170-217	2.38	100	99.9
46E EPNC	Eckman	4.4		
EP1 - North Marina	Ponar	2.8		
EP2 - Mid Marina	Ponar	6		
EP3 - South Marina	Ponar	5.3		

toc, density

TRENTON CHANNEL PROJECT		%TOTAL ORG.	DENSITY	DENSITY
SEDIMENT CHEMISTRY RESUL	Core length	CARBON	LB/FT3	LB/FT3
	cm	DRY BASIS	WET	DRY
SEL (Persaud et. al. OME, 1993)		10		
20 C1 EPSC-Inlet	000-083	4.86	99.9	99.8
20 C1	083-088			
49E EPSC	Eckman	5		
36P Monsanto Lagoon	PONAR	5.02	100	99.3
19 C1 Monsanto Bay	000-053	4.72	100	99.6
19 C1	053-085	4.94	100	100
19 C2 Monsanto Bay	000-051	4.51	99.8	99.3
19 C2	051-085	4.11	100	99.9
CHRYSLER BAY-INNER	000-030	30.71		
CHRYSLER BAY-INNER	030-058	1.11	75.3	54.8
CHRYSLER BAY-INNER	058-079	0.436	161.6	125
CHRYSLER BAY-OUTER	000-013			
CHRYSLER BAY-OUTER	013-061	0.956	114.5	78.2
37P Chry Bay Marsh Inlet	PONAR			
39P Swan Island-North	PONAR	3.2	100	100
38P Above Humbug Marina	PONAR	8.62	100	96.5
S9 - Chrysler Bay	Ponar	18.7		
CELERON ISLAND	000-043	11.79	109.6	55.9
CELERON ISLAND	043-074	2.08	135.8	92.4
CELERON ISLAND	074-107	0.538	156	124.5

lat-long

TRENTON CHANNEL PROJECT				
SEDIMENT CHEMISTRY RESULTS			Collection Method/	
SITE DESCRIPTION	Latitude	Longitude	Agency	Estimated Accuracy
55C1 Allied Oil Slip NW	N 42 15 37	W 83 07 29	Mapping Software	+/- 150ft.
55C2 Allied Oil Slip NW - d	N 42 15 37	W 83 07 29	Mapping Software	+/- 150ft.
56C1 Nickelson South Slip	N 42 15 32	W 83 07 43	Loran	+/- 150ft.
56C2 Nickelson South Slip -d	N 42 15 32	W 83 07 44	Loran	+/- 150ft.
59C1 Stenson Club	N 42 14 36	W 83 08 55	Loran	+/- 150ft.
64P Mud Island Northside	N 42 14 4160	W 83 08 3987	Ashtech diff corr	+/- 5ft
65P Mud Island SW	N 42 14 1282	W 83 08 6581	Ashtech diff corr	+/- 5ft
60C1 Mud Island -South side	N 42 14 2701	W 83 08 5673	Ashtech diff corr	+/- 5ft
53C1 Grassy Island NW	N 42 13 6828	W 83 08 1324	Ashtech diff corr	+/- 5ft
54C1 Grassy Island NE	N 42 13 7018	W 83 08 0533	Ashtech diff corr	+/- 5ft
63P Grassy Island W	N 42 13 3979	W 83 08 1478	Ashtech diff corr	+/- 5ft
61P Grassy Isalnd SW	N 42 13 1423	W 83 08 2095	Ashtech diff corr	+/- 5ft
62P Grassy Island SE	N 42 13 1010	W 83 08 1263	Ashtech diff corr	+/- 5ft
57P Mouth of Ecorse Creek	N 42 13 94	W83 08 82	Loran	+/- 150ft.
58C1 Mouth of Ecorse Creek	N 42 13 94	W83 08 82	Loran	+/- 150ft.
52C1 BASF Northworks lower	N 42 12 7136	W 83 08 5514	Ashtech diff corr	+/- 5ft
69C1 Wyandotte Yatch Club	N 42 12 44	W 83 08 73	Loran	+/- 150ft.
68P N of Pt. Hennepin	N 42 12 35	W 83 08 27	Loran	+/- 150ft.
68E N of Pt. Hennepin	N 42 12 35	W 83 08 27	Loran	+/- 150ft.
67C1 Portofino	N 43 11 73	W83 09 00	Loran	+/- 150ft.
43P Portofino Slip	N 42 11 50	W 83 08 57	Mapping Software	+/- 150ft.
42P Pt. Hennepin	N 42 11 48	W 83 08 47	Mapping Software	+/- 150ft.
15 C1 T.C. North Marsh	N 42:10:26	W 83:09:29	Mapping Software	+/- 150ft.
51 C 1 Firestone upper	N 42 10 7916	W 83 09 5462	Ashtech diff corr	+/- 5ft
66C1 Firestone Steel -Mid (	N 42 10 56	W 83 09 60	Ashtech diff corr	+/- 5ft
45P Firestone Steel	N 42 10 23	W 83 09 55	Mapping Software	+/- 150ft.
50P Firestone lower	N 42 10 6264	W 83 09 6997	Ashtech diff corr	+/- 5ft

lat-long

TRENTON CHANNEL PROJECT					
SEDIMENT CHEMISTRY RESULTS			Collection Method/		
SITE DESCRIPTION	Latitude	Longitude	Agency	Estimated Accuracy	
MONGUAGON CREEK-UPSTREAM	N 42:10:31.36	W 83:09:45.44	Trimble-USEPA LLRS	+/- 1 meter	
(aka Federal Marine Terminal)					
MONGUAGON CREEK-UPSTREAM	N 42:10:31.30	W 83:09:45.44	Trimble-USEPA LLRS	+/- 1 meter	
(aka Federal Marine Terminal)					
48E Monguagon Creek	N 42 10 25	W 83 09 86	Loran	+/- 150ft.	
S5 - Monguagon Creek	N 42 10 13	W 83 09 59	Mapping Software	+/- 150ft.	
FI - Fighting Island	(260611.4)	(13460207.77)	ArcView-photo	+/- 2 ft.	
25 C1 MNCK DNS-Nearshore	N 42:10.280	W 83:09.906	Hand Held GPS-MDNR	+/- 100 ft.	
21 C1 MNCK DNS-Offshore	N 42:08.313	W 83:09.945	Hand Held GPS-MDNR	+/- 100 ft.	
MONGUAGON CREEK-DOWN	N 42:10:17.73	W 83:09:53.72	Trimble-USEPA LLRS	+/- 1 meter	
BLACK LAGOON-CENTER	N 42:09:08.37	W 83:10:20.13	Trimble-USEPA LLRS	+/- 1 meter	
BLACK LAGOON-LOWER	N 42:09:02.45	W 83:10:19.23	Trimble-USEPA LLRS	+/- 1 meter	
BLACK LAGOON-EAST	N 42:09:01.36	W 83:10:15.40	Trimble-USEPA LLRS	+/- 1 meter	
24 C1 BLLG-Nearshore	N 42:09.164	W 83:10.325	Hand Held GPS-MDNR	+/- 100 ft.	
47E BLLG	N 42 09 00	W 83 10 30	Loran	+/- 150ft.	
S7 - Black Lagoon	N 42 09 09	W 83 10 19	Mapping Software	+/- 150ft.	
40P East of Bouy N "6"	N 42 07 44	W 83 10 22	Mapping Software	+/- 150ft.	
41P NE of Bouy R "18"	N 42 09 25	W 83 09 47	Mapping Software	+/- 150ft.	
44P DNS from Bouy R "28"	N 42 11 11	W 83 09 14	Mapping Software	+/- 150ft.	
26P Riverside Hospital	N 42:09:05	W 83:10:20	Mapping Software	+/- 150ft.	
27P Trenton Towers	N 42:08:48	W 83:10:24	Mapping Software	+/- 150ft.	
28P Deadhead Cove	N 42:01:18	W 83:10:33	Mapping Software	+/- 150ft.	
28PC2	N 42:01:18	W 83:10:33	Mapping Software	+/- 150ft.	
ELIZABETH PARK CANAL	N 42:08:12.93	W 83:10:34.26	Trimble-USEPA LLRS	+/- 1 meter	
16 C1 EPNC-Upper	N 42:08:13	W 83:10:33	Mapping Software	+/- 150ft.	
17 C1 EPNC-Inner	N 42:08.225	W 83:10.602	Hand Held GPS-MDNR	+/- 100 ft.	
18 C1 EPNC-Lower	N 42:08.200	W 83:10.583	Hand Held GPS-MDNR	+/- 100 ft.	
46E EPNC	N 42 98 12	W 83 10 33	Mapping Software	+/- 150ft.	
29P EPC Bridge 1	N 42:08:10	W 83:10:44	Mapping Software	+/- 150ft.	
30P EPC Bridge 2	N 42:08:04	W 83:10:51	Mapping Software	+/- 150ft.	
31P EPC Bridge 3	N 42:07:56	W 83:11:01	Mapping Software	+/- 150ft.	
32P EPC Bridge 4	N 42:07:40	W 83:11:01	Mapping Software	+/- 150ft.	
33P EPC Bridge 5	N 42:07:17	W 83:10:57	Mapping Software	+/- 150ft.	

