Low Detection Level Study Report
Marina del Rey Harbor Toxic Pollutants TMDL

Prepared for

County of Los Angeles
Department of Public Works,

City of Los Angeles (Los Angeles),

City of Culver City (Culver City),

California Department of Transportation (Caltrans)

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1. Introduction

The County of Los Angeles Department of Public Works (County), City of Los Angeles (Los Angeles), City of Culver City (Culver City), and the California Department of Transportation (Caltrans) are named the responsible parties in the Los Angeles Regional Water Quality Control Board's (Regional Board) Marina del Rey (MdR) Harbor (MdRH) Toxics Total Maximum Daily Load (TMDL). The County is serving as the lead agency for compliance with the TMDL for MdR and has retained Brown and Caldwell (BC) to assist with compliance with various monitoring and special studies required therein. This Study Report summarizes the background, objectives, approach, and intended outcomes of the Low Detection Level (LDL) Study.

1.1 Project Objective

The objective of this project is to conduct the following Special Study mandated under the Toxics TMDL:

1. **LDL Study.** This study involves an evaluation of LDL techniques to determine water quality concentrations for those contaminants where standard detection limits cannot be used to assess California Toxics Rule (CTR) standards or are not sufficient for estimating source loadings from tributaries and stormwater.

1.2 Background

On October 6, 2005, the Regional Board adopted the MdRH Toxics TMDL. Section 7.3 of the TMDL document describes the need for Special Studies, as follows:

> *"Special studies are necessary to refine source assessments, to provide better estimates of loading capacity, and to optimize implementation efforts. The Regional Board will reconsider the TMDL in the sixth year after the effective date in light of the findings of these studies.*
>
> *Studies required for this TMDL include:*
>
> - *Evaluate partitioning coefficients between water column and sediment to assess the contribution of water column discharges to sediment concentrations in the harbor, and*
> - *Evaluate the use of low detection level techniques to determine water quality concentrations for those contaminants where standard detection limits cannot be used to assess compliance for CTR standards or are not sufficient for estimating source loadings from tributaries and stormwater.*
>
> *Studies recommended for this TMDL include:*
>
> - *Develop and implement a monitoring program to collect the data necessary to apply a multiple lines of evidence approach;*
> - *Refine the relationship between pollutants and suspended solids aimed at better understanding of the delivery of pollutants to the watershed, and*

- *Evaluate the effectiveness of BMPs to address pollutants and/or sediments."*

1.2.1 Problem Statement

The TMDL for Toxic Pollutants in Marina Del Rey Harbor prepared by the Regional Board and U.S. Environmental Protection Agency (USEPA) Region 9 presents the required elements of the TMDL in MdR's back basins (Basins D, E and F), and summarizes the technical analyses performed by the Regional Board and USEPA Region 9 to develop this TMDL.

The back basins of the Marina are listed for a variety of toxic pollutants, including metals, organic compounds and sediment toxicity. These sections of MdRH were included on the 1996, 1998, and 2002 California 303(d) list of impaired water bodies (Regional Board 1996, 1998, 2002). The Clean Water Act requires a TMDL be developed to restore the impaired water bodies to their full beneficial uses. The listings for MdR's back basins are based on concentrations of chlordane, dieldrin, dichlorodiphenyltrichloroethane (DDT) and polychlorinated biphenyls (PCBs) in fish tissue and concentrations of copper, lead, zinc, chlordane, and PCBs in sediments.

1.2.2 Project Management Team

The project management team is presented in Table 1.1.

Table 1-1. Project Management Team

Firm / Agency	Contact Name	Contact Title	Contact Number
BC	Lisa Skutecki	Special Studies Toxic TMDL Project Manager	(858) 571-6739
	Melissa Ingalsbe	CMP TMDL Implementation Phase 1 Project Manager	(213) 271 - 2239
MBC	Michael J. Mancuso	Sampling Project Manager	(714) 850 - 4850
ATL	Rachelle Arada	Laboratory Project Manager	(562) 989 - 4045
Physis	Mark Baker	Laboratory Project Manager	(714) 602 - 5320
	Misty B. Mercier	Laboratory Project Manager	(714) 602 - 5320
County of Los Angeles Department of Public Works	Raymond To	Special Studies Toxic TMDL Project Manager	(626) 458-7123
	Antonino Monterrosa	CMP TMDL Implementation Phase 1 Project Manager	(626) 458-4376
City of Los Angeles, Bureau of Sanitation	Huub Cox	Assistant Division Head	(213) 485-3984
	Wendy Dinh	Environmental Engineering Associate	(213) 485-3912
California Department of Transportation	Bob Wu	Senior Transportation Engineer	(213) 897-8636
	Chien Pei Yu	Tranportation Engineer	(213) 897-0974
Culver City	Kaden Young	Associate Engineer	(310) 253-6445
Beaches and Harbors	Chris Sellers	Planner	(310) 578-0961

CMP = Coordinated Monitoring Plan

1.3 Site Location

The MdR watershed is approximately 2.9 square miles and drains into Santa Monica Bay, California. Located south of Venice and north of Playa del Rey, it includes the City of Los Angeles, Culver City and unincorporated areas of Los Angeles County. The climate is warm and dry most of the year with intermittent wet weather events typically between November and March.

MdRH was developed in the early 1960s on degraded wetlands that formed part of the estuary of the Ballona Creek Wetlands. MdRH, which opens into Santa Monica Bay, was constructed by the United States Army Corps of Engineers (USACE) and is the largest artificial small-craft harbor in the United States. MdRH has more than 5,300 wet berthed slips for privately owned pleasure craft, dry storage of approximately 3,000 boats, and launch facilities, which can accommodate approximately 240 trailered boats. The back basins (Basins D, E and F) house approximately 2,000 slips.

The USACE maintains the harbor entrance channel and main channel for navigation by dredging. Since the late 1980s, the USACE has not been able to use open water disposal for sediments dredged from the entrance channel due to the elevated levels of contaminants deposited from adjacent Ballona Creek. Based on the USACE hydrodynamic numerical modeling (RMA4 model) results, the contaminant influence from Ballona Creek does not travel to nor affect the back basins (USACE 1999). Therefore, the bottom sediments in the back basins of the MdRH are assumed to be outside any significant influence from Ballona Creek.

The MdR watershed is highly developed with high-density single-family residence, multiple family residence, and mixed residential comprising the primary land use in the watershed (46.6 percent) followed by retail, commercial, and general office representing the second largest land use (12.2 percent). The receiving waters of MdRH constitute 11.6 percent of the land area and marina facilities cover 9.2 percent of the land use. Open space and recreation represents 4.8 percent of the land use in the watershed. Light industrial and vacant/urban vacant each represent 4.7 percent of the land use. The remaining 6 percent of land area is covered by educational institutions (3.8 percent), under construction (1.2 percent), institutional and military installations (0.6 percent), transportation (0.3 percent), and mixed urban (0.2 percent).

1.4 Associated Reports and Technical Memoranda

Coordinated Monitoring Plan. This Plan was developed by the TMDL responsible parties and submitted to the Los Angeles Regional Water Quality Control Board on March 31, 2008. It established the monitoring guidelines and objectives for the (MdRH Toxics TMDL Coordinated Monitoring Program and includes programs for both wet and dry weather monitoring. The dry weather monitoring consists of harbor water column, harbor sediment and bioaccumulation sample collection and analysis. The wet weather program is comprised of the design and installation of stormwater sampling stations and the collection and analysis of stormwater samples.

Partitioning Coefficient Study Plan. Draft and Final Study Plans were prepared for the study. The Study Plan identifies the locations in which the samples are being collected, specifies the analyses and reporting limits to be achieved, describes the sampling logistics and coordination with the Ambient Monitoring Program (AMP) for MdRH, and discusses sample handling, documentation and reporting.

LDL Study Plan. Draft and Final Study Plans were prepared for the study. The Study Plan identifies the locations in which the samples are being collected, specifies the analyses and reporting limits to be achieved, describes the sampling logistics and coordination with the AMP for MdRH, and discusses sample handling, documentation and reporting.

Draft and Final Quality Assurance Project Plan (QAPP). The QAPP establishes measureable expectations for evaluation of quality control samples (e.g., spikes, blanks, and replicates), chain of custody forms, detection limits, and other measures that ensure data quality adequate to the study objectives.

Draft and Final Data Management and Reporting Plan (DMP). The DMP identifies the protocols by which the data needs to be collected, compiled, archived and uploaded to the County's Integrated Water Quality Database.

Draft and Final Study Reports for the Partitioning Coefficient Study and the LDL Study. These reports will provide formal documentation of all work conducted on the two studies, as well as a compilation of all data collected, statistical analyses and interpretation, results, and conclusions.

2. Methodology

This section summarizes key points of the sampling and analysis approach necessary to understand the findings of the LDL Study. Details are available in the LDL Study Plan and QAPP.

2.1 Study Design Philosophy and Approach

The LDL Study was designed to determine water quality concentrations for those contaminants where standard detection limits could not be used to assess compliance for CTR standards or were not sufficient for estimating source loadings from tributaries and stormwater: PCBs and chlordanes. Other constituents, such as metals, can be detected in receiving waters at concentrations at or below CTR standards using existing methods and are therefore not included in this study.

Long-lived, hydrophobic, bioaccumulative pollutants like chlordane and PCBs generally have concentrations higher in sediment and fish than compared to water. Therefore, detection of those pollutants in water at environmentally relevant concentrations is more challenging than other media. Table 2-1 below compares Reporting Limits (RLs) established by the State Implementation Policy (SIP) of the CTR to water quality objectives (WQOs) promulgated in the CTR and adopted by the State of California. The lowest reportable concentrations of those pollutants are two to three orders of magnitude higher than the applicable WQOs for protection of human health.

Table 2-1. Basin Plan Water Quality Objectives for Marina del Rey

Pollutant	Criteria for the Protection of Aquatic Life		Criteria for the Protection of Human Health		RL (µg/L)
	Saltwater		Water & Organisms (µg/L)	Organisms only (µg/L)	
	Acute (µg/L)	Chronic (µg/L)			
Chlordane	0.09	0.004	0.00057	0.00059	0.1
Total PCBs[1]	-	0.03	0.00017	0.00017	0.5

[1] There are 209 different chemical forms, or congeners, of PCBs that are characterized by the number and arrangement of chlorine atoms. The PCBs WQO is expressed as a sum of the individual congeners, or "total PCBs," The analytical method used in this study would quantify individual congeners. Summation of individual congeners introduces an additional level of complexity when evaluating the RL.

The RL is defined in the SIP as the lowest concentration calibration standard used in an analysis. According to the SIP, concentrations below the RL are not reportable for purposes of compliance and enforcement. The method detection limit (MDL) is the lowest concentration at which a pollutant can be reliable detected. The MDL is defined in 40 CFR Part 136 as three standard deviations of replicate measurements of a blank or low concentration sample. In other words, the MDL is the lower threshold for presence/absence detection without quantification, whereas the RL is the lower threshold for quantification.

A significant challenge to implementing the guidance of 40 CFR Part 136 is that it specifically applies to single analyte measurements. The CTR WQO is for the sum of 209 different PCB congeners, each which has its own unique MDL. To date, there has not been any guidance provided on how to estimate the MDL of the sum of PCBs. The analytical method employed in the MdR CMP for PCBs (USEPA Method 608) is the only method that has been promulgated and properly validated by USEPA in 40 CFR Part 136 for

compliance monitoring of those pollutants. For these reasons, measurements of individual PCB congeners using High Resolution GC MS (HRGCMS) are suitable for scientific studies, but not for enforcement of effluent limits, receiving water limits, and discharge prohibitions in National Pollutant Discharge Elimination System permits.

For the purposes of this study, MDLs for the sum of PCBs are estimated by two approaches described below, and are referred to as "Estimated MDLs" (EMDLs). Detection limits for individual PCB congeners published in USEPA Method 1668 are also referred to as EMDLs in this Study, because the EMDLs published in USEPA Method 1668 have not been validated for stormwater or surface waters. This study evaluates the benefits of using a more sensitive analytical method as a means of reducing the EMDLs for individual PCB congeners. The study concurrently evaluates the effect of background concentrations of PCBs in trip blanks on detection limits and detection of concentrations above EMDLs that exceed numeric targets established by the MdR TMDL.

2.2 Sampling Locations, Frequency, and Analyses

The LDL Study was implemented in parallel and in combination with the existing monitoring program and the partitioning coefficient study being conducted for MdR and MdRH. The sampling locations, type, frequency, constituents and analytical methods for the stormwater monitoring are presented in Table 2-2. The sampling locations, type, frequency, constituents and analytical methods for the harbor water column monitoring and harbor sediment collection are presented in Table 2-3. Sampling locations are presented in Figure 2-1.

Table 2-2. Stormwater Monitoring Locations in Marina del Rey Watershed

Name	Sampling Location Type	Monitoring Types/ Frequency	Lat.	Long.	Thomas Guide	% of Total Drainage Area	Sampling	LDL Constituents	Method	Comment
MdR-3	Project No. 5243 LFD	Composite Up to 4 storm events	33.989	118.45	672:A6	40.90%	Wet-weather event / Stormwater quality only	LDL Chlordane LDL Total PCBs	EPA 625 EPA 1668	Washington Blvd. and Thatcher Ave.
MdR-4	Project No. 3872 LFD	Composite Up to 4 storm events	33.986	118.453	672:A6	16.50%	Wet-weather event / Stormwater quality only	LDL Chlordane LDL Total PCBs	EPA 625 EPA 1668	At the pump house at the east end of Oxford Basin. Construction completed on 3/2010
MdR-5	Project No. 3874 LFD	Composite Up to 4 storm events	33.985	118.459	671:J6	6.70%	Wet-weather event / Stormwater quality only	LDL Chlordane LDL Total PCBs	EPA 625 EPA 1668	At the existing Boone-Olive Pump House and LFD

Table 2-2. Stormwater Monitoring Locations in Marina del Rey Watershed

Name	Sampling Location Type	Monitoring Types/ Frequency	Lat.	Long.	Thomas Guide	% of Total Drainage Area	Sampling	LDL Constituents	Method	Comment
MdRU–C1	Catch Basin	Composite Up to 4 storm events	33.98 3	118.443	672:B7	0.50%	Wet-weather event / Stormwater quality only	LDL Chlordane LDL Total PCBs	EPA 625 EPA 1668	North of Bali and Admiralty Ways
MdRU–C2	Catch Basin	Composite Up to 4 storm events	33.98 9	118.457	671:J6	2.20%	Wet-weather event / Stormwater quality only	LDL Chlordane LDL Total PCBs	EPA 625 EPA 1668	North of Abbot Kinney Blvd. and Woodlawn Ave.

Table 2-3. Marina del Rey Harbor Ambient Monitoring Sites

Name	Sampling Location	Monitoring Types/Frequency	Thomas Guide	LDL Constituents	Method
MDRH-B-1	Harbor Basin D Back Basin	Water Column Quality (Monthly) Benthic Sediment (Quarterly)	672: A7	LDL Chlordane (WQ) LDL Chlordane (Sed) LDL Total PCBs	EPA 625 EPA 8720D EPA 1668
MDRH-B-2	Harbor Basin E Back Basin	Water Column Quality (Monthly) Benthic Sediment (Quarterly)	672: A7	LDL Chlordane (WQ) LDL Chlordane (Sed) LDL Total PCBs	EPA 625 EPA 8720D EPA 1668
MDRH-B-3	Harbor Basin F Back Basin	Water Column Quality (Monthly) Benthic Sediment (Quarterly)	672; B7	LDL Chlordane (WQ) LDL Chlordane (Sed) LDL Total PCBs	EPA 625 EPA 8720D EPA 1668
MDRH-B-4	Harbor End of Main Channel Back Basin	Water Column Quality (Monthly) Benthic Sediment (Quarterly)	671: A7	LDL Chlordane (WQ) LDL Chlordane (Sed) LDL Total PCBs	EPA 625 EPA 8720D EPA 1668

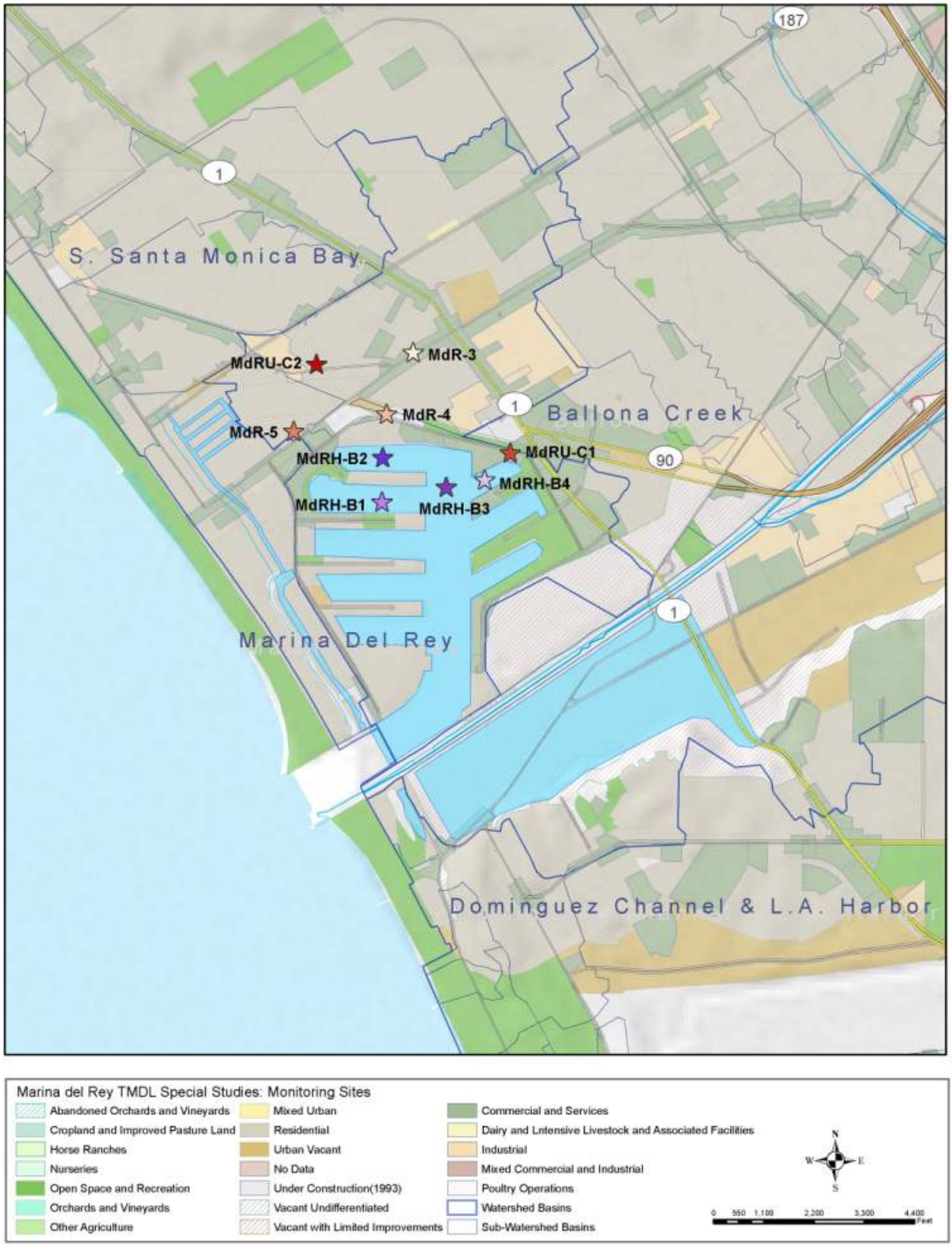

Figure 2-1. Map of Sampling Sites and Land Uses Within Watershed

2.3 Blanks and Replicate Samples

2.3.1 Field/Laboratory Blanks and Trip Blanks

Potential field contamination will be assessed through analysis of trip blanks and duplicate grab samples. One field trip blank will be collected during every sampling event to quantify post-sampling contamination. For the harbor sampling, a trip blank was provided by the laboratory. For the stormwater sampling, a clean composite bottle from the laboratory was filled with deionized water.

The monitoring program also includes field duplicates to assess the precision of laboratory results. A field duplicate, the origin of which is unknown to the laboratory, will be collected during each sampling event. This methodology for assessing post-sampling contamination and laboratory testing procedures provides data to measure the precision and accuracy of the laboratory results.

2.4 Monitoring

Monitoring was conducted in accordance with the protocols defined in the LDL Study Plan. It consisted of harbor water column monitoring, harbor sediment collection and stormwater monitoring. A brief summary of the monitoring is provided below.

2.4.1 Water Quality Monitoring

Water quality monitoring for the Special Studies program were performed in accordance with the TMDL Coordinated Monitoring Plan (CMP). Grab samples were collected on a monthly basis and analyzed for the constituents provided in Table 2-3.

Water quality samples were collected from one of MBC's vessels mid-depth in the water column using a remotely activated Van Dorn water grab sampler.

2.4.2 Sediment Sampling

Sediment chemistry sampling for the Ambient Phase and Special Studies Project were performed in accordance with the TMDL and the CMP and followed the same guidelines/protocols used in the Santa Monica Bay offshore monitoring and Regional Monitoring for comparative purposes. The sites sampled were selected based on the TMDL, Sections 3.1(b) and 3.2.2.

Grab samples were collected on a quarterly basis and analyzed for both benthic sediment chemistry and toxicity testing as listed in Table 2-3. The sediment samples were collected from one of MBC's vessels utilizing a modified Van Veen grab sampler to obtain sufficient material for toxicity tests.

Good faith efforts were made to collect representative samples from each of the four locations. If samples could not be obtained from the exact sample point, a reasonable attempt was made to collect a sample from the vicinity of the original sample point.

2.4.3 Stormwater Monitoring

Stormwater (wet weather) samples were collected at the five locations presented in Table 2-2 and analyzed for the constituents listed in Table 2-2. The composite stormwater samples were collected using auto-samplers, programmed based on a flow-rating curve for the portion of the watershed draining to the sampling site. MdR-4 and MdR-5 were permanently installed ISCO samplers. MdR-3, MdRU-C1, and MdRU-C2 were temporary enclosures with mobile ISCO samplers. The enclosure and sampler were set-up, programmed, and calibrated prior to all storms, based on weather forecasts.

2.5 Analytical Method Details

Lower MDLs and RLs can be attained by using more sensitive analytical instrumentation. Packed column GC separation with electron capture detection, as prescribed in USEPA Method 608 was replaced with capillary gas chromatography and detection by High Resolution Gas Chromatography Mass Spectrometry (HR-GC/MS) for PCB analyses. For chlordanes, USEPA method 608 was replaced with USEPA Method 625, which uses capillary gas chromatography with Low Resolution GC/MS. (LR-GC/MS). These are the most sensitive commercially available methods of analytical techniques for low detection limit analysis of PCBs and chlordanes. In this study, the concentration of the lowest calibration standards used by the laboratory were approximately ten-fold greater than the laboratory MDL for each analyte.

Table 2-4. Sample Volume and Container

Monitoring Type	Sample Type	Laboratory	Container	Volume
Harbor Water Quality	Total PCBs and Chlordane	Physis	Glass	1L
Harbor Sediment	Total PCBs and Chlordane	Physis	1 sediment bag	Full
Stormwater Quality	Total PCBs and Chlordane	Physis	2.5 gal glass (9.6 L)	1L

2.6 Blank Correction and MDL Estimation for PCBs

The lowest concentration of an analyte that can be reliably detected depends on how variable the analytical result is at low concentrations. In order to state affirmatively that a detected result is different from zero by a statistically significant amount, the result must be more than three standard deviations of replicate measurements (according to the definition of 40 CFR Part 136). This is typically assessed by making multiple (i.e., five to ten) measurements of a low concentration sample.

Analyses which have detectable concentrations of the analyte in blanks require subtraction of the blank measurement from the sample measurement. In this case, variability of the result in the blank becomes the controlling factor – the MDL is assessed based on three standard deviations of replicate blank measurements.

The procedure for blank correction and MDL estimation is complicated for PCB analyses using EPA Method 1668, which provides data on the sum of 209 individual PCB congeners. Each congener has its own unique blank correction and MDL. There is no established guidance in 40 CFR Part 136 or any other EPA documents for how to perform blank corrections and estimate the MDL for the sum of PCBs based on individual congener results.

For this study, two techniques were used to perform blank subtractions and estimate MDLs (reported herein as EMDLs). Neither technique is established in formal guidance, but both are based on a scientific rationale that relies on previous precedents, with changes in assumptions. These techniques were employed in order to correct the data for any positive biases present that arise from the widespread presence of PCBs in the environment.

Using both approaches helps understand how decisions about the blank correction approach may or may not influence study findings.

The trip blank data provided with this study only account for background PCB concentrations measured in purified water transported in the same type of bottle as the sample – they are essentially bottle blanks. The trip blank is quantified with the same instrument used to quantify the PCBs and chlordane samples. A total of six bottle blanks were used to estimate blank means and standard deviations. Blank corrections for background contamination due to atmospheric dust, residual PCBs potentially present in sampling equipment due to "memory effects" and the ubiquitous background global concentrations of PCBs(e.g., Gregor and Gummer, 1989) have not been evaluated in this study and may contribute to some of the PCB concentrations detections above EMDLs.

2.6.1 Technique 1

PCB

Technique 1 treats the sum of uncorrected PCB measurements provided by the laboratory as if the sum were a single analyte measurement. The mean and standard deviation of the sum of PCBs in all trip blanks is calculated. The mean sum of PCBs measurement in blanks is subtracted from the sum of uncorrected PCBs measurement in each sample. Three times the sum of the standard deviations of the PCBs in the blanks is the EMDL. This approach is based on the guidance of 40 CFR Part 136, with the exception that the sum of PCBs is a multi-analyte measurement. The trip blank data is presented in Appendix A.

Chlordane

Chlordane was non-detect in all blanks (presented in Appendix A). Therefore, the chlordane measurements were not blank corrected for this study report, and the chlordane MDLs are as reported by the laboratory for individual chlordane isomers. Chlordane isomer concentrations are summed to calculate total chlordanes for comparison to WQOs.

2.6.2 Technique 2

PCB

Technique 2 uses individual congener measurements in blanks and samples. The average and the standard deviation of each congener is calculated for the blanks. The average is added to two times the standard deviation; then the average plus two standard deviations is subtracted from each congener measurement (uncorrected PCB measurement) in each sample; negative congener results are replaced with zero. The blank-corrected congener measurements in a sample are summed to determine the sum of PCBs. In this approach, the EMDL is estimated as the propagated standard deviations of individual congener measurements (i.e., the square root of the sum of squared standard deviations for congener measurements in replicate blanks).

Technique 2 is informed by an approach for blank correction in a treated wastewater (Los Alamos National Laboratory (LANL), 2008) proposed to USEPA for a very specific permit implementation. Treated wastewater is a medium very different from stormwater or surface marine water samples. Treated wastewater typically has very low and relatively consistent constituent concentrations. Stormwater and surface water samples are much more variable, and field collection methods are more susceptible to incidental contamination artifacts that generate false positive results. The reference to LANL (2008) does not imply that the authors of that document concur with the approach proposed in Technique 2 for this study; the reference only is to acknowledge the origin of the congener-specific blank subtraction approach used in this Study.

Technique 2 may over-correct some samples because it relies on the mean plus two standard deviations of congeners measured in the blank. The trip blank data is presented in Appendix A.

Chlordane

Chlordane was non-detect in all blanks (presented in Appendix A). Therefore, the chlordane measurements were not blank corrected for this study report, and the chlordane MDLs are as reported by the laboratory for individual chlordane isomers. Chlordane isomer concentrations are summed to calculate total chlordanes for comparison to WQOs.

2.6.3 Comparison of Techniques

Technique 1 is risk-averse with respect to false negative results. In other words, it has a greater chance (compared to Technique 2) of a finding that PCBs were detected when in fact they may be present due to individual congener contaminants not corrected for by the blanks. Technique 2 is risk-averse with respect to false positive results. Subtraction of the mean plus two standard deviations ensures that a congener measurement does not count towards the sum of PCBs unless it is present in a sample at levels that are greater than zero by a statistically significant (95 percent confidence) amount.

3. Data and Findings

This section presents a summary of the data that are reported in detail in Appendix A, and initial findings and interpretations. Section 3.1 describes initial findings based on the data, organized around the study objectives identified in the Study Plan.

PCBs were present in all samples for all events sampled, including stormwater, harbor water quality, and harbor sediments. PCB concentrations for the trip blanks were comparable (within the estimated range of precision) to most PCB concentrations for the harbor water quality samples. PCB concentrations in stormwater, harbor, and sediment samples were blank corrected by Technique 1 and Technique 2 as described in Section 2.6 above. PCB concentrations that were not corrected for concentrations present in the Blanks (either by Technique 1 or Technique 2) are referred to as uncorrected PCB concentrations or uncorrected. If the PCB data is corrected using Technique 1 or 2, then the data are referred to as corrected PCB concentrations or corrected.

Chlordane measurements in sediment and water samples collected from MdRH were all non-detect. Chlordane was non-detect in all trip blanks. Chlordane was detected at two sites, MdRU-C2 and MdR-3, in samples collected during two stormwater events – February 17, 2011 and March 20, 2011.

3.1 Initial Findings

The findings presented below address the following study objectives:

1. Compare the concentrations obtained for both the LDL Study and the CMP to WQOs;
2. Use simple graphics to display the seasonal and spatial variation;
3. Determine if there is a relationship between PCB and chlordane concentrations in stormwater and suspended sediment concentrations (SSC) that allows estimation of pollutant concentrations in suspended sediments; and
4. Determine if the estimated concentration of PCBs and chlordanes in suspended sediments transported by stormwater greater or less than concentrations of PCBs and chlordanes in bottom sediments.

3.1.1 PCBs

3.1.1.1 Objective 1: Comparison to WQOs

Using Technique 1, the total PCB concentrations for the harbor water quality samples and the stormwater samples were corrected and compared to the uncorrected concentrations (Figure 3-1). Median total PCB concentrations of harbor samples, both corrected and uncorrected, were in attainment of the interim TMDL target for PCBs in the water column (30,000 pg/L).

The variability of uncorrected harbor water quality PCB concentrations is similar to that of trip blank concentrations; the median concentration of uncorrected harbor water quality samples (3,500 pg/L) is somewhat higher than that of the blanks (1,410 pg/L). Blank-corrected harbor water quality measurements are generally below the Technique 1 EMDL, with one exception at site MdRH-B3 in June. The Technique 1 EMDL (3,200 pg/L) is greater than the final water quality numeric target (170 pg/L), so the single detection above the EMDL in June is the only detected exceedance of the final TMDL target in the receiving water of the harbor.

