Characterization of Toxic Impacts on Living Marine Resources in Tidal Rivers of the Chesapeake Bay

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1. Abstract

In 1999, the Chesapeake Bay Program completed a survey of existing data on chemical contaminants and the potential for bioeffects in 38 tidal river systems of Chesapeake Bay. This review led to the identification of 20 areas for which there were insufficient data to adequately characterize the potential for contaminant bioeffects on the Bay's living resources. The goal of the present study was to estimate the current status of ecological condition in five of these areas and thus help to complete the overall toxics inventory for the Bay. These five systems included the Chester River, Nanticoke River, Pocomoke River, Lower Mobjack Bay (Poquosin and Back Rivers) and the South and Rhode Rivers. This study utilized a Sediment Quality Triad (SQT) approach in combination with additional water-column contaminant analysis to allow for a "weight of evidence" assessment of environmental condition. A total of 60 stations distributed among the five systems, using a probabilistic stratified random design, were sampled during the summer of 2004 to allow for synoptic measures of sediment contamination, sediment toxicity, and benthic condition. Upon completion of all analyses, stations were assigned to one of four categories based on the three legs of the triad. Stations with high sediment quality had no hits on any of the three legs of the triad; those with moderate quality had one hit; those with marginal quality had two hits; and those with poor quality had hits for all three legs of the triad. The Pocomoke River had by far the largest proportion of the total area (97.5%) classified as having high sediment quality, while the Rhode/South system had the highest proportion (11.4%) classified as poor. None of the stations in the Chester River, Nanticoke River, and Lower Mobjack Bay systems were classified as poor. More than 65% of the area of each of the five systems was classified with high to moderate sediment quality. The Rhode/South system had 30.4% of total area classified with marginally to severely poor quality. The results of this study highlight the importance of using multiple indicators and a "weight of evidence" approach to characterize environmental quality and the potential bioeffects of toxic contaminants.

2. Introduction

Toxic chemical contaminants may enter rivers and estuaries through a variety of pathways that include storm-water runoff, municipal wastewater, non-point source agricultural runoff and industrial point source discharges. Some of these chemicals, such as agricultural pesticides, may be highly toxic but short-lived in the environment. Other toxic contaminants such as polycyclic aromatic hydrocarbons, polychlorinated biphenyls, and metals are more persistent and may accumulate in sediments and biota and cause both acute and chronic toxicity in aquatic organisms. Efforts to assess the effects of toxic contaminants should include an evaluation of these exposure scenarios.

In 1999, the Chesapeake Bay Program (CBP) completed a comprehensive survey of existing data on chemical contaminants and their potential bioeffects in 38 tidal river areas of Chesapeake Bay (CBP 1999). This review led to the identification of 20 areas for which there were either inconclusive or insufficient data to adequately characterize the potential for contaminant bioeffects on the Bay's living resources. In efforts to support goals of the Chesapeake 2000 Agreement (an important partnership set up to protect and restore the Chesapeake Bay ecosystem), the Toxics Subcommittee of the Chesapeake Bay Program subsequently developed a "Toxics 2000 Strategy" with a commitment to:

> *"…update the 1999 Toxics Characterization by conducting the necessary biological and chemical monitoring to characterize the status of chemical contaminant effects on living resources in those tidal rivers characterized as 'areas with insufficient or inconclusive data' and in the mainstem Bay."*

Data from a variety of recent and ongoing federal, state, and CBP studies that were not available at the time of the 1999 Toxics Characterization will help to fulfill this commitment. Such studies are identified in a subsequent analysis of data gaps conducted by the Toxics Subcommittee and included in their Three-Year Budget Plan (March 2001). However, additional data are still needed for those waters where new data are not being collected or where recent findings are inconclusive and need to be substantiated.

The main objective of the present study was to estimate the current status in ecological condition of five such river areas of the Chesapeake Bay and thus to help complete the overall toxics inventory goal for the bay. These systems included the Chester River, Nanticoke River, Pocomoke River, Lower Mobjack Bay (Poquoson and Back Rivers), and the South and Rhode Rivers (Figure 1). The study utilized a Sediment Quality Triad (SQT) approach in combination with additional water-column contaminant analysis. The SQT approach provides a means to assess the condition of these estuaries from the perspective of sediment quality, based primarily on combined measures of sediment contamination, sediment toxicity, and condition of ambient benthic fauna. Combining such measures in this fashion has been shown to be very effective as a "weight-of-evidence" approach to assessing pollution-induced degradation of the benthos, especially in relation to persistent sediment-associated contaminants (Long and Chapman 1985, Chapman 1990). The present report presents results of the SQT component. The companion water-column chemistry analysis provides added value as a measure of potential water-born toxicity and exposure scenarios, which can be especially important to capture with respect to non-persistent contaminants, such as some insecticides that are short-lived but highly toxic. Results of the water column characterization are presented in a separate companion report by McConnell (2005) and are referenced throughout this report as appropriate.

3. Methods

3.1 Sampling Design and Field Collection

A total of 60 stations were distributed as follows among the five tidal-river areas using a stratified random design (Figure 2):

Chester River (15 sites)
Nanticoke River (15 sites)
Pocomoke River (10 sites)
Lower Mobjack Bay (Poquoson and Back Rivers) (10 sites)

South and Rhode Rivers (10 sites)

Geographic delineations of these areas were based upon the 2003 Chesapeake Bay Program Analytical Segmentation Scheme, using ArcView GIS shapefiles obtained from the Chesapeake Bay Program web site (CBP 2004). Each river was stratified into segments with stations apportioned approximately equally among segments (Figure. 2). The original CBP segmentation scheme defined monitoring segments based primarily on salinity. For this study, the segmentation scheme was modified so as to obtain at least two (usually three) segments, or strata, within each system such that the strata were of approximately equal length with respect to the longitudinal axis of the system. Resulting river segments (e.g., upper vs. mid vs. lower portions) approximate corresponding salinity zones, exhibiting similar within-segment salinity and hydrographic characteristics.

Within each stratum, a set of random locations was generated using the Random Point Generator extension to ArcView (Jenness 2003). Locations where depth was less than approximately 1 m, which would be inaccessible with our research vessels, were eliminated. Of the remaining sites, three to five locations in each stratum were chosen at random and designated as primary sites, and an equivalent number of locations were designated as a set of alternate sites from which to draw if any of the primary sites were not able to be sampled in the field. The process was repeated for each stratum to give the desired total number of sites for each system.

The above probabilistic random station design was applied in order to provide a basis for making unbiased statistical estimates of the spatial extent of degraded versus non-degraded condition within a system (i.e., river), based on the status of various measured ecological indicators relative to desired criteria among component sampling sites. A similar approach has been applied throughout EPA's related EMAP and National Coastal Assessment (NCA) programs. Methods for estimating the proportion of area of each system meeting certain criteria, and its associated variance, are based on published formulae for stratified random sampling designs (Cochran 1977). For every site i in stratum h, y_{hi} takes the value 1 when a criterion is met, and 0 otherwise. The estimated proportion and its associated variance for stratum h is calculated as

$$\hat{p}_h = \overline{y}_h = \sum_{i=1}^{n_h} \frac{y_{hi}}{n_h} \tag{1}$$

and

$$\operatorname{var}(p_h) = s_h^2 = \sum_{i=1}^{n_h} \frac{(y_{hi} - \overline{y}_h)^2}{n_h - 1}\,. \tag{2}$$

The estimated proportion for a given system (combined across L strata) is given as

$$\hat{P} = \sum_{i=1}^{L} W_h \overline{y}_h\,, \tag{3}$$

where the weighting factor $W_h = A_h/A$; A_h is the area of stratum h, and A is the combined area of all strata (for the given system). The variance of (3) is calculated as

$$\mathrm{var}(\hat{P}) = \sum_{h=1}^{L} W_h^2 S_h^2 / n_h \ . \qquad (4)$$

Sampling at the 60 stations was divided into three cruise legs. Twenty stations, 15 in Chester River and five in the Nanticoke River, were sampled on Leg 1 between 14 - 18 July 2004. Twenty stations, 10 in the Nanticoke River and 10 in the Pocomoke River, were sampled on Leg 2 between 2 - 6 August 2004. Twenty stations, 10 in the Rhode/South Rivers and 10 in lower Mobjack Bay, were sampled on Leg 3 between 9 - 13 September 2004. Coordinates for each station are given in Appendix 1.

At each station, there was synoptic sampling of a variety of ecological indicators — including general habitat characteristics, multiple stressor levels, toxicity, and biological responses — to support "weight-of-evidence" assessments of condition and to allow for the examination of potential associations between presence of stressors and potential bioeffects. Salinity (ppt), pH, temperature (^{o}C), dissolved oxygen (mg L^{-1}), and water depth (m) were measured at approximately 1 m off the bottom using a Hydrolab Minisonde 4 water-quality data logger. Sediment samples for chemical contaminant analysis, total organic carbon (TOC), acid volatile sulfide (AVS), grain-size analysis, toxicity testing, and benthic community assessments were collected at each station using a 0.04-m^2 Young grab sampler. Grabs were collected to a maximum depth of 10 cm and rejected if < 5 cm or if there was other evidence of sampling disturbance (e.g., major slumping, debris caught in jaws). Surficial sediments (upper 2-3 cm) were collected and composited from multiple grabs to provide sufficient material (~ 8L) for the TOC and grain-size analysis, contaminant analysis, and sediment toxicity testing. Subsamples of the composited material were removed and placed into appropriate sample containers. As part of the QA/QC process, steps were taken (including between-station rinses of the grab and sampling utensils with acetone and seawater) to minimize spurious contamination. Sediments collected for contaminant analyses were shipped on ice to the laboratory, stored frozen and analyzed within 12 months of receipt. Sediments collected for toxicity testing were shipped cold on ice to the laboratory and analyzed within 30 days of receipt. Three separate Young grabs also were collected at each station and processed as replicate samples for the analysis of benthic macroinfauna (animals >0.5 mm). Contents of the grabs were sieved in the field with a 0.5-mm mesh screen. Material remaining on the screen was fixed in 10% buffered formalin with rose bengal and transferred to the laboratory for further processing.