TRENTON CHANNEL PROJECT SEDIMENT CHEMISTRY RESULTS SITE DESCRIPTION	Latitude	Longitude	Collection Method/ Agency	Estimated Accuracy
EP MARINA - OUTSIDE	N 42:07:47.15	W 83:10:35.47	Trimble-USEPA LLRS	+/- 1 meter
EP MARINA - UPLAND	N 42:07:46.28	W 83:10:36.91	Trimble-USEPA LLRS	+/- 1 meter
EP MARINA - RIVER BED UP.	N 42:07:44.29	W 83:10:37.60	Trimble-USEPA LLRS	+/- 1 meter
EP MARINA - RIVER BED DN.	N 42:07:42.83	W 83:10:39.41	Trimble-USEPA LLRS	+/- 1 meter
EP1 - North Marina	(231691.73)	(13446002.56)	ArcView-photo	+/- 2 ft.
EP2 - Mid Marina	(231498.13)	(13445947.77)	ArcView-photo	+/- 2 ft.
EP3 - South Marina	(231304.52)	(13445858.27)	ArcView-photo	+/- 2 ft.
EPN (new site)	(231830.54)	(13446000.74)	ArcView-photo	+/- 2 ft.
EPM-N	(231830.54)	(13446000.74)	ArcView-photo	+/- 2 ft.
S11-EPM Upland	(231691.73)	(13446002.56)	ArcView-photo	+/- 2 ft.
S11D- EPM Upland Dup.	(231691.73)	(13446002.56)	ArcView-photo	+/- 2 ft.
EPM-1 (S11-EPM Upland)	(231691.73)	(13446002.56)	ArcView-photo	+/- 2 ft.
S12-EPM Mid	(231498.13)	(13445947.77)	ArcView-photo	+/- 2 ft.
EPM-2 (S12-EPM Mid)	(231691.73)	(13446002.56)	ArcView-photo	+/- 2 ft.
EPM2-dup (S12- EPM Upland)	(231691.73)	(13446002.56)	ArcView-photo	+/- 2 ft.
S13-EPM South	(231304.52)	(13445858.27)	ArcView-photo	+/- 2 ft.
EPM-3 (S13-EPM South)	(231304.52)	(13445858.27)	ArcView-photo	+/- 2 ft.
34P EPSC DOCK	N 42:07:16	W 83:10:55	Mapping Software	+/- 150ft.
35P EPSC-Inlet	N 42:07:13	W 83:10:47	Mapping Software	+/- 150ft.
35PC2	N 42:07:13	W 83:10:47	Mapping Software	+/- 150ft.
20 C1 EPSC-Inlet	N 42:07.213	W 83:10.818	Hand Held GPS-MDNR	+/- 100 ft.
49E EPSC	N 42 07 19	W 83 11 05	Loran	+/- 150ft.
36P Monsanto Lagoon	N 42 07 03	W 83 10 57	Mapping Software	+/- 150ft.
19 C1 Monsanto Bay	N 42:07.000	W 83:10.881	Hand Held GPS-MDNR	+/- 100 ft.
19 C2 Monsanto Bay	N 42:07.000	W 83:10.881	Hand Held GPS-MDNR	+/- 100 ft.
CHRYSLER BAY-INNER	N 42:06:49.26	W 83:11:06.68	Trimble-USEPA LLRS	+/- 1 meter
CHRYSLER BAY-OUTER	N 42:06:47.91	W 83:11:02.65	Trimble-USEPA LLRS	+/- 1 meter
37P Chry Bay Marsh Inlet	N 42 06 49	W 83 11 06	Mapping Software	+/- 150ft.
39P Swan Island-North	N 42 06 10	W 83 10 28	Mapping Software	+/- 150ft.
38P Above Humbug Marina	N 42 06 03	W 83 11 22	Mapping Software	+/- 150ft.
S9 - Chrysler Bay	N 42 06 50	W 83 11 02	Mapping Software	+/- 150ft.
CELERON ISLAND	N 42:04:45.36	W 83:10:29.20	Trimble-USEPA LLRS	+/- 1 meter

DATA RESULTS. Classification - Upstream to Downstream

Classification of Contaminated Sediment Sites as applied to the Trenton Channel Sediment Survey Results 1993-1996

Summed Exceedances

Not-impacted <1 < Impacted < 15 < Moderately Impacted < 30 < Severely Contaminated < 60 < Extremely Contaminated