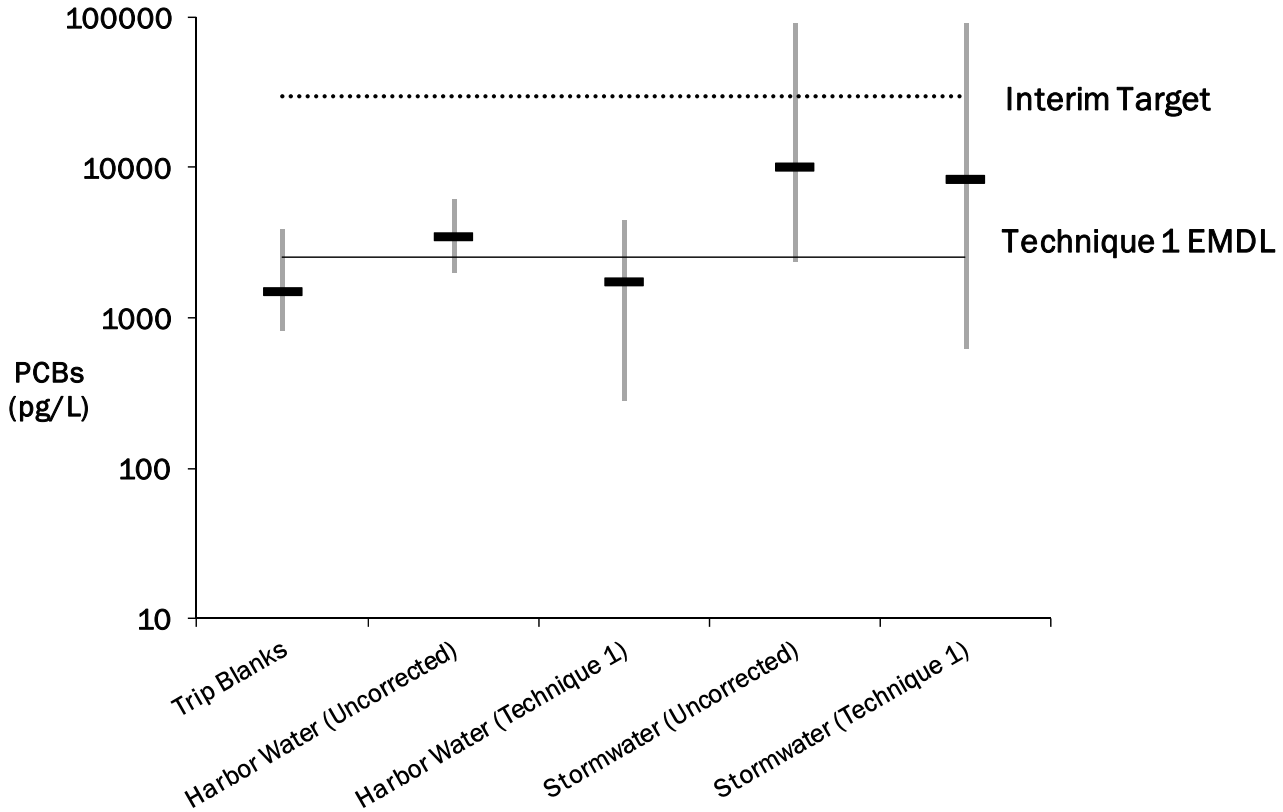

Figure 3-1. PCB Concentrations for Stormwater and Harbor Water Quality, Both Uncorrected and Corrected for Blank Concentrations Using Technique 1

Dark horizontal bars indicate the median; vertical bars indicate the range.
Dotted horizontal line indicates the TMDL interim water column target.
Solid horizontal line indicates the Technique 1 EMDL

Stormwater concentrations can also be compared to the interim and final TMDL targets; however, attainment of water column targets is measured in receiving waters (harbor samples), not stormwater discharges. Therefore, comparisons of stormwater concentrations to water column TMDL targets are not indicators for attainment of TMDL waste load allocations for stormwater. The waste load allocations for stormwater are based on attainment of numeric targets for PCBs in suspended sediments, which are evaluated in the next section. Comparisons of stormwater concentrations to TMDL targets for receiving waters are only intended to establish a point of reference with respect to WQOs.

Median concentrations of PCBs in stormwater attain the interim TMDL target. Exceedances of the interim target in stormwater samples were measured in samples collected on February 19, 2011 from sites MdR-3 and MdRU-C2. Were it not for blank correction, PCB concentrations measured at site MDRU-C2 would also have exceeded the interim target on February 26, 2011. For most stormwater samples, both the blank corrected and the uncorrected total PCB concentrations are above the Technique 1 EMDL, and therefore in exceedance of the final TMDL target.

The findings above using Technique 1 are consistent with the findings using Technique 2. All measured PCB concentrations in harbor water, both blank-corrected and uncorrected, were below the interim target for PCBs in the water column (Figure 3-2). Median concentrations of stormwater samples were also below the interim target. As with Technique 1, the two instances where stormwater measurements are above the interim TMDL target are in samples collected on February 19, 2011 from sites MdR-3 and MdRU-C2. Also consistent with Technique 1, the only harbor sample with a detected concentration above the Technique 2 EMDL (1,200 pg/L) was collected from site MdRH-B3 in June.

The key difference between the two approaches is the EMDLs: Technique 1 has an EMDL of 3,200 pg/L, compared to an EMDL of 1,200 pg/L for Technique 2. Since both of these are estimates, the EMDLs are considered to be roughly comparable, and it is not surprising that both approaches lead to similar conclusions. By either approach, the controlling factor on the EMDL is the presence of measurable PCB concentrations in blanks. This means that increasing sample volumes to attain greater concentration factors may not lead to proportionally lower EMDLs.

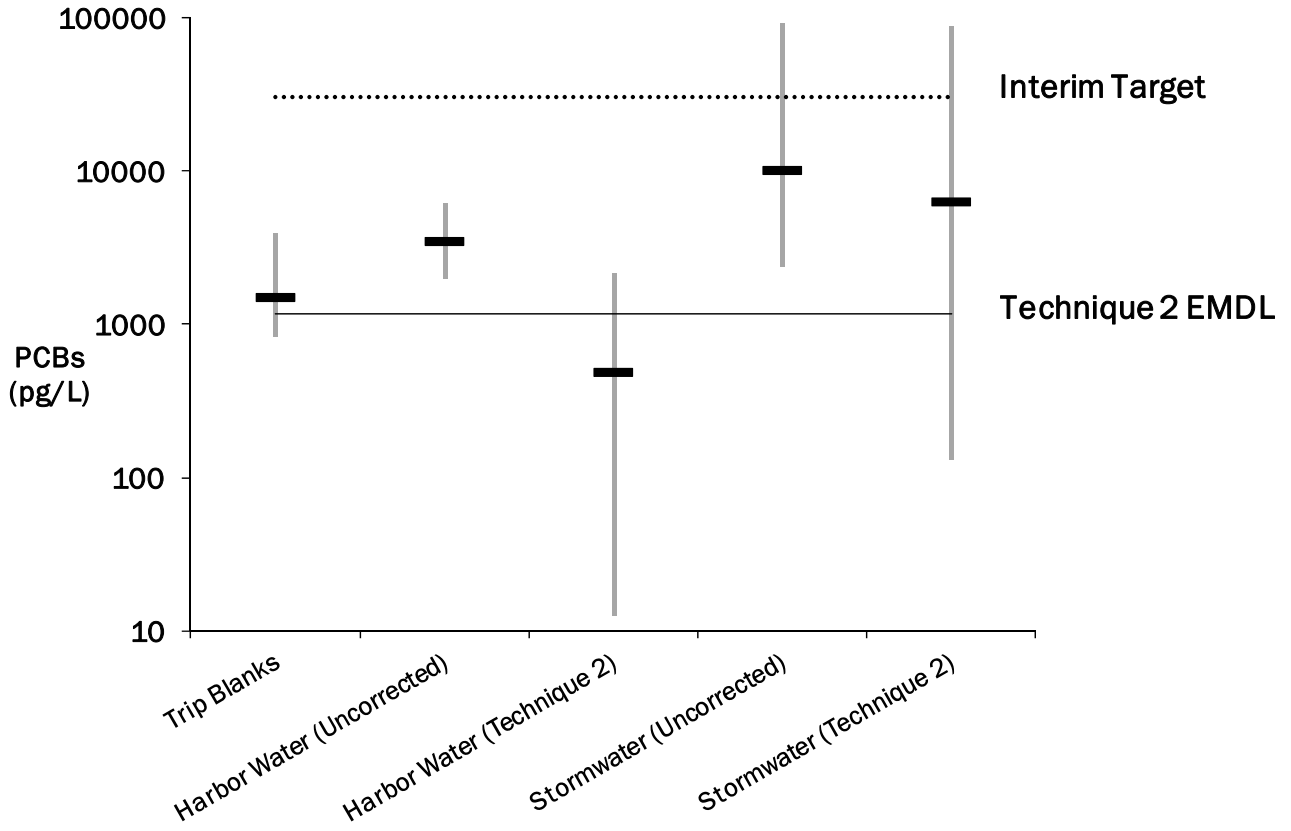

Figure 3-2. PCB Concentrations for Stormwater and Harbor Water Quality, Both Uncorrected and Corrected for Blank Concentrations Using Technique 2

Dark horizontal bars indicate the median; vertical bars indicate the range.
Dotted horizontal line indicates the TMDL interim water column target.
Solid horizontal line indicates the Technique 1 EMDL

Figure 3-3 below fulfills the first study goal (Objective 1) by comparing concentrations obtained from this LDL Study and the CMP to WQOs that establish the interim and final TMDL targets. The figure also puts the comparisons to numeric targets in perspective. A previous literature review compiled data from monitoring studies that used LDLs to measure PCBs in rain, snow and field blanks. PCB concentrations in measured stormwater discharged to MdRH are at or lower than PCB concentrations in rain water (prior to hitting the ground, not in stormwater) from urban areas and somewhat higher than pristine areas such as the Greek Isles, Great Lakes, or Sweden. All of those samples from the literature review, including snow from the Arctic Circle and field blanks, would exceed the final TMDL target of 170 pg/L if it applied to those water sources. Re-distribution of PCBs from source areas by airborne transport of dust and volatilized PCBs has established a global background for total PCBs in all waters that exceeds the CTR WQO. These waters include pristine areas and trip blanks made of ultrapure water.

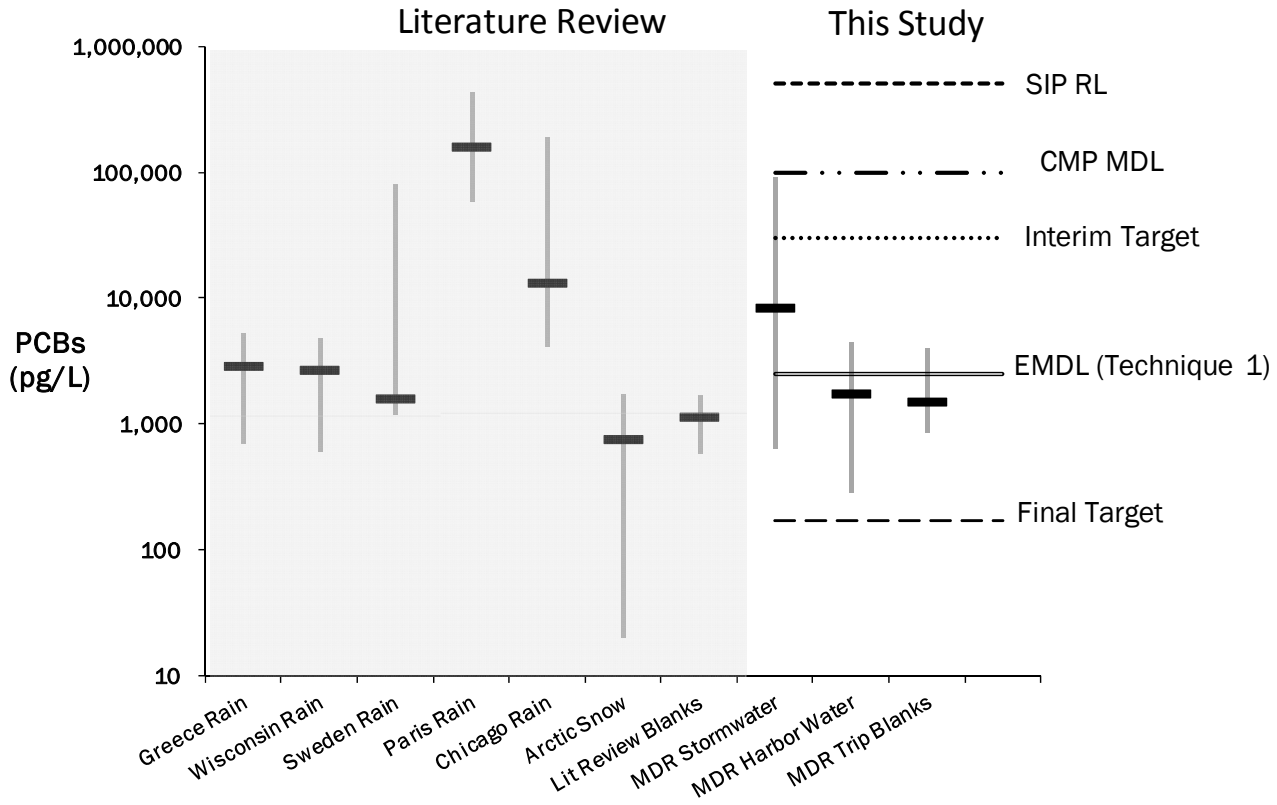

Figure 3-3. Total PCB Concentrations from MdR Special Studies Compared to Literature Values, TMDL Targets, SIP Reporting Limits, and the Technique 1 EMDL from This Study

Shaded area indicates data from a scientific literature review conducted by BC.
Bold black horizontal symbols indicate the median, grey vertical lines indicate the range of data.
Horizontal lines indicate (from top to bottom): the SIP Reporting Limit (short dashes); the CMP MDL (long dashes with two dots; the water column interim target (dotted line); the Technique 1 EMDL (double solid line) and the TMDL final water column target (long dashed line)

Figure 3-1, Figure 3-2, and Figure 3-3 show both the benefits of the current Study and the diminishing returns of attempting to attain lower EMDLs. Prior to conducting this study, readily available water column data indicated non-detects, because SIP Reporting Limits are above typically encountered concentrations in surface waters. All samples measured in receiving waters of MdRH in this Study were shown to attain the interim numeric TMDL target for water column concentrations (30,000 pg/L). Although the EMDL of either Technique (1,200 – 3,000 pg/L) is greater than the final TMDL target (170 pg/L), there is little benefit to reducing the EMDL, as it can already be surmised from a literature review that concentrations in almost any water sample analyzed would exceed the final TMDL target.

3.1.1.2 Objective 2: Seasonal and Spatial Variations

The medians and ranges shown in Figure 3-1, Figure 3-2, and Figure 3-3 above are caused by variations in PCB concentrations in both space and time. The maps shown in Figure 3-4 and Figure 3-5 below fulfill the second study goal (Objective 2) by summarizing the spatial and temporal variability of PCB concentrations in stormwater and harbor water. Details supporting these figures are available in Appendix A.

A series of analysis of variance (ANOVA) (Table 3-1) were performed on the uncorrected, corrected using Technique 1, and corrected using Technique 2 total PCB concentrations. The ANOVA tests for significant differences between two data sets. The results of the ANOVAs, performed on the stormwater data and the harbor water quality data, comparing the monitoring locations and the months are presented in Table 3-1. An "X" is used to indicate if the results of the ANOVA proved that there was a difference between the data sets (i.e. if the *F ratio* is greater than the *F crit*). A "0" is used to indicate that no difference was found. The full output of the ANOVAs are presented in Appendix B. The results of the ANOVA also fulfill the second study goal (Objective 2).

Table 3-1. Results of the ANOVAs for the Monitoring Types

Monitoring Type	Uncorrected		Corrected Technique 1		Corrected Technique 2	
	Spatial	Temporal	Spatial	Temporal	Spatial	Temporal
Stormwater Data	0	0	0	0	0	0
Harbor Water Quality Data	X	0	X	0	0	0

"X" Indicates that a Statistical Difference Exists between the Data Sets.

Based on the results in Table 3-1, there are no differences in the total PCB concentrations (uncorrected or corrected) due to temporal or spatial influences in the stormwater data and there are no differences due to temporal influences throughout the harbor. Spatial differences exist in the harbor PCB concentrations, both uncorrected and corrected using Technique 1; however, it is unclear if these differences are meaningful or due to uncertainty of measurement. An ANOVA was performed to check for seasonal variations and variations between the front back basins (MdRH-B1 and MdRH-B4) and the back back basins (MdRH-B2 and MdRH-B3); however, no variation was found,

As previously stated, harbor water samples are consistently in attainment of the interim numeric target (30,000 pg/L). Concentrations of PCBs in stormwater discharges above the interim receiving water target were detected at MdRU-C2 on February 19, 2011 and February 26, 2011, and at MdR-3 on February 19, 2011. The receiving water TMDL target is used here for comparison only; it is assumed that receiving water column targets are not directly applied as numeric limits for stormwater discharges.

The elevated concentrations noted are, however, revealing about potential PCB sources and loads. In the next section, analysis of PCB and suspended sediment relationships helps understand the range of PCB concentrations in suspended sediments as a tool for evaluating progress towards attainment of stormwater loads assigned by the TMDL.

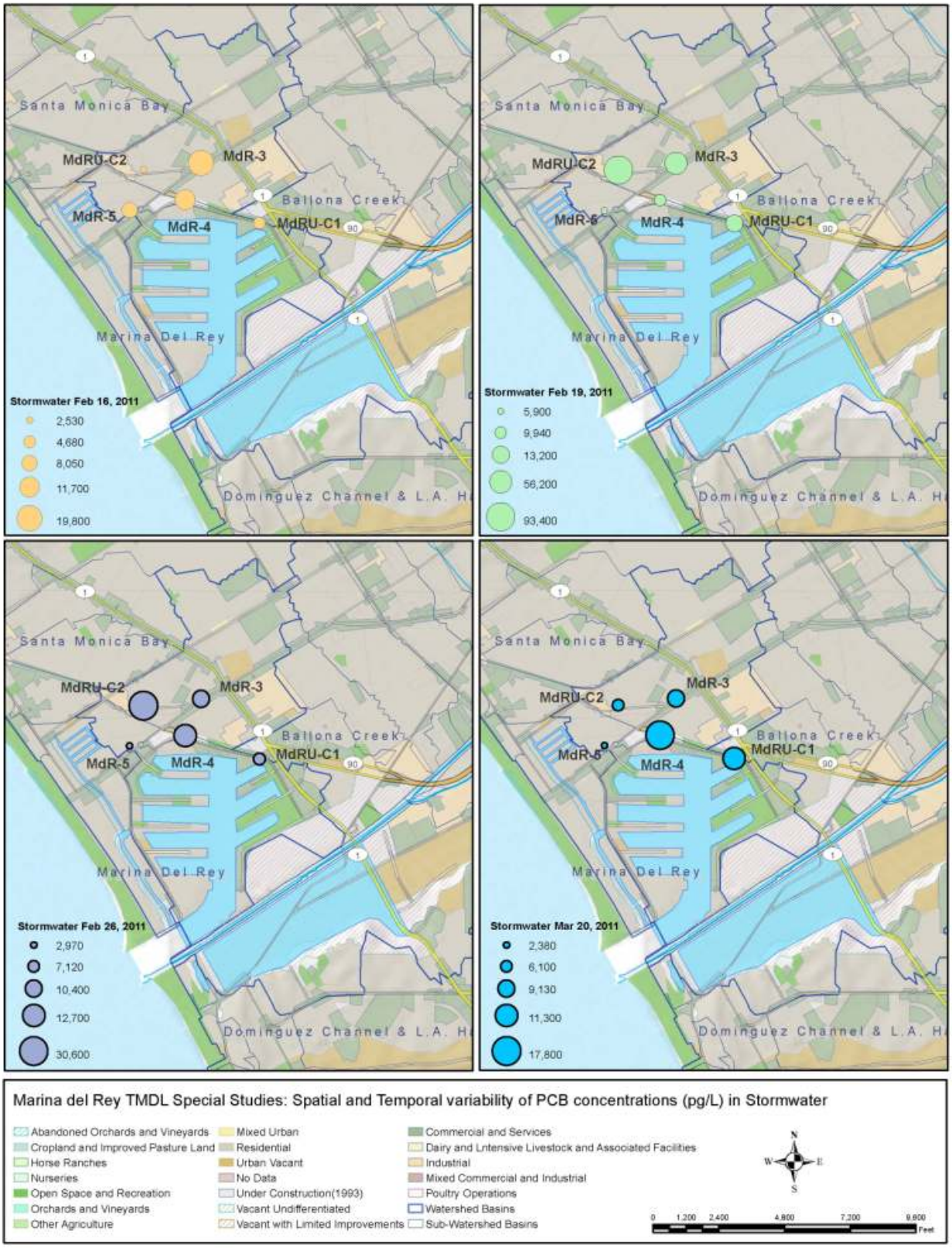

Figure 3-4. Spatial and Temporal Variability of PCB Concentrations in Stormwater Samples

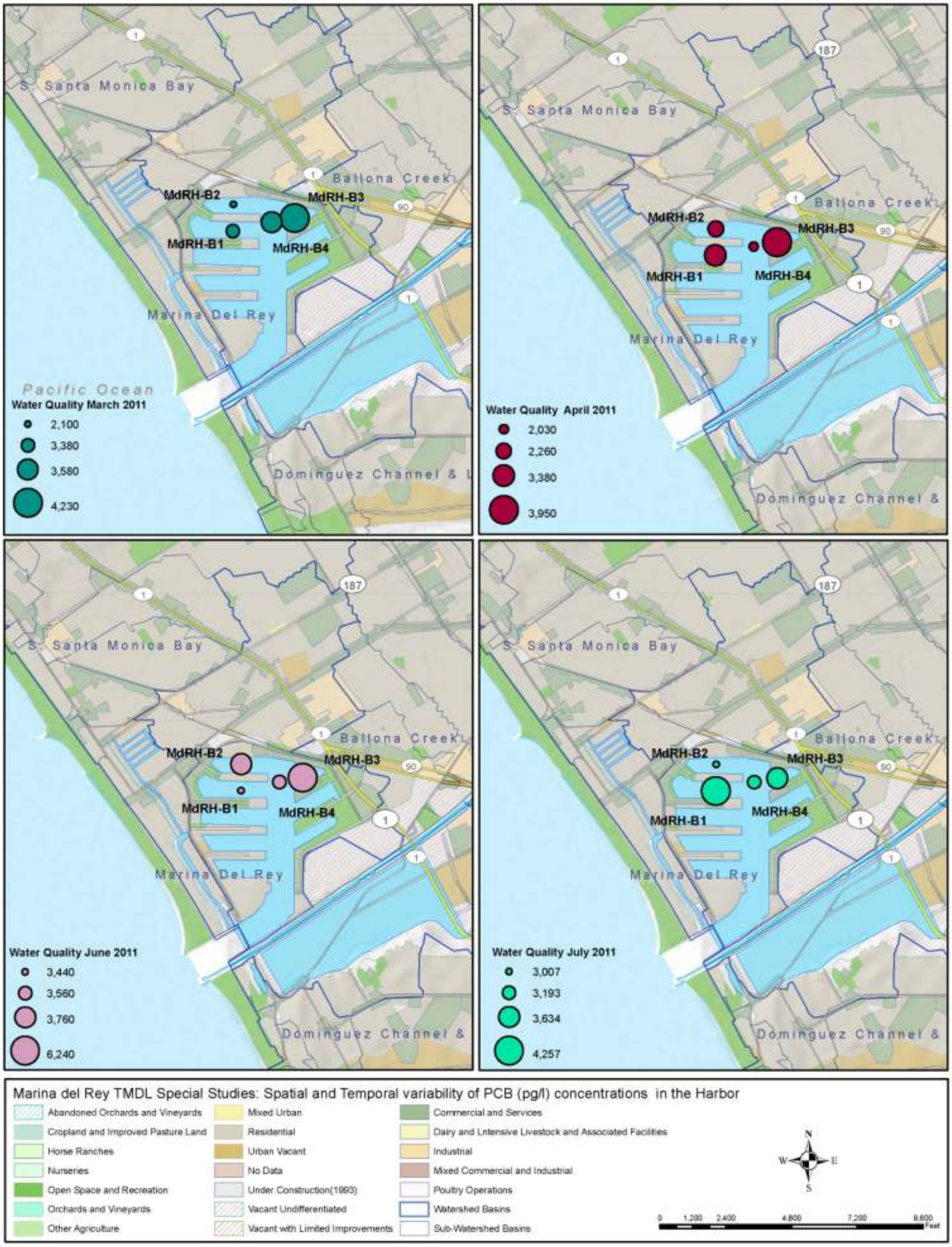

Figure 3-5. Spatial and Temporal Variability of PCB Concentrations in Harbor Water Quality Samples.

3.1.1.3 Objective 3: Relationship between PCBs and Suspended Sediment Concentrations

To determine the correlations between the PCB concentrations and the SSC concentrations, statistical analyses were performed (Tables 3-2 through 3-4, Appendix C.) These include the mean and standard deviation, Pearson correlation, Poisson distribution, Spearman's rank, and a 95 percent confidence interval. Correlations were calculated between the total PCB concentrations and the SSC (fine) concentrations, SSC (coarse) concentrations, and SSC (total) concentrations. Spearman's Rank and Pearson's correlation do not include data in the Total PCBs column because the strength of the correlation is presented in the SSC (fine), SSC (coarse), and SSC (total) columns. The Spearman's ranks, presented in Tables 3-2 through 3-4, indicate how well the Total PCBs concentration ranking follows the SSC concentrations ranking, one ($\pm$1) being a perfect correlation. A Spearman's Rank of zero (0) indicates that no correlation exists. The remaining statistics are presented in Appendix C.

The positive values of the Spearman's Ranks in Table 3-2 demonstrates that as the SSC concentrations increase, the Uncorrected PCB concentrations also increase. The Uncorrected PCB concentrations in the stormwater are more strongly correlated with the coarse SSC concentrations, than the total or the fines. The Spearman's Rank of 0.55 between the total Uncorrected PCB concentrations and the total SSC concentrations indicates a correlation between the data. The coarse SSC concentrations results for the harbor water quality samples were all non-detect; therefore, no Spearman's Rank could be determined. The Spearman's Rank for harbor water quality (0.30) indicates that while Uncorrected PCB and SSC concentration increase together, the Uncorrected PCB concentrations do not follow the SSC concentrations.

Table 3-2. Statistical Analyses to determine the Correlation between Uncorrected PCB Concentrations and SSC Concentrations

	Statistical Analysis	Total PCBs (pg/L)	SSC (Fine) (mg/L)	SSC (Coarse) (mg/L)	SSC (Total) (mg/L)
Statistics for All Data	Mean	11,000	25	16	41
	Standard Deviation	17,000	54	54	91
	95% Confidence Interval	5,700	18	18	30
	Spearman's Rank		0.51	0.67	0.57
Statistics for Stormwater Data	Mean	17,000	39	30	69
	Standard Deviation	22,000	70	71	116
	95% Confidence Interval	9,500	31	31	51
	Spearman's Rank		0.47	0.62	0.55
Statistics for Harbor Water Quality Data	Mean	3,500	6.4	0.00	6.4
	Standard Deviation	1,000	5.5	0.00	5.5
	95% Confidence Interval	490	2.7	NA[1]	2.7
	Spearman's Rank		0.30	NA	0.30

[1] *NA = not applicable, these statistical analyses could not be performed because the SSC coarse concentration was 0.00 mg/L*

The positive values of the Spearman's Ranks in Table 3-3 demonstrates that as the SSC concentrations increase, the Corrected PCB concentrations (by Technique 1) also increase. The Corrected PCB concentrations in the stormwater are more strongly correlated with the coarse SSC concentrations, than the total or the fines. The Spearman's Rank of 0.57 between the total Corrected PCB concentrations and the total SSC concentrations indicates a correlation between the data. The coarse SSC concentrations results for the harbor water quality samples were all non-detect; therefore, no Spearman's Rank could be determined. The Spearman's Rank for the harbor (0.30) indicates that while the Corrected PCB and SSC concentration increase together, the Corrected PCB concentrations do not follow the SSC concentrations.

Table 3-3. Statistical Analyses to determine the Correlation between Corrected PCB Concentrations (Technique 1) and SSC Concentrations

	Statistical Analysis	Total PCBs (pg/L)	SSC (Fine) (mg/L)	SSC (Coarse) (mg/L)	SSC (Total) (mg/L)
Statistics for All Data	Mean	9,100	25	16	41
	Standard Deviation	17,000	54	54	91
	95% Confidence Interval	5,700	18	18	30
	Spearman's Rank		0.51	0.67	0.57
Statistics for Stormwater Data	Mean	15,000	39	30	69
	Standard Deviation	22,000	70	71	120
	95% Confidence Interval	9,500	31	31	51
	Spearman's Rank		0.47	0.62	0.55
Statistics for Harbor Water Quality Data	Mean	1,800	6.4	0.00	6.4
	Standard Deviation	1,000	5.5	0.00	5.5
	95% Confidence Interval	490	2.7	NA[1]	2.7
	Spearman's Rank		0.30	NA	0.30

[1] *NA = not applicable, these statistical analyses could not be performed because the SSC coarse concentration was 0.00 mg/L*

The positive values of the Spearman's Ranks in Table 3-4 demonstrates that as the SSC concentrations increase, the Corrected PCB concentrations (by Technique 2) also increase. The Corrected PCB concentrations in the stormwater are more strongly correlated with the coarse SSC concentrations, than the total or the fines. The Spearman's Rank of 0.49 between the total Corrected PCB concentrations and the total SSC concentrations indicates a correlation between the data. The coarse SSC concentrations results for the harbor water quality samples were all non-detect; therefore, no Spearman's Rank could be determined.

Table 3-4. Statistical Analyses to determine the Correlation between Corrected PCB Concentrations (Technique 2) and SSC Concentrations					
	Statistical Analysis	Total PCBs (pg/L)	SSC (Fine) (mg/L)	SSC (Coarse) (mg/L)	SSC (Total) (mg/L)
Statistics for All Data	Mean	7,600	25	16	41
	Standard Deviation	17,000	54	54	91
	95% Confidence Interval	5,500	18	18	30
	Spearman's Rank		0.42	0.66	0.49
Statistics for Stormwater Data	Mean	13,000	39	30	69
	Standard Deviation	21,000	70	71	120
	95% Confidence Interval	9,300	31	31	51
	Spearman's Rank		0.42	0.56	0.49
Statistics for Harbor Water Quality Data	Mean	600	6.4	0.00	6.4
	Standard Deviation	520	5.5	0.00	5.5
	95% Confidence Interval	260	2.7	NA[1]	2.7
	Spearman's Rank		-0.06	NA	-0.06

[1] *NA = not applicable, these statistical analyses could not be performed because the SSC coarse concentration was 0.00 mg/L*

The Harbor Water Quality Spearman's Rank (-0.06) indicates that as the Corrected PCB concentrations increase, the SSC concentrations (total and fine) decreases. The Corrected PCB concentrations are not correlated with the SSC concentrations (total and fine).

Due to the hydrophobic nature of PCBs, scatter plots of total PCB concentrations in the sample vs. SSC can be used to estimate the concentrations of PCBs in suspended sediments discharged by stormwater. These can be used to assess potential watershed sources of sediments with elevated PCB concentrations, and to evaluate progress towards attainment of TMDL waste load allocations for stormwater. In situations where a significant amount of variation in the PCB concentration is explained by variation in SSC, the slope of the best fit line provides an estimate of the µgs of PCBs per kg of suspended sediment.

Figure 3-6 shows the overall relationship between water column PCB concentrations and SSC. For the combined data set of stormwater and harbor water samples, variation in SSC accounts for about 84 percent of the variation in PCB concentrations in water. The slope of the best fit line is 180 µg/kg. Note that in the scatter plot of the entire data set, the regression is driven by two clusters of data. The cluster of data having SSC < 100 mg/L anchors the regression line in the lower left corner. The slope of the regression in Figure 3-6 is primarily driven by the three data points in the upper right quadrant of the figure (MdRU-C2 in two events and MdR-3 in one event). The slope of 180 µg/kg is best interpreted as a rough estimate of the PCB concentrations in sediments for just those three data points having SSC > 100 mg/L.