All field sampling efforts and samples collected were documented on standardized data forms. Station data were recorded on a Field Collection Parameter Sheet and a Benthic Sample Collection Sheet. Once collected and packaged, the samples were logged onto a Chain of Custody Tracking form. The Field Collection Parameter Sheet included a record of sampling date and time; unique sample identification number; location and coordinates; sediment sample types and water sample types collected; water quality parameters taken and the field team members present. The Benthic Sample Collection Sheet included a record of sampling date and time; unique sample identification number;

location and coordinates; specific details on sediment type, color, odor and biota present; and the field team members present. The Chain of Custody recorded the sample ID; analysis required of the individual sample containers, date, time, location and storage needs. Copies of these forms accompanied sample containers throughout processing and the originals were archived in a master notebook maintained by the project manager. In some cases, specific laboratory sample tracking and data forms specific to the tasks of benthic taxonomy, sediment toxicity testing, and chemical analysis were used to track the status of sample processing, data results and personnel. QA/QC forms were used as a part of the quality check for benthic and sediment samples.

3.2 Sediment Chemistry Analysis

Extraction and sample preparation for organics were similar to those described by Krahn et al. (1988) and Fortner et al. (1996). Samples were extracted with CH_2CL_2 using accelerated solvent extraction [ASE], concentrated by nitrogen blow-down, and cleaned by gel permeation chromatography. PAHs, organochlorine pesticides, PCBs and PBDEs were analyzed using an array of analytical instrumentation, including gas chromatography (GC)-ion trap mass spectrophotometry (ITMS) and GC/MS with negative chemical ionization (NCI) and electron ionization (EI) sources. Trace metals were analyzed using methods similar to those described by Long et al. (1998) for Al, As, Cd, Cr, Cu, Fe, Pb, Mn, Ni, Sn, Zn, As, Cd, Pb, Ag, and Se by a combination of inductively coupled plasma spectroscopy (ICP/MS) and by graphite furnace atomic absorption (GFAA). Mercury was analyzed by direct mercury analysis using atomic absorption detection. Quality control samples (blanks, spikes, duplicates and SRMs) were analyzed for each group of samples for each analytical method. Target analytes, levels of concern (i.e., ERL and ERM Sediment Quality Guideline values, Long et al. 1995), and MDLs for sediment contaminants are provided in Table 1. All sediment contaminant analyte MDLs were below ERLs. All detections above the MDL were quantified and reported. Mean ERM-Quotients (ERM-Qs), which are the means of individual contaminant concentrations in a sample relative to corresponding ERM values, were used to quantify potentially harmful mixtures of various contaminants present at varying concentrations. Mean ERM-Qs were calculated using the same methods and chemicals used by Long et al. (1998) and Hyland et al. (1999). This approach does not include Ni and total PAHs in the calculations. Critical points for evaluating risks of benthic impacts within different mean ERM-Q ranges were based on the results of Hyland et al. (2003) as follows: ≤ 0.022 low, > 0.022-0.098 medium, > 0.098-0.473 high, > 0.473 very high.

3.3 Sediment Toxicity Testing

Two sediment bioassays involving whole sediment exposures were used to assess potential sediment toxicity. These tests were the acute 10-day juvenile clam assay and the U.S. EPA standard 28-day chronic amphipod assay. All samples received in the laboratory were stored at 4ºC until processed. These samples were accompanied by tracking forms listing site, collection time, and testing requirements so that processing and testing occurred within the appropriate holding periods (i.e., 30 days). Both assays were run with negative controls consisting of reference sediment collected from either

Folly River, SC (clam assay) or Leadenwah Creek, SC (amphipod assay).

Juvenile Clam Assay
The juvenile clam bioassay was developed during previous EPA funded studies in which the effects of contaminated sediments on survival of juvenile clams (*Mercenaria mercenaria*) was evaluated after a 10-day laboratory exposure (Fulton et al. 1999). Mortality was evaluated as the end point in this study. Juvenile clams >212 µm and <350 µm in length were exposed to sediments for 10 days. Sediments from each site were sieved through a 212 µm screen and approximately 60 mL was added to five replicate 473-ml jars. Control sediments (collected from Folly River, SC) were treated the same as the test sediments. Filtered seawater, adjusted to 30 ppt with deionized water, was added to each replicate jar for a total volume of 180 ml. The sediment was allowed to settle under aeration for 24-h before the addition of the clams. Clams (30 per jar) were then added to the sediments and placed in an Environmental Chamber at 20^{o}C with gentle aeration for 10 days. All replicates were fed 5 ml of the algae *Isochrysis galbana* every 48h during the course of the assay. Water quality measurements were made each day. At the end of the exposure period, the clams were re-sieved and mortality was assessed under a dissecting scope.

28-Day Chronic Amphipod Assay
The 28-d method for assessing sediment-associated toxicity using the estuarine amphipod *Leptocheirus plumulosus* was performed using standard methods (EPA 2001). All amphipod tests were conducted using organisms from established laboratory cultures maintained at 20 ppt salinity. Sediments were processed by press sieving through a 250 µm stainless steel sieve and the <250 µm fraction was stored at 4ºC for 14 days to remove indigenous organisms. The toxicity of each sample was assessed by adding 175 mL of the sieved sediment and 725 mL of 0.4 µm filtered 20‰ natural seawater to a 1-L beaker and allowed to settle overnight at 25ºC with gentle aeration. There were 5 replicates per site. Each replicate contained 20 randomly selected *L. plumulosus* larvae between 250 and 500 µm in length. Water quality monitoring, test maintenance and feeding were performed as specified in the standard protocol.

Each replicate was sieved through a 1 mm and 250 µm sieve. The adults remaining on the 1 mm sieve were enumerated and then processed to calculate a dry weight estimate for growth. The material retained on the 250 µm sieve was preserved in ethanol with rose bengal and stained larvae were enumerated on a dissecting microscope. Results were compared to those measured in the control sediment.

Reference Toxicant Tests
Sodium dodecyl sulfate (SDS) was used as a reference toxicant for both test species to ensure that each batch of organisms used in the toxicity testing were of comparable sensitivity. To establish baseline sensitivity levels, at least three reference toxicant tests were completed prior to conducting bioassays with field collected sediments. The acceptance criteria for a given batch of animals were defined as the mean LC50 for all previous tests ± 2 standard deviations.

Statistical Analyses of Bioassay Results
For each leg of the study, amphipod and clam survival by site was analyzed using a generalized linear model (PROC GENMOD) fit to a binomial distribution and using a logit-link function (SAS, Cary, NC). To account for other variables that may have contributed to clam and amphipod mortality, stepwise multiple linear regressions were performed (SAS, Cary, NC). In the case of amphipods and clams, survivorship (the dependant variable) was regressed against a suite of numeric parameters from the laboratory (during the bioassays) and the field (at the time of sample collection). These data consisted of field and lab water conditions of temperature, salinity, pH, dissolved oxygen concentration, and ammonia. Also included were sediment characteristics data (grain size, TOC, etc.). All data were log-transformed [$\log_{10}(x) + 1$].

3.4 Benthic Community Analysis

Once in the laboratory, samples were transferred from formalin to 70% ethanol. Animals were sorted from the sample debris under a dissecting microscope and identified to the lowest practical taxon (usually species). Data quality steps included: (1) tests of ongoing sorting proficiency on 10% of samples by independent sorters to assure that ≥ 95% of animals in each sample were removed by original sorter; (2) use of skilled taxonomists with updated standard taxonomic keys and reference collections to perform species identifications; (3) checks for potential misidentifications on minimum of 10% of samples by independent qualified taxonomists; and (4) appropriate corrective actions to resolve any potential sorting or species identification errors. Data were used to compute density (m^{-2}) of total fauna (all species combined), densities of numerically dominant species (m^{-2}), numbers of species, H' diversity (Shannon and Weaver 1949) derived with base-2 logarithms, and estimates of condition based on the Chesapeake Bay benthic index of biotic integrity (B-IBI, Weisberg et al. 1997, Llanso et al. 2002). Statistical differences in these variables among the various river segments were examined using a combination of t-tests and analysis of variance (ANOVA) in conjunction with Tukey's Honestly Significant Difference (HDS) multiple-comparison test.

The B-IBI is a multi-metric index that reflects the degree to which component measures of key biological attributes at a station deviate from corresponding optimum values expected under undisturbed conditions, based on the distribution of values at best available reference sites in similar habitats. Computation of the B-IBI was based on the procedures and habitat designations of Weisberg et al. (1997) as modified by Llanso et al. (2002). B-IBI ranges used to classify samples into one of three condition categories (degraded, non-degraded, intermediate/indeterminate) followed the recommendations of Llanso et al. (2003, see also Alden et al. 2002) designed to improve classification efficiencies across various habitat types. These scoring criteria are presented here in Table 2. The use of a benthic index provides a quantitative unbiased basis for coding a sample as degraded vs. non-degraded biologically, and thus is an important component in the assessment of overall ecological condition within the sediment-quality-triad approach.

4. Results

4.1 Habitat Characteristics

Box and whisker plots of key habitat characteristics (depth, salinity, DO, % silt-clay, TOC, AVS and mean ERM-Q) are presented in Figure 3 as a summary of the distributional properties of these variables throughout the five river systems and component river segments. A listing of these same variables by individual station is presented, along with corresponding station coordinates, in Appendix 1.

Salinities ranged from tidal fresh (< 0.5 ppt) in the upper Chester, upper Nanticoke, and upper/mid Pocomoke Rivers to high mesohaline (12-18 ppt) in the lower portions of the Chester, Nanticoke, and Pocomoke Rivers and Mobjack Bay (Figure 3). The Chester and Nanticoke Rivers exhibited salinity patterns characteristic of gradient estuaries with lowest values in the upper river segments, highest values in the lower segments, and intermediate values in the middle segments. The pattern in the Pocomoke River was similar, with low salinities in the upper river and highest salinities in the lower river, though the upper and middle segments had equally low salinities within the tidal fresh range. The narrowest salinity distributions occurred among the Upper South/Lower South/Lower Rhode river segments, all in the low mesohaline (5-12 ppt) zone, and the two lower Mobjack Bay segments, both in the high mesohaline zone. Oligohaline salinities (0.5-5 ppt) were common in the middle portions of the Chester and Nanticoke Rivers.