Location Index	Trenton Channel Project Sediment Results SITE DESCRIPTION	Core length in cm	CLASSIFICATION	BIO + TOX EXCEEDANCE TOTAL	EXCEEDANCES (x over guidelines) BIO Exceedance	Tox Exceedance	Toxics Metals	Organics	Bioaccum PCBs	Hg
1.1	55C1 Allied Oil Slip NW	000-030	Extremely Contaminated	89.8	44.9	44.7	14.8	30.0	26.9	18.0
1.2	55C1 Allied Oil Slip NW	030-091	Extremely Contaminated	94.1	50.3	43.8	15.6	28.2	38.3	12.0
1.3	55C1 Allied Oil Slip NW	091-152	Extremely Contaminated	78.3	35.2	43.1	11.0	32.0	25.2	10.0
1.4	55C1 Allied Oil Slip NW	152-218	Extremely Contaminated	83.7	32.5	51.2	12.9	38.4	21.5	11.0
1.45										
1.5	55C2 Allied Oil Slip NW - dup	000-030	Extremely Contaminated	69.6	31.3	38.3	12.1	26.2	21.4	9.9
1.6	55C2 Allied Oil Slip NW - dup	030-091	Extremely Contaminated	85.7	43.0	42.6	16.2	26.5	28.0	15.0
1.7	55C2 Allied Oil Slip NW - dup	091-147	Extremely Contaminated	78.5	37.4	41.1	15.0	26.1	26.4	11.0
1.75										
2.1	56C1 Nickelson South Slip	000-030	Extremely Contaminated	79.1	19.8	59.4	16.0	43.4	15.7	4.1
2.2	56C1 Nickelson South Slip	030-043	Extremely Contaminated	99.1	28.0	71.1	25.3	45.8	22.4	5.6
2.25										
2.3	56C2 Nickelson South Slip -dup	000-030	Extremely Contaminated	85.5	19.3	66.2	18.1	48.1	15.1	4.2
2.4	56C2 Nickelson South Slip -dup	030-091	Severely Contaminated	49.5	25.3	24.2	21.6	2.7	24.6	0.7
2.5	56C2 Nickelson South Slip -dup	091-152	Moderately Contaminated	27.3	11.8	15.6	7.3	8.3	4.8	7.0
2.6	56C2 Nickelson South Slip -dup	152-201	Severely Contaminated	35.1	15.7	19.4	11.2	8.2	6.6	9.1
2.65										
3.1	59C1 Stenson Club	000-030	Severely Contaminated	56.3	29.0	27.4	9.4	18.0	21.7	7.3
3.2	59C1 Stenson Club	030-091	Severely Contaminated	57.8	29.5	28.4	10.4	17.9	21.2	8.3
3.3	59C1 Stenson Club	091-152	Extremely Contaminated	63.0	32.0	31.0	11.4	19.5	17.0	15.0
3.4	59C1 Stenson Club	152-213	Severely Contaminated	48.8	33.8	15.0	6.6	8.4	3.8	30.0
3.5	59C1 Stenson Club	213-224	Severely Contaminated	34.7	25.4	9.3	3.9	5.4	4.4	21.0
3.55										
4.1	64P Mud Island Northside	Ponar	Impacted	5.2	1.3	3.8	2.5	1.4	0.5	0.8
4.15										
5.1	65P Mud Island SW	Ponar	Impacted	14.3	6.1	8.2	5.0	3.2	2.8	3.3
5.15										
6.1	60C1 Mud Island -South side	000-030	Impacted	9.2	5.5	2.8	1.4	1.3	3.2	2.3
6.2	60C1 Mud Island -South side	030-091	Impacted	8.1	6.6	1.5	1.5	0.0	4.9	1.7
6.3	60C1 Mud Island -South side	091-137	Impacted	5.4	3.9	1.5	1.5	0.0	3.1	0.8
6.35										
7	53C1 Grassy Island NW	000-030	Impacted	6.3	3.3	3.0	3.0	0.1	0.0	3.3
7.1	53C1 Grassy Island NW	030-071	Impacted	1.8	0.3	1.5	1.3	0.2	0.0	0.3
7.15										
8	54C1 Grassy Island NE	000-034	Impacted	5.5	3.4	2.0	1.8	0.2	1.8	1.8
8.5										
9	63P Grassy Island W	Ponar	Impacted	4.8	1.4	3.4	2.0	1.4	0.0	1.4
9.5										
10	61P Grassy Isaind SW	Ponar	Impacted	9.8	5.1	4.6	2.5	2.1	1.2	3.9
10.5										
11	62P Grassy Island SE	Ponar	Impacted	10.2	4.6	5.6	3.4	2.2	1.3	3.3
11.5										
12	57P Mouth of Ecorse Creek	Ponar	Moderately Contaminated	25.6	14.6	11.1	5.0	6.1	10.6	4.0
12.5										
13	58C1 Mouth of Ecorse Creek	000-030	Impacted	5.3	3.4	1.9	1.9	0.0	3.4	0.0
13.5										
14	52C1 BASF Northworks lower	000-030	Moderately Contaminated	29.4	14.2	15.1	6.9	8.3	5.8	8.4
14.1	52C1 BASF Northworks lower	030-091	Severely Contaminated	31.6	16.9	14.7	6.9	7.7	3.9	13.0
14.2	52C1 BASF Northworks lower	091-152	Severely Contaminated	31.1	16.3	14.8	6.9	7.9	1.3	15.0
14.3	52C1 BASF Northworks lower	152-213	Moderately Contaminated	17.3	8.9	8.4	3.3	5.2	0.0	8.9

DATA RESULTS. Classification - Upstream to Downstream

Classification of Contaminated Sediment Sites as applied to the Trenton Channel Sediment Survey Results 1993-1998

Summed Exceedances

Not-impacted <1 < Impacted < 15 < Moderately Impacted < 30 < Severely Contaminated < 80 < Extremely Contaminated

	Trenton Channel Project	Core		BIO + TOX				EXCEEDANCES (x over guidelines)			
Location	Sediment Results	length		EXCEEDANCE	BIO	Tox	Toxics		Bioaccumi		
Index	SITE DESCRIPTION	in cm	CLASSIFICATION	TOTAL	Exceedance	Exceedance	Metals	Organics	PCBs	Hg	
15	69C1 Wyandotte Yacht Club	000-030	Severely Contaminated	33.7	21.0	12.7	5.8	7.0	10.0	11.0	
15.1	69C1 Wyandotte Yacht Club	030-066	Severely Contaminated	32.6	20.4	12.3	5.3	8.9	5.4	15.0	
15.15											
16	68P N of Pt. Hennepin	Ponar	Impacted	2.1	0.7	1.4	1.0	0.4	0.0	0.7	
16.5											
17	68E N of Pt. Hennepin	Eckman	Impacted	2.1	0.8	1.3	1.1	0.1	0.0	0.8	
17.5											
18	67C1 Portofino	000-030	Moderately Contaminated	24.5	13.2	11.3	8.3	5.1	5.7	7.5	
18.5											
19	43P Portofino Slip	PONAR	Impacted	8.9	3.2	5.7	4.6	1.1	0.0	3.2	
19.5											
20	42P Pt. Hennepin	PONAR	Impacted	4.4	2.2	2.2	1.9	0.3	0.0	2.2	
20.5											
21	15 C1 T.C. North Marsh	000-022	Impacted	2.0	0.0	2.0	2.0	0.0	0.0	0.0	
21.1	15 C1 T.C. North Marsh	022-062	Impacted	1.8	0.0	1.8	1.8	0.0	0.0	0.0	
21.2	15 C1 T.C. North Marsh	062-100	Impacted	2.1	0.0	2.1	2.1	0.0	0.0	0.0	
21.5											
22	51 C 1 Firestone upper	000-030	Extremely Contaminated	203.0	185.8	17.2	8.9	8.3	55.8	130.0	
22.1	51 C 1 Firestone upper	030-091	Extremely Contaminated	214.4	188.2	26.2	12.5	13.7	28.2	160.0	
22.2	51 C 1 Firestone upper	091-152	Extremely Contaminated	225.9	203.0	22.8	10.6	12.2	43.0	160.0	
22.3	51 C 1 Firestone upper	152-194	Extremely Contaminated	130.8	111.3	19.5	8.4	11.1	16.3	95.0	
22.5											
23	66C1 Firestone Steel -Mid (45P site)	000-030	Extremely Contaminated	201.8	175.1	26.7	11.9	14.8	15.1	160.0	
23.1	66C1 Firestone Steel -Mid (45P site)	030-091	Extremely Contaminated	130.5	111.7	18.9	9.2	9.7	11.7	100.0	
23.2	66C1 Firestone Steel -Mid (45P site)	091-104	Severely Contaminated	48.0	31.0	17.0	6.6	10.4	2.0	29.0	
23.5											
24	45P Firestone Steel	PONAR	Extremely Contaminated	118.9	103.3	15.6	10.0	5.6	3.3	100.0	
24.1	45P Firestone Steel	PONAR	Extremely Contaminated	82.3	71.7	10.7	10.7	0.0	6.7	65.0	
24.5											
25	50P Firestone lower	Ponar	Extremely Contaminated	135.6	110.4	25.3	13.4	11.8	10.4	100.0	
25.5											
27	MONGUAGON CREEK-UPSTREA	000-030	Severely Contaminated	48.1	31.3	16.9	11.6	5.2	7.3	24.0	
27.1	MONGUAGON CREEK-UPSTREA	030-104	Extremely Contaminated	65.3	19.6	45.7	18.1	27.6	7.6	12.0	
27.2	MONGUAGON CREEK-UPSTREA	104-142	Extremely Contaminated	163.5	132.9	30.5	14.6	15.9	33.9	99.0	
27.5											
28	MONGUAGON CREEK-UPSTREA	000-030	Severely Contaminated	47.9	31.4	16.5	10.5	6.0	8.4	25.0	
28.1	MONGUAGON CREEK-UPSTREA	030-078	Extremely Contaminated	92.8	64.0	28.8	14.1	14.7	30.0	34.0	
28.2	MONGUAGON CREEK-UPSTREA	078-150	Extremely Contaminated	91.7	60.4	31.3	16.8	14.5	29.4	31.0	
28.3	MONGUAGON CREEK-UPSTREA	150-180	Extremely Contaminated	103.9	87.3	16.6	8.2	8.4	30.3	57.0	
28.5											
29	48E Monguagon Creek	Eckman	Moderately Contaminated	29.9	7.5	22.4	13.6	8.9	4.6	2.9	
29.5											
30	S5 - Monguagon Creek	Ponar	Severely Contaminated	40.1	18.7	21.4	11.3	10.1	18.7	0.0	
30.5											
31	FI - Fighting Island	Ponar	Impacted	1.6	0.2	1.3	1.2	0.1	0.2	0.0	
31.5											
32	25 C1 MNCK DNS-Nearshore	000-027	Moderately Contaminated	20.3	11.0	9.3	8.3	1.0	0.0	11.0	
32.1	25 C1 MNCK DNS-Nearshore	027-051	Moderately Contaminated	19.2	9.5	9.7	9.4	0.3	0.0	9.5	
32.2	25 C1 MNCK DNS-Nearshore	051-095	Moderately Contaminated	29.3	18.3	11.1	10.6	0.5	3.3	15.0	
32.3	25 C1 MNCK DNS-Nearshore	095-132	Severely Contaminated	36.2	17.5	18.7	18.0	0.7	3.5	14.0	
32.5											
33	21 C1 MNCK DNS-Offshore	000-027	Impacted	1.2	0.0	1.2	1.2	0.0	0.0	0.0	
33.1	21 C1 MNCK DNS-Offshore	027-051	Impacted	3.8	2.3	1.5	1.5	0.0	0.0	2.3	
33.5											
34	MONGUAGON CREEK-DOWN	000-150	Extremely Contaminated	77.3	56.9	20.4	17.5	2.9	17.9	39.0	
34.1	MONGUAGON CREEK-DOWN	150-168	Extremely Contaminated	173.1	147.3	25.9	20.6	5.2	37.3	110.0	
34.5											