The dashed line in Figure 3-6 shows a theoretical best fit line if all PCB concentrations in suspended sediments were to be uniformly 22.7 µg/kg (the TMDL target for sediments) and if PCB concentrations in water varied exactly in proportion to SSC. Comparison of the best fit slope suggests that suspended sediments discharged during high sediment events at MdRU-C2 and MdR-3 exceeded the TMDL target of 22.7 µg/kg, based on this preliminary data. Those three events also had water column concentrations above the interim numeric target applied to receiving waters (30,000 pg/L).

PCB concentrations in discharges with lower suspended sediments (SSC < 100 mg/L) are analyzed in Figure 3-7. Two clusters of data are apparent from inspection of the graph. The "baseline" concentration of PCBs in stormwater suspended sediments is estimated using the population of unlabeled stormwater and harbor samples shown; the slope of the best fit line indicates an estimated concentration of 130 µg/kg PCBs in suspended sediments when no blank corrections are applied.

The effect of blank correction using Technique 1 is evaluated in Figure 3-8 and Figure 3-9. Technique 1 results in similar conclusions: an estimated PCB concentration of 180 µg/kg based on the high SSC samples driving the regression in Figure 3-8, and an estimated baseline concentration of 130 µg/kg based on the low SSC (<100 mg/L) data set shown in Figure 3-9. Blank correction by Technique 2 results in somewhat lower estimates of 170 µg/kg PCBs in the three high SSC events shown in Figure 3-10 and 100 µg/kg in the baseline data set shown in Figure 3-11.

The labeled outliers from the baseline regressions shown in Figure 3-7, Figure 3-9, and Figure 3-11 suggest possible source areas of sediments with elevated concentrations of PCBs. By either technique of blank correction, and in the uncorrected samples, MdR-4 consistently stands out during stormwater events as having higher PCB concentrations in water relative to the SSC; MdR-3 and MdR-5 also showed elevated PCB/SSC ratios during one event (February 16, 2011).

In summary, the sample collection and analysis methods used enabled assessment of PCB concentrations in suspended sediments. There is an estimated baseline concentration ranging from 100 µg/kg to as much as 180 µg/kg in sediments, depending on the data analysis assumptions. MdR-4 (the discharge into the Oxford Flood Control Basin) is considerable higher compared to the baseline – possibly by as much as five to ten fold greater. Both the baseline and the elevated cluster at MdR-4 are above the numeric target for PCBs in sediments established by the TMDL.

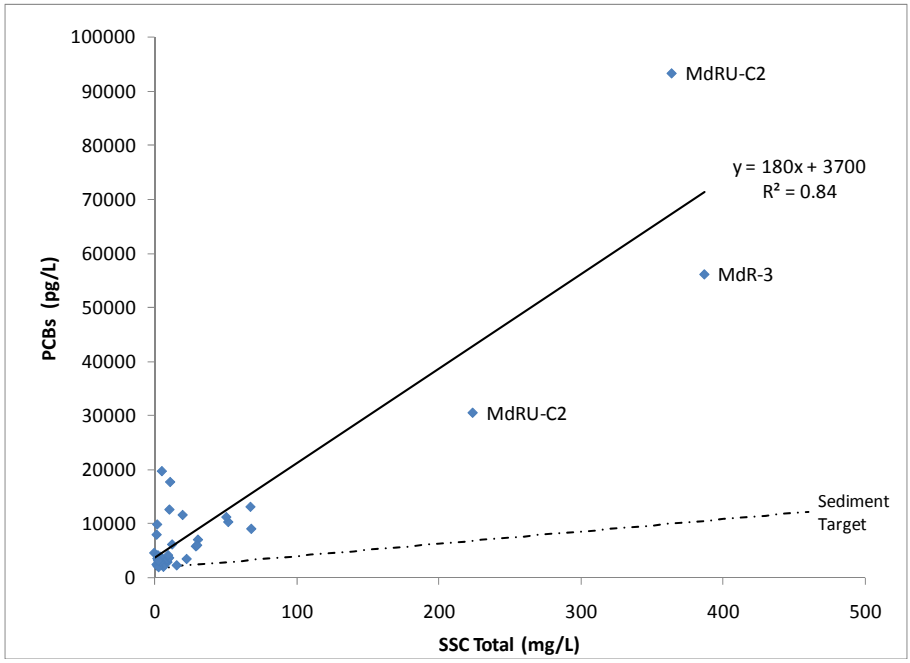

Figure 3-6. Relationship Between Water Column Uncorrected PCBs and SSC

Plot shows best fit simple linear regression for all stormwater and harbor water samples combined.
SSC concentrations are the sum of fines (<63 µm) and coarse (>63 µm) sediments.
Dashed line indicates the theoretical slope if stormwater sediments attained the TMDL target of 22.7 µg/kg.

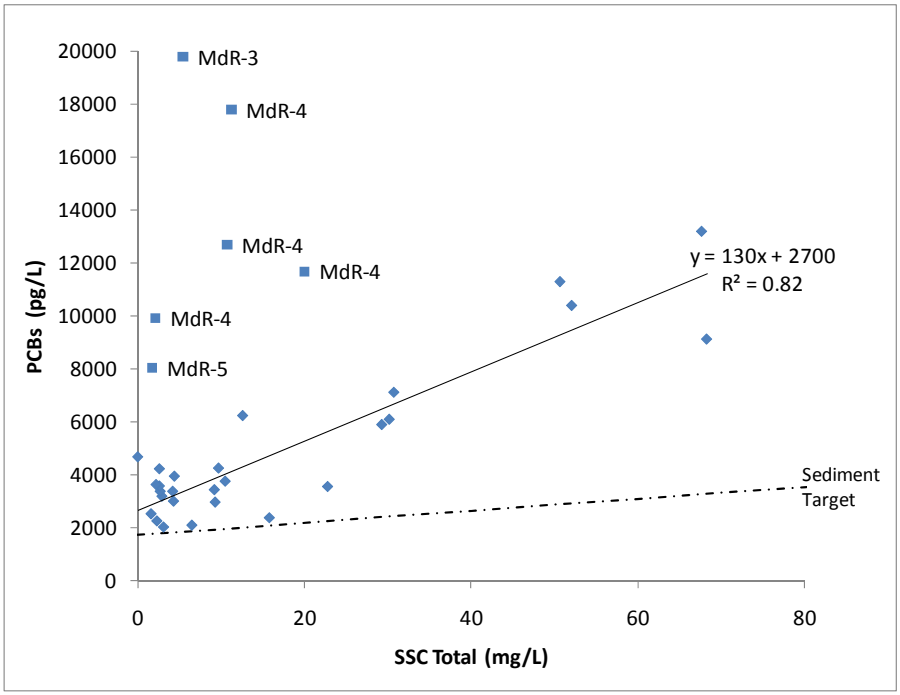

Figure 3-7. Relationship Between Water Column Uncorrected PCBs and Low SSC

Plot shows best fit simple linear regression for all stormwater and harbor water samples with SSC<100 mg/L, excluding the labeled outliers.
SSC concentrations are the sum of fines (<63 µm) and coarse (>63 µm) sediments.
Dashed line indicates the theoretical slope if stormwater sediments attained the TMDL target of 22.7 µg/kg.
The two main clusters of data are presented by squares (the outliers) and the diamonds (which are used to determine the correlation.

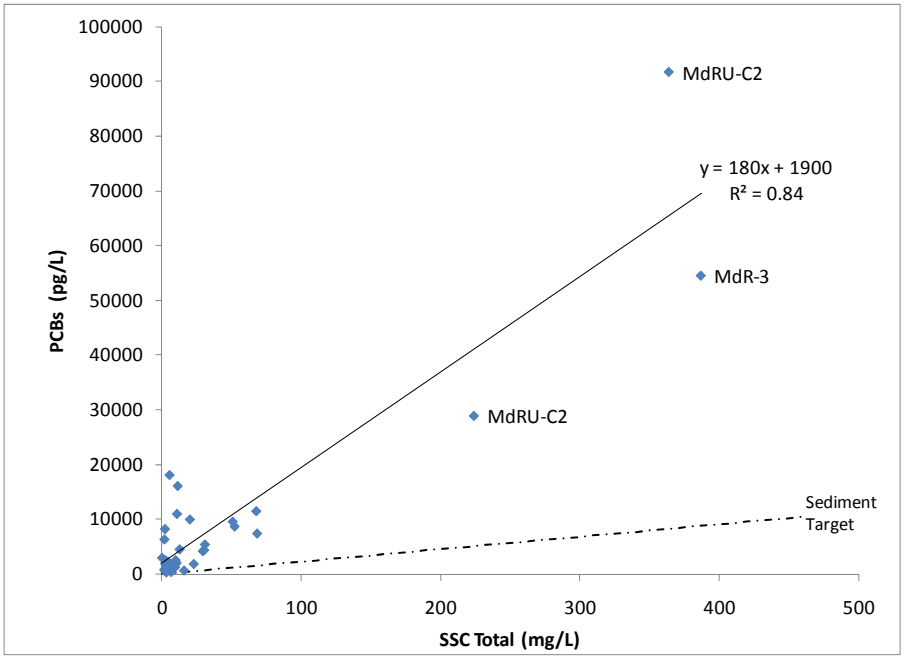

Figure 3-8. Relationship Between Water Column Technique 1 Corrected PCBs and SSC

Plot shows best fit simple linear regression for all stormwater and harbor water samples combined.
SSC concentrations are the sum of fines (<63 µm) and coarse (>63 µm) sediments.
Dashed line indicates the theoretical slope if stormwater sediments attained the TMDL target of 22.7 µg/kg.

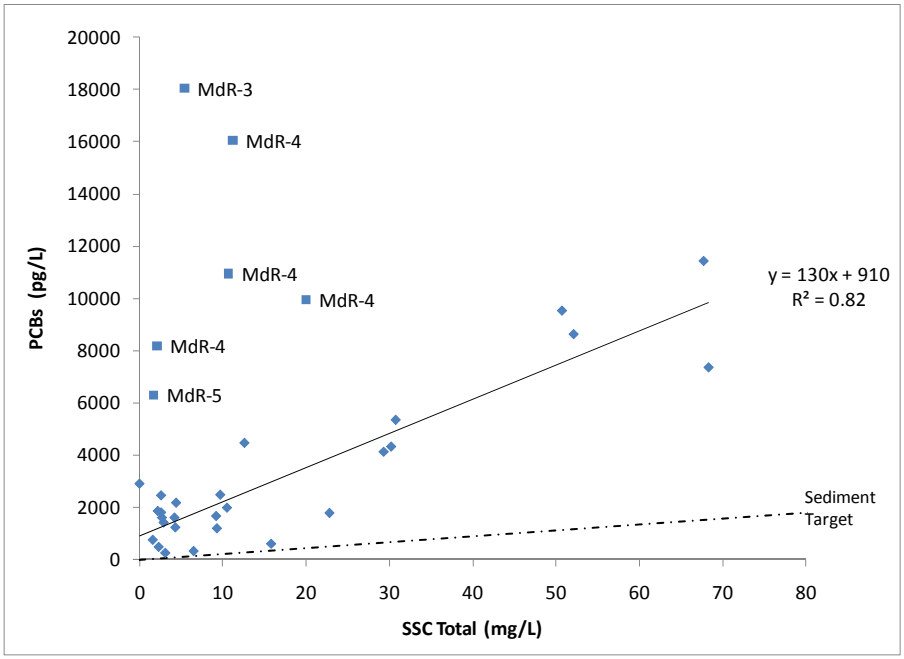

Figure 3-9. Relationship Between Water Column Technique 1 Corrected PCBs and Low SSC

Plot shows best fit simple linear regression for all stormwater and harbor water samples with SSC<100 mg/L, excluding the labeled outliers.
SSC concentrations are the sum of fines (<63 µm) and coarse (>63 µm) sediments.
Dashed line indicates the theoretical slope if stormwater sediments attained the TMDL target of 22.7 µg/kg.
The two main clusters of data are presented by squares (the outliers) and the diamonds (which are used to determine the correlation

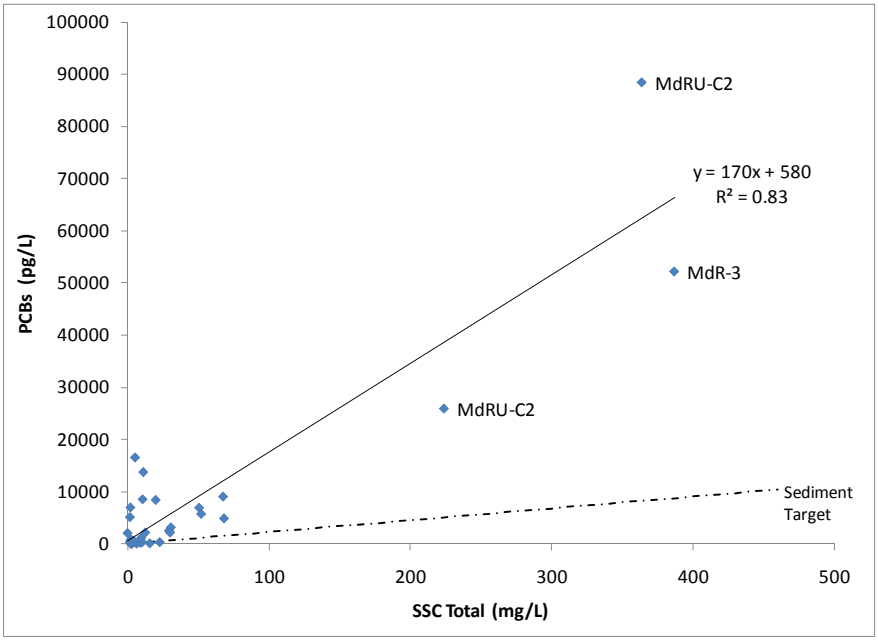

Figure 3-10. Relationship Between Water Column Technique 2 Correct PCBs and SSC

Plot shows best fit simple linear regression for all stormwater and harbor water samples combined.
SSC concentrations are the sum of fines (<63 µm) and coarse (>63 µm) sediments.
Dashed line indicates the theoretical slope if stormwater sediments attained the TMDL target of 22.7 µg/kg.

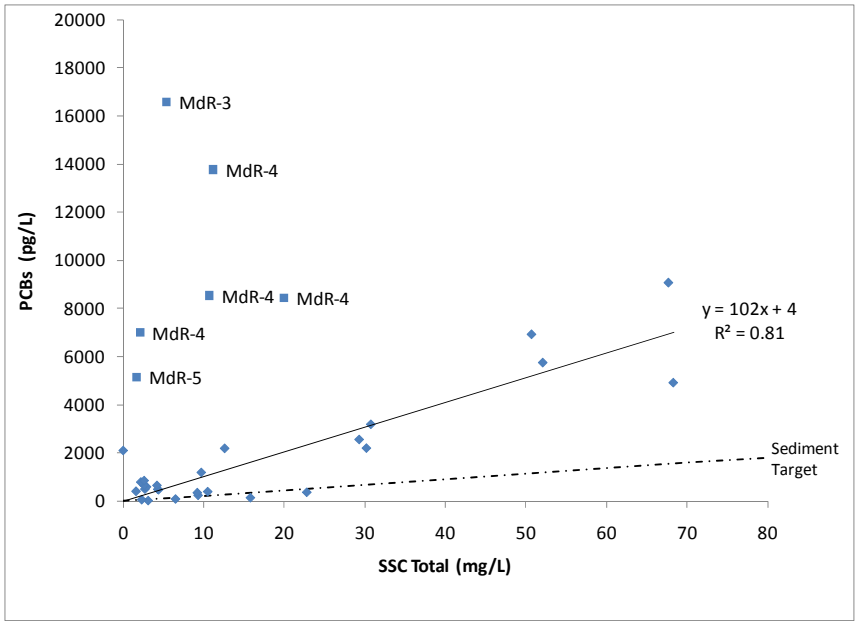

Figure 3-11. Relationship Between Water Column Technique 2 Corrected PCBs and Low SSC

Plot shows best fit simple linear regression for all stormwater and harbor water samples with SSC<100 mg/L, excluding the labeled outliers.
SSC concentrations are the sum of fines (<63 µm) and coarse (>63 µm) sediments.
Dashed line indicates the theoretical slope if stormwater sediments attained the TMDL target of 22.7 µg/kg.
The two main clusters of data are presented by squares (the outliers) and the diamonds (which are used to determine the correlation

3.1.1.4 Objective 4: Bottom Sediment vs. Discharged Suspended Sediment Comparisons

PCB concentrations in sediment samples from MdR are considerably higher than trip blanks (Table 3-5). Therefore, based on lessons learned from water column analyses, blank subtraction by either Technique 1 or Technique 2 would not make a significant difference to findings about PCB concentrations in MdR bottom sediments. The sediment data from this study are presented without blank correction for comparison to previous assessments in MdR and other regions.

Table 3-5. Uncorrected Total PCB Concentrations in Marina del Rey Harbor Sediment Samples (µg/Kg)

Date	Location	Total PCBs
March, 2011	MdRH-B1	74
	MdRH-B2	79
	MdRH-B3	61
	MdRH-B4	36
	Trip Blank	1.8
June, 2011	MdRH-B1	27
	MdRH-B2	140
	MdRH-B3	19
	MdRH-B4	48
	Trip Blank	0.7

Table 3-6 shows that the range of PCB concentrations found in bottom sediments measured in this study (19 – 140 µg/kg) is within the range of previous measurements in MdRH (LARWQCB and USEPA 2005), and above the TMDL target for sediments (22.7 µg/kg). Comparison to data from studies conducted by urban stormwater programs in the San Francisco Bay Area helps put the data into context. PCBs in non-urban sediments from the Bay Area study range from 0.3 – 10 µg/kg, compared to 60 – 1,300 µg/kg for sediments found in urban stormwater conveyance systems. Thus, the data set characterized as MdR Stormwater Baseline in this study is comparable to the lower range of Bay Area urban stormwater, whereas the sediments from MdR-4 are in the higher range of Bay Area urban sediments.

Table 3-6. Comparison of PCB Concentrations in Stormwater Suspended Sediments to Harbor Sediments

Data Set	Range of PCB Concentrations (µg/kg)
MdR Stormwater Baseline (This Study)	100 - 180
MdR-4 (This Study)	>500
Harbor Sediments (This Study)	19 - 140
Harbor Sediments (Previous Study)[1]	<20 - 400
TMDL Target	22.7
San Francisco Bay Area Urban Sediments[2]	60 – 1,300
San Francisco Bay Area Non-UrbanSediments[2]	0.3 - 10

LARWQCB and USEPA 2005

EOA Inc. on behalf of the Joint Agencies Stormwater Program, 2002

3.1.2 Chlordanes

3.1.2.1 Objective 1: Comparison to WQOs

Chlordane concentrations in all sediment and water quality samples collected from MdRH during this study were initially all non-detect. Figure 3-12 shows the chlordane concentrations for stormwater, harbor water quality, and the trip blanks from the initial analysis. The laboratory RL (5 ng/L) and the laboratory MDL (1 ng/L) were above the WQO (0.57 ng/L) which established the TMDL target for receiving waters; therefore the data are inconclusive with respect to comparison of harbor water to WQOs. This study's RL (5 ng/L) is ten-fold lower compared to the CMP (50 ng/L), and the MDL (1 ng/L) is close to, but slightly higher than the final TMDL target (0.57 ng/L).

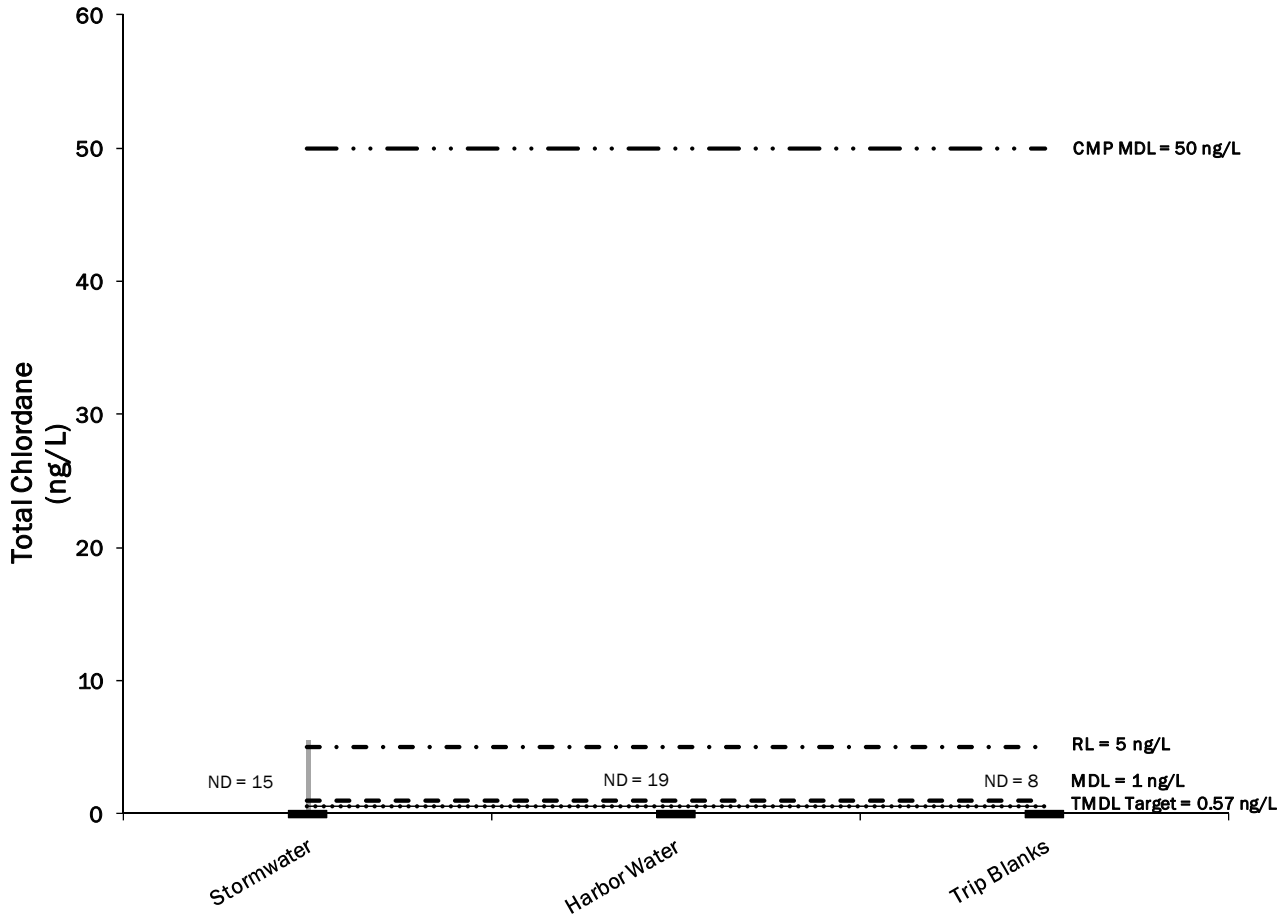

Figure 3-12. Total Chlordane Concentrations for the Stormwater and Harbor Water Quality Samples

Bold black horizontal symbols indicate the median, grey vertical lines indicate the range of data. ND = number of non-detects. Horizontal lines indicate (from top to bottom): the CMP RL (long dashes with two dots) ; the RL from this study (dash-dot line); the MDL from this study (dashed line) and the TMDL final water column target (dotted line). Concentrated from 2L to 500µL.

The only noted instances where water samples were measured above the chlordane WQO were stormwater sites MdR-3 and MdRU-C2 on February 17, 2011, and site MdRU-C2 on March 20, 2011. In contrast to PCBs, chlordane was consistently non-detect in the blanks, so blank concentrations do not appear to limit the ability to detect chlordane at lower levels.

Reanalysis of the chlordane samples, by negative chemical ionization (NCI), concentrated to a smaller volume (100 µL instead of 500 µL as previously performed) allowed for a lower MDL (0.028 ng/L). This lower MDL permitted lower concentrations to be detected (Figure 3-13 and Figure 3-14). Although the reanalysis allowed for detects, there were still a significant number of non-detects. For stormwater, there were seven (7) non-detects (35 percent of the samples). For harbor water quality, there were eight (8) non-detects (50 percent of the samples). For trip blanks, there were six (6) non-detects (86 percent of the samples). Figure 3-14 shows the same data as Figure 3-13 with a logarithmic scale.

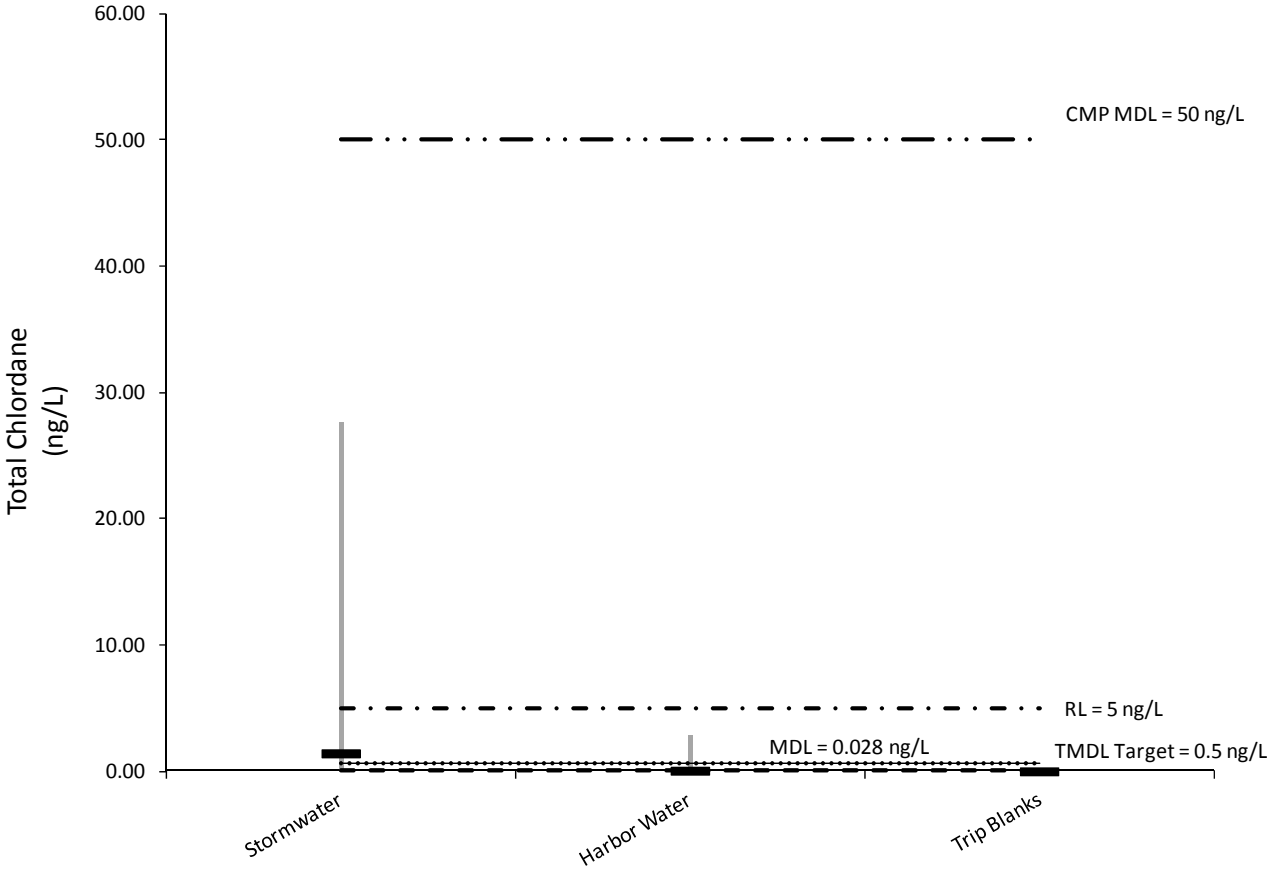

Figure 3-13. Total Chlordane Concentrations for the Stormwater and Harbor Water Quality Samples

Bold black horizontal symbols indicate the median, grey vertical lines indicate the range of data. Horizontal lines indicate (from top to bottom): the CMP RL (long dashes with two dots); the RL from this study (dash-dot line); the MDL from this study (dashed line) and the TMDL final water column target (dotted line). Concentrated from 2L to 100µL.

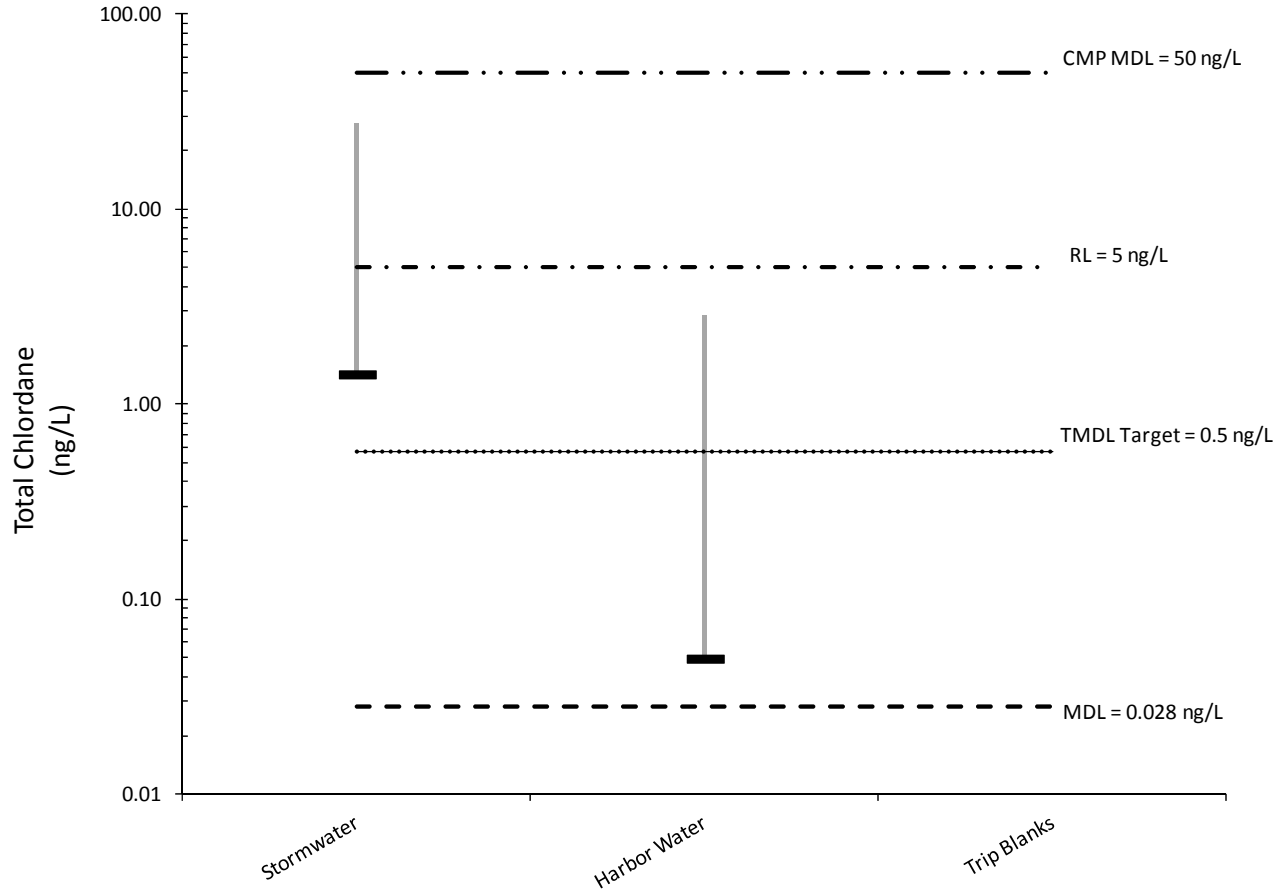

Figure 3-14. Total Chlordane Concentrations for the Stormwater and Harbor Water Quality Samples

Bold black horizontal symbols indicate the median (which includes non-detects), grey vertical lines indicate the maximum. Horizontal lines indicate (from top to bottom): the CMP RL (long dashes with two dots) ; the RL from this study (dash-dot line); the MDL from this study (dashed line) and the TMDL final water column target (dotted line). Concentrated from 2L to 100µL.