Based on the habitat designations by Weisberg et al. (1997, Llanso 2002), sediment with a silt-clay content > 40% by weight was classified as mud and ≤ 40% was classified as sand. Accordingly, the most commonly occurring habitats (based on salinity and sediment type designations) within the five rivers and component segments were as follows (Figure 3):

- U. Chester R.: Tidal-fresh mud
- M. Chester R.: Oligohaline to low mesohaline mud
- L. Chester R.: Low mesohaline mud
- U. Nanticoke R.: Tidal-fresh mud
- M. Nanticoke R.: Oligohaline to low mesohaline mud
- L. Nanticoke R.: Low mesohaline mud
- U. Pocomoke R.: Tidal-fresh sand and mud
- M. Pocomoke R.: Tidal-fresh mud
- L. Pocomoke R.: High mesohaline sand and mud
- U. South R.: Low mesohaline sand and mud
- L. South R.: Low mesohaline mud
- L. Rhode R.: Low mesohaline sand and mud
- Poquosin R./L. Mobjack Bay: High mesohaline sand and mud
- Back R./L. Mobjack Bay: High mesohaline sand and mud

Station depths ranged from 0.5-10 m though most stations across all river segments (based on inter-quartile ranges) were typically within about 1-5 m (Figure 3). The deepest station was Station 15 in lower Chester River with a depth of 10 m (Appendix 1).

Most stations had relatively high DO levels (> 5 mg L^{-1}) at the time of sampling (Appendix 1). DO was generally the lowest in the upper to mid portions of Nanticoke and Pocomoke Rivers, with values in the 3-5 mg L^{-1} range. Only one station (the deepest station 15 in lower Chester River) had DO in a low hypoxic range (< 2 mg L^{-1}) often associated with a high risk of benthic impacts (Diaz and Rosenberg 1995). Though low DO was not a widespread occurrence in this study, it is important to consider that the instantaneous (point-in-time) measurements on which these results are based may have underestimated the magnitude and duration of actual low-DO events at any given station. Longer-term observations might reveal a greater incidence of low-DO events in these areas.

Total organic carbon (TOC) ranged from 0.2 mg g^{-1} at Station 47 in the Back River/lower Mobjack Bay to 123 mg g^{-1} at Station 31 in the upper Pocomoke River (Appendix 1). Hyland et al. (2005) identified a TOC threshold of 36 mg g^{-1} as the beginning of a range associated with a high risk of impaired benthic condition. There are many stations, particularly in the upper to middle portions of the Chester, Nanticoke, Pocomoke, and South Rivers, that have high TOC levels in this potential bioeffect range (Figure 3, Appendix 1).

Acid volatile sulfide (AVS) is an important factor controlling the bioavailability of divalent metals such as cadmium, copper, lead, nickel, zinc, and mercury (Allen et al. 1993). Thus, high levels of AVS can reduce the potential toxicity of sediment-associated divalent metals. In this study, AVS ranged from 0.000 µmol g^{-1} at Station 8 in the Chester River to 233.905 µmol g^{-1} at Station 51 in the upper South River (Appendix 1). AVS levels were quite high at selected stations in the Rhode/South, Nanticoke, and Lower Mobjack Bay systems.

Mean ERM-Q results (included in Figure 3) are presented in the following section on sediment contaminants.

4.2 Sediment Contaminants

Metals

Contaminant results for all stations are provided in Appendix 2 and summarized in Table 3. All contaminant concentrations are reported on a dry weight basis. The average total metal concentration (excluding Al and Fe) in the Chester River ranged from 1627 µg g^{-1} in the upper section to 3825 µg g^{-1} in the middle section and the overall average total metal concentration for the Chester River was 2382 µg g^{-1}. The average total metal concentration in the Nanticoke River ranged from 414 µg g^{-1} in the lower section to 938 µg g^{-1} in the middle section and the overall average for the Nanticoke River was 731 µg g^{-1}. In the Pocomoke River, the average total metal concentration ranged from 318 µg g^{-1}

in the lower section to 381 µg g^{-1} in the middle section. The average for the Pocomoke was 346 µg g^{-1}. The average total metal concentration in Lower Mobjack Bay ranged from 160 µg g^{-1} in the Back River to 278 µg g^{-1} in the Poquosin. The total average metal concentration in the South River ranged from 1121 µg g^{-1} in the upper section to 4141 µg g^{-1} in the lower section while the average total metal concentration in the lower section of the Rhode River was 574 µg g^{-1}. In general, total metal concentrations were highest in the lower section of the South River and the middle section of the Chester River. These high total metal concentrations in these rivers were driven largely by high Mn concentrations.

PAHs

Average total PAH concentrations in the Chester River ranged from 689 ng g^{-1} in middle section to 877 ng g^{-1} in the lower section. The average total PAH concentration for the Chester River was 784 ng g^{-1}. The average total PAH concentration for the Nanticoke River ranged from 248 ng g^{-1} in the lower section to 2206 ng g^{-1} in the upper section. The overall average for the Nanticoke was 1036 ng g^{-1}. Average total PAH concentrations in the Pocomoke River ranged from 145 ng g^{-1} in the lower section to 1408 ng g^{-1} in the upper section. The average total PAH concentration for the Pocomoke was 890 ng g^{-1}. The average total PAH concentrations in Lower Mobjack Bay ranged from 167 ng g^{-1} in the Back River to 309 ng g^{-1} in the Poquosin. The average total PAH concentration in the South River ranged from 2723 ng g^{-1} in the lower section to 4704 ng g^{-1} in the upper section. The average total PAH concentration in the Rhodes River was 777 ng g^{-1}. In general, Total PAH concentrations were highest at stations in the upper section of the South River. Total PAH levels were also high at some stations in the upper sections of the Nanticoke and the Pocomoke.

Pesticides

Total DDTs represented the dominant pesticide class detected in each of the river systems. Average total DDT concentrations in the Chester River ranged from 0.52 ng g^{-1} in the middle section to 2.05 ng g^{-1} in the upper section. The overall average for the Chester River was 1.15 ng g^{-1}. Average total DDT concentrations in the Nanticoke River ranged from 0.47 ng g^{-1} in the lower section to 5.21 ng g^{-1} in the upper section. The average total DDT concentration for the Nanticoke River was 2.30 ng g^{-1}. Average total DDT concentrations in the Pocomoke ranged from < DL in the lower section to 5.96 ng g^{-1} in the upper section. The overall average total DDT concentration for the Pocomoke was 2.38 ng g^{-1}. Average total DDT concentrations in Lower Mobjack Bay ranged from < DL in the Poquosin River to 0.73 ng g^{-1} in the Back River. The average total DDT concentration in the South River ranged from 1.90 ng g^{-1} in the lower section to 5.63 ng g^{-1} in the upper section. The average total DDT concentration in the Rhodes River was 0.97 ng g^{-1}.

PCBs and PBDEs

PBDEs were not detected in sediments from any of the river systems. Average total PCB concentrations in the Chester River ranged from 0.51 ng g^{-1} in the middle section to 2.92 ng g^{-1} in the upper section. The overall average total PCB concentration for the Chester River was 1.56 ng g^{-1}. The average total PCB concentration for the Nanticoke River ranged from 0.3 ng g^{-1} in the middle section to 6.22 ng g^{-1} in the upper section and the overall average for the Nanticoke was 2.64 ng g^{-1}. The average total PCB concentration for the Pocomoke River ranged from 0.47 ng g^{-1} in the middle section to 0.87 ng g^{-1} in the lower section. The overall average for the Pocomoke was 0.63 ng/g. The average total PCB concentration for Lower Mobjack Bay was 1.67 ng g^{-1} and ranged from 1.33 ng g^{-1} in the Back River to 2.01 ng g^{-1} in the Poquosin. Average total PCB concentrations in the South River ranged from 6.50 ng g^{-1} in the lower section to 19.67 ng g^{-1} in the upper section.

ERM/ERL Exceedances and Mean ERM-Qs

The numbers of ERM/ERL exceedances and Mean ERM-Qs for each station are listed in Appendix 3. Mean ERM-Qs are summarized for each river system in Figure 3 and individual analytes exceeding these guidelines are highlighted in Appendix 3. Sediments from only two stations had contaminant concentrations that exceeded the ERM criteria for any analyte. These two stations (51, 51) were from the upper section of the South River and had concentrations that exceeded the ERM (51.6 µg g^{-1}) for nickel.

The number of ERL exceedances at Chester River sites ranged from zero at Stations 2, 8, and 12 to seven at Station 13. Analytes commonly exceeding ERL levels in the Chester River system included arsenic, nickel, zinc, 2-methylnapthalene, fluorene, acenaphthene and total DDT. Mean ERM-Qs at the Chester River Sites ranged from 0.007 at Site 2 to 0.081 at Station 13.

In the Nanticoke River, the number of ERL exceedances ranged from zero at Stations 22, 26, 28, 29, and 30 to 10 at Station 17. Analytes that often exceeded ERL thresholds in the Nanticoke included arsenic, nickel, fluorene, and total DDT. Four of the five stations in the lower Nanticoke had no ERL exceedances. Mean ERM-Qs ranged from 0.005 at Station P22 to 0.138 at Station P17.

The number of ERL exceedances in the Pocomoke River ranged from zero at Stations 33, 35, 36, 37, 38, and 40 to seven at Station 31. Arsenic was the only analyte that often exceeded the ERL in the Pocomoke. Station 31, however, had exceedances for As, Cd, Ni, Zn, acenaphthene, fluorene, 4, 4 DDE and total DDT. Three of the four stations in the lower Pocomoke had no ERL exceedances. Mean ERM-Qs ranged from 0.005 at Station 40 to 0.131 at Station 31. In Lower Mobjack Bay, ERL exceedances in the Poquosin River ranged from zero at Stations 44 and 45 to two at Station 41. In the Back River ERL exceedances ranged from zero at Stations 46-49 to two at Station 50. Mean ERM-Qs in the Poquosin River ranged from 0.004 at Station 45 to 0.054 at Station 41. For the Back River, mean ERM-Qs ranged from 0.001 at Station 47 to 0.045 at Station 50. The number of ERL exceedances in the South River ranged from zero at Station 53 to 21 at Station 51. Mean ERM-Qs in the South River ranged from 0.011 at Station 53 to 0.303 at Station 51. In the Rhode River, the number of ERL exceedances ranged from zero at Station 60 to nine at Station 59. Mean ERM-Q s ranged from 0.013 at Station 60 to 0.105 at Station 59.