DATA RESULTS. Classification - Upstream to Downstream

Classification of Contaminated Sediment Sites as applied to the Trenton Channel Sediment Survey Results 1993-1996

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							EXCEEDANCES (x over guidelines)			
	Trenton Channel Project	Core		BIO + TOX						
Location	Sediment Results	length		EXCEEDANCE	BIO	Tox	Toxics		Bioaccum	
Index	SITE DESCRIPTION	in cm	CLASSIFICATION	TOTAL	Exceedance	Exceedance	Metals	Organics	PCBs	Hg
Not-impacted <1 < Impacted < 15 < Moderately Impacted < 30 < Severely Contaminated < 60 < Extremely Contaminated										
35	BLACK LAGOON-CENTER	000-030	Severely Contaminated	37.2	14.0	23.2	18.7	4.5	0.0	14.0
35.1	BLACK LAGOON-CENTER	030-120	Extremely Contaminated	85.3	50.7	34.6	21.2	13.4	19.7	31.0
35.2	BLACK LAGOON-CENTER	120-210	Extremely Contaminated	97.0	73.5	23.5	17.0	6.5	5.5	68.0
35.3	BLACK LAGOON-CENTER	210-229	Moderately Contaminated	20.6	14.0	6.6	4.1	2.4	0.0	14.0
35.5										
36	BLACK LAGOON-LOWER	000-060	Extremely Contaminated	91.3	64.5	26.8	20.9	5.9	8.5	56.0
36.1	BLACK LAGOON-LOWER	060-152	Extremely Contaminated	91.1	78.0	13.1	9.7	3.5	0.0	78.0
36.2	BLACK LAGOON-LOWER	152-203	Severely Contaminated	57.1	48.0	9.1	7.3	1.8	0.0	48.0
36.5										
37	BLACK LAGOON-EAST	000-055	Non-Impacted	0.8	0.0	0.8	0.8	0.0	0.0	0.0
37.1	BLACK LAGOON-EAST	055-103	Non-Impacted	0.7	0.0	0.7	0.7	0.0	0.0	0.0
37.2	BLACK LAGOON-EAST	103-166	Non-Impacted	0.7	0.0	0.7	0.7	0.0	0.0	0.0
37.3	BLACK LAGOON-EAST	166-229	Non-Impacted	0.8	0.0	0.8	0.8	0.0	0.0	0.0
37.5										
38	BLACK LAGOON-EAST	000-035	Non-Impacted	0.7	0.0	0.7	0.7	0.0	0.0	0.0
38.1	BLACK LAGOON-EAST	035-133	Non-Impacted	0.7	0.0	0.7	0.7	0.0	0.0	0.0
38.2	BLACK LAGOON-EAST	133-182	Non-Impacted	0.9	0.0	0.9	0.9	0.0	0.0	0.0
38.5										
39	24 C1 BLLG-Nearshore	000-030	Severely Contaminated	42.2	17.0	25.2	20.3	4.9	5.0	12.0
39.1	24 C1 BLLG-Nearshore	030-075	Severely Contaminated	43.0	19.6	23.4	21.0	2.5	7.6	12.0
39.5										
40	24 C1 BLLG-Nearshore	030-075	Severely Contaminated	43.0	13.0	30.0	29.9	0.1	0.0	13.0
40.5										
41	47E BLLG	Eckman	Extremely Contaminated	137.9	119.9	18.0	10.9	7.1	9.9	110.0
41.5										
42	S7 - Black Lagoon	Ponar	Severely Contaminated	40.0	14.4	25.6	16.2	9.3	14.4	0.0
42.5										
43	40P East of Bouy N "6"	PONAR	Impacted	4.3	1.8	2.5	2.3	0.2	0.0	1.8
43.5										
44	41P NE of Bouy R "18"	PONAR	Impacted	6.2	4.0	4.2	3.6	0.5	1.7	2.3
44.5										
45	44P ONS from Bouy R "28"	PONAR	Impacted	13.8	6.5	7.3	7.3	0.0	0.0	6.5
45.5										
46	26P Riverside Hospital	PONAR	Impacted	13.5	5.6	7.9	7.4	0.5	0.0	5.6
46.5										
47	27P Trenton Towers	PONAR	Extremely Contaminated	77.3	64.0	13.3	13.1	0.2	0.0	64.0
47.5										
48	28P Deadhead Cove	PONAR	Impacted	13.8	7.0	6.8	6.6	0.2	0.0	7.0
48.1	28PC2	PONAR	Impacted	13.4	6.7	6.7	6.5	0.2	0.0	6.7
48.5										
49	ELIZABETH PARK CANAL	000-079	Extremely Contaminated	95.6	64.2	31.4	13.4	18.0	8.2	56.0
49.1	ELIZABETH PARK CANAL	079-180	Severely Contaminated	41.7	23.0	18.7	10.1	8.6	0.0	23.0
49.2	ELIZABETH PARK CANAL	180-260	Severely Contaminated	32.8	15.0	17.8	7.2	10.6	0.0	15.0
49.3	ELIZABETH PARK CANAL	260-330	Severely Contaminated	38.9	24.0	14.9	8.7	6.2	0.0	24.0
49.5										
50	16 C1 EPNC-Upper	000-080	Extremely Contaminated	90.1	78.2	11.9	10.3	1.6	31.2	47.0
50.1	16 C1 EPNC-Upper	080-120	Severely Contaminated	50.2	40.0	10.2	8.8	1.4	0.0	40.0
50.2	16 C1 EPNC-Upper	120-157	Severely Contaminated	40.9	29.2	11.6	9.6	2.0	1.2	28.0
50.5										
51	17 C1 EPNC-Inner	000-040	Extremely Contaminated	91.5	80.8	10.8	8.5	2.2	6.8	74.0
51.1	17 C1 EPNC-Inner	040-080	Severely Contaminated	35.4	26.0	9.4	7.7	1.7	0.0	26.0
51.2	17 C1 EPNC-Inner	080-140	Moderately Contaminated	26.5	18.0	8.5	6.2	2.3	0.0	18.0
51.3	17 C1 EPNC-Inner	140-175	Moderately Contaminated	16.9	12.0	4.9	3.8	1.0	0.0	12.0
51.5										
52	18 C1 EPNC-Lower	000-055	Extremely Contaminated	83.9	75.0	9.0	6.8	2.2	7.0	68.0
52.1	18 C1 EPNC-Lower	055-125	Severely Contaminated	57.9	48.0	9.9	9.0	0.9	2.0	46.0
52.2	18 C1 EPNC-Lower	125-170	Severely Contaminated	42.9	28.2	14.7	7.1	7.6	4.2	24.0
52.3	18 C1 EPNC-Lower	170-217	Moderately Contaminated	23.2	15.0	8.2	4.7	3.5	0.0	15.0
52.5										
53	46E EPNC	Eckman	Severely Contaminated	30.5	20.2	10.3	7.9	2.4	5.2	15.0
53.5										
55	29P EPC Bridge 1	PONAR	Impacted	12.1	4.0	8.1	8.1	0.0	0.0	4.0
55.5										
56	30P EPC Bridge 2	PONAR	Impacted	3.9	1.8	2.1	2.1	0.0	0.0	1.8
56.5										
57	31P EPC Bridge 3	PONAR	Moderately Contaminated	24.9	17.0	7.9	7.6	0.3	0.0	17.0
57.5										
58	32P EPC Bridge 4	PONAR	Severely Contaminated	36.0	25.5	10.6	10.3	0.2	16.7	8.8
58.5										