3.1.2.2 Objective 2: Seasonal and Spatial Variation

A series of ANOVAs (Table 3-7) were performed on total chlordane concentrations. The results of the ANOVAs, performed on the stormwater data and the harbor water quality data, comparing the monitoring locations and the months are presented in Table 3-7. An "X" is used to indicate if the results of the ANOVA proved that there was a difference between the data sets. A "0" is used to indicate that no difference exists. The full output of the ANOVAs are presented in Appendix B. The results of the ANOVA also fulfill the second study goal (Objective 2).

Table 3-7. Results of the ANOVAs for the Monitoring Types

Monitoring Type	Spatial	Temporal
Stormwater Data	0	0
Harbor Water Quality Data	0	X

"X" Indicates that a Statistical Difference Exists between the Data Sets.

Based on the results in Table 3-7, there are no differences in the total chlordane concentrations due to temporal or spatial influences in the stormwater data. There are no differences in the total chlordane concentrations due to spatial influences throughout the harbor. Temporal differences exist in the harbor chlordane concentrations. An ANOVA was performed to check for seasonal variations – variations between the winter months and the summer months; a variation was found here as well.

3.1.2.3 Objective 3: Relationship between Chlordanes and Suspended Sediment Concentrations

The few initial detections of chlordanes in water preclude a relationship analysis using linear regression or other tools. Elevated levels of SSC could indicate the chlordane concentrations will be above the receiving water WQO. By going back and re-analyzing samples using NCI and a higher preconcentration, sufficient numbers of detectable results were obtained to perform meaningful correlation analysis and evaluate chlordane / SSC relationships.

To determine the correlations between the total chlordane concentrations and the SSC concentrations, several statistical analyses were performed (Table 3-8, Appendix C.) These include the mean and standard deviation, Pearson correlation, Poisson distribution, Spearman's rank, and a 95 percent confidence interval. Correlations were calculated between the total chlordane concentrations and the SSC (fine) concentrations, SSC (coarse) concentrations, and SSC (total) concentrations. Spearman's Rank and Pearson's correlation do not include data in the total chlordane column because the strength of the correlation is presented in the SSC (fine), SSC (coarse), and SSC (total) columns. The Spearman's ranks presented in Table 3-8, indicate how well the total chlordane concentration ranking follows the SSC concentrations ranking, one (1) being a perfect correlation. A Spearman's Rank of zero (0) indicates that no correlation exists. The remaining statistics are presented in Appendix C.

The positive values of the Spearman's Ranks in Table 3-8 demonstrates that as the SSC concentrations increase, the chlordane concentrations also increase. The chlordane concentrations in the stormwater are more strongly correlated with the fine SSC concentrations, than the total or the coarse (0.92 versus 0.90 and 0.85, respectively); however, these Spearman's Ranks indicate strong correlations between the chlordane and coarse SSC concentrations, as well as the chlordane and total SSC concentrations.

Table 3-8. Statistical Analyses to determine the Correlation between Chlordane Concentrations and SSC Concentrations

	Statistical Analysis	Total Chlordane (ng/L)	SSC (Fine) (mg/L)	SSC (Coarse) (mg/L)	SSC (Total) (mg/L)
Statistics for All Data	Mean	3.20	24.77	16.47	41.23
	Standard Deviation	7.28	54.56	54.32	91.12
	95% Confidence Interval	2.38	17.82	17.75	29.77
	Spearman's Rank		0.75	0.72	0.72
Statistics for Stormwater Data	Mean	5.03	39.45	29.65	69.09
	Standard Deviation	9.42	70.35	70.89	115.90
	95% Confidence Interval	4.13	30.83	31.07	50.80
	Spearman's Rank		0.92	0.85	0.90
Statistics for Harbor Water Quality Data	Mean	0.91	6.41	0.00	6.41
	Standard Deviation	1.04	5.52	0.00	5.52
	95% Confidence Interval	0.51	2.70	NA	2.70
	Spearman's Rank		0.06	NA[1]	0.06

[1] *NA = not applicable, these statistical analyses could not be performed because the SSC coarse concentration was 0.00 mg/L*

The coarse SSC concentrations results for the harbor water quality samples were all non-detect; therefore, no Spearman's Rank could be determined. The Spearman's Rank for the harbor (0.06) indicates that while the chlordane and SSC concentrations (fine and total) increase together, the chlordane concentrations do not follow the SSC concentrations.

As previously described, due to the hydrophobic nature of chlordane, scatter plots of total chlordane concentrations the sample vs. SSC can also be used to estimate the concentrations of chlordane in suspended sediments discharged by stormwater, which can be used to assess potential watershed sources of sediments with elevated chlordane concentrations, and to evaluate progress towards attainment of TMDL waste load allocations for stormwater.

Figure 3-6 shows the overall relationship between water column chlordane concentrations and SSC. For the combined data set of stormwater and harbor water samples, variation in SSC accounts for about 84 percent of the variation in PCB concentrations in water. The slope of the best fit line is 0.078 µg/g (78 µg/kg).

The dashed line in Figure 3-6 shows a theoretical best fit line if all chlordane concentrations in suspended sediments were to be uniformly 0.5 µg/kg (the TMDL target for sediments) and if chlordane concentrations in water varied exactly in proportion to SSC. Based on the data, it appears that sediments discharged in stormwater from the MdR watershed are in exceedance of the TMDL target for chlordane in bottom sediments of MdR Harbor (0.5 µg/kg).

The spatial variability of the detections of chlordane in stormwater is shown in Figure 3-15 below. The spatial variability of the detections of chlordane in the harbor water quality is shown in Figure 3-15 below. The instances when detectable chlordane concentrations were observed in stormwater discharges above the receiving water target were high when suspended sediment concentrations (>100 mg/L) were observed.

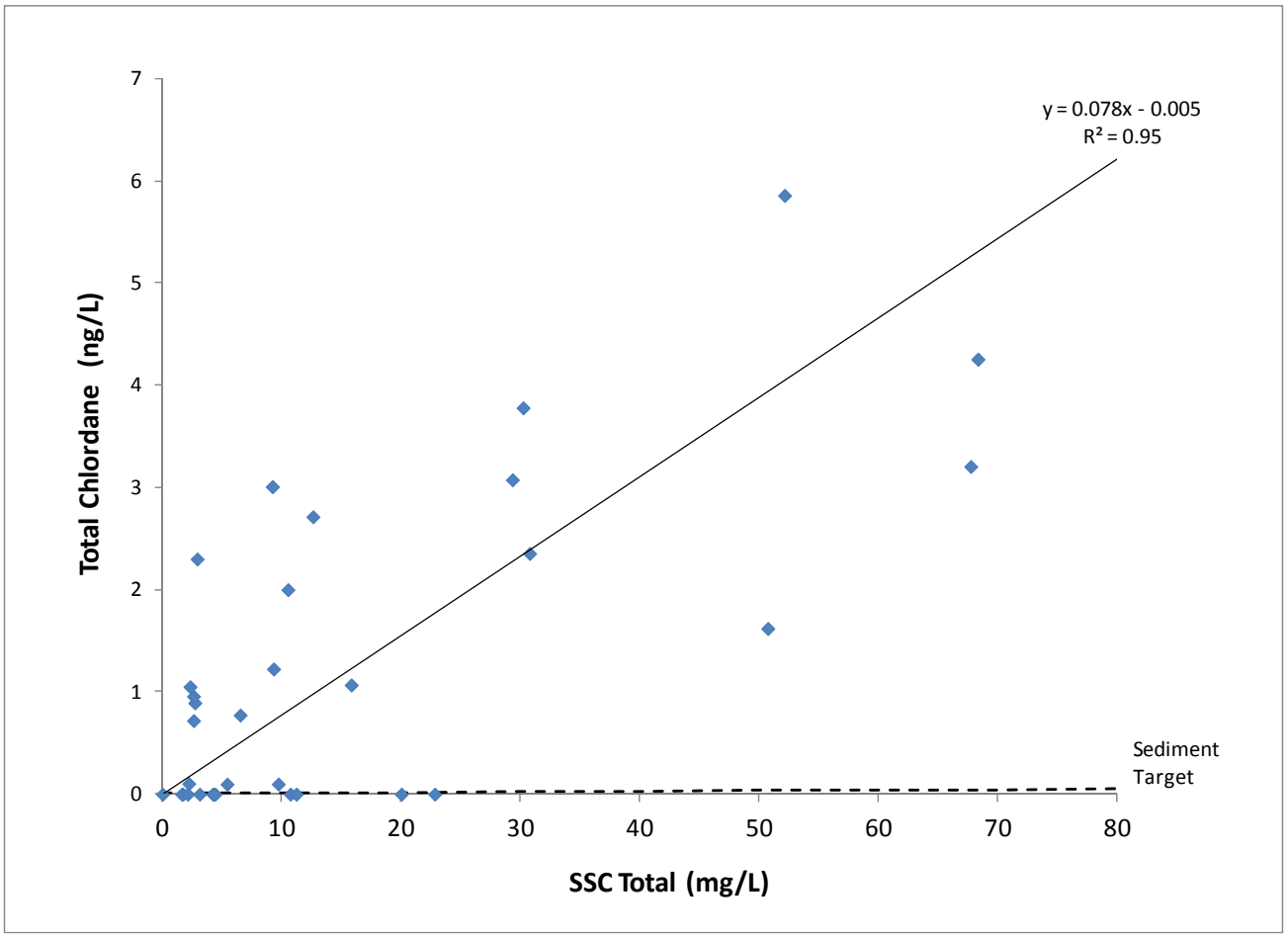

Figure 3-15. Relationship between water column Total Chlordane and Total SSC.
Plot shows best fit simple linear regression for all stormwater and harbor water samples combined.
SSC concentrations are the sum of fines (<63 µm) and coarse (>63 µm) sediments.
Dashed line indicates the theoretical slope if stormwater sediments attained the TMDL target of 0.5 µg/kg.

3.1.2.4 Objective 4: Bottom Sediment vs. Discharged Suspended Sediment Comparisons

Chlordanes concentrations in all bottom sediments collected in March and June of 2011 were non-detect; the detection limit was 1 µg/kg and the reporting limit was 5 µg/kg. These concentrations are above the sediment target established by the TMDL, and so the data are inconclusive with respect to attainment of the TMDL target (0.5 µg/kg).

3.2 Interpretation

The following study objectives have been achieved:

1. Compare the concentrations obtained for both the LDL Study and the CMP to WQOs;
2. Use simple graphics to display the seasonal and spatial variation;
3. Determine if there is a relationship between PCB and chlordane concentrations in stormwater and SSC that allows estimation of pollutant concentrations in suspended sediments; and
4. Determine if the estimated concentration of PCBs and chlordanes in suspended sediments transported by stormwater greater or less than concentrations of PCBs and chlordanes in bottom sediments.

The findings of the study are consistent with the history of PCB and chlordane usage in the United States, and the land use patterns of the watershed. Both PCBs and chlordanes have been banned since the early to mid 1980s. However, chlordane has a much faster degradation rate in the environment compared to PCBs. Decades after the ban, monitoring data from MdR shows chlordane concentrations consistent below detection limits in sediments and harbor water, and only sporadically detected in stormwater. The few detections above WQOs for chlordanes are associated with high SSC events.

In contrast to chlordanes, the more persistent PCBs are consistently detected in harbor sediments, occasionally in harbor water, and more frequently in stormwater. PCB concentrations detected in receiving waters of the harbor during this study have consistently been in attainment of the interim TMDL target for water (<30,000 pg/L). Fifteen (15) percent of stormwater PCB concentrations were above the interim numeric target that applies to receiving waters of the harbor.

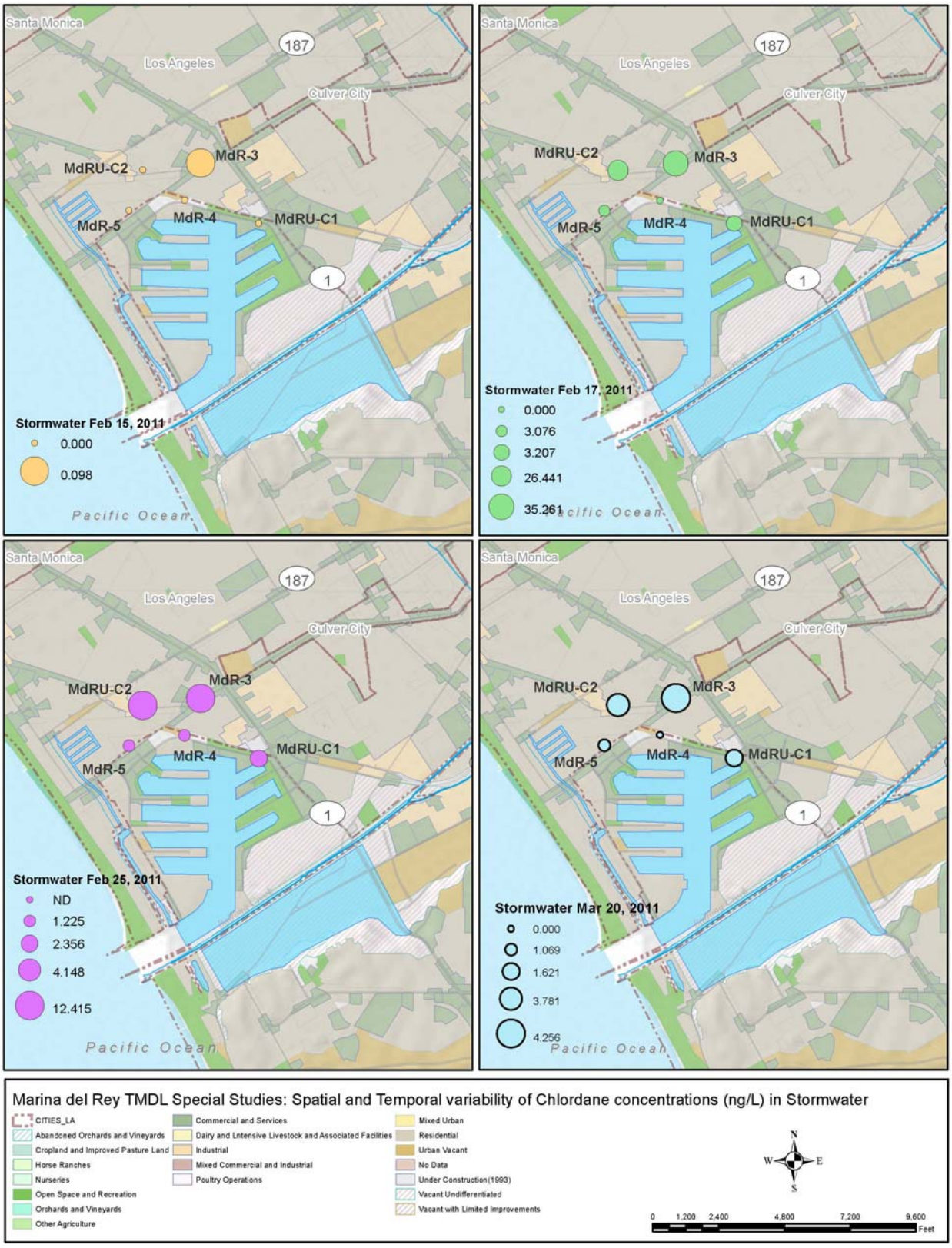

Figure 3-15. Spatial and Temporal Variability of Chlordane Concentrations in Stormwater Samples

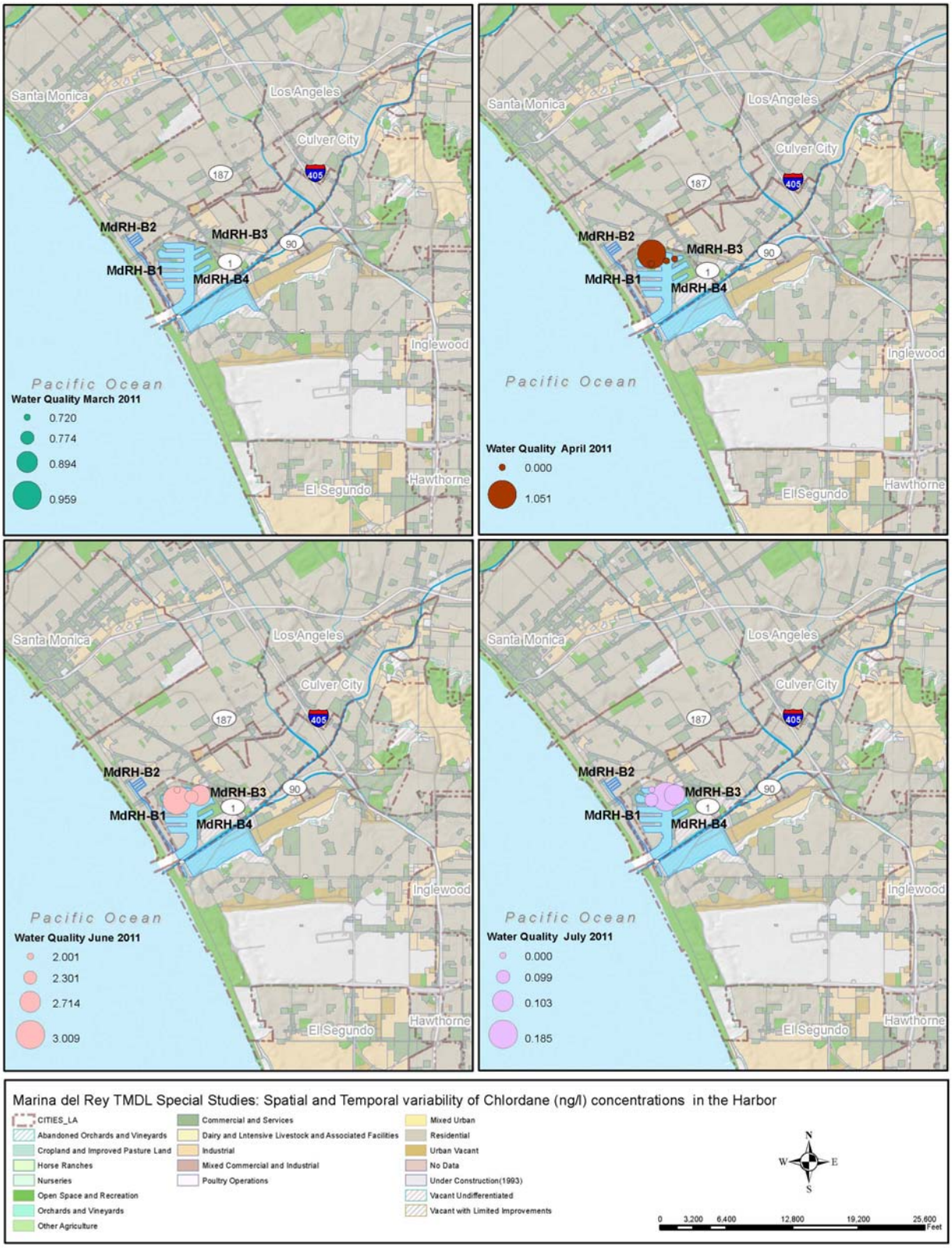

Figure 3-16. Spatial and Temporal Variability of Chlordane Concentrations in Stormwater Samples

3.3 Costs Analysis

The cost estimates presented below were created based on the cost estimates developed through the proposal phase of the study. For the 20-L LDL Study, a cost estimate was provided by the San Francisco Bay Regional Monitoring Program (SFEI). The cost estimates for the Coordinated Monitoring Plan are based on the current project costs for the MdR TMDL CMP Implementation Project. The 1L LDL cost estimates are based on the current project costs. The 4L cost estimates are provided by the laboratory. Other costs, such as labor and equipment, are based on the current study costs.

3.3.1 PCB Cost Estimate

As presented in Figure 3-17 and Table 3-8, the laboratory is the highest contributing factor to the total costs. The costs provided in Figure 3-18 and Table 3-7 are per sample. The sensitivity indicates the MDL or the RL. The "Total LDL Study", given for each accuracy level, is an estimate for the collecting and analyzing the same number of samples collected in MdRH for the LDL Study. For the LDL Study, there were four harbor monitoring locations, each collected four times, for a total number of samples of 16. While the differences in the costs per sample do not appear to be the different, the total cost for the LDL Study provides an example of how quickly the costs multiply when numerous samples are collected and analyzed.

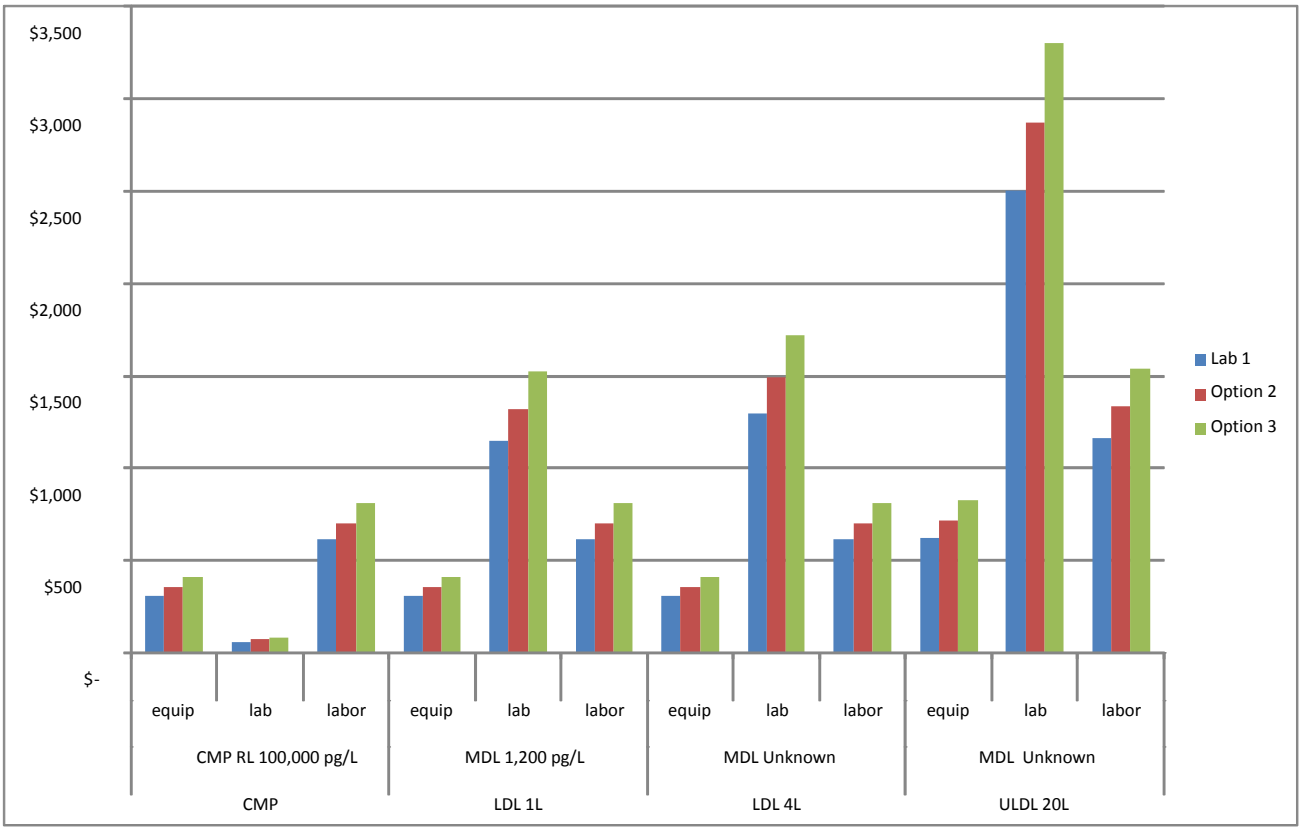

Figure 3-17. Cost Estimates for PCB Analyses Using Various Sensitivities

Table 3-8. Cost Estimates for PCB Analyses using Various Sensitivities					
Method	Sensitivity	Category	Lab 1 ($)	Option 2 ($)	Option 3 ($)
CMP	RL 100,000 pg/L	Equipment	313	359	413
		Laboratory	62	71	81
		Labor	612	704	809
		CMP Total	$ 986	$ 1,134	$ 1,304
		CMP Total LDL Study	$ 15,778	$ 18,144	$ 20,866
LDL 1L	MDL 1,200 pg/L	Equipment	313	359	413
		Laboratory	1,150	1,322	1,521
		Labor	612	704	809
		LDL 1L Total	$ 2,074	$ 2,386	$ 2,744
		LDL 1L Total LDL Study	$ 33,192	$ 38,171	$ 43,896
LDL 4L	MDL Unknown	Equipment	313	359	413
		Laboratory	1,300	1,495	1,719
		Labor	612	704	809
		LDL 4L Total	$ 2,224	$ 2,558	$ 2,942
		LDL 4L Total LDL Study	$ 35,592	$ 40,931	$ 47,070
ULDL 20L	MDL Unknown	Equipment	625	719	826
		Laboratory	2,500	2,875	3,306
		Labor	1,161	1,335	1,536
		ULDL 20L Total	$ 4,286	$ 4,929	$ 5,668
		ULDL 20L Total for LDL Study	$ 68,580	$ 78,867	$ 90,697

The findings and interpretations presented in this report indicate that additional effort on LDL studies would yield diminishing returns. The cost comparisons shown in Figure 3-18 and Table 3-7 indicate that the cost per sample were significantly increased by going to lower detection limits. The benefits obtained from the increased cost included the discovery that harbor water attains the interim target, and identification of specific locations (MDR-4) where stormwater sediments have relatively higher PCB concentrations compared to, Added effort to process higher sample volumes (e.g., 4 liters or 20 liters) may not lead to significantly lower detection limits, because the limiting factor on detection is the variability of PCB concentrations in blanks.

3.3.2 Chlordanes Cost Estimate

As presented in Figure 3-18 and Table 3-9, the laboratory is the highest contributing factor to the total costs. The costs provided in Figure 3-19 and Table 3-9 are per sample. The sensitivity indicates the method detection limit or the reporting limit. The “Total LDL Study”, given for each accuracy level, is an estimate for the collecting and analyzing the same number of samples collected in MdRH for the LDL Study. For the LDL Study, there were four harbor monitoring locations, each collected four times, for a total number of samples of 16. While the differences in the costs per sample do not appear to be the different, the total cost for the LDL Study provides an example of how quickly the costs multiply when numerous samples are collected and analyzed.

Table 3-9. Cost Estimates for Chlordane Analyses using Various Sensitivities					
Method	Sensitivity	Category	Lab 1 ($)	Option 2 ($)	Option 3 ($)
CMP	RL 50 ng/L	Equipment	313	359	413
		Laboratory	84	97	111
		Labor	612	704	809
		CMP Total	$ 1,008	$ 1,160	$ 1,334
		CMP Total for LDL Study	$ 16,136	$ 18,556	$ 6,612
LDL 2L	MDL 1.0 ng/L	Equipment	313	359	413
		Laboratory	248	285	328
		Labor	612	704	809
		LDL 2L Total	$ 1,172	$ 1,348	$ 1,551
		LDL 2L Total for LDL Study	$ 18,760	$ 21,574	$ 24,810
LDL 2L NCI	MDL 0.028 ng/L	Equipment	313	359	413
		Laboratory	348	400	460
		Labor	612	704	809
		LDL 2L NCI Total	$ 1,272	$ 1,463	$ 1,683
		LDL 2L NCI Total for LDL Study	$ 20,360	$ 23,414	$ 26,926
ULDL 20L	MDL Unknown	Equipment	625	719	826
		Laboratory	2,500	2,875	3,306
		Labor	1,161	1,335	1,536
		ULDL 20L Total	$ 4,286	$ 4,929	$ 5,668
		ULDL 20L Total for LDL Study	$ 68,580	$ 78,867	$ 90,697

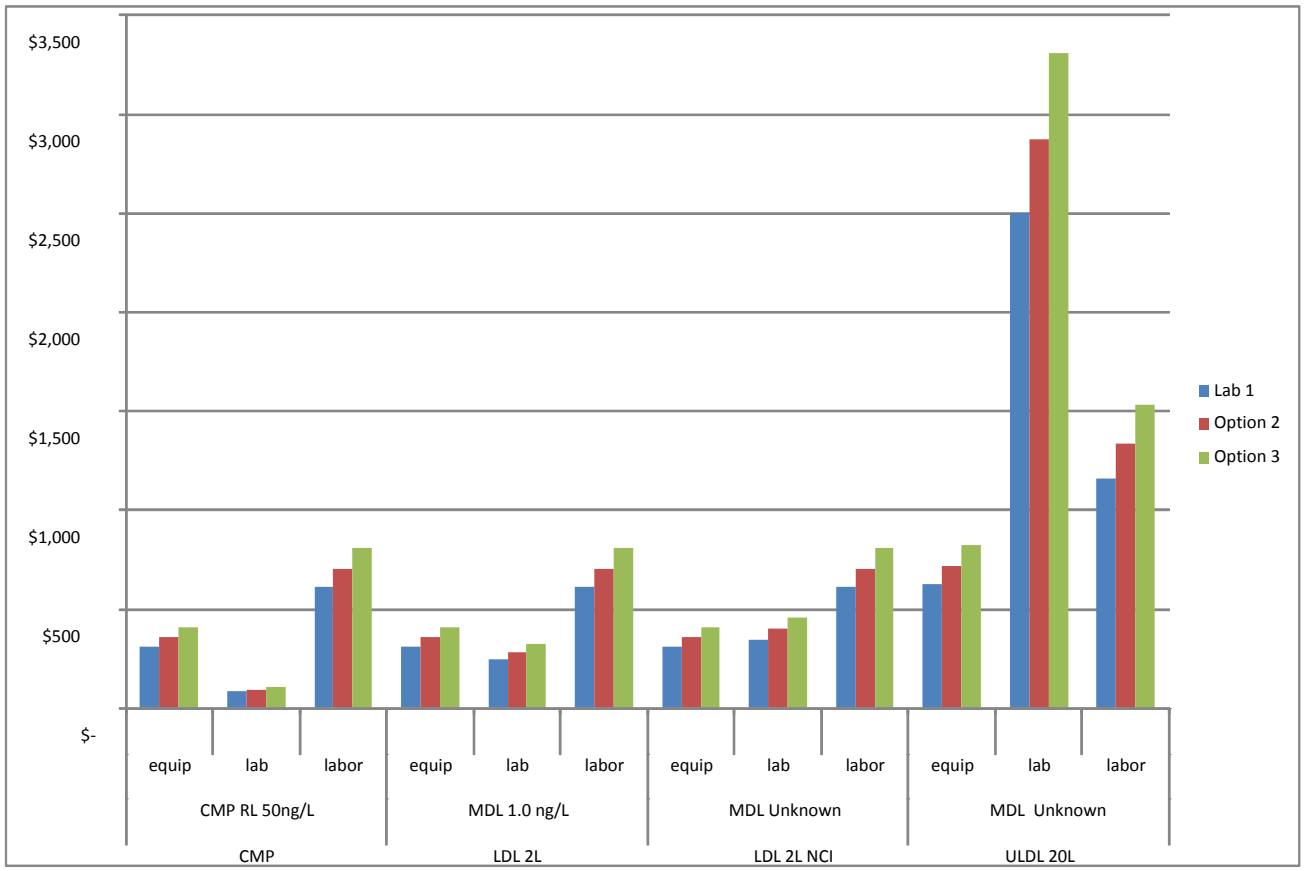

Figure 3-18. Cost Estimates for Chlordane Analyses Using Various Accuracy Levels

As presented in this report, the additional effort used for 2L NCI provided detects in both the stormwater and harbor water quality samples. This effort allowed detects with estimated method detection limits below the TMDL target (0.57 ng/L); however, over 40 percent of the samples reanalyzed (not including trip blanks) were non-detect, indicating that chlordane was not present in the sample. Further effort and costs for larger sample collection and extraction, such as 4L or 20L, would most likely not provide additional information.