The median mean ERM-Q for the upper section of the South River was much higher than in any of the other river systems (Figure 3).

Analytical Chemistry QA/QC

Metals

For each batch of samples, a series of samples were co-processed to ensure quality assurance and control. A series of standard reference materials (National Research Council of Canada MESS-3) and spiked blanks were analyzed. The resulting SRM data indicated that recoveries averaged 90.3% with a standard deviation of 5.8%. The recoveries ranged from 65-122.5%. Recoveries in the spiked blanks averaged 97.3% (+/- 4.9%) and ranged from 84.6-118.3%.

Organics

For each batch of samples, a series of samples were co-processed to ensure quality assurance and control. A series of standard reference materials (National Institutes of Standards and Technology 1944) and spike blanks were analyzed. The resulting SRM data indicated that PAH recoveries averaged 99.5% with a standard deviation of 23.9%. For pesticides, recoveries averaged 123.3% with a standard deviation of 24.7%. PCB recoveries in the SRM ranged from 91.3 to 106.6% (averaging 101.5 +/- 3.9%). PAH recoveries averaged 105.5% and ranged from 85.9-177.5 in spiked blank samples while pesticide recoveries averaged 102.2% and ranged from 73.8-127.5 PCB recoveries in the spiked blanks ranged from 80.3-111.4% and averaged 101.4 +/- 3.4%.

Field Blanks

Contaminant levels in field blanks were compared to laboratory blanks prepared from the same reference sediment to account for any potential contamination of sediment samples associated with collection and transport in the field. Contaminant levels were very similar in each set of blank samples. Total metal concentrations in the field blanks averaged 117 $\mu g\ g^{-1}$ in comparison to the laboratory blanks that averaged 101 $\mu g\ g^{-1}$. Total PAH concentrations in the field blanks averaged 8.6 $ng\ g^{-1}$ while the level in the laboratory blank was 12.4 $ng\ g^{-1}$. PCBs, pesticides and PBDEs were < DL in both the laboratory and field blanks (Appendix 2).

Bioassay Reference Sediments

The total metal concentration in the reference site sediments used in the clam bioassays averaged 100 $\mu g\ g^{-1}$ and total PAH and total PCB concentrations averaged 18.7 $ng\ g^{-1}$ and 0.229 $ng\ g^{-1}$, respectively. Pesticides and PBDEs were < DL. Total metal concentrations in the reference sediments for the amphipod bioassays averaged 85 $\mu g\ g^{-1}$ and total PAH and total PCB concentrations averaged 93.0 $ng\ g^{-1}$ and 0.250 $ng\ g^{-1}$, respectively. Pesticides and PBDEs were < DL (Appendix 2).

4.3 Sediment Toxicity

Juvenile Clam Assay

Juvenile clam bioassay results are summarized in Figure 4 and Table 4. Sediments were characterized as toxic in the juvenile clam assay when survival in the sediments from a sampling site was significantly ($p<0.05$) lower and < 80% of that in reference site sediments. Juvenile clam mortality in Chester River sediments was generally high. Overall, sediments from 11 of the 15 Chester River stations were toxic in the clam assay. All five of the sediments from the upper section of the Chester were toxic while only two of the five stations from the lower Chester produced toxicity. Nanticoke River sediments were also highly toxic in the clam bioassay. Overall, 14 of the 15 stations had sediments that were toxic to the clams. Only one station (30) from the lower Nanticoke was non-toxic. Sediments from six of the ten Pocomoke River stations were characterized as toxic in the clam assay. All of the sediments from the upper and middle sections of the Pocomoke produced toxicity while all of the sediments from the lower Pocomoke were non-toxic. Sediments from only one of the ten Lower Mobjack Bay stations (43) were toxic in the clam bioassay. Sediments from only two of the seven South River stations were toxic in the clam assay. Survival in reference sediments was 100% in all assays.

Amphipod Assay

Amphipod bioassay results are summarized in Figure 5 and Table 4. Sub-lethal endpoint (growth, reproduction) results are provided in Appendix 4 and 11. Sediments were characterized as toxic in the amphipod assays using the same protocol described previously for the clam tests. Sub-lethal endpoint results were not included in these characterizations. Sediments from 10 of the 15 Chester River stations were toxic in the amphipod bioassays. Sediments from the lower section were least toxic with only one of the five stations having sediments characterized as toxic while all five of the stations from the middle section were toxic. In the Nanticoke River, sediments from six of the 15 stations were toxic. Only one of the sediment samples from the lower section of the Nanticoke was toxic while sediments from three of the five middle section stations produced toxicity. Sediments from five of the 10 Pocomoke River stations were toxic in the amphipod assay. Only one of the four Pocomoke lower stations had toxic sediments while two of the stations from both the upper and middle sections had sediments that produced toxicity in the amphipod assay. Only two of the 10 stations from the South River had sediments that were toxic in the amphipod assay. Both of these stations were from the lower section of the river. None of the sediments from the Rhode River stations were toxic. Only one station from Lower Mobjack Bay had sediments characterized as toxic in the amphipod assay. This was Station 47 from the Back River. Amphipod survival in reference sediments was 64%, 96%, and 75% for legs one, two, and three, respectively. Although amphipod survival in reference sediments for legs one and three was somewhat below recommended acceptance criteria described in the U.S. EPA protocol (2001), a decision was made to utilize the data from these legs in the overall assessment. In all cases, the bioassay results for sediments from each of the field sites was compared to that in reference sediments in concurrent tests.

Sediments from 21 of the 60 stations had amphipod growth rate reduced in comparison to those in reference sediments while sediments from 31 of the 60 sites had reduced rates of amphipod reproduction (Appendix 4).

Overall Toxicity Assessment

A comparison of the results from the two assays indicated that sediments from 57% of the 60 stations were toxic in the clam assay and 40% were toxic in the amphipod assay. Results of the two assays were in agreement for 70% of the 60 stations. Sediments from three stations were toxic to amphipods, but not clams while sediments from 14 stations were toxic to clams and not amphipods. Overall, 33% of the stations had sediments that were characterized as toxic in both assays. In subsequent discussions, only those stations that produced toxicity in both assays are classified as toxic.

Sediments from at least one segment of four of the five river systems (South River, Pocomoke, Nanticoke, and Chester) were confirmed as toxic by both of the bioassays. Only the lower Mobjack Bay river system had no stations with toxic sediments. The Chester River system had the most stations with toxic sediments (nine). Toxicity was most widespread in the upper section and least widespread in the lower section. In the Chester, toxicity observed in the bioassays was not clearly associated with measured contaminants in sediments. The number of ERL exceedances in stations characterized as toxic in the bioassays ranged from zero to six while the number of ERL exceedances in non-toxic sediments ranged from zero to seven. Mean ERM-Qs in toxic sediments ranged from 0.007 to 0.079 while mean ERM-Qs in non-toxic samples ranged from 0.011 to 0.098. Water-column pesticide analyses conducted as part of a companion study (McConnell 2005), however, indicated relativey high concentrations of herbicides such as simazine and atrazine particularly in the upper and middle river sections. This may suggest that other unmeasured contaminants in nonpoint source runoff are being transported to the river which could have affected survival in the bioassays. Additionally, statistical analyses (Tables 5-6) indicated a positive relationship between survival in the bioassays and the pH of the overlying water in the bioassays. This may suggest that other characteristics of the sediments from the more freshwater, low pH stations could also have caused reductions in pH in the bioassays and thus affected survival.

As with the Chester, toxicity in the bioassays with Nanticoke River sediments did not show a clear-cut relationship with the level of contaminants measured in sediments. The number of ERL exceedances in the non-toxic sediments ranged from zero to 12 while the number of exceedances in toxic sediments ranged from zero to six. Mean ERM-Qs in toxic samples ranged from 0.025 to 0.070. In non-toxic samples, mean ERM-Qs ranged from 0.005 to 0.138. Again, many of the toxic sediments were from the more freshwater stations with low pH. There was also evidence of nonpoint source inputs to the Nanticoke. Relatively high concentrations of pesticides such as metolachlor were measured in water samples from some of the Nanticoke stations (McConnell 2005).

Sediments from the two Pocomoke stations with the most ERL exceedances (Station 31-eight exceedances and Station 34-seven exceedances) were toxic in the bioassays. The mean ERM-Qs for these stations were 0.131 and 0.100. Sediments from two additional stations (Station 32 and Station 36), however, with ≤ two exceedances were also toxic and the mean ERM-Qs for these sediments were 0.020 and 0.017. The number of ERL exceedances in the non-toxic sediments from the Pocomoke was zero. Some pesticides were detected in water samples from the Pocomoke, but levels were generally lower than those measured in the Chester and the Nanticoke (McConnell 2005).

Toxicity in sediments from the Rhode/South River system was not closely associated with contaminants measured in sediments. The upper South River had the most contaminated stations sampled in this study. Stations 51 and 52 had 21 and 19 ERL exceedances, respectively. The mean ERM-Qs for these stations were 0.303 and 0.266. Neither of these stations was classified as toxic in the bioassays. This lack of toxicity in the bioassays may have been due, in part, to physicochemical characteristics of the sediments. Both of these stations had very high levels of TOC and AVS (Appendix 1), and this may have reduced the bioavailability of organic and inorganic contaminants in the bioassays. The number of ERL exceedances in non-toxic sediments from this system ranged from zero to 21 while the number of exceedances in sediments from station P55, the only station classified as toxic, was nine. The Rhode/South system also showed evidence of non-point source inputs of pesticides especially atrazine (McConnell 2005).

The lower Mobjack Bay system was the least contaminated system in terms of sediment-associated contaminants. The number of ERL exceedances in sediments from this system ranged from zero to two and mean ERM-Qs ranged from 0.002 to 0.054. There was good agreement between the results from the bioassays and the level of measured contaminants in sediments. None of the sediments from this system were classified as toxic based on the bioassay results. Additionally, this system appeared to have the least input of nonpoint source pollutants based on the level of pesticides measured in surface water samples.