DATA RESULTS. Classification - Upstream to Downstream

Classification of Contaminated Sediment Sites as applied to the Trenton Channel Sediment Survey Results 1993-1996

Summed Exceedances

Not-impacted <1 < Impacted < 15 < Moderately Impacted < 30 < Severely Contaminated < 60 < Extremely Contaminated

Location Index	Trenton Channel Project Sediment Results SITE DESCRIPTION	Core length in cm	CLASSIFICATION	BIO + TOX EXCEEDANCE TOTAL	BIO Exceedance	Tox Exceedance	EXCEEDANCES (x over guidelines) Toxics Metals	Organics	Bioaccum PCBs	Hg
59	33P EPC Bridge 5	PONAR	Moderately Contaminated	21.4	11.6	9.7	9.3	0.4	2.5	9.1
59.5										
60	EP MARINA - OUTSIDE	000-020	Impacted	1.7	0.0	1.7	1.7	0.0	0.0	0.0
60.5										
61	EP MARINA - UPLAND	000-006	Impacted	1.8	0.0	1.8	1.8	0.0	0.0	0.0
61.5										
62	EP MARINA - RIVER BED UP	000-010	Severely Contaminated	48.9	34.2	14.8	10.0	4.8	4.2	30.0
62.1	EP MARINA - RIVER BED UP	010-020	Extremely Contaminated	65.0	46.3	18.7	10.4	8.2	4.3	42.0
62.2	EP MARINA - RIVER BED UP	020-028	Extremely Contaminated	79.9	57.9	22.0	11.7	10.3	5.9	52.0
62.3	EP MARINA - RIVER BED UP	028-038	Extremely Contaminated	61.5	48.1	13.4	12.7	0.7	5.1	43.0
62.5										
63	EP MARINA - RIVER BED DN	000-013	Severely Contaminated	51.2	40.0	11.2	7.1	4.1	0.0	40.0
63.1	EP MARINA - RIVER BED DN.	013-018	Severely Contaminated	50.0	40.0	10.0	7.7	2.3	0.0	40.0
63.5										
65	EP1 - Upland (S11)	Ponar	Moderately Contaminated	15.3	3.8	11.4	7.9	3.5	3.8	0.0
65.5										
66	EP2 - Mid Marina (S12)	Ponar	Moderately Contaminated	25.7	8.0	17.7	10.8	7.0	8.0	0.0
66.5										
67	EP3 - South Marina (S13)	Ponar	Moderately Contaminated	20.2	4.8	15.4	10.1	5.3	4.8	0.0
67.5										
68	EPN (new site)	Ponar	Severely Contaminated	59.2	44.0	15.2	14.8	0.4	0.0	44.0
68.05										
68.1	EPM-N	Eckman	Moderately Contaminated	23.8	15.0	8.8	8.7	0.1	0.0	15.0
68.5										
69	S11-EPM Upland	Ponar	Severely Contaminated	31.4	23.0	8.4	8.1	0.3	0.0	23.0
69.1	S11D- EPM Upland Dup.	Ponar	Severely Contaminated	31.2	23.0	8.2	8.0	0.2	0.0	23.0
69.15										
69.2	EPM-1 (S11-EPM Upland)	Eckman	Moderately Contaminated	27.0	18.0	9.0	8.9	0.1	0.0	18.0
69.5										
69.5										
70	S12-EPM Mid	Ponar	Severely Contaminated	40.0	29.0	11.0	10.4	0.6	0.0	29.0
70.05										
70.1	EPM-2 (S12-EPM Mid)	Eckman	Moderately Contaminated	25.6	16.0	9.6	9.2	0.4	0.0	16.0
70.15										
70.2	EPM2-dup (S12- EPM Upland)	Eckman	Moderately Contaminated	26.2	17.0	9.2	9.2	0.0	0.0	17.0
70.25										
71	S13-EPM South	Ponar	Severely Contaminated	40.9	31.0	9.9	9.3	0.5	0.0	31.0
71.05										
71.1	EPM-3 (S13-EPM South)	Eckman	Severely Contaminated	45.3	38.0	7.3	6.4	0.9	0.0	38.0
71.15										
72	34P EPSC DOCK	PONAR	Severely Contaminated	30.8	18.5	12.3	11.9	0.4	2.5	16.0
72.5										
73	35P EPSC-Inlet	PONAR	Moderately Contaminated	22.5	12.0	10.5	10.1	0.4	0.0	12.0
73.1	35P EPSC-Inlet	PONAR	Moderately Contaminated	19.7	10.0	9.7	9.3	0.4	0.0	10.0
73.15										
74	20 C1 EPSC-Inlet	000-083	Extremely Contaminated	62.2	47.3	14.9	13.2	1.7	7.3	40.0
74.1	20 C1 EPSC-Inlet	083-088	Extremely Contaminated	72.1	55.0	17.0	14.8	2.3	4.0	51.0
74.15										
74.2	49E EPSC	Eckman	Moderately Contaminated	23.7	9.6	14.1	7.0	7.1	0.0	9.6
74.25										
75	36P Monsanto Lagoon	PONAR	Severely Contaminated	57.3	41.7	15.6	14.5	1.1	2.7	39.0
75.5										
77	19 C1 Monsanto Bay	000-053	Severely Contaminated	50.1	37.6	12.5	10.6	1.9	1.6	36.0
77.1	19 C1 Monsanto Bay	053-085	Severely Contaminated	51.7	42.5	9.2	7.8	1.4	3.5	39.0
77.15										
77.2	19 C2 Monsanto Bay	000-051	Severely Contaminated	51.7	40.3	11.5	9.2	2.2	7.3	33.0
77.3	19 C2 Monsanto Bay	051-085	Severely Contaminated	45.9	36.2	9.8	7.1	2.6	4.2	32.0
77.35										
78	CHRYSLER BAY-INNER	000-030	Impacted	3.1	2.0	1.1	1.1	0.0	0.0	2.0
78.1	CHRYSLER BAY-INNER	030-058	Impacted	1.5	0.0	1.5	1.5	0.0	0.0	0.0
78.2	CHRYSLER BAY-INNER	058-079	Impacted	1.7	0.0	1.7	1.7	0.0	0.0	0.0
78.25										
79	CHRYSLER BAY-OUTER	000-013	Moderately Contaminated	27.9	20.4	7.5	6.4	1.1	5.4	15.0
79.1	CHRYSLER BAY-OUTER	013-061	Impacted	1.9	0.0	1.9	1.9	0.0	0.0	0.0
79.15										
80	37P Chry Bay Marsh Inlet	PONAR	Impacted	4.6	1.8	2.8	2.8	0.0	0.0	1.8
80.5										
81	39P Swan Island-North	PONAR	Impacted	7.5	3.8	3.7	3.1	0.6	0.0	3.8
81.5										
82	38P Above Humbug Marina	PONAR	Moderately Contaminated	15.7	8.7	7.0	6.8	0.2	0.0	8.7
82.5										
83	S9 - Chrysler Bay	Ponar	Impacted	14.1	4.2	9.9	7.9	2.0	4.2	0.0
83.5										
84	CELERON ISLAND	000-043	Impacted	3.1	1.6	1.5	1.4	0.1	0.0	1.6
84.1	CELERON ISLAND	043-074	Impacted	1.5	0.0	1.5	1.5	0.0	0.0	0.0
84.2	CELERON ISLAND	074-107	Impacted	1.8	0.0	1.8	1.8	0.0	0.0	0.0

Classification B.