4. Conclusions

This report meets special study requirements of the MdR TMDL for the LDL Study. Prior to conducting this study, methods used for compliance monitoring resulted in consistent non-detects in water, because detection limits for USEPA approved methods are higher than WQOs for most typical PCB and chlordane concentrations in stormwater and harbor water.

After conducting this study, the available measurements show that the interim water column targets for PCBs are attained, and that the sediment PCB targets are generally exceeded in stormwater and bottom sediments. Final water column PCB targets are not likely attained in surface waters of the study area, due to both local inputs and global background concentrations. However, confirming attainment or exceedance of the final water column PCB target of 170 pg/L is constrained by the presence of PCBs in blanks.

These insights provide value in terms of new PCBs information. These findings and interpretations also indicated that additional effort on LDL studies would yield diminishing returns. Added effort to process higher sample volumes, at higher costs, (e.g., 4 liters or 20 liters) may not lead to significantly lower detection limits, because the limiting factor on detection is the variability of PCB concentrations in blanks.

To attain even lower PCBs detection limits than the ones attained by this study, significantly greater effort would be needed to establish analytical control of blanks through enhanced equipment cleaning procedures and repeated testing of equipment blanks and bottle blanks. It could take several dozen replicate field and trip blanks to produce low surface water measurements that are convincingly and statistically greater than background noise of the measurement.

Lower PCBs detection limits are not needed to make good decisions about the steps required to attain the waste load allocations (WLAs) established for stormwater in the TMDL. Stormwater WLAs are based on attainment of numeric targets for PCBs and chlordanes in sediments. PCBs in stormwater appear to exceed the sediment target in most places, with notably higher PCB/SSC ratios present in the discharges to the Oxford Flood Control Basin (MdR-4). The only detectable exceedances of the interim water column numeric target for PCBs occurred concurrently with the only detected chlordane concentrations in stormwater; those samples had relatively high concentrations of SSC.

Details of the measures discussed above are beyond the scope of this report; however, there are valuable lessons learned available from similar projects currently under way in the Bay Area that address stormwater load reductions of PCBs in a TMDL context (BASMAA 2011).

As noted in the study findings, there were essentially no non-detects for total PCBs. Total PCBs were even detected in the travel blanks, which means that at present, blank levels and sample collection protocols are more limiting than the extraction or analysis procedure. The study findings achieve all the goals set forth in the TMDL by comparing water column and sediment concentrations to water quality objectives and TMDL targets, and by using the information to draw initial conclusions about PCB sources and loadings that were not previously possible.

The chlordane findings also achieve goals set forth for an LDL Study in the TMDL and improve understanding of chlordanes concentrations. The LDL Study achieved a reporting limit of 5 ng/L, ten-fold lower than the CMP RL of 50 ng/L. The LDL Study method detection limit was 1 ng/L; however, even though this is more sensitive than the CMP, it is still above the water quality objective of 0.57 ng/L. It would be beneficial to identify and implement a cost-effective analytical approach with a detection limit below 0.57 ng/L. Attaining non-detects below the water quality objective would, over time, tend to support a case for revisiting the listing of chlordane as a pollutant impairing Marina del Rey Harbor.

Chlordane concentrations in harbor water were consistently non-detect. The laboratory RL and MDL were above the WQO which established the TMDL target for receiving waters; therefore the data are inconclusive with respect to comparison of harbor water to WQOs. Chlordanes concentrations in all bottom sediments collected in March and June of 2011 were non-detect; the detection limit was 1 µg/kg and the reporting limit was 5 µg/kg. These concentrations are above the sediment target established by the TMDL (0.5 µg/kg), and so the data are inconclusive with respect to attainment of the TMDL target.

As a way of furthering and supporting the chlordane findings, the sample extracts were reanalyzed to test if concentrations less than 1 ng/L could be detected. Lower detection limits (0.028 ng/L) for chlordanes were attained on re-analysis by:

1. Concentrating the extracts;
2. Using NCI; and
3. Running lower calibration standards.

These findings and interpretations provide valuable insight for chlordane information and also indicate that additional effort on LDL studies would yield diminishing returns. Added effort to process higher sample volumes at higher costs, (e.g., 4 liters or 20 liters) would not likely provide any information that hasn't already been uncovered through the analyses performed in this Study.

The PCB and chlordane findings achieve the goals set for conducting an LDL Study and address the questions posed by the TMDL.

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Appendix A: Raw Data Tabulated

Harbor Water Quality Chlordane Data (Raw) in ng/L							
Date	Location	Chlordane-alpha	Chlordane-gamma	cis-Nonachlor	Heptachlor	Oxychlordane	trans-Nonachlor
March	MdRH-B1	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B2	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B3	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B4	0.00	0.00	0.00	0.00	0.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00
April	MdRH-B1	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B2	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B3	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B4	0.00	0.00	0.00	0.00	0.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00
June	MdRH-B1	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B2	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B3	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B4	0.00	0.00	0.00	0.00	0.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00
July	MdRH-B1	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B2	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B3	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B4	0.00	0.00	0.00	0.00	0.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00

Harbor Sediment Chlordane Data (Raw) in ng/dry g							
Date	Location	Chlordane-alpha	Chlordane-gamma	cis-Nonachlor	Heptachlor	Oxychlordane	trans-Nonachlor
March	MdRH-B1	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B2	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B3	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B4	0.00	0.00	0.00	0.00	0.00	0.00
June	MdRH-B1	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B2	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B3	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B4	0.00	0.00	0.00	0.00	0.00	0.00

Stormwater Chlordane Data (Raw) in ng/L							
Date	Location	Chlordane-alpha	Chlordane-gamma	cis-Nonachlor	Heptachlor	Oxychlordane	trans-Nonachlor
2/15/2011	MdR-3	0.00	0.00	0.00	0.00	0.00	0.00
	MdR-4	0.00	0.00	0.00	0.00	0.00	0.00
	MdR-5	0.00	0.00	0.00	0.00	0.00	0.00
	MdRU-C1	0.00	0.00	0.00	0.00	0.00	0.00
	MdRU-C2	0.00	0.00	0.00	0.00	0.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00
2/17/2011	MdR-3	5.60	2.20	2.50	0.00	0.00	3.90
	MdR-4	0.00	0.00	0.00	0.00	0.00	0.00
	MdR-5	0.00	0.00	0.00	0.00	0.00	0.00
	MdRU-C1	0.00	0.00	0.00	0.00	0.00	0.00
	MdRU-C2	5.30	11.40	0.00	0.00	0.00	0.70
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00
2/25/2011	MdR-3	0.00	0.00	0.00	0.00	0.00	0.00
	MdR-4	0.00	0.00	0.00	0.00	0.00	0.00
	MdR-5	0.00	0.00	0.00	0.00	0.00	0.00
	MdRU-C1	0.00	0.00	0.00	0.00	0.00	0.00
	MdRU-C2	0.00	0.00	0.00	0.00	0.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00
3/20/2011	MdR-3	3.00	3.80	1.60	0.00	0.00	0.00
	MdR-4	0.00	0.00	0.00	0.00	0.00	0.00
	MdR-5	0.00	0.00	0.00	0.00	0.00	0.00
	MdRU-C1	0.00	0.00	0.00	0.00	0.00	0.00
	MdRU-C2	3.20	3.80	1.50	0.00	0.00	2.10
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00

Harbor Water Quality Chlordane Data By NCI in ng/L							
Date	Location	Chlordane-alpha	Chlordane-gamma	cis-Nonachlor	Heptachlor	Oxychlordane	trans-Nonachlor
March	MdRH-B1	0.00	0.00	0.00	0.00	0.18	0.00
	MdRH-B2	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B3	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B4	0.00	0.00	0.00	0.00	0.21	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.12	0.00
April	MdRH-B1	0.00	0.00	0.00	0.00	0.04	0.00
	MdRH-B2	0.52	0.53	0.42	0.00	0.85	0.40
	MdRH-B3	0.00	0.00	0.00	0.00	0.08	0.00
	MdRH-B4	0.00	0.00	0.00	0.00	0.08	0.00
	Trip Blank	0.13	0.15	0.10	0.00	0.13	0.14
June	MdRH-B1	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B2	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B3	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B4	0.00	0.00	0.00	0.00	0.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00
July	MdRH-B1	0.00	0.10	0.12	0.00	0.07	0.12
	MdRH-B2	0.00	0.00	0.08	0.00	0.06	0.00
	MdRH-B3	0.00	0.10	0.09	0.00	0.05	0.00
	MdRH-B4	0.05	0.13	0.09	0.00	0.06	0.09
	Trip Blank	0.00	0.00	0.00	0.00	0.08	0.00

Stormwater Chlordane Data By NCI in ng/L							
Date	Location	Chlordane-alpha	Chlordane-gamma	cis-Nonachlor	Heptachlor	Oxychlordane	trans-Nonachlor
2/15/2011	MdR-3	0.000	0.098	0.000	0.000	0.473	0.000
	MdR-4	0.000	0.000	0.000	0.000	0.000	0.000
	MdR-5	0.000	0.000	0.000	0.000	0.000	0.000
	MdRU-C1	0.000	0.000	0.000	0.000	0.057	0.000
	MdRU-C2	0.000	0.000	0.000	0.000	0.053	0.000
	Trip Blank	0.000	0.000	0.000	0.000	0.000	0.000
2/17/2011	MdR-3	7.556	27.705	8.489	0.000	1.268	18.731
	MdR-4	0.000	0.000	0.000	0.000	0.000	0.000
	MdR-5	0.757	2.319	0.890	0.000	0.669	1.716
	MdRU-C1	0.901	2.306	0.851	0.000	0.735	1.282
	MdRU-C2	6.294	20.147	4.822	0.000	0.673	15.415
	Trip Blank	0.000	0.000	0.000	0.000	0.000	0.000
2/25/2011	MdR-3	1.349	4.510	1.414	0.000	0.868	3.217
	MdR-4	0.000	0.000	0.156	0.000	0.153	0.000
	MdR-5	0.329	0.896	0.370	0.000	0.713	0.691
	MdRU-C1	0.580	1.776	0.636	0.000	0.929	1.149
	MdRU-C2	3.294	9.121	2.472	0.000	0.328	5.920
	Trip Blank	0.000	0.000	0.000	0.000	0.000	0.000
3/20/2011	MdR-3	1.313	2.944	0.984	0.000	0.662	2.013
	MdR-4	0.000	0.000	0.000	0.000	0.000	0.000
	MdR-5	0.286	0.783	0.314	0.000	0.387	0.582
	MdRU-C1	0.445	1.176	0.540	0.000	0.776	0.862
	MdRU-C2	0.906	2.874	1.136	0.000	0.383	2.312
	Trip Blank	0.000	0.000	0.000	0.000	0.000	0.000

Harbor Water Quality PCB Data (Raw) in pg/L																							
Date	Location	PCB 1	PCB 2	PCB 3	PCB 4	PCB 10	PCB 9	PCB 7	PCB 6	PCB 5	PCB 8	PCB 14	PCB 11	PCBs 12 + 13	PCB 15	PCB 19	PCBs 18 + 30	PCB 17	PCB 27	PCB 24	PCB 16	PCB 32	PCB 34	PCB 23
March	MdRH-B1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	59.10	0.00	398.00	0.00	0.00	20.40	93.20	58.70	0.00	0.00	57.10	29.30	0.00	0.00
	MdRH-B2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	238.00	0.00	0.00	0.00	73.40	43.80	0.00	0.00	47.00	27.70	0.00	0.00
	MdRH-B3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	83.20	0.00	391.00	0.00	0.00	0.00	103.00	56.80	0.00	0.00	64.80	39.80	0.00	0.00
	MdRH-B4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	492.00	0.00	0.00	0.00	108.00	63.70	0.00	0.00	57.00	33.40	0.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	107.00	0.00	615.00	0.00	0.00	0.00	123.00	72.00	0.00	0.00	82.30	39.40	0.00	0.00
April	MdRH-B1	18.90	11.20	21.40	0.00	0.00	0.00	0.00	0.00	0.00	56.40	0.00	482.00	0.00	0.00	0.00	48.20	28.10	0.00	0.00	27.30	14.80	0.00	0.00
	MdRH-B2	23.60	16.00	25.80	0.00	0.00	0.00	0.00	0.00	0.00	78.40	0.00	601.00	0.00	0.00	0.00	62.10	23.80	0.00	0.00	33.90	16.20	0.00	0.00
	MdRH-B3	24.50	16.90	29.10	0.00	0.00	0.00	0.00	0.00	0.00	90.20	0.00	878.00	0.00	0.00	20.40	81.80	45.10	0.00	0.00	50.10	25.00	0.00	0.00
	MdRH-B4	15.50	12.20	21.40	0.00	0.00	0.00	0.00	0.00	0.00	69.30	0.00	515.00	0.00	0.00	0.00	48.30	25.20	0.00	0.00	29.60	16.00	0.00	0.00
	Trip Blank	18.40	0.00	24.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	513.00	0.00	0.00	0.00	42.10	30.70	0.00	0.00	28.90	0.00	0.00	0.00
June	MdRH-B1	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1010.00	0.00	0.00	16.40	63.90	32.10	0.00	0.00	30.00	30.00	0.00	0.00
	MdRH-B2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1160.00	0.00	0.00	0.00	65.90	35.50	9.72	0.00	28.90	29.50	0.00	0.00
	MdRH-B3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1220.00	0.00	0.00	19.70	82.10	44.50	10.10	0.00	26.90	34.70	0.00	0.00
	MdRH-B4	0.00	0.00	11.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	972.00	0.00	0.00	14.30	64.20	30.50	10.40	0.00	26.00	30.00	0.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37.00	23.90	0.00	0.00	19.40	15.50	0.00	0.00
July	MdRH-B1	60.10	96.40	82.00	39.10	0.00	0.00	0.00	28.40	0.00	57.10	0.00	334.00	53.50	34.60	0.00	67.40	36.80	11.90	0.00	28.80	32.70	0.00	0.00
	MdRH-B2	59.30	99.70	87.40	43.50	0.00	13.10	0.00	0.00	0.00	57.40	0.00	365.00	72.60	28.50	0.00	57.90	26.40	10.00	0.00	22.40	27.30	0.00	0.00
	MdRH-B3	58.80	82.90	78.10	37.50	0.00	0.00	0.00	29.80	0.00	64.00	0.00	336.00	45.80	0.00	13.90	69.50	37.70	10.70	0.00	22.50	38.00	0.00	0.00
	MdRH-B4	58.10	85.40	70.60	44.70	0.00	0.00	0.00	0.00	0.00	54.90	0.00	304.00	56.90	33.60	0.00	54.90	25.50	11.40	0.00	21.90	28.60	0.00	0.00
	Trip Blank	56.60	79.70	67.60	27.20	0.00	0.00	0.00	0.00	0.00	48.60	0.00	297.00	37.30	26.90	0.00	45.10	24.10	6.51	0.00	21.10	11.70	0.00	0.00

		Harbor Water Quality PCB Data (Raw) in pg/L																				
Date	Location	PCBs 26 + 29	PCB 25	PCB 31	PCBs 20 + 28	PCBs 21 + 33	PCB 22	PCB 36	PCB 39	PCB 38	PCB 35	PCB 37	PCB 54	PCBs 50 + 53	PCBs 45 + 51	PCB 46	PCB 52	PCBs 43 + 73	PCBs 49 + 69	PCB 48	PCBs 44 + 47 + 65	PCBs 59 + 62 + 75	PCB 42
March	MdRH-B1	25.10	11.50	130.00	139.00	89.00	44.70	0.00	0.00	0.00	0.00	22.80	0.00	20.10	0.00	0.00	187.00	0.00	83.50	25.40	192.00	0.00	28.70
	MdRH-B2	17.60	0.00	78.00	81.60	46.40	23.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	123.00	0.00	68.60	0.00	125.00	0.00	0.00
	MdRH-B3	24.80	9.74	116.00	125.00	74.00	38.00	0.00	0.00	0.00	0.00	17.40	0.00	0.00	28.60	0.00	157.00	0.00	68.30	22.50	146.00	0.00	0.00
	MdRH-B4	31.80	9.51	163.00	169.00	99.50	53.20	0.00	0.00	0.00	0.00	32.20	0.00	21.50	0.00	0.00	217.00	0.00	87.10	24.60	200.00	0.00	29.60
	Trip Blank	27.70	0.00	149.00	155.00	99.80	65.80	0.00	0.00	0.00	0.00	25.90	0.00	0.00	0.00	0.00	169.00	0.00	79.70	0.00	203.00	0.00	0.00
April	MdRH-B1	12.10	0.00	48.50	57.40	28.80	15.60	0.00	0.00	0.00	0.00	13.40	0.00	0.00	0.00	0.00	95.30	0.00	53.80	10.70	111.00	0.00	17.00
	MdRH-B2	9.94	0.00	45.90	55.10	33.60	16.30	0.00	0.00	0.00	0.00	0.00	0.00	12.30	27.40	0.00	86.60	0.00	45.30	9.30	154.00	0.00	11.80
	MdRH-B3	20.70	0.00	100.00	111.00	62.40	41.40	0.00	0.00	0.00	0.00	19.50	0.00	16.20	36.80	0.00	133.00	0.00	62.00	15.30	190.00	0.00	22.80
	MdRH-B4	11.80	0.00	46.10	47.10	32.00	13.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.30	0.00	56.50	0.00	41.20	0.00	120.00	0.00	0.00
	Trip Blank	8.49	0.00	41.70	41.80	22.80	13.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	51.70	0.00	23.80	0.00	124.00	0.00	0.00
June	MdRH-B1	15.40	0.00	70.80	93.30	51.10	25.40	0.00	0.00	0.00	0.00	0.00	0.00	16.00	24.60	0.00	145.00	0.00	63.80	14.80	117.00	0.00	24.70
	MdRH-B2	15.80	0.00	74.70	104.00	51.20	30.90	0.00	0.00	0.00	0.00	0.00	0.00	17.40	0.00	0.00	147.00	0.00	67.80	15.00	134.00	0.00	24.60
	MdRH-B3	17.00	0.00	82.10	129.00	56.80	31.30	0.00	0.00	0.00	0.00	0.00	0.00	26.80	30.70	0.00	187.00	0.00	86.10	18.40	171.00	0.00	31.30
	MdRH-B4	16.20	0.00	76.30	95.00	49.80	26.00	0.00	0.00	0.00	0.00	0.00	0.00	21.30	22.80	0.00	131.00	0.00	64.80	15.40	132.00	8.55	23.20
	Trip Blank	0.00	0.00	43.20	46.70	24.70	19.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	70.00	0.00	20.40	0.00	67.50	0.00	0.00
July	MdRH-B1	31.90	15.30	76.40	110.00	47.50	30.00	0.00	0.00	0.00	16.30	28.20	0.00	21.00	21.10	9.99	138.00	0.00	62.60	21.10	120.00	10.20	31.50
	MdRH-B2	28.20	13.20	78.90	101.00	43.30	30.60	0.00	0.00	0.00	17.50	26.80	0.00	18.40	17.50	4.18	126.00	0.00	67.80	14.30	102.00	10.50	25.60
	MdRH-B3	19.50	12.00	78.80	95.90	53.20	28.80	0.00	0.00	0.00	10.90	31.40	0.00	24.00	15.90	8.61	151.00	0.00	75.20	20.40	106.00	12.90	34.70
	MdRH-B4	25.80	8.81	55.00	90.10	44.40	22.50	0.00	0.00	0.00	15.30	26.90	0.00	16.50	13.70	0.00	97.40	0.00	57.00	14.40	83.80	9.19	23.40
	Trip Blank	12.50	7.82	51.10	54.40	33.30	18.80	0.00	0.00	0.00	12.40	20.50	0.00	7.88	11.70	0.00	53.80	0.00	23.80	11.40	49.50	0.00	12.50

		Harbor Water Quality PCB Data (Raw) in pg/L																					
Date	Location	PCBs 41 + 71 + 40	PCB 64	PCB 72	PCB 68	PCB 57	PCB 58	PCB 67	PCB 63	PCBs 70 + 61 + 74 + 76	PCB 66	PCB 55	PCB 56	PCB 60	PCB 80	PCB 79	PCB 78	PCB 81	PCB 77	PCB 104	PCB 96	PCB 103	PCB 94
March	MdRH-B1	34.10	41.00	0.00	0.00	0.00	0.00	0.00	0.00	162.00	86.80	0.00	31.20	22.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B2	21.80	27.10	0.00	0.00	0.00	0.00	0.00	0.00	81.30	62.20	0.00	15.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B3	47.10	30.50	0.00	0.00	0.00	0.00	0.00	0.00	128.00	71.20	0.00	22.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B4	42.70	52.00	0.00	0.00	0.00	0.00	0.00	0.00	193.00	102.00	0.00	36.60	21.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Trip Blank	0.00	29.20	0.00	0.00	0.00	0.00	0.00	0.00	136.00	53.30	0.00	23.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
April	MdRH-B1	18.60	19.40	0.00	0.00	0.00	0.00	0.00	0.00	96.50	57.00	0.00	21.10	12.00	0.00	0.00	0.00	0.00	8.41	0.00	0.00	0.00	0.00
	MdRH-B2	24.10	18.40	0.00	6.54	0.00	0.00	0.00	0.00	59.50	33.70	0.00	13.00	6.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B3	44.30	36.60	0.00	7.22	0.00	0.00	0.00	0.00	129.00	65.70	0.00	20.90	12.60	0.00	0.00	0.00	0.00	7.69	0.00	0.00	0.00	0.00
	MdRH-B4	17.50	14.60	0.00	0.00	0.00	0.00	0.00	0.00	54.90	28.60	0.00	9.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Trip Blank	0.00	10.90	0.00	0.00	0.00	0.00	0.00	0.00	35.90	12.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
June	MdRH-B1	34.20	29.80	0.00	0.00	0.00	0.00	0.00	0.00	120.00	82.40	0.00	15.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B2	32.00	30.10	0.00	0.00	0.00	0.00	0.00	0.00	117.00	83.60	0.00	21.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B3	47.30	41.80	0.00	0.00	0.00	0.00	0.00	0.00	164.00	103.00	0.00	31.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B4	38.60	29.20	0.00	0.00	0.00	0.00	0.00	0.00	119.00	80.20	0.00	23.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Trip Blank	16.60	19.10	0.00	0.00	0.00	0.00	0.00	0.00	52.70	17.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
July	MdRH-B1	49.90	43.80	0.00	0.00	0.00	0.00	0.00	0.00	142.00	115.00	0.00	31.00	19.00	0.00	0.00	0.00	0.00	11.20	0.00	0.00	0.00	0.00
	MdRH-B2	36.50	36.50	0.00	0.00	0.00	0.00	0.00	0.00	107.00	77.90	0.00	26.80	11.90	0.00	0.00	0.00	0.00	8.83	0.00	0.00	0.00	0.00
	MdRH-B3	51.80	39.30	0.00	0.00	0.00	0.00	0.00	0.00	133.00	95.40	0.00	33.70	18.40	0.00	0.00	0.00	0.00	9.09	0.00	0.00	0.00	0.00
	MdRH-B4	40.10	31.30	0.00	0.00	0.00	0.00	0.00	3.33	102.00	69.20	0.00	26.60	15.90	0.00	0.00	0.00	0.00	6.76	0.00	0.00	0.00	0.00
	Trip Blank	22.60	19.90	0.00	0.00	0.00	0.00	0.00	0.00	52.50	25.80	0.00	13.50	9.26	0.00	0.00	0.00	0.00	5.27	0.00	0.00	0.00	0.00

		Harbor Water Quality PCB Data (Raw) in pg/L																				
Date	Location	PCB 95	PCBs 93 + 100	PCBs 98 + 102	PCBs 88 + 91	PCB 84	PCB 89	PCB 121	PCB 92	PCBs 90 + 101 + 113	PCBs 83 + 99	PCB 112	PCBs 86 + 87 + 97 + 109 + 119 + 125	PCB 117	PCBs 85 + 116	PCBs 110 + 115	PCB 82	PCB 111	PCB 120	PCBs 108 + 124	PCB 107	PCB 123	PCB 106
March	MdRH-B1	152.00	0.00	0.00	0.00	44.10	0.00	0.00	26.70	167.00	75.50	0.00	87.60	0.00	18.00	137.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B2	103.00	0.00	0.00	0.00	24.90	0.00	0.00	0.00	109.00	60.50	0.00	52.00	0.00	0.00	86.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B3	121.00	0.00	0.00	31.50	22.90	0.00	0.00	0.00	162.00	97.70	0.00	65.90	0.00	0.00	112.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B4	161.00	0.00	0.00	21.60	55.60	0.00	0.00	27.50	190.00	80.50	0.00	104.00	0.00	0.00	110.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Trip Blank	136.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	146.00	77.50	0.00	0.00	0.00	0.00	69.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
April	MdRH-B1	80.90	0.00	0.00	18.10	21.20	0.00	0.00	18.50	130.00	82.80	0.00	64.30	0.00	17.20	126.00	0.00	0.00	0.00	4.82	7.34	0.00	0.00
	MdRH-B2	48.50	0.00	0.00	7.78	15.60	0.00	0.00	11.20	74.20	46.50	0.00	43.10	0.00	9.40	67.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B3	90.20	0.00	0.00	20.80	26.00	0.00	0.00	17.20	133.00	79.00	0.00	75.50	0.00	12.80	120.00	10.80	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B4	35.40	0.00	0.00	8.16	0.00	0.00	0.00	0.00	59.60	35.90	0.00	36.00	0.00	0.00	56.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Trip Blank	26.20	0.00	0.00	0.00	0.00	0.00	0.00	6.62	34.20	0.00	0.00	21.60	0.00	0.00	22.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
June	MdRH-B1	81.40	0.00	0.00	19.20	27.40	0.00	0.00	22.60	128.00	86.40	0.00	72.40	0.00	0.00	122.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B2	91.10	0.00	0.00	16.80	35.60	0.00	0.00	23.30	137.00	93.10	0.00	71.40	0.00	0.00	131.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B3	122.00	0.00	0.00	33.10	35.00	0.00	0.00	26.90	209.00	148.00	0.00	88.10	0.00	21.90	170.00	0.00	0.00	0.00	0.00	11.10	0.00	0.00
	MdRH-B4	92.40	0.00	0.00	20.80	27.90	0.00	0.00	20.80	124.00	86.10	0.00	71.40	0.00	0.00	122.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Trip Blank	44.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.10	17.10	0.00	31.20	0.00	0.00	50.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
July	MdRH-B1	122.00	0.00	0.00	23.90	35.10	0.00	0.00	39.10	168.00	8.94	0.00	96.10	26.00	26.00	155.00	8.94	0.00	0.00	96.10	0.00	0.00	0.00
	MdRH-B2	86.00	0.00	0.00	16.90	27.20	0.00	0.00	17.20	107.00	6.62	0.00	50.00	14.80	14.80	86.30	10.50	0.00	0.00	50.00	0.00	0.00	0.00
	MdRH-B3	91.20	0.00	0.00	24.40	26.20	0.00	0.00	21.20	130.00	7.50	0.00	80.50	16.00	16.00	112.00	9.53	0.00	0.00	80.50	0.00	0.00	0.00
	MdRH-B4	79.00	0.00	0.00	20.60	19.90	0.00	0.00	17.20	101.00	8.13	0.00	58.90	17.60	17.60	94.20	6.21	0.00	0.00	58.90	0.00	0.00	0.00
	Trip Blank	36.00	0.00	0.00	10.80	11.60	0.00	0.00	9.06	33.10	2.54	0.00	24.20	5.86	5.86	37.20	2.93	0.00	0.00	24.20	0.00	0.00	0.00

		Harbor Water Quality PCB Data (Raw) in pg/L																					
Date	Location	PCB 118	PCB 122	PCB 114	PCB 105	PCB 127	PCB 126	PCB 155	PCB 152	PCB 150	PCB 136	PCB 145	PCB 148	PCBs 135 + 151	PCB 154	PCB 144	PCBs 147 + 149	PCB 134	PCB 143	PCBs 139 + 140	PCB 131	PCB 142	PCB 132	PCB 133
March	MdRH-B1	92.60	0.00	0.00	26.00	0.00	0.00	0.00	0.00	0.00	18.30	0.00	0.00	48.10	0.00	0.00	102.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B2	79.50	0.00	0.00	32.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.30	0.00	0.00	68.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B3	85.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.30	0.00	0.00	63.80	0.00	0.00	199.00	0.00	0.00	0.00	0.00	0.00	30.00	0.00
	MdRH-B4	75.30	0.00	0.00	25.10	0.00	0.00	0.00	0.00	0.00	15.60	0.00	0.00	44.50	0.00	0.00	85.20	0.00	0.00	0.00	0.00	0.00	25.00	0.00
	Trip Blank	41.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.70	0.00	0.00	68.10	0.00	0.00	164.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
April	MdRH-B1	141.00	0.00	8.54	49.20	0.00	0.00	0.00	0.00	0.00	14.60	0.00	0.00	35.90	0.00	0.00	116.00	0.00	0.00	0.00	0.00	0.00	40.30	0.00
	MdRH-B2	65.00	0.00	0.00	22.70	0.00	0.00	0.00	0.00	0.00	6.07	0.00	0.00	18.20	0.00	0.00	48.50	0.00	0.00	0.00	0.00	0.00	15.60	0.00
	MdRH-B3	110.00	0.00	0.00	41.70	0.00	0.00	0.00	0.00	0.00	14.30	0.00	0.00	33.90	0.00	0.00	94.70	0.00	0.00	0.00	0.00	0.00	36.10	0.00
	MdRH-B4	56.00	0.00	0.00	24.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.10	0.00	0.00	56.20	0.00	0.00	0.00	0.00	0.00	13.30	0.00
	Trip Blank	22.10	0.00	0.00	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.80	0.00	0.00	0.00	0.00	0.00	10.00	0.00
June	MdRH-B1	102.00	0.00	0.00	34.30	0.00	0.00	0.00	0.00	0.00	11.60	0.00	0.00	31.60	0.00	0.00	75.40	0.00	0.00	0.00	0.00	0.00	26.50	0.00
	MdRH-B2	108.00	0.00	0.00	36.40	0.00	0.00	0.00	0.00	0.00	10.60	0.00	0.00	41.40	0.00	0.00	90.90	0.00	0.00	0.00	0.00	0.00	24.30	0.00
	MdRH-B3	162.00	0.00	0.00	48.50	0.00	0.00	0.00	0.00	0.00	22.10	0.00	0.00	93.30	10.30	0.00	214.00	0.00	0.00	0.00	0.00	0.00	44.40	0.00
	MdRH-B4	96.30	0.00	0.00	30.70	0.00	0.00	0.00	0.00	0.00	13.00	0.00	0.00	33.40	0.00	0.00	94.00	0.00	0.00	0.00	0.00	0.00	28.60	0.00
	Trip Blank	46.60	0.00	0.00	19.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
July	MdRH-B1	154.00	0.00	0.00	51.40	0.00	0.00	0.00	0.00	0.00	22.20	0.00	0.00	58.20	0.00	0.00	135.00	0.00	0.00	0.00	0.00	0.00	50.20	0.00
	MdRH-B2	75.90	0.00	0.00	23.00	0.00	0.00	0.00	0.00	0.00	12.60	0.00	0.00	21.60	0.00	0.00	55.50	0.00	0.00	0.00	0.00	0.00	17.80	0.00
	MdRH-B3	113.00	0.00	0.00	43.80	0.00	0.00	0.00	0.00	0.00	13.40	0.00	0.00	43.60	0.00	0.00	95.30	0.00	0.00	0.00	0.00	0.00	27.70	0.00
	MdRH-B4	97.60	0.00	0.00	37.80	0.00	0.00	0.00	0.00	0.00	12.70	0.00	0.00	38.00	0.00	0.00	87.30	0.00	0.00	0.00	0.00	0.00	23.20	0.00
	Trip Blank	19.20	0.00	0.00	9.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.00	0.00	0.00	0.00	0.00	0.00	9.74	0.00