4.4 Benthic Community Characteristics

Key benthic characteristics — total faunal abundance, number of species, H' diversity (base 2 logs), and overall community condition expressed as the B-IBI — were compared among the various river segments for each of the five river systems (Table 7, Figure 6). Most benthic variables did not show large statistically significant differences (at $\alpha = 0.05$) among river segments from the same system, though there were a few notable exceptions (e.g., upper South River in comparison to the remaining two segments, and relative differences between the two lower Mobjack Bay segments). Also, in general there was a tendency for higher species numbers to occur in the more saline lower portions of the rivers. For example, there were significantly more species in lower Nanticoke River than in the corresponding upper and middle portions. Though not statistically significant, a similar pattern of lower numbers of species in the upper portions and highest numbers in the lower sections occurred in the Chester and Pocomoke Rivers as well. Such differences are probably due in large part to the naturally occurring pattern of increasing diversity with increasing salinity that is characteristic of the estuarine benthos (Boesch 1977).

Three of the five river areas —South River, Nanticoke River, and lower Mobjack Bay — showed evidence of degraded benthic assemblages in at least one segment (Table 7, Appendix 5). The upper South River appeared to be a particularly stressed system. Table 7 reveals a degraded benthos with significantly lower ($\alpha = 0.05$) densities, species richness, H' diversity, and B-IBI scores in this segment compared to the lower South and Rhode Rivers. The top dominant (most abundant) species (Table 8) was the classic opportunistic and pollution-tolerant polychaete *Streblospio benedicti* (Pearson and Rosenberg 1978). Also among the top-five dominants was another pollution-indicative polychaete *Marenzelleria viridis* (= *Scolecolepides viridis* in Pearson and Rosenberg 1978). Especially noteworthy signs of stress are the low scores for the benthic index, which was designed to account for variations related to the influence of natural environmental controlling factors such as salinity. Component Stations 51 and 52 had B-IBI scores of 1.7 and 1.5 respectively, both in the range indicative of impaired benthic condition (Appendix 5). Degraded benthic condition at these same two stations was accompanied by evidence of both organically enriched and chemically contaminated sediments. Concentrations of TOC in sediments at Stations 51 and 52 were 55.1 and 49.7 mg g^{-1} respectively (Appendix 1), both in the range (> 36 mg g^{-1}) indicative of conditions associated with a high risk of reduced benthic species richness (Hyland et al. 2005). Though there were no ERM exceedances, numerous chemical contaminants were found in excess of corresponding lower-threshold ERL sediment quality guidelines (from Long et al. 1995): 23 at Station 51 and 21 at Station 52 (Appendix 3). Mean ERM quotients also were high, 0.3117 and 0.2734 at Stations 51 and 52 respectively, both in a range associated with a high incidence of impaired benthic condition (>0.098, Hyland et al. 2003; see Section 3.2 above).

The Nanticoke River showed evidence of degraded benthic assemblages, especially in the lower segment and to a lesser degree in the middle and upper segments (Table 7). Three of the five stations in the lower river (27 through 29) were coded as degraded and one (26) was borderline between degraded and intermediate (Appendix 5). In the middle segment, there was one of five stations (25) coded as degraded and three (21, 23, and 24) coded as intermediate; and in the upper river, there was one of five stations (17) coded as degraded and two (19 and 20) coded as intermediate. Dominant fauna in the Nanticoke River (Table 8) included the pollution-indicative oligochaetae (all three segments), polychaete *Marenzelleria viridis* (middle and lower), and bivalve *Macoma balthica* (lower). The incidence of a degraded benthos among these stations did not appear to be strongly linked to the presence of chemical contaminants. Only one of the degraded benthic sites, Station 17 in the upper river, had a mean ERM-Q in the range (> 0.098) indicative of a high risk of impaired benthic condition (Appendix 3). This same station also had 12 contaminants at concentrations in excess of corresponding ERL sediment quality guidelines. All remaining stations in the Nanticoke River had low to moderate levels of chemical contaminants below the above expected bioeffect range. However, several of the above stations with intermediate to degraded benthic condition (19, 20, 21, 24, and 25) had relatively high levels of TOC in the range (> 36 mg g^{-1}) associated with a high risk of reduced benthic species richness.

Lower Mobjack Bay, particularly stations in the Poquosin and Back River tributaries, also showed evidence of a degraded benthos. B-IBI scores by segment averaged 2.1 in the Poquosin River/Lower Mobjack Bay segment and 2.8 in the Back River/Lower Mobjack Bay segment (Table 7). As part of the sampling design, the first segment consisted of four stations in the Poquosin River and one in Mobjack Bay proper, and the second segment consisted of three stations in the Back River and two in Mobjack Bay proper (Figure 2). All four of the stations in the Poquosin River portion of this first segment (Stations 41 through 44) and two of the three stations in the Back River portion of the second segment (48 and 49) had B-IBI scores in the degraded benthic range (Appendix 5). As for the upper South River, the top dominant in the Poquosin/lower bay segment was again the classic opportunistic/pollution-tolerant species *Streblospio benedicti* (Table 8). In fact, all top-five dominants for this area are listed as pollution-indicative species (Pearson and Rosenberg 1978). In comparison to these degraded sites, Stations 45, 46, and 47 in the more open waters of Mobjack Bay proper had healthy benthic assemblages with B-IBI scores of 3.4, 3.4, and 3.9 respectively (Appendix 5). The incidence of degraded benthic condition in the lower Mobjack Bay study area did not appear to be associated with chemical contamination or organic over-enrichment of sediments. Concentrations of both chemical contaminants and TOC were below expected bioeffect ranges at all of the above degraded benthic sites (Appendices 2 and 1, respectively).

The Pocomoke and Chester Rivers in general appeared to have a lower incidence of degraded benthic condition, with the exception of some signs of intermediate stress in the middle and lower Chester River (Table 7). All three segments of the Pocomoke River had relatively high mean B-IBI scores. There were no individual stations coded as degraded and only three stations (31and 33 in the upper river, and 34 in the middle segment) had B-IBI scores in the intermediate range (Appendix 5). The non-degraded condition of benthic assemblages throughout most stations in the Pocomoke River was accompanied by relatively low to moderate levels of sediment contaminants and organic matter, with the exception of two sites (Stations 31 and 34) which had mean ERM quotients and TOC levels both within expected bioeffect ranges (Appendices 2 and 1). The TOC concentration at Station 31 in the upper Pocomoke River, in fact, was 123 mg g^{-1}, higher than any other station among the five river systems.

The upper segment of the Chester River was characterized largely as non-degraded with a mean B-IBI score of 3.8 (Table 7). Four of the five stations in this segment (Stations 1 thru 4) were coded as non-degraded and one (Station 5) was coded as intermediate (Appendix 5). In comparison, the average index scores within the middle and lower segments of the river were lower (i.e., 3.3 and 3.4, respectively). Two of the five stations in the middle segment (Stations 6 and 7) had intermediate condition and one (Station 10) had degraded condition. One station (15) in the lower segment had degraded condition while all others were rated as non-degraded. All but one of the above sites with either intermediate or degraded benthic condition (i.e., Station 15) had no chemical contaminants or TOC within upper bioeffect ranges (Appendices 2 and 1). Degraded condition at Station 15 was accompanied by a relatively high mean ERM-Q of 0.098, just below the range (> 0.098) indicative of a high risk of impaired benthic condition (Hyland et al. 2003). As noted above, Station 15 also was the only site in the study where low DO (< 2 mg L^{-1}) was recorded, which could have contributed to the degraded benthic condition at this site as well. Dauer et al. (2002) provide a multivariate diagnostic tool, derived from linear discriminant analysis, for distinguishing between low DO and chemical contaminantion as sources of degraded benthic condition in samples from Chesapeake Bay. Application of their bay-wide discriminant function to the present data from Station 15, resulted in a discriminant score of 36.1905, in excess of the cutoff value of 0.2411, implicating low DO as the stronger controlling factor affecting benthic condition at this site. High TOC (in excess of 36 mg g^{-1}, Hyland et al. 2005) was found at three stations in the Chester River (1, 4, and 5) but not in association with clearly degraded benthic condition (though Station 5 had intermediate condition).

5. Discussion

Sediment quality was evaluated using the SQT which utilizes a weight of the evidence approach to assess estuarine condition. In this study, sediment contamination, sediment toxicity and condition of ambient fauna were measured synoptically to allow for such a characterization of the five river systems. The results of the three legs of the SQT are provided in Table 9. Overall, results of the IBI (benthic condition) and ERM exceedance criteria (sediment chemical contamination) were in agreement for 58% of the stations sampled while the IBI and toxicity assessments agreed for 55% of the stations. The toxicity assessments and ERM exceedance criteria were in agreement for 62% of the stations and all three legs of the triad were in agreement for 38% of the stations.

The overall characterization of sediment quality for the five river systems is depicted in Table 10 and Figure 7. Stations were assigned to one of four categories based on the three legs of the SQT. Green stations were those with no hits for any of the three legs of the triad; stations with one hit coded yellow; orange stations had hits on two legs of the triad; and red stations had hits for all three legs. The percent area represented by stations within each of these categories was calculated based on areas derived from the 2003 Chesapeake Bay Program Analytical Segmentation Scheme, modified as described in the Methods section of this report (i.e., the length of segments was altered to obtain at least two, but usually three, segments within each system so that the segments were of approximately equal length with respect to the longitudinal axis of the system). For each system, the percent area represented by stations meeting a given criterion (no hits, one hit, two hits, or hits in all three legs of the SQT) was calculated as the proportion of stations meeting the criterion in a segment (stratum), weighted by the area of that stratum divided by the total area of all strata in the system, and summed across strata in that system (as per Equation (3) in the Methods section). Figure 7 provides a geographical comparison of the percent area represented by stations within each of the categories, and Table 10 lists the corresponding % area values and number of stations in each category.

In the Chester River, 51.6% of the total area coded green, 38.0% coded yellow, 10.3% coded orange, and none of the area was coded red. Stations coding yellow in this system generally had sediments that produced toxicity, but did not have degraded benthos or evidence of elevated levels of sediment contamination. Stations coding orange generally had toxic sediments and a degraded benthos, but no elevation of sediment contamination (with one exception, Station 15). One possible explanation for the toxicity and/or degraded benthos without evidence of elevated contaminant levels in sediments could be the presence of unmeasured contaminants transported to the system in nonpoint source runoff. An additional explanation for the increased toxicity in the bioassays may have been related to physicochemical characteristics of the sediments. Most of the stations that produced toxicity in the bioassays were from the upper and middle sections of the river and were characterized by stations with low pH and salinity. Overall, in the Chester River, evidence of high sediment quality, with healthy benthic assemblages and no significant toxicity or chemical contamination, was observed in over half (52%) of the area, while matching evidence of degraded condition based on co-occurring hits in two or more legs of the SQT was found in a small portion (10%) of the river.