DATA RESULTS Classification - Most Contaminated to Least Contaminated

Classification of Contaminated Sediment Sites as applied to the Trenton Channel Sediment Survey Results 1993-1996

Summed Exceedances

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Location Index	Trenton Channel Project Sediment Results SITE DESCRIPTION	Core length in cm	CLASSIFICATION	BIO + TOX EXCEEDANCE TOTAL	BIO Exceedance	Tox Exceedance	EXCEEDANCES (x over guidelines) Toxics Metals	Organics	Bioaccum PCBs	Hg
22.2	51 C 1 Firestone upper	091-152	Extremely Contaminated	225.9	203.0	22.8	10.6	12.2	43.0	160.0
22.1	51 C 1 Firestone upper	030-091	Extremely Contaminated	214.4	188.2	26.2	12.5	13.7	28.2	160.0
22	51 C 1 Firestone upper	000-030	Extremely Contaminated	203.0	185.8	17.2	8.9	8.3	55.8	130.0
23	66C1 Firestone Steel -Mid (45P site)	000-030	Extremely Contaminated	201.8	175.1	26.7	11.9	14.8	15.1	160.0
34.1	MONGUAGON CREEK-DOWN	150-168	Extremely Contaminated	173.1	147.3	25.9	20.6	5.2	37.3	110.0
27.2	MONGUAGON CREEK-UPSTREAM	104-142	Extremely Contaminated	163.5	132.9	30.5	14.6	15.9	33.9	99.0
41	47E BLLG	Eckman	Extremely Contaminated	137.9	119.9	18.0	10.9	7.1	9.9	110.0
25	50P Firestone lower	Ponar	Extremely Contaminated	135.6	110.4	25.3	13.4	11.8	10.4	100.0
22.3	51 C 1 Firestone upper	152-194	Extremely Contaminated	130.8	111.3	19.5	8.4	11.1	16.3	95.0
23.1	66C1 Firestone Steel -Mid (45P site)	030-091	Extremely Contaminated	130.5	111.7	18.9	9.2	9.7	11.7	100.0
24	45P Firestone Steel	PONAR	Extremely Contaminated	118.9	103.3	15.6	10.0	5.6	3.3	100.0
28.3	MONGUAGON CREEK-UPSTREAM	150-180	Extremely Contaminated	103.9	87.3	16.6	8.2	8.4	30.3	57.0
2.2	56C1 Nickelson South Slip	030-043	Extremely Contaminated	99.1	28.0	71.1	25.3	45.8	22.4	5.6
35.2	BLACK LAGOON-CENTER	120-210	Extremely Contaminated	97.0	73.5	23.5	17.0	6.5	5.5	58.0
49	ELIZABETH PARK CANAL	000-079	Extremely Contaminated	95.6	64.2	31.4	13.4	18.0	8.2	56.0
1.2	55C1 Allied Oil Slip NW	030-091	Extremely Contaminated	94.1	50.3	43.8	15.6	28.2	38.3	12.0
28.1	MONGUAGON CREEK-UPSTREAM	030-078	Extremely Contaminated	92.8	64.0	28.8	14.1	14.7	30.0	34.0
28.2	MONGUAGON CREEK-UPSTREAM	078-150	Extremely Contaminated	91.7	60.4	31.3	16.8	14.5	29.4	31.0
51	17 C1 EPNC-Inner	000-040	Extremely Contaminated	91.5	80.8	10.8	8.5	2.2	6.6	74.0
36	BLACK LAGOON-LOWER	000-060	Extremely Contaminated	91.3	64.5	26.8	20.9	5.9	6.5	58.0
36.1	BLACK LAGOON-LOWER	060-152	Extremely Contaminated	91.1	78.0	13.1	9.7	3.5	0.0	78.0
50	18 C1 EPNC-Upper	000-060	Extremely Contaminated	90.1	78.2	11.9	10.3	1.6	31.2	47.0
1.1	55C1 Allied Oil Slip NW	000-030	Extremely Contaminated	89.6	44.9	44.7	14.8	30.0	26.9	18.0
1.6	55C2 Allied Oil Slip NW - dup	030-091	Extremely Contaminated	85.7	43.0	42.8	16.2	26.5	28.0	15.0
2.3	56C2 Nickelson South Slip -dup	000-030	Extremely Contaminated	85.5	19.3	66.2	18.1	48.1	15.1	4.2
35.1	BLACK LAGOON-CENTER	030-120	Extremely Contaminated	85.3	50.7	34.6	21.2	13.4	19.7	31.0
52	18 C1 EPNC-Lower	000-055	Extremely Contaminated	83.9	75.0	9.0	6.8	2.2	7.0	68.0
1.4	55C1 Allied Oil Slip NW	152-218	Extremely Contaminated	83.7	32.5	51.2	12.9	38.4	21.5	11.0
24.1	45P Firestone Steel	PONAR	Extremely Contaminated	82.3	71.7	10.7	10.7	0.0	6.7	65.0
62.2	EP MARINA - RIVER BED UP	020-028	Extremely Contaminated	79.9	57.9	22.0	11.7	10.3	5.9	52.0
2.1	56C1 Nickelson South Slip	000-030	Extremely Contaminated	79.1	19.6	59.4	16.0	43.4	15.7	4.1
1.7	55C2 Allied Oil Slip NW - dup	091-147	Extremely Contaminated	78.5	37.4	41.1	15.0	26.1	26.4	11.0
1.3	55C1 Allied Oil Slip NW	091-152	Extremely Contaminated	78.3	35.2	43.1	11.0	32.0	25.2	10.0
34	MONGUAGON CREEK-DOWN	000-150	Extremely Contaminated	77.3	56.9	20.4	17.5	2.9	17.9	39.0
47	27P Trenton Towers	PONAR	Extremely Contaminated	77.3	64.0	13.3	13.1	0.2	0.0	64.0
74.1	20 C1 EPSC-Inlet	083-088	Extremely Contaminated	72.1	55.0	17.0	14.8	2.3	4.0	51.0
1.5	55C2 Allied Oil Slip NW - dup	000-030	Extremely Contaminated	59.6	31.3	38.3	12.1	26.2	21.4	9.9
27.1	MONGUAGON CREEK-UPSTREAM	030-104	Extremely Contaminated	65.3	19.6	45.7	18.1	27.6	7.6	12.0
62.1	EP MARINA - RIVER BED UP	010-020	Extremely Contaminated	65.0	46.3	18.7	10.4	8.2	4.3	42.0
3.3	59C1 Stanson Club	091-152	Extremely Contaminated	63.0	32.0	31.0	11.4	19.5	17.0	15.0
74	20 C1 EPSC-Inlet	000-083	Extremely Contaminated	62.2	47.3	14.9	13.2	1.7	7.3	40.0
62.3	EP MARINA - RIVER BED UP	028-036	Extremely Contaminated	61.5	48.1	13.4	12.7	0.7	5.1	43.0