		Harbor Water Quality PCB Data (Raw) in pg/L																					
Date	Location	PCB 165	PCB 146	PCB 161	PCBs 153 + 168	PCB 141	PCB 130	PCB 137	PCB 164	PCBs 129 + 138 + 163	PCB 160	PCB 158	PCBs 128 + 166	PCB 159	PCB 162	PCB 167	PCBs 156 + 157	PCB 169	PCB 188	PCB 179	PCB 184	PCB 176	PCB 186
March	MdRH-B1	0.00	0.00	0.00	112.00	0.00	0.00	0.00	0.00	96.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.60	0.00	0.00	0.00
	MdRH-B2	0.00	0.00	0.00	82.70	0.00	0.00	0.00	0.00	111.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B3	0.00	34.50	0.00	281.00	30.50	0.00	0.00	0.00	210.00	0.00	0.00	0.00	0.00	0.00	0.00	23.00	0.00	0.00	25.90	0.00	0.00	0.00
	MdRH-B4	0.00	0.00	0.00	80.60	0.00	0.00	0.00	0.00	71.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Trip Blank	0.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	146.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.10	0.00	0.00	0.00
April	MdRH-B1	0.00	25.10	0.00	170.00	22.70	0.00	0.00	14.30	169.00	0.00	16.20	22.00	0.00	0.00	12.80	28.50	0.00	0.00	14.50	0.00	0.00	0.00
	MdRH-B2	0.00	0.00	0.00	56.00	0.00	0.00	0.00	0.00	59.20	0.00	0.00	0.00	0.00	0.00	0.00	13.80	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B3	0.00	19.30	0.00	127.00	18.20	0.00	0.00	0.00	135.00	0.00	0.00	14.20	0.00	0.00	8.23	17.40	0.00	0.00	10.70	0.00	0.00	0.00
	MdRH-B4	0.00	15.70	0.00	78.40	0.00	0.00	0.00	0.00	77.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.08	0.00	0.00	0.00
	Trip Blank	0.00	0.00	0.00	9.40	0.00	0.00	0.00	0.00	13.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
June	MdRH-B1	0.00	0.00	12.60	109.00	13.80	0.00	0.00	0.00	121.00	0.00	9.36	13.80	0.00	0.00	0.00	0.00	0.00	0.00	7.02	0.00	0.00	0.00
	MdRH-B2	0.00	0.00	14.70	128.00	0.00	0.00	0.00	0.00	130.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B3	0.00	0.00	39.00	378.00	45.40	0.00	0.00	20.00	307.00	0.00	31.20	28.40	0.00	0.00	0.00	37.00	0.00	0.00	29.10	0.00	0.00	0.00
	MdRH-B4	0.00	0.00	18.00	134.00	16.30	0.00	0.00	0.00	133.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.40	0.00	0.00	0.00
	Trip Blank	0.00	0.00	0.00	21.00	0.00	0.00	0.00	0.00	37.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
July	MdRH-B1	0.00	26.40	0.00	146.00	26.40	0.00	0.00	0.00	170.00	0.00	13.60	29.70	0.00	0.00	10.80	22.60	0.00	0.00	19.10	0.00	0.00	0.00
	MdRH-B2	0.00	12.80	0.00	68.40	11.30	0.00	0.00	0.00	71.00	0.00	4.83	13.00	0.00	0.00	0.00	0.00	0.00	0.00	4.73	0.00	4.10	0.00
	MdRH-B3	0.00	19.20	0.00	113.00	14.70	5.53	0.00	5.43	115.00	0.00	9.23	14.80	0.00	0.00	6.97	13.00	0.00	0.00	12.90	0.00	17.80	0.00
	MdRH-B4	0.00	17.30	0.00	115.00	15.70	0.00	0.00	8.58	112.00	0.00	9.46	12.30	0.00	0.00	7.65	11.40	0.00	0.00	9.38	0.00	4.14	0.00
	Trip Blank	0.00	5.52	0.00	21.50	6.94	0.00	0.00	0.00	26.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		Harbor Water Quality PCB Data (Raw) in pg/L																					
Date	Location	PCB 178	PCB 175	PCB 187	PCB 182	PCB 183	PCB 185	PCB 174	PCB 177	PCB 181	PCBs 171 + 173	PCB 172	PCB 192	PCBs 180 + 193	PCB 191	PCB 170	PCB 190	PCB 189	PCB 202	PCB 201	PCB 204	PCB 197	PCB 200	PCBs 198 + 199
March	MdRH-B1	0.00	0.00	32.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B2	0.00	0.00	28.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	32.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B3	0.00	0.00	93.90	0.00	45.90	0.00	73.00	31.30	0.00	0.00	0.00	0.00	241.00	0.00	110.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.50
	MdRH-B4	0.00	0.00	18.80	0.00	0.00	0.00	22.90	0.00	0.00	0.00	0.00	0.00	27.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Trip Blank	0.00	0.00	83.50	0.00	65.90	0.00	72.10	0.00	0.00	0.00	0.00	0.00	224.00	0.00	74.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
April	MdRH-B1	11.00	0.00	55.90	0.00	22.10	0.00	35.40	27.00	0.00	15.10	10.10	0.00	118.00	0.00	71.80	13.20	8.10	0.00	0.00	0.00	0.00	0.00	24.70
	MdRH-B2	0.00	0.00	16.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.40	0.00	17.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B3	0.00	0.00	37.40	0.00	18.50	0.00	25.90	0.00	0.00	12.40	0.00	0.00	81.50	0.00	35.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.50
	MdRH-B4	0.00	0.00	28.60	0.00	18.70	0.00	18.80	0.00	0.00	0.00	0.00	0.00	67.90	0.00	30.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
June	MdRH-B1	0.00	0.00	29.60	0.00	0.00	0.00	22.40	0.00	0.00	0.00	0.00	0.00	59.20	0.00	29.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRH-B2	0.00	0.00	40.40	0.00	19.30	0.00	25.80	19.90	0.00	0.00	0.00	0.00	83.50	0.00	39.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.90
	MdRH-B3	22.00	0.00	126.00	0.00	69.20	0.00	87.10	45.50	0.00	28.90	23.10	0.00	321.00	0.00	163.00	41.20	0.00	10.20	0.00	0.00	0.00	0.00	50.20
	MdRH-B4	0.00	0.00	41.80	0.00	20.40	0.00	23.00	0.00	0.00	0.00	0.00	0.00	83.20	0.00	38.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.90
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
July	MdRH-B1	5.83	0.00	49.40	0.00	22.90	22.90	31.20	22.10	0.00	0.00	8.15	0.00	63.50	0.00	37.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.10
	MdRH-B2	0.00	0.00	16.90	0.00	8.43	8.43	11.80	8.64	0.00	4.47	0.00	0.00	26.30	0.00	12.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.01
	MdRH-B3	12.90	0.00	28.50	0.00	13.20	13.20	24.80	17.80	0.00	11.50	0.00	0.00	59.30	0.00	32.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.90
	MdRH-B4	7.08	0.00	37.60	0.00	22.60	22.60	27.80	15.10	0.00	9.05	5.91	0.00	72.60	0.00	38.80	8.25	0.00	0.00	0.00	0.00	0.00	0.00	16.60
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		Harbor Water Quality PCB Data (Raw) in pg/L																	
Date	Location	PCB 196	PCB 203	PCB 195	PCB 194	PCB 205	PCB 208	PCB 207	PCB 206	PCB 209	Total MonoCB	Total DiCB	Total TriCB	Total TetraCB	Total PentaCB	Total HexaCB	Total HeptaCB	Total OctaCB	Total NonaCB	Total PCBs
March	MdRH-B1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	457.00	721.00	913.00	826.00	376.00	86.00	0.00	0.00	3380.00
	MdRH-B2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	238.00	439.00	524.00	548.00	286.00	61.00	0.00	0.00	2100.00
	MdRH-B3	25.20	26.00	0.00	59.60	0.00	0.00	0.00	0.00	0.00	0.00	474.00	668.00	722.00	699.00	893.00	621.00	152.00	0.00	4230.00
	MdRH-B4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	492.00	820.00	1030.00	851.00	322.00	69.40	0.00	0.00	3580.00
	Trip Blank	0.00	0.00	0.00	54.60	0.00	0.00	0.00	0.00	0.00	0.00	722.00	839.00	693.00	470.00	653.00	559.00	54.60	0.00	3990.00
April	MdRH-B1	14.80	18.00	14.10	31.70	0.00	0.00	0.00	0.00	15.70	51.40	538.00	294.00	520.00	770.00	689.00	402.00	103.00	0.00	3380.00
	MdRH-B2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.90	65.40	680.00	297.00	509.00	412.00	217.00	73.70	0.00	0.00	2260.00
	MdRH-B3	12.40	10.20	0.00	0.00	0.00	0.00	0.00	0.00	16.30	70.50	969.00	577.00	800.00	737.00	518.00	221.00	41.10	0.00	3950.00
	MdRH-B4	0.00	0.00	0.00	20.50	0.00	0.00	0.00	0.00	0.00	49.10	584.00	270.00	365.00	311.00	260.00	172.00	20.50	0.00	2030.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.90	43.20	513.00	230.00	259.00	145.00	49.70	0.00	0.00	0.00	1260.00
June	MdRH-B1	0.00	0.00	0.00	21.70	0.00	0.00	0.00	0.00	13.50	15.00	1010.00	428.00	687.00	696.00	425.00	148.00	21.70	0.00	3440.00
	MdRH-B2	0.00	12.30	0.00	25.40	0.00	0.00	0.00	0.00	0.00	0.00	1160.00	446.00	690.00	745.00	440.00	228.00	55.60	0.00	3760.00
	MdRH-B3	31.60	35.60	30.80	84.20	0.00	0.00	0.00	0.00	0.00	0.00	1220.00	535.00	938.00	1080.00	1270.00	956.00	242.00	0.00	6240.00
	MdRH-B4	0.00	0.00	0.00	28.40	0.00	0.00	0.00	0.00	0.00	11.60	972.00	439.00	708.00	692.00	470.00	220.00	48.30	0.00	3560.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	230.00	264.00	260.00	83.20	0.00	0.00	0.00	837.00
July	MdRH-B1	9.11	10.60	5.08	18.60	0.00	0.00	0.00	11.50	9.77	238.00	422.00	517.00	795.00	980.00	658.00	246.00	32.70	11.50	4256.71
	MdRH-B2	1.99	3.72	3.12	8.00	0.00	0.00	0.00	0.00	0.00	246.00	466.00	440.00	562.00	520.00	245.00	51.60	3.12	0.00	3007.10
	MdRH-B3	0.00	0.00	0.00	16.00	0.00	0.00	0.00	0.00	9.90	220.00	336.00	478.00	814.00	668.00	430.00	147.00	0.00	0.00	3634.49
	MdRH-B4	9.63	8.35	7.92	14.60	0.00	0.00	0.00	0.00	0.00	214.00	359.00	326.00	475.00	426.00	425.00	239.00	34.20	0.00	3193.13
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	204.00	297.00	295.00	282.00	168.00	56.60	0.00	0.00	0.00	1609.51

Harbor Sediment PCB Data (Raw) in ng/kg																											
Date	Location	PCB 1	PCB 2	PCB 3	PCB 4	PCB 10	PCB 9	PCB 7	PCB 6	PCB 5	PCB 8	PCB 14	PCB 11	PCBs 12 + 13	PCB 15	PCB 19	PCBs 18 + 30	PCB 17	PCB 27	PCB 24	PCB 16	PCB 32	PCB 34	PCB 23	PCBs 26 + 29	PCB 25	PCB 31	PCBs 20 + 28
March	MdRH-B1	31.50	18.60	27.50	0.00	0.00	0.00	0.00	0.00	0.00	122.00	0.00	202.00	0.00	219.00	26.20	119.00	77.40	23.30	0.00	59.40	98.20	0.00	0.00	55.50	48.40	312.00	658.00
	MdRH-B2	54.40	19.20	33.00	0.00	0.00	0.00	0.00	0.00	0.00	141.00	0.00	206.00	0.00	241.00	23.70	118.00	91.50	30.20	0.00	59.90	131.00	0.00	0.00	55.70	52.90	337.00	772.00
	MdRH-B3	37.00	17.30	35.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	384.00	0.00	0.00	35.40	159.00	104.00	34.30	0.00	75.90	120.00	0.00	0.00	59.60	40.20	319.00	635.00
	MdRH-B4	20.50	7.99	19.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	274.00	0.00	0.00	16.80	102.00	67.20	10.70	0.00	44.10	58.50	0.00	0.00	38.10	26.90	214.00	387.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	263.00	0.00	0.00	0.00	75.50	37.40	0.00	0.00	41.50	22.00	0.00	0.00	0.00	0.00	80.80	77.60
June	MdRH-B1	12.90	9.54	12.80	0.00	0.00	0.00	0.00	0.00	0.00	43.20	0.00	284.00	0.00	82.80	10.10	50.00	35.90	12.00	0.00	19.00	45.40	0.00	0.00	24.80	20.10	144.00	305.00
	MdRH-B2	69.00	45.80	68.40	55.80	0.00	0.00	0.00	45.30	0.00	223.00	0.00	661.00	77.50	397.00	31.50	171.00	156.00	51.70	0.00	109.00	251.00	8.71	0.00	92.10	89.80	558.00	1450.00
	MdRH-B3	15.60	7.59	12.10	0.00	0.00	0.00	0.00	0.00	0.00	30.60	0.00	245.00	0.00	53.80	9.42	39.90	26.20	9.17	0.00	15.50	38.10	0.00	0.00	17.10	14.50	99.30	209.00
	MdRH-B4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	464.00	0.00	105.00	0.00	93.70	59.60	20.70	20.00	32.90	81.50	0.00	0.00	40.70	28.00	226.00	516.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.80	22.40	0.00	0.00	17.70	12.40	0.00	0.00	0.00	0.00	43.80	57.10

		Harbor Sediment PCB Data (Raw) in ng/kg																							
Date	Location	PCBs 21 + 33	PCB 22	PCB 36	PCB 39	PCB 38	PCB 35	PCB 37	PCB 54	PCBs 50 + 53	PCBs 45 + 51	PCB 46	PCB 52	PCBs 43 + 73	PCBs 49 + 69	PCB 48	PCBs 44 + 47 + 65	PCBs 59 + 62 + 75	PCB 42	PCBs 41 + 71 + 40	PCB 64	PCB 72	PCB 68	PCB 57	PCB 58	PCB 67
March	MdRH-B1	183.00	103.00	0.00	8.37	0.00	26.10	246.00	0.00	155.00	111.00	39.90	1340.00	13.70	866.00	116.00	1130.00	90.00	323.00	407.00	381.00	41.50	25.50	0.00	6.96	36.00
	MdRH-B2	217.00	113.00	0.00	11.70	0.00	28.50	269.00	0.00	194.00	125.00	49.00	1670.00	23.40	1170.00	153.00	1440.00	118.00	401.00	519.00	480.00	48.20	27.80	0.00	10.80	43.60
	MdRH-B3	192.00	116.00	0.00	0.00	0.00	21.30	227.00	0.00	180.00	131.00	48.90	1430.00	0.00	956.00	113.00	1230.00	100.00	358.00	471.00	394.00	46.60	25.60	0.00	0.00	0.00
	MdRH-B4	138.00	77.60	0.00	4.90	0.00	11.90	135.00	0.00	98.70	81.40	26.10	785.00	9.97	502.00	79.60	712.00	58.00	189.00	273.00	236.00	16.60	15.50	0.00	6.26	16.70
	Trip Blank	55.20	26.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	101.00	0.00	47.20	0.00	104.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
June	MdRH-B1	84.80	48.40	0.00	0.00	0.00	0.00	95.30	0.00	61.60	54.30	18.30	567.00	0.00	368.00	49.80	531.00	40.30	129.00	170.00	163.00	17.10	12.20	0.00	0.00	14.10
	MdRH-B2	421.00	208.00	0.00	18.30	0.00	56.70	516.00	5.17	246.00	208.00	78.20	2140.00	0.00	1610.00	206.00	2060.00	163.00	627.00	723.00	661.00	73.80	44.80	12.50	18.80	68.60
	MdRH-B3	63.20	33.00	0.00	0.00	0.00	0.00	70.70	0.00	50.80	42.10	15.80	400.00	0.00	260.00	34.00	387.00	31.60	107.00	134.00	124.00	12.80	9.11	0.00	0.00	11.80
	MdRH-B4	156.00	86.80	0.00	0.00	0.00	0.00	187.00	0.00	108.00	107.00	28.50	905.00	0.00	608.00	78.50	891.00	63.30	213.00	289.00	249.00	18.00	14.60	0.00	0.00	25.30
	Trip Blank	32.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	54.50	0.00	0.00	0.00	72.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		Harbor Sediment PCB Data (Raw) in ng/kg																							
Date	Location	PCB 63	PCBs 70 + 61 + 74 + 76	PCB 66	PCB 55	PCB 56	PCB 60	PCB 80	PCB 79	PCB 78	PCB 81	PCB 77	PCB 104	PCB 96	PCB 103	PCB 94	PCB 95	PCBs 93 + 100	PCBs 98 + 102	PCBs 88 + 91	PCB 84	PCB 89	PCB 121	PCB 92	PCBs 90 + 101 + 113
March	MdRH-B1	54.70	2220.00	2140.00	10.30	565.00	199.00	19.00	44.90	0.00	8.39	220.00	0.00	13.60	48.80	12.80	2050.00	27.70	102.00	432.00	562.00	13.00	0.00	623.00	3930.00
	MdRH-B2	62.20	2580.00	2510.00	0.00	659.00	227.00	21.10	55.00	0.00	11.60	252.00	0.00	14.80	52.30	13.90	1910.00	36.80	117.00	459.00	599.00	16.50	0.00	693.00	3940.00
	MdRH-B3	53.00	2220.00	2020.00	0.00	575.00	213.00	0.00	51.90	0.00	0.00	203.00	0.00	15.70	49.00	18.10	1660.00	33.40	117.00	427.00	573.00	16.30	0.00	614.00	3420.00
	MdRH-B4	31.30	1140.00	1050.00	0.00	310.00	119.00	0.00	22.90	0.00	0.00	106.00	0.00	9.50	22.50	0.00	895.00	7.39	53.60	218.00	305.00	10.60	0.00	323.00	1880.00
	Trip Blank	0.00	54.80	22.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	77.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	75.00
June	MdRH-B1	23.90	934.00	937.00	0.00	232.00	91.50	0.00	17.50	0.00	4.23	88.80	0.00	4.71	22.10	5.65	687.00	15.70	45.80	179.00	226.00	7.28	0.00	228.00	1300.00
	MdRH-B2	94.30	3500.00	3410.00	0.00	949.00	311.00	23.60	87.10	0.00	16.50	397.00	0.00	23.20	93.20	23.90	3890.00	59.90	222.00	845.00	1120.00	30.10	0.00	1090.00	6610.00
	MdRH-B3	16.40	647.00	653.00	0.00	172.00	65.70	0.00	13.30	0.00	0.00	60.30	0.00	4.22	15.60	5.13	532.00	10.90	34.60	137.00	176.00	6.33	0.00	165.00	932.00
	MdRH-B4	31.90	1440.00	1440.00	0.00	418.00	165.00	0.00	0.00	0.00	0.00	153.00	0.00	0.00	0.00	0.00	1280.00	0.00	82.30	305.00	434.00	0.00	0.00	410.00	2360.00
	Trip Blank	0.00	53.20	19.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.50

		Harbor Sediment PCB Data (Raw) in ng/kg																					
Date	Location	PCBs 83 + 99	PCB 112	PCBs 86 + 87 + 97 + 109 + 119 + 125	PCB 117	PCBs 85 + 116	PCBs 110 + 115	PCB 82	PCB 111	PCB 120	PCBs 108 + 124	PCB 107	PCB 123	PCB 106	PCB 118	PCB 122	PCB 114	PCB 105	PCB 127	PCB 126	PCB 155	PCB 152	PCB 150	PCB 136
March	MdRH-B1	2510.00	0.00	2020.00	129.00	464.00	3800.00	269.00	0.00	24.80	124.00	334.00	78.60	0.00	4100.00	35.40	38.70	1480.00	0.00	29.30	0.00	5.98	11.60	529.00
	MdRH-B2	2880.00	0.00	2310.00	78.60	619.00	4340.00	326.00	0.00	31.60	145.00	415.00	92.70	0.00	5060.00	39.40	58.40	1820.00	0.00	40.70	0.00	3.78	9.69	442.00
	MdRH-B3	2480.00	0.00	1920.00	107.00	462.00	3600.00	288.00	0.00	23.00	117.00	308.00	75.50	0.00	3790.00	35.60	53.30	1470.00	0.00	23.20	0.00	0.00	0.00	419.00
	MdRH-B4	1290.00	0.00	1060.00	52.20	258.00	1940.00	161.00	0.00	13.70	59.00	159.00	39.60	0.00	2030.00	16.20	28.50	800.00	0.00	14.90	0.00	6.51	0.00	246.00
	Trip Blank	28.00	0.00	0.00	0.00	0.00	37.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
June	MdRH-B1	1040.00	0.00	697.00	28.50	203.00	1420.00	104.00	0.00	11.60	51.80	141.00	43.50	0.00	1840.00	0.00	26.00	625.00	0.00	0.00	0.00	1.90	4.03	132.00
	MdRH-B2	3310.00	0.00	4000.00	188.00	1040.00	7340.00	527.00	0.00	50.90	262.00	593.00	148.00	0.00	9140.00	82.60	106.00	2950.00	0.00	58.90	0.00	8.03	19.80	805.00
	MdRH-B3	751.00	0.00	523.00	21.80	140.00	1030.00	85.30	0.00	8.29	33.20	107.00	23.60	0.00	1290.00	13.50	14.70	456.00	0.00	0.00	0.00	0.00	2.51	96.80
	MdRH-B4	1720.00	0.00	1360.00	44.00	419.00	2580.00	241.00	0.00	0.00	77.60	220.00	52.70	0.00	3090.00	50.60	50.00	1160.00	0.00	0.00	0.00	0.00	0.00	258.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	43.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		Harbor Sediment PCB Data (Raw) in ng/kg																					
Date	Location	PCB 145	PCB 148	PCBs 135 + 151	PCB 154	PCB 144	PCBs 147 + 149	PCB 134	PCB 143	PCBs 139 + 140	PCB 131	PCB 142	PCB 132	PCB 133	PCB 165	PCB 146	PCB 161	PCBs 153 + 168	PCB 141	PCB 130	PCB 137	PCB 164	PCBs 129 + 138 + 163	PCB 160
March	MdRH-B1	0.00	9.55	1550.00	89.10	200.00	4150.00	279.00	0.00	76.80	55.70	0.00	1600.00	93.70	0.00	952.00	0.00	5120.00	780.00	389.00	159.00	363.00	6250.00	0.00
	MdRH-B2	0.00	11.10	1380.00	110.00	166.00	3970.00	266.00	0.00	102.00	56.60	0.00	1620.00	112.00	0.00	1050.00	0.00	5500.00	606.00	450.00	219.00	366.00	7040.00	0.00
	MdRH-B3	0.00	0.00	981.00	73.90	119.00	2970.00	213.00	0.00	73.80	36.50	0.00	1200.00	75.40	0.00	692.00	0.00	3870.00	448.00	312.00	142.00	262.00	4850.00	0.00
	MdRH-B4	0.00	0.00	632.00	47.00	74.60	1760.00	119.00	0.00	40.80	27.10	0.00	697.00	42.40	0.00	417.00	0.00	2210.00	300.00	178.00	89.20	138.00	2790.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	104.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	128.00	0.00	0.00	0.00	0.00	90.20	0.00
June	MdRH-B1	0.00	4.27	454.00	50.10	130.00	1220.00	92.70	0.00	29.20	16.40	0.00	473.00	31.30	0.00	303.00	0.00	1660.00	193.00	119.00	65.20	103.00	2080.00	0.00
	MdRH-B2	0.00	18.20	3370.00	186.00	462.00	8950.00	547.00	0.00	181.00	126.00	0.00	3400.00	202.00	0.00	1790.00	0.00	10600.00	1720.00	766.00	322.00	867.00	12100.00	0.00
	MdRH-B3	0.00	0.00	320.00	22.70	53.20	857.00	65.90	0.00	21.00	10.80	0.00	327.00	22.70	0.00	210.00	0.00	1140.00	142.00	89.20	47.50	70.80	1400.00	0.00
	MdRH-B4	0.00	0.00	815.00	78.40	233.00	2070.00	165.00	0.00	42.00	26.30	0.00	890.00	43.80	0.00	495.00	0.00	2800.00	375.00	228.00	120.00	202.00	3760.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	19.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.90	0.00	0.00	0.00	0.00	30.30	0.00

		Harbor Sediment PCB Data (Raw) in ng/kg																						
Date	Location	PCB 158	PCBs 128 + 166	PCB 159	PCB 162	PCB 167	PCBs 156 + 157	PCB 169	PCB 188	PCB 179	PCB 184	PCB 176	PCB 186	PCB 178	PCB 175	PCB 187	PCB 182	PCB 183	PCB 185	PCB 174	PCB 177	PCB 181	PCBs 171 + 173	PCB 172
March	MdRH-B1	492.00	904.00	50.20	21.00	298.00	669.00	0.00	6.57	493.00	0.00	139.00	0.00	256.00	53.90	1530.00	7.13	707.00	92.80	1130.00	846.00	16.60	450.00	253.00
	MdRH-B2	523.00	1060.00	39.20	25.20	285.00	688.00	0.00	9.03	451.00	0.00	114.00	0.00	257.00	40.30	1470.00	14.70	607.00	106.00	892.00	731.00	9.85	321.00	186.00
	MdRH-B3	356.00	787.00	29.40	12.90	241.00	507.00	0.00	0.00	330.00	0.00	81.60	0.00	188.00	28.30	1060.00	0.00	442.00	62.90	683.00	560.00	0.00	251.00	151.00
	MdRH-B4	207.00	447.00	23.90	6.73	127.00	311.00	0.00	0.00	225.00	0.00	58.90	0.00	125.00	17.40	778.00	0.00	344.00	46.80	532.00	375.00	0.00	160.00	108.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
June	MdRH-B1	148.00	327.00	12.30	6.63	106.00	247.00	0.00	3.32	147.00	0.00	41.40	0.00	88.90	17.50	516.00	0.00	232.00	0.00	315.00	263.00	0.00	117.00	68.70
	MdRH-B2	1000.00	1820.00	53.30	42.30	539.00	1270.00	0.00	12.10	871.00	0.00	263.00	0.00	487.00	93.80	2610.00	25.30	1170.00	128.00	1810.00	1240.00	10.80	572.00	318.00
	MdRH-B3	107.00	229.00	0.00	5.73	75.60	179.00	0.00	0.00	105.00	0.00	29.00	0.00	61.30	12.10	358.00	0.00	165.00	0.00	229.00	176.00	0.00	82.50	45.70
	MdRH-B4	273.00	602.00	0.00	0.00	172.00	444.00	0.00	0.00	280.00	0.00	78.80	0.00	159.00	25.70	926.00	11.30	410.00	0.00	617.00	469.00	0.00	206.00	124.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		Harbor Sediment PCB Data (Raw) in ng/kg																						
Date	Location	PCB 192	PCBs 180 + 193	PCB 191	PCB 170	PCB 190	PCB 189	PCB 202	PCB 201	PCB 204	PCB 197	PCB 200	PCBs 198 + 199	PCB 196	PCB 203	PCB 195	PCB 194	PCB 205	PCB 208	PCB 207	PCB 206	PCB 209	Total MonoCB	Total DiCB
March	MdRH-B1	0.00	2650.00	56.80	1340.00	247.00	75.40	178.00	98.50	0.00	22.60	65.20	695.00	302.00	361.00	208.00	600.00	27.30	117.00	49.10	344.00	292.00	77.60	543.00
	MdRH-B2	0.00	2220.00	40.10	981.00	198.00	47.20	220.00	110.00	0.00	22.70	85.70	834.00	333.00	445.00	222.00	646.00	30.80	149.00	72.00	532.00	523.00	107.00	588.00
	MdRH-B3	0.00	1630.00	28.70	800.00	162.00	39.90	158.00	77.80	0.00	12.30	61.30	605.00	217.00	324.00	176.00	446.00	24.30	112.00	45.20	350.00	283.00	89.40	384.00
	MdRH-B4	0.00	1330.00	18.70	565.00	117.00	24.30	135.00	86.70	0.00	13.40	70.20	614.00	264.00	348.00	162.00	434.00	21.70	85.00	41.80	256.00	197.00	48.40	274.00
	Trip Blank	0.00	109.00	0.00	47.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	263.00
June	MdRH-B1	0.00	795.00	15.20	366.00	71.50	19.60	68.50	36.00	0.00	10.20	23.80	285.00	113.00	150.00	80.20	245.00	13.80	49.40	10.40	151.00	161.00	35.20	410.00
	MdRH-B2	0.00	3670.00	66.90	1630.00	308.00	92.80	317.00	191.00	0.00	29.10	153.00	1310.00	519.00	707.00	375.00	1090.00	57.20	228.00	89.70	680.00	553.00	183.00	1460.00
	MdRH-B3	0.00	561.00	8.84	262.00	50.80	14.20	53.60	27.40	0.00	7.26	18.00	216.00	81.60	124.00	59.40	186.00	9.10	39.40	16.10	125.00	85.40	35.30	329.00
	MdRH-B4	0.00	1460.00	22.40	726.00	144.00	31.20	118.00	71.50	0.00	12.40	55.50	546.00	214.00	287.00	151.00	459.00	22.80	90.40	33.40	296.00	256.00	0.00	570.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		Harbor Sediment PCB Data (Raw) in ng/kg							
Date	Location	Total TriCB	Total TetraCB	Total PentaCB	Total HexaCB	Total HeptaCB	Total OctaCB	Total NonaCB	Total PCBs
March	MdRH-B1	2040.00	10600.00	23200.00	25100.00	10300.00	2560.00	510.00	75300.00
	MdRH-B2	2310.00	12900.00	26100.00	26100.00	8700.00	2950.00	752.00	81000.00
	MdRH-B3	2140.00	10800.00	21700.00	18700.00	6500.00	2100.00	506.00	63200.00
	MdRH-B4	1330.00	5890.00	11600.00	10900.00	4820.00	2150.00	383.00	37700.00
	Trip Blank	417.00	329.00	255.00	323.00	201.00	0.00	0.00	1790.00
June	MdRH-B1	894.00	4520.00	8950.00	8000.00	3080.00	1030.00	221.00	27301.00
	MdRH-B2	4190.00	17700.00	43800.00	51200.00	15400.00	4760.00	998.00	140212.00
	MdRH-B3	645.00	3250.00	6510.00	5500.00	2160.00	782.00	181.00	19478.00
	MdRH-B4	1550.00	7240.00	15900.00	14100.00	5690.00	1940.00	420.00	47696.00
	Trip Blank	229.00	200.00	161.00	70.40	0.00	0.00	0.00	660.00