In the Nanticoke River, only 18.2% of the area coded green, 54.7% coded yellow, 27.0% coded orange, and none of the area coded red. Yellow stations were those that had either degraded benthos or toxic sediments with no linkage to high levels of measured contaminants. As noted earlier, adverse exposure conditions associated with high TOC may have contributed to degraded benthic condition at several of these sites.

The Pocomoke River had 97.5% of the area coded green, 1.5% coded yellow, and 1% coded red. Thus, high sediment quality was more spatially extensive in this system than in any of the other rivers surveyed. One station (P31) in the upper section and one station (P34) in the middle section had hits for all three legs of the triad, but the corresponding area was limited to only 1%. None of the stations in the lower section of the Pocomoke had hits on any of the legs of the SQT.

The Rhode/South system had the highest levels of sediment-associated contaminants of any of the five river systems sampled. It also had the highest percent area coding red (11.4%), revealing strong evidence of contaminant-induced degradation of the benthos. The stations coding orange in this system were generally those with hits for benthic degradation and exceedances of contaminant bioeffect thresholds. There was a much lower incidence of toxicity. The high levels of both TOC and AVS in the sediments at many of the sites in the Rhode/South system may have reduced the bioavailability of organic and inorganic contaminants and thus reduced the toxicity of the sediments in the bioassays. Also, as noted earlier, organic enrichment of sediments, as evidenced by high TOC in excess of associated bioeffects thresholds, may have contributed to degraded benthic condition at several of the sites.

The Lower Mobjack Bay system was the least contaminated of the five systems studied based on the levels of contaminants measured in sediments. In this system, 41.6% of the area coded green and 58.4% coded yellow. None of the stations sampled were coded as either orange or red. All of the hits in this system were associated with degraded benthos in the absence of exceedances of contaminant thresholds or bioassay toxicity. There were also no co-occurrences of a degraded benthos and either high TOC or low DO. Thus, there was no connection between measures of adverse biological and exposure conditions. Possible explanations include: (1) benthic impacts were due to unmeasured chronic stressors and the short-term bioassays were less sensitive to such stressors; (2) benthic impacts were caused by other natural disturbances (e.g. storm scour, erosional effects; or (3) some variability and uncertainty in the predictive ability or classification efficiency of the B-IBI. Regardless of the cause, sites where degraded benthos occurred were in the Poquosin and Back River tributaries of this system, while stations in the more open waters of Mobjack Bay proper had healthy benthic assemblages.

A comparison of the systems sampled in this study indicates that only two of the systems had any stations coding red with hits on all three legs of the SQT. In the Rhode/South system this represented 11.4% of the total area while in the Pocomoke such highly degraded stations represented only 1% of the total area. All of the river systems had > 65% of the area with sediment quality coding as either high (green) or moderately good (yellow). The Chester, Nanticoke, and Lower Mobjack Bay systems had the least evidence of sediment-associated contaminants with only one station in the first two systems and no stations in Lower Mobjack Bay having contaminant levels that exceeded the defined contaminant bioeffect thresholds. In the Chester River particularly, however, there was evidence of non-point source inputs of pesticides. Many of the stations in Rhode/South system had relatively high levels of sediment-associated organic and inorganic contamination. Although ERM exceedances were rare, many of the stations had a large number of ERL exceedances. Of the systems sampled, the Pocomoke River had by far the largest proportion of estuarine area with high sediment quality.

The results of this study highlight the importance of using multiple indicators and a weight of evidence approach to characterize environmental/sediment quality and the potential bioeffects of toxic contaminants. The potential for sediment-associated contaminants to cause toxicity is greatly affected by physicochemical factors that can alter bioavailability; thus an assessment should not be based on contaminant levels alone. Laboratory sediment bioassays are sensitive to a variety of factors including the physicochemical characteristics of the sediments. Additionally, bioassays are generally of relatively short duration and may be less sensitive to long-term chronic effects reflected in the benthos. Benthic indicators can be affected by a variety of unmeasured stressors and non-contaminant environmental factors. Thus, the assessment approach used in this study assigned equal weights to each of three indicators and scored each station and river system based on a weight of evidence approach.

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Table 1. List of target analytes, environmental levels of concern and MDLs for sediment contaminants.

Analyte	Units	ERL/ERM	Maximum MDL	Analyte	Units	ERL/ERM	Maximum MDL
METALS							
Aluminum	%		0.089	Manganese	µg/g dry		49.190
Antimony	µg/g dry		0.807	Mercury	µg/g dry	0.15 / 0.71	0.009
Arsenic	µg/g dry	8.2 / 70	0.939	Nickel	µg/g dry	20.9 / 51.6	1.139
Cadmium	µg/g dry	1.2 / 9.6	0.095	Selenium	µg/g dry		0.165
Chromium	µg/g dry	81 / 370	1.649	Silver	µg/g dry	1 / 3.7	0.278
Copper	µg/g dry	34 / 270	6.465	Tin	µg/g dry		0.145
Iron	%		0.524	Zinc	µg/g dry	150 / 410	16.510
Lead	µg/g dry	46.7 / 218	0.522				
PESTICIDES							
2,4'-DDD	ng/g dry		2.189	Endosulfan I	ng/g dry		0.880
2,4'-DDE	ng/g dry		0.547	Endosulfan II	ng/g dry		1.812
2,4'-DDT	ng/g dry		2.470	Endosulfan Sulfate	ng/g dry		2.640
4,4'-DDD	ng/g dry		1.841	Gamma-HCH (g-BHC, lindane)	ng/g dry		0.606
4,4'-DDE	ng/g dry	2.2 / 27	1.827	Heptachlor	ng/g dry		1.427
4,4'-DDT	ng/g dry		5.487	Heptachlor epoxide	ng/g dry		4.067
Aldrin	ng/g dry		3.668	Hexachlorobenzene	ng/g dry		1.486
Chlorpyrifos	ng/g dry		0.311	Mirex	ng/g dry		1.235
Cis-chlordane (alpha-chlordane)	ng/g dry		9.703	Trans-nonachlor	ng/g dry		9.947
Dieldrin	ng/g dry		0.806	TOTAL DDTs	ng/g dry	1.58 / 46.1	
PCBs							
PCB 103	ng/g dry		1.028	PCB 193	ng/g dry		1.331
PCB 104	ng/g dry		0.887	PCB 194	ng/g dry		0.606
PCB 105	ng/g dry		0.976	PCB 195	ng/g dry		1.767
PCB 106/118	ng/g dry		3.372	PCB 2	ng/g dry		1.013
PCB 107/108	ng/g dry		1.893	PCB 20	ng/g dry		0.932
PCB 110	ng/g dry		1.368	PCB 200/201	ng/g dry		0.813
PCB 114	ng/g dry		1.605	PCB 202	ng/g dry		0.799
PCB 119	ng/g dry		1.627	PCB 207	ng/g dry		2.056

Table 1. (continued)

Analyte	Units	ERL/ERM	Maximum MDL	Analyte	Units	ERL/ERM	Maximum MDL
PCB 12	ng/g dry		1.316	PCB 209	ng/g dry		0.806
PCB 123	ng/g dry		6.441	PCB 26	ng/g dry		0.873
PCB 126	ng/g dry		1.139	PCB 28	ng/g dry		2.662
PCB 128/167	ng/g dry		0.666	PCB 29	ng/g dry		1.560
PCB 130	ng/g dry		1.213	PCB 3	ng/g dry		0.688
PCB 132/168	ng/g dry		1.117	PCB 31	ng/g dry		2.263
PCB 138/163/164	ng/g dry		0.621	PCB 37	ng/g dry		1.279
PCB 141	ng/g dry		0.873	PCB 44	ng/g dry		0.806
PCB 146	ng/g dry		3.291	PCB 45	ng/g dry		1.605
PCB 149	ng/g dry		2.219	PCB 48	ng/g dry		0.747
PCB 15	ng/g dry		1.146	PCB 5/8	ng/g dry		2.551
PCB 151	ng/g dry		1.050	PCB 50	ng/g dry		1.464
PCB 153	ng/g dry		2.744	PCB 56/60	ng/g dry		1.501
PCB 154	ng/g dry		0.976	PCB 61/74	ng/g dry		1.982
PCB 156	ng/g dry		0.836	PCB 63	ng/g dry		1.516
PCB 157	ng/g dry		0.762	PCB 66	ng/g dry		1.494
PCB 158	ng/g dry		1.272	PCB 69	ng/g dry		2.588
PCB 159	ng/g dry		0.629	PCB 70	ng/g dry		3.062
PCB 169	ng/g dry		0.828	PCB 76	ng/g dry		2.034
PCB 170/190	ng/g dry		0.976	PCB 77	ng/g dry		1.087
PCB 172	ng/g dry		0.902	PCB 81	ng/g dry		1.309
PCB 174	ng/g dry		1.072	PCB 82	ng/g dry		1.494
PCB 177	ng/g dry		1.176	PCB 84	ng/g dry		2.381
PCB 18	ng/g dry		2.936	PCB 87/115	ng/g dry		1.413
PCB 180	ng/g dry		0.799	PCB 88	ng/g dry		1.523
PCB 183	ng/g dry		1.035	PCB 89/90/101	ng/g dry		1.095
PCB 184	ng/g dry		0.710	PCB 9	ng/g dry		2.803
PCB 187	ng/g dry		0.599	PCB 92	ng/g dry		0.932
PCB 188	ng/g dry		0.643	PCB 95	ng/g dry		0.710
PCB 189	ng/g dry		0.895	PCB 99	ng/g dry		1.265
TOTAL PCBs	ng/g dry	22.7 / 180					
PAHs							
Napthalene	ng/g dry	160 / 2100	1.645	flouranthene	ng/g dry	600 / 5100	1.140

Table 1. (continued)