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68	EPN (new site)	Ponar	Severely Contaminated	59.2	44.0	15.2	14.8	0.4	0.0	44.0
52.1	18 C1 EPNC-Lower	055-125	Severely Contaminated	57.9	48.0	9.9	9.0	0.9	2.0	46.0
3.2	59C1 Stenson Club	030-091	Severely Contaminated	57.8	29.5	28.4	10.4	17.9	21.2	5.3
75	36P Monsanto Lagoon	PONAR	Severely Contaminated	57.3	41.7	15.6	14.5	1.1	2.7	39.0
38.2	BLACK LAGOON-LOWER	152-203	Severely Contaminated	57.1	48.0	9.1	7.3	1.8	0.0	48.0
3.1	59C1 Stenson Club	000-030	Severely Contaminated	56.3	29.0	27.4	9.4	16.0	21.7	7.3
77.2	19 C2 Monsanto Bay	000-051	Severely Contaminated	51.7	40.3	11.5	9.2	2.2	7.3	33.0
77.1	19 C1 Monsanto Bay	053-085	Severely Contaminated	51.7	42.5	9.2	7.8	1.4	3.5	39.0
83	EP MARINA - RIVER BED DN.	000-013	Severely Contaminated	51.2	40.0	11.2	7.1	4.1	0.0	40.0
50.1	16 C1 EPNC-Upper	080-120	Severely Contaminated	50.2	40.0	10.2	8.8	1.4	0.0	40.0
77	19 C1 Monsanto Bay	000-053	Severely Contaminated	50.1	37.6	12.5	10.6	1.9	1.6	36.0
83.1	EP MARINA - RIVER BED DN.	013-018	Severely Contaminated	50.0	40.0	10.0	7.7	2.3	0.0	40.0
2.4	58C2 Nickelson South Slip -dup	030-091	Severely Contaminated	49.5	25.3	24.2	21.8	2.7	24.8	0.7
82	EP MARINA - RIVER BED UP	000-010	Severely Contaminated	48.9	34.2	14.8	10.0	4.8	4.2	30.0
3.4	59C1 Stenson Club	152-213	Severely Contaminated	48.8	33.8	15.0	6.6	8.4	3.8	30.0
27	MONGUAGON CREEK-UPSTREAM	000-030	Severely Contaminated	48.1	31.3	16.9	11.6	5.2	7.3	24.0
23.2	66C1 Firestone Steel -Mid (45P site)	091-104	Severely Contaminated	48.0	31.0	17.0	6.6	10.4	2.0	29.0
28	MONGUAGON CREEK-UPSTREAM	000-030	Severely Contaminated	47.9	31.4	16.5	10.5	6.0	6.4	25.0
77.3	19 C2 Monsanto Bay	051-085	Severely Contaminated	45.9	36.2	9.8	7.1	2.6	4.2	32.0
71.1	EPM-3 (S13-EPM South)	Eckman	Severely Contaminated	45.3	38.0	7.3	6.4	0.9	0.0	38.0
39.1	24 C1 BLLG-Nearshore	030-075	Severely Contaminated	43.0	19.6	23.4	21.0	2.5	7.6	12.0
40	24 C1 BLLG-Nearshore	030-075	Severely Contaminated	43.0	13.0	30.0	29.9	0.1	0.0	13.0
52.2	18 C1 EPNC-Lower.	125-170	Severely Contaminated	42.9	28.2	14.7	7.1	7.6	4.2	24.0
39	24 C1 BLLG-Nearshore	000-030	Severely Contaminated	42.2	17.0	25.2	20.3	4.9	5.0	12.0
49.1	ELIZABETH PARK CANAL	079-180	Severely Contaminated	41.7	23.0	18.7	10.1	8.6	0.0	23.0
50.2	16 C1 EPNC-Upper.	120-157	Severely Contaminated	40.9	29.2	11.6	9.6	2.0	1.2	28.0
71	S13-EPM South	Ponar	Severely Contaminated	40.9	31.0	9.9	9.3	0.5	0.0	31.0
30	S5 - Monguagon Creek	Ponar	Severely Contaminated	40.1	18.7	21.4	11.3	10.1	18.7	0.0
70	S12-EPM Mid	Ponar	Severely Contaminated	40.0	29.0	11.0	10.4	0.6	0.0	29.0
42	S7 - Black Lagoon	Ponar	Severely Contaminated	40.0	14.4	25.6	16.2	9.3	14.4	0.0
49.3	ELIZABETH PARK CANAL	260-330	Severely Contaminated	38.9	24.0	14.9	8.7	6.2	0.0	24.0
35	BLACK LAGOON-CENTER	000-030	Severely Contaminated	37.2	14.0	23.2	18.7	4.5	0.0	14.0
32.3	25 C1 MNCK DNS-Nearshore	095-132	Severely Contaminated	36.2	17.5	18.7	18.0	0.7	3.5	14.0
58	32P EPC Bridge 4	PONAR	Severely Contaminated	36.0	25.5	10.6	10.3	0.2	16.7	8.8
51.1	17 C1 EPNC-Inner	040-080	Severely Contaminated	35.4	26.0	9.4	7.7	1.7	0.0	26.0
2.6	58C2 Nickelson South Slip -dup	152-201	Severely Contaminated	35.1	15.7	19.4	11.2	8.2	6.6	9.1
3.5	59C1 Stenson Club	213-224	Severely Contaminated	34.7	25.4	9.3	3.9	5.4	4.4	21.0
15	69C1 Wyandotte Yacht Club	000-030	Severely Contaminated	33.7	21.0	12.7	5.8	7.0	10.0	11.0
49.2	ELIZABETH PARK CANAL	180-260	Severely Contaminated	32.8	15.0	17.8	7.2	10.6	0.0	15.0
15.1	69C1 Wyandotte Yacht Club	030-066	Severely Contaminated	32.6	20.4	12.3	5.3	6.9	5.4	15.0
14.1	52C1 BASF Northworks lower	030-091	Severely Contaminated	31.5	16.9	14.7	6.9	7.7	3.9	13.0
59	S11-EPM Upland	Ponar	Severely Contaminated	31.4	23.0	8.4	8.1	0.3	0.0	23.0
59.1	S11D- EPM Upland Dup.	Ponar	Severely Contaminated	31.2	23.0	8.2	8.0	0.2	0.0	23.0
14.2	52C1 BASF Northworks lower	091-152	Severely Contaminated	31.1	16.3	14.8	6.9	7.9	1.3	15.0
72	34P EPSC DOCK	PONAR	Severely Contaminated	30.8	18.5	12.3	11.9	0.4	2.5	16.0
53	48E EPNC	Eckman	Severely Contaminated	30.5	20.2	10.3	7.9	2.4	5.2	15.0

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29	48E Monguagon Creek	Eckman	Moderately Contaminated	29.9	7.5	22.4	13.6	8.9	4.6	2.9
14	52C1 BASF Northworks lower	000-030	Moderately Contaminated	29.4	14.2	15.1	6.9	8.3	5.8	9.4
32.2	25 C1 MNCK DNS-Nearshore	051-095	Moderately Contaminated	29.3	18.3	11.1	10.6	0.5	3.3	15.0
79	CHRYSLER BAY-OUTER	000-013	Moderately Contaminated	27.9	20.4	7.5	6.4	1.1	5.4	15.0
2.5	56C2 Nickelson South Slip -dup	091-152	Moderately Contaminated	27.3	11.8	15.6	7.3	8.3	4.8	7.0
59.2	EPM-1 (S11-EPM Upland)	Eckman	Moderately Contaminated	27.0	18.0	9.0	8.9	0.1	0.0	18.0
51.2	17 C1 EPNC-Inner	080-140	Moderately Contaminated	26.5	18.0	8.5	6.2	2.3	0.0	18.0
70.2	EPM2-dup (S12- EPM Upland)	Eckman	Moderately Contaminated	26.2	17.0	9.2	9.2	0.0	0.0	17.0
66	EP2 - Mid Marina (S12)	Ponar	Moderately Contaminated	25.7	8.0	17.7	10.8	7.0	8.0	0.0
12	57P Mouth of Ecorse Creek	Ponar	Moderately Contaminated	25.6	14.6	11.1	5.0	6.1	10.6	4.0
70.1	EPM-2 (S12-EPM Mid)	Eckman	Moderately Contaminated	25.6	16.0	9.6	9.2	0.4	0.0	16.0
57	31P EPC Bridge 3	PONAR	Moderately Contaminated	24.9	17.0	7.9	7.6	0.3	0.0	17.0
18	67C1- Portofino	000-030	Moderately Contaminated	24.5	13.2	11.3	6.3	5.1	5.7	7.5
68.1	EPM-N	Eckman	Moderately Contaminated	23.8	15.0	8.8	8.7	0.1	0.0	15.0
74.2	49E EPSC	Eckman	Moderately Contaminated	23.7	9.6	14.1	7.0	7.1	0.0	9.6
52.3	18 C1 EPNC-Lower	170-217	Moderately Contaminated	23.2	15.0	8.2	4.7	3.5	0.0	15.0
73	35P EPSC-Inlet	PONAR	Moderately Contaminated	22.5	12.0	10.5	10.1	0.4	0.0	12.0
59	33P EPC Bridge 5	PONAR	Moderately Contaminated	21.4	11.8	9.7	9.3	0.4	2.5	9.1
35.3	BLACK LAGOON-CENTER	210-229	Moderately Contaminated	20.6	14.0	6.6	4.1	2.4	0.0	14.0
32	25 C1 MNCK DNS-Nearshore	000-027	Moderately Contaminated	20.3	11.0	9.3	8.3	1.0	0.0	11.0
67	EP3 - South Marina (S13)	Ponar	Moderately Contaminated	20.2	4.8	15.4	10.1	5.3	4.8	0.0
73.1	35P EPSC-Inlet	PONAR	Moderately Contaminated	19.7	10.0	9.7	9.3	0.4	0.0	10.0
32.1	25 C1 MNCK DNS-Nearshore	027-051	Moderately Contaminated	19.2	9.5	9.7	9.4	0.3	0.0	9.5
14.3	52C1 BASF Northworks lower	152-213	Moderately Contaminated	17.3	8.9	8.4	3.3	5.2	0.0	8.9
51.3	17 C1 EPNC-Inner	140-175	Moderately Contaminated	16.9	12.0	4.9	3.8	1.0	0.0	12.0
82	38P Above Humbug Marina	PONAR	Moderately Contaminated	15.7	8.7	7.0	6.8	0.2	0.0	8.7
65	EP1 - Upland (S11)	Ponar	Moderately Contaminated	15.3	3.8	11.4	7.9	3.5	3.8	0.0