Stormwater PCB Data (Raw) in pg/L																									
Date	Location	PCB 1	PCB 2	PCB 3	PCB 4	PCB 10	PCB 9	PCB 7	PCB 6	PCB 5	PCB 8	PCB 14	PCB 11	PCBs 12 + 13	PCB 15	PCB 19	PCBs 18 + 30	PCB 17	PCB 27	PCB 24	PCB 16	PCB 32	PCB 34	PCB 23	PCBs 26 + 29	PCB 25
2/16/2011	MdR-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	676.00	0.00	0.00	0.00	27.80	0.00	0.00	0.00	22.90	12.60	0.00	0.00	0.00	0.00
	MdR-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	767.00	0.00	0.00	0.00	36.60	0.00	0.00	0.00	0.00	17.30	0.00	0.00	0.00	0.00
	MdR-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	667.00	0.00	0.00	0.00	35.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRU-C1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	641.00	0.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRU-C2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	815.00	0.00	0.00	0.00	23.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	848.00	0.00	0.00	0.00	29.00	0.00	0.00	0.00	0.00	12.60	0.00	0.00	0.00	0.00
2/19/2011	MdR-3	195.00	369.00	181.00	0.00	0.00	0.00	0.00	301.00	0.00	0.00	0.00	5390.00	285.00	0.00	65.50	614.00	381.00	127.00	53.30	225.00	0.00	0.00	0.00	0.00	0.00
	MdR-4	20.20	23.90	17.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	540.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.10	0.00
	MdR-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	879.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.30	0.00
	MdRU-C1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1240.00	0.00	0.00	0.00	48.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRU-C2	218.00	252.00	169.00	0.00	0.00	0.00	0.00	384.00	0.00	991.00	0.00	1470.00	426.00	1990.00	404.00	1530.00	721.00	196.00	53.30	909.00	679.00	0.00	0.00	624.00	311.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	489.00	0.00	0.00	0.00	17.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2/26/2011	MdR-3	17.80	17.70	20.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1870.00	0.00	0.00	0.00	120.00	70.50	0.00	0.00	75.20	34.80	0.00	0.00	28.90	13.30
	MdR-4	0.00	17.10	24.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1120.00	0.00	0.00	0.00	89.90	37.40	0.00	0.00	48.00	17.40	0.00	0.00	15.20	0.00
	MdR-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1120.00	0.00	0.00	0.00	53.30	0.00	0.00	0.00	41.60	0.00	0.00	0.00	0.00	0.00
	MdRU-C1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1110.00	0.00	0.00	0.00	53.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.70	0.00
	MdRU-C2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1240.00	0.00	0.00	113.00	563.00	243.00	47.80	0.00	328.00	179.00	0.00	0.00	200.00	83.70
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1050.00	0.00	0.00	0.00	42.90	32.00	0.00	0.00	27.50	15.70	0.00	0.00	0.00	0.00
3/20/2011	MdR-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	85.60	0.00	784.00	0.00	0.00	0.00	124.00	67.50	0.00	0.00	68.00	40.10	0.00	0.00	37.00	0.00
	MdR-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	81.90	0.00	606.00	0.00	0.00	0.00	134.00	78.30	0.00	0.00	59.90	31.50	0.00	0.00	31.50	14.10
	MdR-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	70.90	0.00	426.00	0.00	0.00	0.00	94.70	55.20	0.00	0.00	57.60	33.60	0.00	0.00	0.00	0.00
	MdRU-C1	0.00	0.00	22.50	0.00	0.00	0.00	0.00	0.00	0.00	111.00	0.00	843.00	0.00	71.50	0.00	133.00	75.60	0.00	0.00	91.70	43.40	0.00	0.00	45.10	0.00
	MdRU-C2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	58.00	0.00	623.00	0.00	60.90	0.00	125.00	69.90	0.00	0.00	70.50	35.10	0.00	0.00	30.30	10.40
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	64.30	0.00	425.00	0.00	0.00	0.00	91.90	61.60	0.00	0.00	52.40	28.50	0.00	0.00	25.20	0.00

		Stormwater PCB Data (Raw) in pg/L																				
Date	Location	PCB 31	PCBs 20 + 28	PCBs 21 + 33	PCB 22	PCB 36	PCB 39	PCB 38	PCB 35	PCB 37	PCB 54	PCBs 50 + 53	PCBs 45 + 51	PCB 46	PCB 52	PCBs 43 + 73	PCBs 49 + 69	PCB 48	PCBs 44 + 47 + 65	PCBs 59 + 62 + 75	PCB 42	PCBs 41 + 71 + 40	PCB 64
2/16/2011	MdR-3	38.60	45.80	18.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.60	0.00	203.00	0.00	39.40	0.00	219.00	0.00	0.00	21.00	35.10
	MdR-4	44.30	44.10	20.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	45.30	0.00	214.00	0.00	58.40	0.00	171.00	0.00	0.00	0.00	19.80
	MdR-5	33.80	49.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.20	0.00	97.30	0.00	27.60	0.00	196.00	0.00	0.00	0.00	19.60
	MdRU-C1	30.50	46.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.80	0.00	89.20	0.00	26.40	0.00	152.00	0.00	0.00	0.00	13.20
	MdRU-C2	44.10	50.30	0.00	19.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	31.20	0.00	72.50	0.00	22.60	0.00	156.00	0.00	0.00	0.00	19.90
	Trip Blank	41.80	44.90	35.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.00	0.00	40.30	0.00	0.00	0.00	153.00	0.00	0.00	0.00	0.00
2/19/2011	MdR-3	23.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1340.00	0.00	667.00	0.00	1100.00	0.00	0.00	453.00	471.00
	MdR-4	43.20	45.80	28.60	18.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.50	0.00	101.00	0.00	36.60	0.00	109.00	0.00	0.00	10.00	16.70
	MdR-5	63.20	68.90	39.30	23.60	0.00	0.00	0.00	0.00	33.20	0.00	0.00	21.20	0.00	104.00	0.00	31.00	0.00	134.00	0.00	14.20	35.40	31.90
	MdRU-C1	99.30	118.00	71.80	43.50	0.00	0.00	0.00	0.00	51.50	0.00	0.00	58.80	0.00	232.00	0.00	85.50	0.00	305.00	0.00	35.80	83.90	80.00
	MdRU-C2	2390.00	3060.00	1270.00	986.00	70.90	0.00	0.00	201.00	1220.00	0.00	578.00	876.00	291.00	2830.00	103.00	1610.00	509.00	3000.00	402.00	901.00	1830.00	1380.00
	Trip Blank	24.50	30.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	51.90	0.00	33.40	0.00	0.00	0.00	141.00	0.00	0.00	0.00	0.00
2/26/2011	MdR-3	179.00	172.00	97.20	60.30	0.00	0.00	0.00	21.30	50.30	0.00	23.40	74.30	0.00	264.00	0.00	115.00	27.30	316.00	0.00	37.30	95.90	76.80
	MdR-4	103.00	101.00	65.70	37.20	0.00	0.00	0.00	0.00	23.20	0.00	0.00	51.90	0.00	185.00	0.00	67.00	0.00	257.00	0.00	0.00	51.10	47.20
	MdR-5	67.70	69.20	36.50	21.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	56.20	0.00	86.20	0.00	39.70	0.00	203.00	0.00	0.00	0.00	23.90
	MdRU-C1	83.10	87.60	56.30	36.90	0.00	0.00	0.00	0.00	37.60	0.00	0.00	52.00	0.00	155.00	0.00	67.80	0.00	281.00	0.00	0.00	71.10	44.40
	MdRU-C2	845.00	1100.00	412.00	363.00	0.00	0.00	0.00	0.00	577.00	0.00	199.00	313.00	93.40	1120.00	0.00	542.00	191.00	1400.00	130.00	314.00	763.00	527.00
	Trip Blank	57.60	56.90	35.80	18.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	65.40	0.00	64.50	0.00	26.70	0.00	288.00	0.00	0.00	0.00	0.00
3/20/2011	MdR-3	225.00	234.00	133.00	87.70	0.00	0.00	0.00	33.20	64.70	0.00	0.00	58.30	0.00	284.00	0.00	108.00	52.00	237.00	0.00	51.40	114.00	76.80
	MdR-4	154.00	173.00	99.40	51.80	0.00	0.00	0.00	0.00	27.70	0.00	22.90	61.60	0.00	386.00	0.00	104.00	31.30	272.00	0.00	36.60	85.40	65.30
	MdR-5	100.00	97.20	69.60	30.70	0.00	0.00	0.00	0.00	36.10	0.00	0.00	0.00	0.00	119.00	0.00	39.20	0.00	134.00	0.00	0.00	0.00	0.00
	MdRU-C1	219.00	249.00	152.00	82.30	0.00	0.00	0.00	0.00	80.60	0.00	37.80	67.30	0.00	317.00	0.00	117.00	39.90	280.00	0.00	47.20	99.00	90.60
	MdRU-C2	161.00	190.00	110.00	68.00	0.00	0.00	0.00	0.00	48.20	0.00	0.00	0.00	0.00	230.00	0.00	95.40	28.10	213.00	0.00	35.60	91.20	61.50
	Trip Blank	100.00	112.00	78.00	35.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	56.80	0.00	121.00	0.00	49.70	0.00	120.00	0.00	0.00	0.00	0.00

		Stormwater PCB Data (Raw) in pg/L																				
Date	Location	PCB 72	PCB 68	PCB 57	PCB 58	PCB 67	PCB 63	PCBs 70 + 61 + 74 + 76	PCB 66	PCB 55	PCB 56	PCB 60	PCB 80	PCB 79	PCB 78	PCB 81	PCB 77	PCB 104	PCB 96	PCB 103	PCB 94	PCB 95	PCBs 93 + 100
2/16/2011	MdR-3	0.00	0.00	0.00	0.00	0.00	0.00	371.00	103.00	0.00	43.90	18.40	0.00	11.10	0.00	0.00	126.00	0.00	0.00	0.00	0.00	492.00	0.00
	MdR-4	0.00	32.80	0.00	0.00	0.00	0.00	230.00	68.00	0.00	28.10	0.00	0.00	0.00	0.00	0.00	42.70	0.00	0.00	0.00	0.00	278.00	0.00
	MdR-5	0.00	31.30	0.00	0.00	0.00	0.00	131.00	43.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.60	0.00	0.00	0.00	0.00	176.00	0.00
	MdRU-C1	0.00	35.70	0.00	0.00	0.00	0.00	95.70	32.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.30	0.00	0.00	0.00	0.00	124.00	0.00
	MdRU-C2	0.00	0.00	0.00	0.00	0.00	0.00	65.10	18.80	0.00	15.90	0.00	0.00	0.00	0.00	0.00	18.60	0.00	0.00	0.00	0.00	61.50	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	30.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.90	0.00
2/19/2011	MdR-3	0.00	0.00	0.00	0.00	0.00	0.00	2630.00	842.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2110.00	0.00
	MdR-4	0.00	20.60	0.00	0.00	0.00	0.00	154.00	53.10	0.00	30.90	0.00	0.00	0.00	0.00	0.00	71.60	0.00	0.00	0.00	0.00	145.00	0.00
	MdR-5	0.00	21.90	0.00	0.00	0.00	0.00	149.00	56.60	0.00	32.00	14.80	0.00	0.00	0.00	0.00	47.50	0.00	0.00	0.00	0.00	117.00	0.00
	MdRU-C1	0.00	30.10	0.00	0.00	0.00	0.00	352.00	147.00	0.00	86.40	51.20	0.00	0.00	0.00	0.00	77.90	0.00	0.00	0.00	0.00	349.00	0.00
	MdRU-C2	27.30	59.80	40.90	0.00	87.30	112.00	4090.00	2510.00	69.10	1760.00	855.00	0.00	0.00	0.00	0.00	646.00	0.00	37.90	0.00	26.80	1800.00	43.40
	Trip Blank	0.00	30.40	0.00	0.00	0.00	0.00	28.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.20	0.00
2/26/2011	MdR-3	0.00	32.40	0.00	0.00	0.00	0.00	319.00	146.00	0.00	74.70	46.10	0.00	0.00	0.00	0.00	52.60	0.00	0.00	0.00	0.00	211.00	0.00
	MdR-4	0.00	22.40	0.00	0.00	0.00	0.00	279.00	76.10	0.00	32.90	15.90	0.00	0.00	0.00	0.00	72.50	0.00	0.00	0.00	0.00	288.00	0.00
	MdR-5	0.00	0.00	0.00	0.00	0.00	0.00	79.70	29.80	0.00	20.00	0.00	0.00	0.00	0.00	0.00	14.20	0.00	0.00	0.00	0.00	54.80	0.00
	MdRU-C1	0.00	0.00	0.00	0.00	0.00	0.00	209.00	76.20	0.00	48.80	19.70	0.00	0.00	0.00	0.00	49.40	0.00	0.00	0.00	0.00	160.00	0.00
	MdRU-C2	0.00	35.90	0.00	0.00	36.50	25.00	1540.00	937.00	0.00	667.00	344.00	0.00	0.00	0.00	0.00	268.00	0.00	0.00	0.00	0.00	514.00	0.00
	Trip Blank	0.00	28.40	0.00	0.00	0.00	0.00	38.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.90	0.00
3/20/2011	MdR-3	0.00	27.50	0.00	0.00	0.00	0.00	384.00	174.00	0.00	96.30	53.70	0.00	0.00	0.00	0.00	52.30	0.00	0.00	0.00	0.00	258.00	0.00
	MdR-4	0.00	21.20	0.00	0.00	0.00	0.00	450.00	142.00	0.00	64.00	22.30	0.00	0.00	0.00	0.00	101.00	0.00	0.00	0.00	0.00	595.00	0.00
	MdR-5	0.00	0.00	0.00	0.00	0.00	0.00	113.00	52.00	0.00	29.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	88.30	0.00
	MdRU-C1	0.00	27.90	0.00	0.00	0.00	0.00	418.00	175.00	0.00	94.00	53.50	0.00	0.00	0.00	0.00	80.00	0.00	0.00	0.00	0.00	314.00	0.00
	MdRU-C2	0.00	28.60	0.00	0.00	0.00	0.00	198.00	118.00	0.00	57.90	28.80	0.00	0.00	0.00	0.00	36.40	0.00	0.00	0.00	0.00	158.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	77.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	54.30	0.00

		Stormwater PCB Data (Raw) in pg/L																				
Date	Location	PCBs 98 + 102	PCBs 88 + 91	PCB 84	PCB 89	PCB 121	PCB 92	PCBs 90 + 101 + 113	PCBs 83 + 99	PCB 112	PCBs 86 + 87 + 97 + 109 + 119 + 125	PCB 117	PCBs 85 + 116	PCBs 110 + 115	PCB 82	PCB 111	PCB 120	PCBs 108 + 124	PCB 107	PCB 123	PCB 106	PCB 118	PCB 122
2/16/2011	MdR-3	16.30	72.70	225.00	0.00	0.00	165.00	1020.00	484.00	0.00	852.00	18.20	162.00	1520.00	166.00	0.00	0.00	79.60	121.00	30.10	0.00	1690.00	16.30
	MdR-4	0.00	46.70	84.80	0.00	0.00	80.90	736.00	242.00	0.00	490.00	0.00	92.90	797.00	74.70	0.00	0.00	42.60	34.50	0.00	0.00	1130.00	0.00
	MdR-5	0.00	26.90	75.10	0.00	0.00	67.10	411.00	200.00	0.00	347.00	0.00	77.20	597.00	65.70	0.00	0.00	0.00	0.00	0.00	0.00	700.00	0.00
	MdRU-C1	0.00	0.00	50.50	0.00	0.00	40.30	232.00	76.80	0.00	186.00	0.00	35.60	330.00	45.40	0.00	0.00	0.00	22.70	0.00	0.00	369.00	0.00
	MdRU-C2	0.00	0.00	0.00	0.00	0.00	0.00	93.40	43.80	0.00	73.80	0.00	12.20	116.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	152.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	32.30	0.00	0.00	0.00	0.00	0.00	25.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.00	0.00
2/19/2011	MdR-3	0.00	342.00	726.00	0.00	0.00	560.00	2820.00	1510.00	0.00	2280.00	0.00	0.00	3770.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3080.00	0.00
	MdR-4	0.00	21.10	67.50	0.00	0.00	52.50	338.00	175.00	0.00	363.00	15.00	83.70	747.00	73.70	0.00	0.00	49.20	59.80	17.30	0.00	838.00	0.00
	MdR-5	0.00	17.30	42.60	0.00	0.00	37.60	168.00	82.80	0.00	166.00	0.00	31.40	329.00	0.00	0.00	0.00	0.00	15.80	0.00	0.00	263.00	0.00
	MdRU-C1	0.00	67.60	145.00	0.00	0.00	89.10	524.00	257.00	0.00	249.00	0.00	116.00	820.00	89.60	0.00	0.00	0.00	42.80	0.00	0.00	632.00	0.00
	MdRU-C2	119.00	445.00	828.00	49.40	0.00	511.00	2450.00	1440.00	0.00	2240.00	64.50	558.00	3980.00	540.00	0.00	37.80	179.00	307.00	0.00	0.00	2400.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	39.20	0.00	0.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.20	0.00
2/26/2011	MdR-3	0.00	40.10	91.90	0.00	0.00	52.60	327.00	159.00	0.00	254.00	0.00	50.00	443.00	57.00	0.00	0.00	19.30	31.50	0.00	0.00	441.00	0.00
	MdR-4	0.00	42.90	131.00	0.00	0.00	102.00	562.00	262.00	0.00	456.00	0.00	93.50	864.00	93.80	0.00	0.00	46.80	57.00	0.00	0.00	1150.00	0.00
	MdR-5	0.00	0.00	0.00	0.00	0.00	0.00	77.90	26.50	0.00	61.00	0.00	0.00	110.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	111.00	0.00
	MdRU-C1	0.00	0.00	57.60	0.00	0.00	46.70	251.00	116.00	0.00	210.00	0.00	33.90	388.00	44.70	0.00	0.00	0.00	21.00	0.00	0.00	365.00	0.00
	MdRU-C2	0.00	155.00	263.00	0.00	0.00	103.00	686.00	411.00	0.00	571.00	0.00	184.00	1150.00	144.00	0.00	0.00	44.30	82.30	0.00	0.00	958.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	28.10	0.00	0.00	0.00	0.00	0.00	36.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	47.20	0.00
3/20/2011	MdR-3	0.00	41.30	89.30	0.00	0.00	68.50	357.00	177.00	0.00	270.00	0.00	44.70	439.00	0.00	0.00	0.00	0.00	23.10	0.00	0.00	397.00	0.00
	MdR-4	0.00	99.50	237.00	0.00	0.00	175.00	968.00	477.00	0.00	730.00	0.00	113.00	1360.00	134.00	0.00	0.00	59.00	97.70	18.90	0.00	1510.00	0.00
	MdR-5	0.00	0.00	33.80	0.00	0.00	0.00	84.30	0.00	0.00	0.00	0.00	0.00	106.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	96.40	0.00
	MdRU-C1	0.00	58.40	127.00	0.00	0.00	69.20	456.00	221.00	0.00	330.00	0.00	71.10	614.00	71.00	0.00	0.00	0.00	0.00	0.00	0.00	536.00	0.00
	MdRU-C2	0.00	27.70	58.30	0.00	0.00	33.80	208.00	120.00	0.00	144.00	0.00	33.60	282.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	251.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	59.10	0.00	0.00	0.00	0.00	0.00	45.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.20	0.00

		Stormwater PCB Data (Raw) in pg/L																				
Date	Location	PCB 114	PCB 105	PCB 127	PCB 126	PCB 155	PCB 152	PCB 150	PCB 136	PCB 145	PCB 148	PCBs 135 + 151	PCB 154	PCB 144	PCBs 147 + 149	PCB 134	PCB 143	PCBs 139 + 140	PCB 131	PCB 142	PCB 132	PCB 133	PCB 165
2/16/2011	MdR-3	35.30	769.00	0.00	49.20	0.00	0.00	0.00	104.00	0.00	0.00	282.00	12.30	52.90	838.00	90.70	0.00	20.20	30.90	0.00	603.00	0.00	0.00
	MdR-4	0.00	449.00	0.00	0.00	0.00	0.00	0.00	43.60	0.00	0.00	149.00	0.00	22.10	470.00	37.60	0.00	0.00	0.00	0.00	277.00	0.00	0.00
	MdR-5	0.00	331.00	0.00	0.00	0.00	0.00	0.00	43.90	0.00	0.00	95.40	0.00	22.40	334.00	0.00	0.00	0.00	0.00	0.00	250.00	0.00	0.00
	MdRU-C1	0.00	152.00	0.00	0.00	0.00	0.00	0.00	19.20	0.00	0.00	59.50	0.00	0.00	182.00	17.60	0.00	0.00	0.00	0.00	121.00	0.00	0.00
	MdRU-C2	0.00	72.40	0.00	0.00	0.00	0.00	0.00	7.09	0.00	0.00	17.30	0.00	0.00	59.10	0.00	0.00	0.00	0.00	0.00	38.90	0.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2/19/2011	MdR-3	0.00	1520.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1380.00	0.00	0.00	3600.00	0.00	0.00	0.00	0.00	0.00	1560.00	0.00	0.00
	MdR-4	25.80	388.00	0.00	30.50	0.00	0.00	0.00	29.30	0.00	0.00	109.00	0.00	19.20	380.00	29.70	0.00	0.00	0.00	0.00	302.00	0.00	0.00
	MdR-5	0.00	153.00	0.00	0.00	0.00	0.00	0.00	15.70	0.00	0.00	95.70	0.00	0.00	212.00	0.00	0.00	0.00	0.00	0.00	130.00	0.00	0.00
	MdRU-C1	0.00	330.00	0.00	0.00	0.00	0.00	0.00	60.90	0.00	0.00	174.00	0.00	28.40	475.00	0.00	0.00	0.00	0.00	0.00	278.00	0.00	0.00
	MdRU-C2	0.00	1370.00	0.00	0.00	0.00	0.00	0.00	342.00	0.00	0.00	900.00	43.10	143.00	2690.00	222.00	0.00	87.10	63.10	0.00	1380.00	58.60	0.00
	Trip Blank	0.00	18.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2/26/2011	MdR-3	13.80	237.00	0.00	0.00	0.00	0.00	0.00	36.90	0.00	0.00	106.00	0.00	16.30	284.00	0.00	0.00	0.00	0.00	0.00	142.00	0.00	0.00
	MdR-4	25.20	541.00	0.00	25.70	0.00	0.00	0.00	45.10	0.00	0.00	127.00	0.00	32.50	474.00	47.90	0.00	0.00	0.00	0.00	338.00	0.00	0.00
	MdR-5	0.00	63.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	76.70	0.00	0.00	0.00	0.00	0.00	47.90	0.00	0.00
	MdRU-C1	0.00	203.00	0.00	0.00	0.00	0.00	0.00	34.40	0.00	0.00	70.30	0.00	0.00	261.00	0.00	0.00	0.00	0.00	0.00	149.00	0.00	0.00
	MdRU-C2	0.00	510.00	0.00	0.00	0.00	0.00	0.00	82.00	0.00	0.00	248.00	0.00	53.20	729.00	45.30	0.00	0.00	0.00	0.00	394.00	0.00	0.00
	Trip Blank	0.00	19.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3/20/2011	MdR-3	0.00	231.00	0.00	0.00	0.00	0.00	0.00	58.60	0.00	0.00	114.00	0.00	0.00	332.00	27.50	0.00	0.00	0.00	0.00	150.00	0.00	0.00
	MdR-4	34.20	703.00	0.00	38.10	0.00	0.00	0.00	90.30	0.00	0.00	209.00	0.00	42.80	754.00	110.00	0.00	0.00	0.00	0.00	483.00	0.00	0.00
	MdR-5	0.00	49.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	67.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRU-C1	0.00	291.00	0.00	0.00	0.00	0.00	0.00	61.20	0.00	0.00	124.00	0.00	30.40	364.00	0.00	0.00	0.00	0.00	0.00	203.00	0.00	0.00
	MdRU-C2	0.00	133.00	0.00	0.00	0.00	0.00	0.00	25.60	0.00	0.00	71.00	0.00	0.00	177.00	0.00	0.00	0.00	0.00	0.00	93.70	0.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		Stormwater PCB Data (Raw) in pg/L																				
Date	Location	PCB 146	PCB 161	PCBs 153 + 168	PCB 141	PCB 130	PCB 137	PCB 164	PCBs 129 + 138 + 163	PCB 160	PCB 158	PCBs 128 + 166	PCB 159	PCB 162	PCB 167	PCBs 156 + 157	PCB 169	PCB 188	PCB 179	PCB 184	PCB 176	PCB 186	PCB 178
2/16/2011	MdR-3	206.00	0.00	1220.00	310.00	146.00	142.00	142.00	2280.00	0.00	266.00	462.00	0.00	0.00	158.00	366.00	0.00	0.00	39.60	0.00	15.60	0.00	23.40
	MdR-4	111.00	0.00	652.00	201.00	71.20	72.50	62.20	1540.00	0.00	110.00	258.00	0.00	0.00	64.60	193.00	0.00	0.00	19.20	0.00	0.00	0.00	0.00
	MdR-5	91.90	0.00	506.00	126.00	48.90	64.90	74.30	941.00	0.00	101.00	180.00	0.00	0.00	65.70	161.00	0.00	0.00	21.70	0.00	0.00	0.00	0.00
	MdRU-C1	37.50	0.00	250.00	64.90	27.70	29.40	31.20	446.00	0.00	53.10	80.90	0.00	0.00	29.30	71.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRU-C2	0.00	0.00	92.00	23.30	0.00	0.00	0.00	161.00	0.00	17.10	24.10	0.00	0.00	14.60	30.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2/19/2011	MdR-3	0.00	0.00	3060.00	0.00	0.00	0.00	0.00	5320.00	0.00	550.00	0.00	0.00	0.00	0.00	953.00	0.00	0.00	384.00	0.00	0.00	0.00	0.00
	MdR-4	112.00	0.00	677.00	190.00	92.00	87.00	87.20	1420.00	0.00	155.00	312.00	0.00	0.00	68.30	174.00	0.00	0.00	22.60	0.00	0.00	0.00	0.00
	MdR-5	64.70	0.00	340.00	70.40	0.00	0.00	0.00	559.00	0.00	42.90	71.80	0.00	0.00	0.00	58.50	0.00	0.00	29.50	0.00	0.00	0.00	0.00
	MdRU-C1	112.00	0.00	618.00	168.00	72.00	42.50	69.30	992.00	0.00	110.00	164.00	0.00	0.00	61.60	148.00	0.00	0.00	69.40	0.00	19.20	0.00	47.50
	MdRU-C2	523.00	0.00	2610.00	687.00	324.00	261.00	322.00	4210.00	0.00	434.00	783.00	0.00	0.00	175.00	521.00	0.00	0.00	401.00	0.00	116.00	0.00	205.00
	Trip Blank	0.00	0.00	24.90	0.00	0.00	0.00	0.00	40.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2/26/2011	MdR-3	51.20	0.00	329.00	78.40	41.00	24.70	44.70	595.00	0.00	53.90	76.10	0.00	0.00	31.70	95.50	0.00	0.00	34.60	0.00	13.20	0.00	23.80
	MdR-4	120.00	0.00	658.00	163.00	79.20	71.30	72.20	1200.00	0.00	134.00	260.00	0.00	0.00	109.00	266.00	0.00	0.00	20.00	0.00	0.00	0.00	0.00
	MdR-5	0.00	0.00	88.30	26.10	0.00	0.00	0.00	134.00	0.00	0.00	13.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRU-C1	57.70	0.00	305.00	73.50	0.00	0.00	26.00	477.00	0.00	53.40	83.20	0.00	0.00	32.80	84.50	0.00	0.00	33.00	0.00	0.00	0.00	0.00
	MdRU-C2	114.00	0.00	736.00	203.00	73.60	52.10	82.30	1260.00	0.00	150.00	223.00	0.00	0.00	54.20	171.00	0.00	0.00	118.00	0.00	38.20	0.00	84.90
	Trip Blank	0.00	0.00	21.50	0.00	0.00	0.00	0.00	33.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3/20/2011	MdR-3	71.20	0.00	370.00	90.50	43.40	0.00	31.60	494.00	0.00	63.90	108.00	0.00	0.00	30.40	92.60	0.00	0.00	51.70	0.00	0.00	0.00	0.00
	MdR-4	152.00	0.00	916.00	216.00	102.00	109.00	103.00	1700.00	0.00	179.00	309.00	0.00	0.00	137.00	345.00	0.00	0.00	41.30	0.00	0.00	0.00	0.00
	MdR-5	0.00	0.00	92.60	0.00	0.00	0.00	0.00	127.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRU-C1	62.00	0.00	442.00	104.00	41.90	0.00	41.60	674.00	0.00	66.10	105.00	0.00	0.00	44.50	103.00	0.00	0.00	47.20	0.00	0.00	0.00	0.00
	MdRU-C2	33.10	0.00	220.00	0.00	0.00	0.00	0.00	294.00	0.00	27.10	49.20	0.00	0.00	0.00	58.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		Stormwater PCB Data (Raw) in pg/L																				
Date	Location	PCB 175	PCB 187	PCB 182	PCB 183	PCB 185	PCB 174	PCB 177	PCB 181	PCBs 171 + 173	PCB 172	PCB 192	PCBs 180 + 193	PCB 191	PCB 170	PCB 190	PCB 189	PCB 202	PCB 201	PCB 204	PCB 197	PCB 200	PCBs 198 + 199
2/16/2011	MdR-3	0.00	120.00	0.00	88.30	0.00	182.00	103.00	0.00	74.70	40.50	0.00	401.00	0.00	298.00	52.10	0.00	12.70	0.00	0.00	0.00	0.00	60.70
	MdR-4	0.00	93.50	0.00	41.70	0.00	108.00	44.60	0.00	46.90	0.00	0.00	256.00	0.00	188.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.60
	MdR-5	0.00	57.20	0.00	45.40	0.00	59.60	0.00	0.00	0.00	0.00	0.00	156.00	0.00	116.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRU-C1	0.00	28.50	0.00	0.00	0.00	38.90	0.00	0.00	0.00	0.00	0.00	91.30	0.00	70.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRU-C2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	45.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2/19/2011	MdR-3	0.00	1200.00	0.00	608.00	0.00	640.00	544.00	0.00	0.00	0.00	0.00	1140.00	0.00	855.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdR-4	0.00	82.70	0.00	56.00	0.00	104.00	55.20	0.00	30.40	0.00	0.00	188.00	0.00	149.00	24.30	0.00	0.00	0.00	0.00	0.00	0.00	51.80
	MdR-5	0.00	119.00	0.00	62.60	0.00	89.40	57.40	0.00	0.00	0.00	0.00	227.00	0.00	113.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	77.40
	MdRU-C1	0.00	241.00	0.00	119.00	29.30	209.00	117.00	0.00	70.20	43.30	0.00	513.00	0.00	267.00	44.00	0.00	36.80	15.50	0.00	0.00	19.40	185.00
	MdRU-C2	31.10	1160.00	0.00	587.00	120.00	1110.00	618.00	0.00	327.00	216.00	0.00	2290.00	0.00	913.00	165.00	0.00	186.00	122.00	0.00	0.00	104.00	819.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2/26/2011	MdR-3	0.00	147.00	0.00	76.80	0.00	126.00	72.60	0.00	0.00	0.00	0.00	312.00	0.00	146.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	101.00
	MdR-4	0.00	66.60	0.00	56.60	0.00	93.70	71.10	0.00	59.30	0.00	0.00	272.00	0.00	210.00	38.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdR-5	0.00	38.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	79.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRU-C1	0.00	108.00	0.00	53.10	0.00	94.60	0.00	0.00	0.00	0.00	0.00	250.00	0.00	106.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	88.80
	MdRU-C2	0.00	409.00	0.00	240.00	0.00	422.00	215.00	0.00	133.00	54.80	0.00	867.00	0.00	333.00	89.00	0.00	76.90	47.00	0.00	0.00	0.00	308.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3/20/2011	MdR-3	0.00	114.00	0.00	76.90	0.00	103.00	0.00	0.00	0.00	0.00	0.00	235.00	0.00	91.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	88.60
	MdR-4	0.00	113.00	0.00	55.00	0.00	135.00	94.20	0.00	77.10	0.00	0.00	326.00	0.00	226.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdR-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	80.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MdRU-C1	0.00	151.00	0.00	82.70	0.00	127.00	88.00	0.00	0.00	0.00	0.00	363.00	0.00	169.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	193.00
	MdRU-C2	0.00	80.10	0.00	42.50	0.00	66.10	0.00	0.00	0.00	0.00	0.00	166.00	0.00	84.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	75.30
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		Stormwater PCB Data (Raw) in pg/L																		
Date	Location	PCB 196	PCB 203	PCB 195	PCB 194	PCB 205	PCB 208	PCB 207	PCB 206	PCB 209	Total MonoCB	Total DiCB	Total TriCB	Total TetraCB	Total PentaCB	Total HexaCB	Total HeptaCB	Total OctaCB	Total NonaCB	Total PCBs
2/16/2011	MdR-3	23.30	35.80	18.20	58.60	0.00	0.00	0.00	29.70	362.00	0.00	676.00	166.00	1210.00	7990.00	7730.00	1440.00	209.00	29.70	19800.00
	MdR-4	0.00	0.00	0.00	38.10	0.00	0.00	0.00	0.00	79.00	0.00	767.00	162.00	911.00	4580.00	4330.00	798.00	87.60	0.00	11700.00
	MdR-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	667.00	119.00	626.00	3070.00	3110.00	456.00	0.00	0.00	8050.00
	MdRU-C1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	641.00	102.00	519.00	1660.00	1520.00	229.00	0.00	0.00	4680.00
	MdRU-C2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	815.00	137.00	420.00	626.00	485.00	45.80	0.00	0.00	2530.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	848.00	164.00	257.00	116.00	23.50	0.00	0.00	0.00	1410.00
2/19/2011	MdR-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	745.00	5980.00	1490.00	7500.00	18700.00	16400.00	5380.00	0.00	0.00	56200.00
	MdR-4	0.00	0.00	0.00	32.10	0.00	0.00	0.00	0.00	30.90	61.80	540.00	150.00	628.00	3490.00	4250.00	713.00	83.90	0.00	9940.00
	MdR-5	32.50	38.10	0.00	85.10	0.00	0.00	0.00	41.10	35.80	0.00	879.00	239.00	693.00	1420.00	1660.00	698.00	233.00	41.10	5900.00
	MdRU-C1	75.00	131.00	36.10	132.00	0.00	49.50	0.00	131.00	55.00	0.00	1240.00	433.00	1630.00	3710.00	3570.00	1790.00	631.00	180.00	13200.00
	MdRU-C2	328.00	432.00	212.00	482.00	0.00	170.00	74.10	513.00	411.00	639.00	5250.00	14600.00	24600.00	19400.00	16800.00	8250.00	2680.00	756.00	93400.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	489.00	73.10	285.00	186.00	79.60	0.00	0.00	0.00	1110.00
2/26/2011	MdR-3	42.80	52.80	0.00	84.80	0.00	0.00	0.00	156.00	67.90	56.20	1870.00	924.00	1700.00	2430.00	2010.00	952.00	281.00	156.00	10400.00
	MdR-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.10	1120.00	538.00	1160.00	4740.00	4190.00	887.00	0.00	0.00	12700.00
	MdR-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1120.00	290.00	552.00	504.00	386.00	118.00	0.00	0.00	2970.00
	MdRU-C1	0.00	65.20	0.00	91.10	0.00	0.00	0.00	67.50	0.00	0.00	1110.00	372.00	1070.00	1900.00	1710.00	646.00	245.00	67.50	7120.00
	MdRU-C2	155.00	192.00	72.30	163.00	0.00	0.00	0.00	240.00	167.00	0.00	1240.00	5050.00	9450.00	5770.00	4670.00	3000.00	1010.00	240.00	30600.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1050.00	286.00	512.00	158.00	72.30	0.00	0.00	0.00	2080.00
3/20/2011	MdR-3	0.00	71.10	0.00	71.30	0.00	0.00	0.00	0.00	0.00	0.00	870.00	1110.00	1770.00	2400.00	2080.00	672.00	231.00	0.00	9130.00
	MdR-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	688.00	856.00	1860.00	7350.00	5960.00	1070.00	0.00	0.00	17800.00
	MdR-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	496.00	575.00	486.00	458.00	288.00	80.30	0.00	0.00	2380.00
	MdRU-C1	0.00	98.40	0.00	96.50	0.00	0.00	0.00	142.00	0.00	22.50	1030.00	1170.00	1950.00	3160.00	2470.00	1030.00	388.00	142.00	11300.00
	MdRU-C2	0.00	0.00	0.00	73.60	0.00	0.00	0.00	67.70	64.60	0.00	742.00	919.00	1220.00	1450.00	1050.00	439.00	149.00	67.70	6100.00
	Trip Blank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	489.00	585.00	426.00	188.00	0.00	0.00	0.00	0.00	1690.00