Analyte	Units	ERL/ERM	Maximum MDL	Analyte	Units	ERL/ERM	Maximum MDL
2-Methylnapthalene	ng/g dry	70 / 670	2.303	pyrene	ng/g dry	665 / 2600	0.840
1_Methylnapthalene	ng/g dry		1.776	benz(a)anthracene	ng/g dry	261 / 1600	2.667
Biphenyl	ng/g dry		1.711	chrysene+triphenylene	ng/g dry	384 / 2800 (chrysene)	2.762
2,6-dimethylnaphthalene	ng/g dry		0.820	benzo(b)flouranthene	ng/g dry		1.930
acenaphthylene	ng/g dry	44 / 640	0.820	benzo(j+k)flouranthene	ng/g dry		1.530
acenaphthene	ng/g dry	16 / 500	1.040	benzo(e)pyrene	ng/g dry		1.880
1,6,7-trimethylnaphthalene	ng/g dry		1.020	benzo(a)pyrene	ng/g dry	430 / 1600	3.230
flourene	ng/g dry		0.680	perylene	ng/g dry		2.752
dibenzothiophene	ng/g dry		1.337	indeno(1,2,3-cd)pyrene	ng/g dry		6.650
phenanthrene	ng/g dry	240 / 1500	3.125	dibenz(a,h)anthracene	ng/g dry	63.4 / 260	3.667
anthracene	ng/g dry	85.3 / 1100	0.500	benzo(g,h,i)perylene	ng/g dry		5.564
1-methylphenanthrene	ng/g dry		1.337	High MW PAHs	ng/g dry	1700 / 9600	
Low MW PAHs	ng/g dry	552 / 3160		Total PAHs	ng/g dry	4022 / 44792	
PBDEs							
PBDE 100	ng/g dry		0.865	PBDE 28	ng/g dry		1.102
PBDE 138	ng/g dry		2.588	PBDE 47	ng/g dry		0.991
PBDE 153	ng/g dry		0.828	PBDE 66	ng/g dry		0.932
PBDE 154	ng/g dry		4.763	PBDE 71	ng/g dry		0.976
PBDE 17	ng/g dry		0.740	PBDE 85	ng/g dry		5.095
PBDE 183	ng/g dry		1.228	PBDE 99	ng/g dry		0.932
PBDE 190	ng/g dry		5.110				

Table 2. B-IBI ranges used to classify benthic samples within various habitat types in Chesapeake Bay. Modified from Llanso et al. (2003, Alden et al. 2002).

Habitat[a]	Benthic Condition Category		
	Degraded	Intermediate/ Indeterminate	Non Degraded
Tidal Freshwater	<2.5	2.5-3.5	>3.5
Oligohaline	<2.5	2.5-3.7	>3.7
Low mesohaline	<3.0	3.0-3.4	>3.4
High mesohaline sand	<2.7	2.7-3.0	>3.0
High mesohaline mud	<2.2	2.2-2.5	>2.5
Polyhaline sand	<1.8	1.8-3.7	>3.7
Polyhaline mud	<2.3	2.3-3.0	>3.0

[a]Habitat designations are based on the following ranges (from Weisberg et al. 1997). Salinity (ppt): Tidal freshwater = 0-0.5, oligohaline = 0.5-5, low mesohaline = 5-12, high mesohaline = 12-18, polyhaline = >18. Silt-clay content of sediment (%): Sand = 0-40, mud = >40.

Table 3. Summary of contaminant concentrations by river system segment.

River	Segment	Stations		Total PAH ng/g dry	Total PBDE ng/g dry	Total PCB ng/g dry	Total DDT ng/g dry	Total Pesticide ng/g dry	Total Metals ug/g dry
Chester	*Total*	*1-15*	*average*	*784*	*0*	*1.56*	*1.152*	*1.281*	*2382*
			range	*175-1798*	*ND*	*ND-5.84*	*ND-4.97*	*ND-5.61*	*126.0-6821.7*
	Upper	1-5	average	786	0	2.92	2.05	2.18	1627
			range	270-1242	ND	0.57-5.84	ND-4.97	ND-5.61	126.0-3796.1
	Middle	6-10	average	689	0	0.51	0.52	0.74	3825
			range	175-1400	ND	ND-2.10	ND-1.76	ND-1.76	967.9-6821.7
	Lower	11-15	average	877	0	1.27	0.89	0.92	1695
			range	235-1797	ND	0.25-2.88	ND-2.17	ND-2.17	1065.2-3109.4
Nanticoke	*Total*	*16-30*	*average*	*1036*	*0*	*2.64*	*2.30*	*2.96*	*731*
			range	*84.5-5763*	*ND*	*ND-24.47*	*ND-11.36*	*ND-13.86*	*169.0-1224.4*
	Upper	16-20	average	2206	0	6.22	5.21	6.39	840
			range	709-5763	ND	0.65-24.47	2.07-11.36	2.47-13.86	425.5-1109.9
	Middle	21-25	average	654	0	0.31	1.22	1.71	938
			range	85-1098	ND	ND-0.84	ND-3.24	ND-4.41	218.4-1224.4
	Lower	26-30	average	248	0	1.38	0.46	0.79	414
			range	121-337	ND	ND-3.52	ND-0.88	ND-2.50	169.0-696.7
Pocomoke	*Total*	*31-40*	*average*	*890*	*0*	*0.63*	*2.37*	*2.56*	*346*
			range	*61.1-3451*	*ND*	*ND-3.48*	*ND-12.63*	*ND-14.50*	*84.77-796.0*
	Upper	31-33	average	1408	0	0.48	5.96	6.58	348
			range	345-3451	ND	ND-1.07	0.45-12.63	0.449-14.50	88.84-796.0
	Middle	34-36	average	1367	0	0.47	1.96	1.96	381
			range	231-3402	ND	ND-1.24	ND-5.87	ND-5.87	205.4-622.2
	Lower	37-40	average	145	0	0.87	0.00	0.00	318
			range	91.1-227	ND	ND-3.48	ND	ND	84.77-513.7
Lower Mobjack; Back and Poquoson	*Total*	*41-50*	*average*	*238*	*0*	*1.67*	*0.37*	*0.37*	*219*
			range	*8.75-727*	*ND*	*ND-8.47*	*ND-2.68*	*ND-2.68*	*23.09-434.7*
	Poquosin/L. Bay	41-45	average	309	0	2.01	0.00	0.00	278
			range	15.9-727	ND	ND-8.47	ND	ND	65.28-434.7
	Back/L. Bay	46-50	average	167	0	1.33	0.73	0.73	160
			range	8.75-334	0	ND-6.35	ND-2.68	ND-2.68	23.09-376.7
Rhode and South	*Total*	*51-60*	*average*	*2734*	*0*	*10.57*	*2.74*	*3.43*	*2165*
			range	*106-7523*	*ND*	*2.10-32.54*	*ND-9.07*	*ND-11.496*	*121.6-7243.7*
	U. South	51-53	average	4704	0	19.67	5.63	6.86	1121
			range	106-7523	ND	2.10-32.54	ND-9.07	ND-11.496	164.5-1605.3
	L. South	54-57	average	2723	0	6.50	1.90	2.23	4141
			range	1249-6518	ND	2.78-10.63	1.32-2.55	1.32-3.185	1475.5-7243.7
	L. Rhode	58-60	average	777	0	6.89	0.97	1.63	574
			range	111-1602	ND	2.48-15.31	ND-2.33	0.587-3.337	121.6-820.4

Table 4. Summary of Clam, Amphipod, and Overall Toxicity Assessments

River	River Segment	Station	10-Day Clam Bioassay Assessment	28-Day Amphipod Bioassay Assessment	Overall Toxicity Assessment
Chester	Upper	P01	toxic	non-toxic	non-toxic
Chester	Upper	P02	toxic	toxic	toxic
Chester	Upper	P03	toxic	toxic	toxic
Chester	Upper	P04	toxic	toxic	toxic
Chester	Upper	P05	toxic	toxic	toxic
Chester	Mid	P06	toxic	toxic	toxic
Chester	Mid	P07	toxic	toxic	toxic
Chester	Mid	A08	non-toxic	toxic	non-toxic
Chester	Mid	A09	toxic	toxic	toxic
Chester	Mid	P10	toxic	toxic	toxic
Chester	Lower	P11	toxic	toxic	toxic
Chester	Lower	P12	non-toxic	non-toxic	non-toxic
Chester	Lower	P13	toxic	non-toxic	non-toxic
Chester	Lower	P14	non-toxic	non-toxic	non-toxic
Chester	Lower	P15	non-toxic	non-toxic	non-toxic
Nanticoke	Upper	P16	toxic	toxic	toxic
Nanticoke	Upper	P17	toxic	non-toxic	non-toxic
Nanticoke	Upper	P18	toxic	toxic	toxic
Nanticoke	Upper	P19	toxic	non-toxic	non-toxic
Nanticoke	Upper	P20	toxic	non-toxic	non-toxic
Nanticoke	Mid	P21	toxic	toxic	toxic
Nanticoke	Mid	P22	toxic	non-toxic	non-toxic
Nanticoke	Mid	P23	toxic	toxic	toxic
Nanticoke	Mid	P24	toxic	non-toxic	non-toxic
Nanticoke	Mid	P25	toxic	toxic	toxic
Nanticoke	Lower	P26	toxic	non-toxic	non-toxic

Table 4. (continued)

River	River Segment	Station	10-Day Clam Bioassay Assessment	28-Day Amphipod Bioassay Assessment	Overall Toxicity Assessment
Nanticoke	Lower	P27	toxic	non-toxic	non-toxic
Nanticoke	Lower	P28	toxic	toxic	toxic
Nanticoke	Lower	P29	toxic	non-toxic	non-toxic
Nanticoke	Lower	P30	non-toxic	non-toxic	non-toxic
Pocomoke	Upper	P31	toxic	toxic	toxic
Pocomoke	Upper	P32	toxic	toxic	toxic
Pocomoke	Upper	P33	toxic	non-toxic	non-toxic
Pocomoke	Mid	P34	toxic	toxic	toxic
Pocomoke	Mid	P35	toxic	non-toxic	non-toxic
Pocomoke	Mid	P36	toxic	toxic	toxic
Pocomoke	Lower	P37	non-toxic	non-toxic	non-toxic
Pocomoke	Lower	P38	non-toxic	toxic	non-toxic
Pocomoke	Lower	P39	non-toxic	non-toxic	non-toxic
Pocomoke	Lower	P40	non-toxic	non-toxic	non-toxic
Rhode/South	U. South	P51	non-toxic	non-toxic	non-toxic
Rhode/South	U. South	P52	non-toxic	non-toxic	non-toxic
Rhode/South	U. South	P53	non-toxic	non-toxic	non-toxic
Rhode/South	L. South	P54	non-toxic	toxic	non-toxic
Rhode/South	L. South	P55	toxic	toxic	toxic
Rhode/South	L. South	P56	non-toxic	non-toxic	non-toxic
Rhode/South	L. South	P57	toxic	non-toxic	non-toxic
Rhode/South	L. Rhode	P58	non-toxic	non-toxic	non-toxic
Rhode/South	L. South	P59	non-toxic	non-toxic	non-toxic
Rhode/South	L. South	P60	non-toxic	non-toxic	non-toxic
L. Mobjack Bay	Poquosin/L. Bay	P41	non-toxic	non-toxic	non-toxic
L. Mobjack Bay	Poquosin/L. Bay	P42	non-toxic	non-toxic	non-toxic
L. Mobjack Bay	Poquosin/L. Bay	P43	toxic	non-toxic	non-toxic