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5.1	65P Mud Island SW	Ponar	Impacted	14.3	6.1	8.2	5.0	3.2	2.8	3.3
83	59 - Chrysler Bay	Ponar	Impacted	14.1	4.2	9.9	7.9	2.0	4.2	0.0
45	44P ONS from Bouy R "28"	PONAR	Impacted	13.8	6.5	7.3	7.3	0.0	0.0	6.5
48	28P Deadhead Cove	PONAR	Impacted	13.8	7.0	6.8	6.5	0.2	0.0	7.0
46	26P Riverside Hospital	PONAR	Impacted	13.5	5.6	7.9	7.4	0.5	0.0	5.6
48.1	28PC2	PONAR	Impacted	13.4	6.7	6.7	6.5	0.2	0.0	6.7
55	29P EPC Bridge 1	PONAR	Impacted	12.1	4.0	8.1	8.1	0.0	0.0	4.0
11	62P Grassy Island SE	Ponar	Impacted	10.2	4.6	5.6	3.4	2.2	1.3	3.3
10	61P Grassy Island SW	Ponar	Impacted	9.8	5.1	4.6	2.5	2.1	1.2	3.9
19	43P Portofino Slip	PONAR	Impacted	8.9	3.2	5.7	4.6	1.1	0.0	3.2
6.1	60C1 Mud Island -South side	000-030	Impacted	8.2	5.5	2.8	1.4	1.3	3.2	2.3
44	41P NE of Bouy R "18"	PONAR	Impacted	8.2	4.0	4.2	3.8	0.5	1.7	2.3
6.2	60C1 Mud Island -South side	030-091	Impacted	8.1	6.6	1.5	1.5	0.0	4.9	1.7
81	39P Swan Island-North	PONAR	Impacted	7.5	3.8	3.7	3.1	0.6	0.0	3.8
7	53C1 Grassy Island NW	000-030	Impacted	6.3	3.3	3.0	3.0	0.1	0.0	3.3
8	54C1 Grassy Island NE	000-034	Impacted	5.5	3.4	2.0	1.8	0.2	1.8	1.6
6.3	60C1 Mud Island -South side	091-137	Impacted	5.4	3.9	1.5	1.5	0.0	3.1	0.8
13	58C1 Mouth of Ecorse Creek	000-030	Impacted	5.3	3.4	1.9	1.9	0.0	3.4	0.0
4.1	64P Mud Island Northside	Ponar	Impacted	5.2	1.3	3.8	2.5	1.4	0.5	0.8
9	63P Grassy Island W	Ponar	Impacted	4.8	1.4	3.4	2.0	1.4	0.0	1.4
80	37P Chry Bay Marsh Inlet	PONAR	Impacted	4.6	1.8	2.8	2.5	0.0	0.0	1.8
20	42P Pt. Hennepin	PONAR	Impacted	4.4	2.2	2.2	1.9	0.3	0.0	2.2
43	40P East of Bouy N"8"	PONAR	Impacted	4.3	1.8	2.5	2.3	0.2	0.0	1.8
56	30P EPC Bridge 2	PONAR	Impacted	3.9	1.8	2.1	2.1	0.0	0.0	1.8
33.1	21 C1 MNCK ONS-Offshore	027-051	Impacted	3.8	2.3	1.5	1.5	0.0	0.0	2.3
84	CELERON ISLAND	000-043	Impacted	3.1	1.6	1.5	1.4	0.1	0.0	1.6
78	CHRYSLER BAY-INNER	000-030	Impacted	3.1	2.0	1.1	1.1	0.0	0.0	2.0
21.2	15 C1 T.C. North Marsh	062-100	Impacted	2.1	0.0	2.1	2.1	0.0	0.0	0.0
17	68E N of Pt. Hennepin	Eckman	Impacted	2.1	0.8	1.3	1.1	0.1	0.0	0.8
16	66P N of Pt Hennepin	Ponar	Impacted	2.1	0.7	1.4	1.0	0.4	0.0	0.7
21	15 C1 T.C. North Marsh	000-022	Impacted	2.0	0.0	2.0	2.0	0.0	0.0	0.0
79.1	CHRYSLER BAY-OUTER	013-061	Impacted	1.9	0.0	1.9	1.9	0.0	0.0	0.0
7.1	53C1 Grassy Island NW	030-071	Impacted	1.8	0.3	1.5	1.3	0.2	0.0	0.3
21.1	15 C1 T.C. North Marsh	022-062	Impacted	1.8	0.0	1.8	1.8	0.0	0.0	0.0
78.2	CHRYSLER BAY-INNER	058-079	Impacted	1.7	0.0	1.7	1.7	0.0	0.0	0.0
60	EP MARINA - OUTSIDE	000-020	Impacted	1.7	0.0	1.7	1.7	0.0	0.0	0.0
84.2	CELERON ISLAND	074-107	Impacted	1.6	0.0	1.6	1.6	0.0	0.0	0.0
31	FI - Fighting Island	Ponar	Impacted	1.6	0.2	1.3	1.2	0.1	0.2	0.0
61	EP MARINA - UPLAND	000-006	Impacted	1.6	0.0	1.6	1.6	0.0	0.0	0.0
84.1	CELERON ISLAND	043-074	Impacted	1.5	0.0	1.5	1.5	0.0	0.0	0.0
78.1	CHRYSLER BAY-INNER	030-058	Impacted	1.5	0.0	1.5	1.5	0.0	0.0	0.0
33	21 C1 MNCK ONS-Offshore	000-027	Impacted	1.2	0.0	1.2	1.2	0.0	0.0	0.0
38.2	BLACK LAGOON-EAST	133-182	Non-Impacted	0.9	0.0	0.9	0.9	0.0	0.0	0.0
37	BLACK LAGOON-EAST	000-055	Non-Impacted	0.8	0.0	0.8	0.8	0.0	0.0	0.0
37.3	BLACK LAGOON-EAST	166-229	Non-Impacted	0.8	0.0	0.8	0.8	0.0	0.0	0.0
37.2	BLACK LAGOON-EAST	103-166	Non-Impacted	0.7	0.0	0.7	0.7	0.0	0.0	0.0
38.1	BLACK LAGOON-EAST	035-133	Non-Impacted	0.7	0.0	0.7	0.7	0.0	0.0	0.0
37.1	BLACK LAGOON-EAST	055-103	Non-Impacted	0.7	0.0	0.7	0.7	0.0	0.0	0.0
38	BLACK LAGOON-EAST	000-035	Non-Impacted	0.7	0.0	0.7	0.7	0.0	0.0	0.0