Appendix B: Full ANOVA Results

ANOVA Harbor Water Quality PCBs
Uncorrected

	Location	Total PCBs
March	MdRH-B1	3380
	MdRH-B2	2100
	MdRH-B3	4230
	MdRH-B4	3580
	Trip Blank	3990
April	MdRH-B1	3380
	MdRH-B2	2260
	MdRH-B3	3950
	MdRH-B4	2030
	Trip Blank	1260
June	MdRH-B1	3440
	MdRH-B2	3760
	MdRH-B3	6240
	MdRH-B4	3560
	Trip Blank	837
July	MdRH-B1	4256.71
	MdRH-B2	3007.1
	MdRH-B3	3634.49
	MdRH-B4	3193.13
	Trip Blank	1609.51

Possible monthly correlation

	March	April	June	July
MdRH-B1	3380	3380	3440	4256.71
MdRH-B2	2100	2260	3760	3007.1
MdRH-B3	4230	3950	6240	3634.49
MdRH-B4	3580	2030	3560	3193.13

Anova: Two-Factor Without Replication

SUMMARY	*Count*	*Sum*	*Average*	*Variance*
MdRH-B1	4	14456.71	3614.1775	184288.01
MdRH-B2	4	11127.1	2781.775	581587.27
MdRH-B3	4	18054.49	4513.6225	1383788.42
MdRH-B4	4	12363.13	3090.7825	531744.45
March	4	13290	3322.5	795891.67
April	4	11620	2905	833100.00
June	4	17000	4250	1777466.67
July	4	14091.43	3522.8575	308575.78

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows	6895092.62	3	2298364.2	4.867	0.028	3.863
Columns	3794214.73	3	1264738.2	2.678	0.110	3.863
Error	4250009.71	9	472223.3			
Total	14939317.1	15				

ANOVA Harbor Water Quality PCBs
Method 1 (same as uncorrected)

	Location	Total PCBs
March	MdRH-B1	1631.69
	MdRH-B2	351.69
	MdRH-B3	2481.69
	MdRH-B4	1831.69
April	MdRH-B1	1631.69
	MdRH-B2	511.69
	MdRH-B3	2201.69
	MdRH-B4	281.69
June	MdRH-B1	1691.69
	MdRH-B2	2011.69
	MdRH-B3	4491.69
	MdRH-B4	1811.69
July	MdRH-B1	2508.40
	MdRH-B2	1258.79
	MdRH-B3	1886.18
	MdRH-B4	1444.82

Possible monthly correlation

	March	April	June	July
MdRH-B1	1631.69	1631.69	1691.69	2508.40
MdRH-B2	351.69	511.69	2011.69	1258.79
MdRH-B3	2481.69	2201.69	4491.69	1886.18
MdRH-B4	1831.69	281.69	1811.69	1444.82

Anova: Two-Factor Without Replication

SUMMARY	*Count*	*Sum*	*Average*	*Variance*
MdRH-B1	4	7463.455	1865.86	184288.01
MdRH-B2	4	4133.845	1033.46	581587.27
MdRH-B3	4	11061.24	2765.31	1383788.42
MdRH-B4	4	5369.875	1342.47	531744.45
March	4	6296.745	1574.19	795891.67
April	4	4626.745	1156.69	833100.00
June	4	10006.75	2501.69	1777466.67
July	4	7098.175	1774.54	308575.78

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows	6895092.62	3	2298364.21	4.87	0.03	3.86
Columns	3794214.73	3	1264738.24	2.68	0.11	3.86
Error	4250009.71	9	472223.30			
Total	14939317.1	15				

ANOVA Harbor Water Quality PCBs
Method 2

	Location	Total PCBs
March	MdRH-B1	494
	MdRH-B2	79
	MdRH-B3	843
	MdRH-B4	649
April	MdRH-B1	645
	MdRH-B2	51
	MdRH-B3	463
	MdRH-B4	13
June	MdRH-B1	341
	MdRH-B2	384
	MdRH-B3	2185
	MdRH-B4	359
July	MdRH-B1	1182
	MdRH-B2	486
	MdRH-B3	781
	MdRH-B4	587

Possible monthly and spatial correlation

	March	April	June	July
MdRH-B1	493.7	645.3	341.2	1182.2
MdRH-B2	79.4	51.0	384.0	485.9
MdRH-B3	843.3	463.4	2185.4	780.7
MdRH-B4	649.3	12.8	359.1	587.4

Anova: Two-Factor Without Replication

SUMMARY	*Count*	*Sum*	*Average*	*Variance*
MdRH-B1	4	2662.3	665.6	134019.2
MdRH-B2	4	1000.3	250.1	47444.5
MdRH-B3	4	4272.8	1068.2	582352.3
MdRH-B4	4	1608.6	402.2	82946.6
March	4	2065.7	516.4	105337.0
April	4	1172.5	293.1	96757.5
June	4	3269.6	817.4	831994.9
July	4	3036.2	759.1	94512.6

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows	1540211.61	3	513403.9	2.503603	0.125182	3.862548
Columns	694693.335	3	231564.4	1.129219	0.38797	3.862548
Error	1845594.4	9	205066			
Total	4080499.35	15				

ANOVA Harbor Water Quality PCBs

Seasonal Possible seasonal and spatial correlation

Uncorrected

	Winter	Summer
MdRH-B1	3380.00	3692.24
MdRH-B2	2100.00	3009.03
MdRH-B3	4230.00	4608.16
MdRH-B4	3580.00	2927.71

Anova: Two-Factor Without Replication

SUMMARY	*Count*	*Sum*	*Average*	*Variance*
MdRH-B1	2	7072.236667	3536.1183	48745.87
MdRH-B2	2	5109.033333	2554.5167	413170.80
MdRH-B3	2	8838.163333	4419.0817	71503.75
MdRH-B4	2	6507.71	3253.855	212741.12
Winter	4	13290	3322.5	795891.67
Summer	4	14237.14333	3559.2858	606495.26

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows	3573134.3	3	1191044.8	5.64	0.09	9.28
Columns	112135.062	1	112135.06	0.53	0.52	10.13
Error	634026.482	3	211342.16			
Total	4319295.84	7				

ANOVA Harbor Water Quality PCBs

Method 2 Possible seasonal and spatial correlation

	Winter	Summer
MdRH-B1	493.68	722.88
MdRH-B2	79.43	306.96
MdRH-B3	843.34	1143.16
MdRH-B4	649.29	319.77

Anova: Two-Factor Without Replication

SUMMARY	*Count*	*Sum*	*Average*	*Variance*
MdRH-B1	2	1216.56	608.28	26267.05
MdRH-B2	2	386.39	193.20	25885.60
MdRH-B3	2	1986.50	993.25	44943.61
MdRH-B4	2	969.07	484.53	54290.36
Winter	4	2065.74	516.44	105337.00
Summer	4	2492.78	623.19	157454.30

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows	659781.8317	3	219927	5.13	0.11	9.28
Columns	22794.55793	1	22794.6	0.53	0.52	10.13
Error	128592.0634	3	42864			
Total	811168.4531	7				

ANOVA Harbor Water Quality PCBs
Uncorrected

	March	April	June	July
MdRH-B1	3380	3380	3440	4256.71
MdRH-B4	3580	2030	3560	3193.13
MdRH-B2	2100	2260	3760	3007.1
MdRH-B3	4230	3950	6240	3634.49

	March	April	June	July
front	3480	2705	3500	3724.92
back	3165	3105	5000	3320.795

Anova: Two-Factor Without Replication

SUMMARY	*Count*	*Sum*	*Average*	*Variance*
Row 1	4	13409.9	3352.5	198655.1
Row 2	4	14590.8	3647.7	821034.9
Column 1	2	6645.0	3322.5	49612.5
Column 2	2	5810.0	2905.0	80000.0
Column 3	2	8500.0	4250.0	1125000.0
Column 4	2	7045.7	3522.9	81658.5

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows	174308.2	1	174308.22	0.45	0.55	10.13
Columns	1897107	3	632369.12	1.63	0.35	9.28
Error	1161963	3	387320.93			
Total	3233378	7				

ANOVA Stormwater Quality PCBs
Uncorrected Stormwater

	Location	Total PCBs
2/16/2011	MdR-3	19800.00
2/16/2011	MdR-4	11700.00
2/16/2011	MdR-5	8050.00
2/16/2011	MdRU-C1	4680.00
2/16/2011	MdRU-C2	2530.00
2/16/2011	Trip Blank	1410.00
2/19/2011	MdR-3	56200.00
2/19/2011	MdR-4	9940.00
2/19/2011	MdR-5	5900.00
2/19/2011	MdRU-C1	13200.00
2/19/2011	MdRU-C2	93400.00
2/19/2011	Trip Blank	1110.00
2/26/2011	MdR-3	10400.00
2/26/2011	MdR-4	12700.00
2/26/2011	MdR-5	2970.00
2/26/2011	MdRU-C1	7120.00
2/26/2011	MdRU-C2	30600.00
2/26/2011	Trip Blank	2080.00
3/20/2011	MdR-3	9130.00
3/20/2011	MdR-4	17800.00
3/20/2011	MdR-5	2380.00
3/20/2011	MdRU-C1	11300.00
3/20/2011	MdRU-C2	6100.00
3/20/2011	Trip Blank	1690.00

Potential Spatial and Date correlation

	2/16/2011	2/19/2011	2/26/2011	3/20/2011
MdR-3	19800.00	56200.00	10400.00	9130.00
MdR-4	11700.00	9940.00	12700.00	17800.00
MdR-5	8050.00	5900.00	2970.00	2380.00
MdRU-C1	4680.00	13200.00	7120.00	11300.00
MdRU-C2	2530.00	93400.00	30600.00	6100.00

Anova: Two-Factor Without Replication

SUMMARY	*Count*	*Sum*	*Average*	*Variance*
MdR-3	4	95530	23882.5	486833891.7
MdR-4	4	52140	13035	11392900
MdR-5	4	19300	4825	6991766.667
MdRU-C1	4	36300	9075	15034766.67
MdRU-C2	4	132630	33157.5	1768617225
40590	5	46760	9352	46184070
40593	5	178640	35728	1451850920
40600	5	63790	12758	112873120
40622	5	46710	9342	33599120

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows	2139923850	4	534980962.5	1.446511844	0.278426	3.259167
Columns	2428506580	3	809502193.3	2.188777906	0.142248	3.490295
Error	4438105070	12	369842089.2			
Total	9006535500	19				

Method 1 Stormwater

	Location	Total PCBs
2/16/2011	MdR-3	18051.69
2/16/2011	MdR-4	9951.69
2/16/2011	MdR-5	6301.69
2/16/2011	MdRU-C1	2931.69
2/16/2011	MdRU-C2	781.69
2/19/2011	MdR-3	54451.69
2/19/2011	MdR-4	8191.69
2/19/2011	MdR-5	4151.69
2/19/2011	MdRU-C1	11451.69
2/19/2011	MdRU-C2	91651.69
2/26/2011	MdR-3	8651.69
2/26/2011	MdR-4	10951.69
2/26/2011	MdR-5	1221.69
2/26/2011	MdRU-C1	5371.69
2/26/2011	MdRU-C2	28851.69
3/20/2011	MdR-3	7381.69
3/20/2011	MdR-4	16051.69
3/20/2011	MdR-5	631.69
3/20/2011	MdRU-C1	9551.69
3/20/2011	MdRU-C2	4351.69

Potential Spatial and Date correlation

	2/16/2011	2/19/2011	2/26/2011	3/20/2011
MdR-3	18051.69	54451.69	8651.69	7381.69
MdR-4	9951.69	8191.69	10951.69	16051.69
MdR-5	6301.69	4151.69	1221.69	631.69
MdRU-C1	2931.69	11451.69	5371.69	9551.69
MdRU-C2	781.69	91651.69	28851.69	4351.69

Anova: Two-Factor Without Replication

SUMMARY	*Count*	*Sum*	*Average*	*Variance*
MdR-3	4	88536.75	22134.19	486833891.67
MdR-4	4	45146.75	11286.69	11392900.00
MdR-5	4	12306.75	3076.69	6991766.67
MdRU-C1	4	29306.75	7326.69	15034766.67
MdRU-C2	4	125636.75	31409.19	1768617225.00
40590	5	38018.43	7603.69	46184070.00
40593	5	169898.43	33979.69	1451850920.00
40600	5	55048.43	11009.69	112873120.00
40622	5	37968.43	7593.69	33599120.00

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows	2139923850	4	534980962.5	1.45	0.28	3.26
Columns	2428506580	3	809502193.3	2.19	0.14	3.49
Error	4438105070	12	369842089.2			
Total	9006535500	19				

Method 2 Stormwater

	Location	Total PCBs
2/16/2011	MdR-3	16565
2/16/2011	MdR-4	8439
2/16/2011	MdR-5	5139
2/16/2011	MdRU-C1	2098
2/16/2011	MdRU-C2	401
2/19/2011	MdR-3	52187
2/19/2011	MdR-4	7001
2/19/2011	MdR-5	2554
2/19/2011	MdRU-C1	9081
2/19/2011	MdRU-C2	88370
2/26/2011	MdR-3	5754
2/26/2011	MdR-4	8544
2/26/2011	MdR-5	232
2/26/2011	MdRU-C1	3188
2/26/2011	MdRU-C2	25926
3/20/2011	MdR-3	4919
3/20/2011	MdR-4	13767
3/20/2011	MdR-5	131
3/20/2011	MdRU-C1	6931
3/20/2011	MdRU-C2	2197

Potential Spatial and Date correlation

	2/16/2011	2/19/2011	2/26/2011	3/20/2011
MdR-3	16564.55	52186.75	5753.58	4919.12
MdR-4	8439.02	7000.79	8544.07	13766.85
MdR-5	5139.39	2553.52	232.25	131.46
MdRU-C1	2097.51	9081.06	3187.59	6931.07
MdRU-C2	400.67	88369.82	25925.64	2196.75

Anova: Two-Factor Without Replication

SUMMARY	*Count*	*Sum*	*Average*	*Variance*
MdR-3	4	79424.00	19856.00	492699770.97
MdR-4	4	37750.73	9437.68	8825316.55
MdR-5	4	8056.63	2014.16	5592580.06
MdRU-C1	4	21297.23	5324.31	10557549.13
MdRU-C2	4	116892.88	29223.22	1690121040.86
40590	5	32641.15	6528.23	40871476.28
40593	5	159191.93	31838.39	1400565967.46
40600	5	43643.13	8728.63	101878443.75
40622	5	27945.26	5589.05	27604783.81

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows	2009385667	4	502346417	1.41	0.29	3.26
Columns	2349091755	3	783030585	2.20	0.14	3.49
Error	4274297018	12	356191418			
Total	8632774440	19				

ANOVA Stormwater Quality Chlordane

Stormwater

	2/16/2011	2/19/2011	2/26/2011	3/21/2011
MdR-3	0.10	35.26	5.86	4.26
MdR-4	0.00	0.00	0.00	0.00
MdR-5	0.00	3.08	1.23	1.07
MdRU-C1	0.00	3.21	2.36	1.62
MdRU-C2	0.00	26.44	12.42	3.78

Possible spatial relationship, and possible event relationship

Anova: Two-Factor Without Replication

SUMMARY	*Count*	*Sum*	*Average*	*Variance*
MdR-3_03202011	4	45.48	11.37	259.61
MdR-4_02162011	4	0.00	0.00	0.00
MdR-5_03202011	4	5.37	1.34	1.63
MdRU-C1_02162011	4	7.18	1.80	1.85
MdRU-C2_02162011	4	42.64	10.66	137.69
40590	5	0.10	0.02	0.00
40593	5	67.98	13.60	259.46
40600	5	21.86	4.37	25.00
40623	5	10.73	2.15	3.29

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows	484.89742	4	121.22435	2.183896	0.13252	3.259167
Columns	536.25971	3	178.75324	3.2202975	0.061314	3.490295
Error	666.09958	12	55.508299			
Total	1687.2567	19				

ANOVA Harbor Water Quality Chlordane

Harbor Water

	3/21/2011	4/21/2011	6/22/2011	7/21/2011
MdRH-B1	0.00	0.00	3.01	0.10
MdRH-B2	0.00	1.05	2.00	0.00
MdRH-B3	0.00	0.00	2.71	0.10
MdRH-B4	0.00	0.00	2.30	0.19

Possible Spatial Correlation

Anova: Two-Factor Without Replication

SUMMARY	*Count*	*Sum*	*Average*	*Variance*
MdRH-B1	4	3.11	0.78	2.22
MdRH-B2	4	3.05	0.76	0.93
MdRH-B3	4	2.82	0.70	1.80
MdRH-B4	4	2.49	0.62	1.26
40623	4	0.00	0.00	0.00
40654	4	1.05	0.26	0.28
40716	4	10.03	2.51	0.20
40745	4	0.39	0.10	0.01

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows	0.0600018	3	0.0200006	0.1304754	0.939532601	3.862548
Columns	17.229625	3	5.7432084	37.466233	2.06211E-05	3.862548
Error	1.3796123	9	0.1532903			
Total	18.669239	15				

ANOVA Harbor Water Quality Chlordane

Harbor Water

	Winter	Summer
MdRH-B1	0.00	1.04
MdRH-B2	0.00	1.02
MdRH-B3	0.00	0.94
MdRH-B4	0.00	0.83

Possible spatial correlation

Anova: Two-Factor Without Replication

SUMMARY	*Count*	*Sum*	*Average*	*Variance*
MdRH-B1	2	1.04	0.52	0.54
MdRH-B2	2	1.02	0.51	0.52
MdRH-B3	2	0.94	0.47	0.44
MdRH-B4	2	0.83	0.41	0.34
Winter	4	0.00	0.00	0.00
Summer	4	3.82	0.96	0.01

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows	0.013334	3	0.004445	1	0.5	9.276628
Columns	1.82593	1	1.82593	410.8217	0.000263	10.12796
Error	0.013334	3	0.004445			
Total	1.852597	7				

Appendix C: Additional Statistics on All Data

The Pearson correlation measures the correlation or strength of linear dependence between two variables X and Y; +1 implies that Y increases as X increases; 0 implies that there is no linear correlation between the variables; and -1 implies that Y decreases as X increases. For −1 and 1, a linear equation exists that describes the relationship between X and Y perfectly.

A Poisson experiment examines the number of times an event occurs during a specified interval. The number of successes in a Poisson experiment is referred to as a Poisson random variable. A Poisson distribution is a probability distribution of a Poisson random variable, and returns a p value that is the probability of the data set or event repeating itself. A p value of 1 indicates that data or event will probably repeat itself.

Spearman's rank correlation coefficient assesses how well the relationship between two variables can be described using a monotonic function. If there are no repeated data values, a perfect Spearman correlation of +1 or −1 occurs when each of the variables is a perfect monotone function of the other.

Table D-1. Statistical Analyses to determine the Correlation between Uncorrected PCB Concentrations and SSC Concentrations

	Statistical Analysis	Total PCBs	SSC (Fine)	SSC (Coarse)	SSC (Total)
Statistics for All Data	Mean	10886.15	24.77	16.47	41.23
	Standard Deviation	17396.74	54.56	54.32	91.12
	Spearman's Rank		0.51	0.67	0.57
	Pearson's Correlation		0.88	0.66	0.92
	Poisson Distribution	0.00	0.99	1.00	0.23
	95% Confidence Interval	5682.83	17.82	17.75	29.77
Statistics for Stormwater Data	Mean	16795.00	39.45	29.65	69.09
	Standard Deviation	21772.19	70.35	70.89	115.90
	Spearman's Rank		0.47	0.62	0.55
	Pearson's Correlation		0.86	0.35	0.82
	Poisson Distribution	0.00	0.00	0.04	0.00
	95% Confidence Interval	9541.91	30.83	31.07	50.80
Statistics for Harbor Water Quality Data	Mean	3500.09	6.41	0.00	6.41
	Standard Deviation	997.98	5.52	0.00	5.52
	Spearman's Rank		0.30	NA[1]	0.30
	Pearson's Correlation		0.36	NA	0.36
	Poisson Distribution	0.00	1.00	1.00	1.00
	95% Confidence Interval	489.00	2.70	NA	2.70

1 NA = not applicable, these statistical analyses could not be performed because the SSC coarse concentration was 0.00 mg/L

Table D-2. Statistical Analyses to determine the Correlation between Corrected PCB Concentrations (Technique 1) and SSC Concentrations					
	Statistical Analysis	Total PCBs	SSC (Fine)	SSC (Coarse)	SSC (Total)
Statistics for All Data	Mean	9137.84	24.77	16.47	41.23
	Standard Deviation	17396.74	54.56	54.32	91.12
	Spearman's Rank		0.51	0.67	0.57
	Pearson's Correlation		0.88	0.66	0.92
	Poisson Distribution	0.00	0.99	1.00	0.23
	95% Confidence Interval	5682.83	17.82	17.75	29.77
Statistics for Stormwater Data	Mean	15046.69	39.45	29.65	69.09
	Standard Deviation	21772.19	70.35	70.89	115.90
	Spearman's Rank		0.474	0.615	0.546
	Pearson's Correlation		0.865	0.347	0.822
	Poisson Distribution	0.00	0.00	0.04	0.00
	95% Confidence Interval	9541.91	30.83	31.07	50.80
Statistics for Harbor Water Quality Data	Mean	1751.78	6.41	0.00	6.41
	Standard Deviation	997.98	5.52	0.00	5.52
	Spearman's Rank		0.30	NA[1]	0.30
	Pearson's Correlation		0.36	NA	0.36
	Poisson Distribution	0.00	1.00	1.00	1.00
	95% Confidence Interval	489.00	2.70	NA	2.70

1 NA = not applicable, these statistical analyses could not be performed because the SSC coarse concentration was 0.00 mg/L

Table D-3. Statistical Analyses to determine the Correlation between Corrected PCB Concentrations (Technique 2) and SSC Concentrations					
	Statistical Analysis	Total PCBs	SSC (Fine)	SSC (Coarse)	SSC (Total)
Statistics for All Data	Mean	7582.38	24.76	16.47	41.24
	Standard Deviation	16938.85	54.56	54.32	91.12
	Spearman's Rank		0.42	0.66	0.49
	Pearson's Correlation		0.87	0.66	0.91
	Poisson Distribution	0.00	0.99	1.00	0.23
	95% Confidence Interval	5533.26	17.82	17.74	29.77
Statistics for Stormwater Data	Mean	13171.07	39.45	29.65	69.09
	Standard Deviation	21315.64	70.35	70.89	115.90
	Spearman's Rank		0.42	0.56	0.49
	Pearson's Correlation		0.859	0.622	0.902
	Poisson Distribution	0.00	0.00	0.04	0.00
	95% Confidence Interval	9341.82	30.83	31.07	50.80
Statistics for Harbor Water Quality Data	Mean	596.50	6.41	0.00	6.41
	Standard Deviation	521.57	5.52	0.00	5.52
	Spearman's Rank		-0.064	NA[1]	-0.064
	Pearson's Correlation		0.216	NA	0.216
	Poisson Distribution	0.00	1.00	1.00	1.00
	95% Confidence Interval	255.56	2.70	NA	2.70

1 NA = not applicable, these statistical analyses could not be performed because the SSC coarse concentration was 0.00 mg/L

Table D-4. Statistical Analyses to determine the Correlation between Chlordane Concentrations and SSC Concentrations					
	Statistical Analysis	Total Chlordane	SSC (Fine)	SSC (Coarse)	SSC (Total)
Statistics for All Data	Mean	3.20	24.77	16.47	41.23
	Standard Deviation	7.28	54.56	54.32	91.12
	Spearman's Rank		0.75	0.72	0.72
	Pearson's Correlation		0.73	0.90	0.97
	Poisson Distribution	1.00	0.99	1.00	0.23
	95% Confidence Interval	2.38	17.82	17.75	29.77
Statistics for Stormwater Data	Mean	5.03	39.45	29.65	69.09
	Standard Deviation	9.42	70.35	70.89	115.90
	Spearman's Rank		0.92	0.85	0.90
	Pearson's Correlation		0.71	0.89	0.98
	Poisson Distribution	1.00	0.00	0.04	0.00
	95% Confidence Interval	4.13	30.83	31.07	50.80
Statistics for Harbor Water Quality Data	Mean	0.91	6.41	0.00	6.41
	Standard Deviation	1.04	5.52	0.00	5.52
	Spearman's Rank		0.06	NA[1]	0.06
	Pearson's Correlation		0.13	NA	0.13
	Poisson Distribution	1.00	1.00	1.00	1.00
	95% Confidence Interval	0.51	2.70	NA	2.70

1 NA = not applicable, these statistical analyses could not be performed because the SSC coarse concentration was 0.00 mg/L