Table 4. (continued)

River	River Segment	Station	10-Day Clam Bioassay Assessment	28-Day Amphipod Bioassay Assessment	Overall Toxicity Assessment
L. Mobjack Bay	Poquosin/L. Bay	P44	non-toxic	non-toxic	non-toxic
L. Mobjack Bay	Poquosin/L. Bay	P45	non-toxic	non-toxic	non-toxic
L. Mobjack Bay	Back/L. Bay	P46	non-toxic	non-toxic	non-toxic
L. Mobjack Bay	Back/L. Bay	P47	non-toxic	toxic	non-toxic
L. Mobjack Bay	Back/L. Bay	P48	non-toxic	non-toxic	non-toxic
L. Mobjack Bay	Back/L. Bay	P49	non-toxic	non-toxic	non-toxic
L. Mobjack Bay	Back/L. Bay	P50	non-toxic	non-toxic	non-toxic

Table 5. Analysis of the relationship between physicochemical water quality factors and juvenile clam survival.

Model r^2 =	0.7177
Adjusted r^2 =	0.6972
Model p-value =	<0.0001
Prediction Equation	$\hat{y} = 13.6 - 12.7(Log\_Temp) + 4.8(Log\_pH) - 0.5(Log\_F\_TOC) + 0.7(Log\_F\_Pore\_Salinity)$

Variable	Coefficient (β)	Partial r^2	F Value	p-value
intercept	13.59649			
Log_pH [lab]	4.83080	0.6407	94.57	<0.0001
Log_F_Pore_Salinity [field]	0.71331	0.0546	9.28	0.0035
Log_Temp [lab]	-12.66890	0.0073	5.01	0.0293
Log_F_TOC [field]	-0.51549	0.0152	3.48	0.0674

Table 6. Analysis of the relationship between physicochemical water quality factors and amphipod survival.

Model r^2 =	0.4866
Adjusted r^2 =	0.4591
Model p-value =	<0.0001
Prediction Equation	$\hat{y} = -17.4 + 13.2(Log\_pH) + 5.6(Log\_salinity) - 1.3(Log\_F\_DO)$

Variable	Coefficient (β)	Partial r^2	F Value	p-value
intercept	-17.40426			
Log_pH [lab]	13.19463	0.3039	25.33	<0.0001
Log_salinity [lab]	5.85603	0.1029	9.90	0.0026
Log_F_DO [Field]	-1.32469	0.0796	8.68	0.0047

Table 7. Comparison of benthic abundances, # species, H' diversity (base 2 logs), and benthic index (B-IBI, Weisberg et al. 1997, Llanso et al. 2002) by river segment for each of the five Chesapeake Bay river systems.

	River Segment Means ($\bar{x}$)			ANOVA Results			
A. Chester	**Upper (U)**	**Mid (M)**	**Lower (L)**	**F**	**df**	**Pr>F[a]**	**Sig. Diff[b]**
Abundance (# m^{-2})	1,401	2,601	4,473	2.29	2,42	0.11	U M L
# species (per grab)	8	10	10	1.25	2,42	0.30	U L M
H' (per grab)	2.1	2.2	2.3	0.70	2,42	0.50	U M L
B-IBI	3.8	3.3	3.4	1.43	2,42	0.25	M L U
B. Nanticoke	**Upper (U)**	**Mid (M)**	**Lower (L)**	**F**	**df**	**Pr>F[a]**	**Sig. Diff[b]**
Abundance (# m^{-2})	2,270	8,698	3,897	9.41	2,42	<0.01	U L M
# species (per grab)	6	5	8	5.17	2,42	0.01	M U L
H' (per grab)	1.6	1.2	1.7	2.08	2,42	0.14	M U L
B-IBI	3.2	3.2	2.9	0.60	2,42	0.55	L M U

Table 7 (continued).

	River	Segment ($\bar{x}$)	Means	ANOVA	Results		
C. Pocomoke	**Upper (U)**	**Mid (M)**	**Lower (L)**	**F**	**df**	**Pr>F[a]**	**Sig. Diff[b]**
Abundance (# m^{-2})	1,636	2,222	1,602	0.70	2,26	0.51	L U M
# species (per grab)	8	7	12	3.37	2,26	0.05	M U L
H' (per grab)	2.3	1.9	2.7	2.67	2,26	0.09	M U L
B-IBI	3.9	4.2	3.6	1.24	2,26	0.31	L U M
D. Rhode/South	**U. South (US)**	**L. South (LS)**	**L. Rhode (LR)**	**F**	**df**	**Pr>F[a]**	**Sig. Diff[b]**
Abundance (# m^{-2})	1,336	2,462	2,755	6.69	2,27	<0.01	US LS LR
# species (per grab)	5	8	9	9.75	2,27	<0.01	US LS LR
H' (per grab)	1.3	2.1	2.2	9.23	2,27	<0.01	US LS LR
B-IBI	2.4	3.5	3.8	6.36	2,27	<0.01	US LS LR

Table 7 (continued).

	River	Segment Mean ($\bar{x}$)	ANOVA Results			
E. Lower Mobjack Bay	Poquosin/ L. Bay (P/LMB)	Back/ L. Bay (B/LMB)	t	df	Pr > | t |[c]	Sig. Diff[b]
Abundance (# m^{-2})	2,041	985	3.95	28	<0.01	***
# species (per grab)	11	12	-1.34	28	0.19	
H' (per grab)	2.0	2.8	-3.04	28	<0.01	***
B-IBI	2.1	2.8	-2.13	28	0.04	***

Footnotes

a. F-test based on corresponding degrees of freedom

b. Means connected by bars are not significantly different at α = 0.05, based on Tukey's HSD test

c. t-test

d. *** indicates significantly different at α = 0.05

Table 8. Comparison of dominant infaunal species (5 most abundant in decreasing order) by river segment for each of the five river systems. A=Amphipoda, B=Bivalvia, In=Insecta, Is=Isopoda, O=Oligochaeta, Ph=Phoronida, P=Polychaeta.

River System	Taxon	Mean No. Individuals m^{-2}	Cumulative %	% Stations Where Found
Upper Chester	Tubificidae (O)	421.2	30.1	100.0
	Leptocheirus plumulosus (A)	203.0	44.5	60.0
	Coelotanypus (In)	171.2	56.8	100.0
	Limnodrilus hoffmeisteri (O)	156.1	67.9	80.0
	Rangia cuneata (B)	77.3	73.4	80.0
Middle Chester	*Rangia cuneata (B)*	609.1	23.4	100.0
	Marenzelleria viridis (P)	574.2	45.5	100.0
	Cyathura polita (Is)	284.8	56.4	100.0
	Tubificidae (O)	283.3	67.3	100.0
	Marenzelleria (P)	168.2	73.8	80.0
Lower Chester	*Leptocheirus plumulosus (A)*	833.3	18.6	100.0
	Macoma balthica (B)	740.9	35.2	80.0
	Marenzelleria viridis (P)	651.5	49.8	80.0
	Heteromastus filiformis (P)	548.5	62.0	60.0
	Rangia cuneata (B)	397.0	70.9	80.0
Upper Nanticoke	Tubificidae (O)	1380.3	60.8	100.0
	Leptocheirus plumulosus (A)	339.4	75.8	60.0
	Limnodrilus hoffmeisteri (O)	222.7	85.6	100.0
	Corbicula fluminea (B)	118.2	90.8	60.0
	Coelotanypus (In)	54.5	93.2	100.0
Middle Nanticoke	*Marenzelleria viridis (P)*	4389.4	50.5	100.0
	Leptocheirus plumulosus (A)	2498.5	79.2	80.0
	Marenzelleria (P)	919.7	89.8	80.0
	Cyathura polita (Is)	386.4	94.2	100.0
	Tubificidae (O)	262.1	97.2	100.0
Lower Nanticoke	*Marenzelleria viridis (P)*	1380.3	35.4	80.0
	Tubificidae (O)	1368.2	70.5	100.0
	Cyathura polita (Is)	530.3	84.1	100.0
	Macoma balthica (B)	134.8	87.6	60.0
	Rangia cuneata (B)	87.9	89.9	100.0

Table 8 (continued).

River System	Taxon	Mean No. Individuals m^{-2}	Cumulative %	% Stations Where Found
Upper Pocomoke	Tubificidae (O)	843.4	51.5	100.0
	Corbicula fluminea (B)	214.6	64.7	100.0
	Pisidiidae (B)	143.9	73.5	100.0
	Cladotanytarsus (In)	85.9	78.7	66.7
	Limnodrilus hoffmeisteri (O)	60.6	82.4	100.0
Middle Pocomoke	*Marenzelleria viridis (P)*	646.5	32.7	66.7
	Tubificidae (O)	487.4	57.4	100.0
	Leptocheirus plumulosus (A)	419.2	78.6	100.0
	Cyathura polita (Is)	229.8	90.3	66.7
	Polydora socialis (P)	53.0	93.0	66.7
Lower Pocomoke	*Polydora cornuta (P)*	411.0	25.7	25.0
	Neanthes succinea (P)	197.0	37.9	100.0
	Glycinde solitaria (P)	168.6	48.5	100.0
	Mediomastus ambiseta (P)	143.9	57.4	75.0
	Tellina (B)	113.6	64.5	75.0
Upper South	*Streblospio benedicti (P)*	565.7	42.3	66.7
	Tellina agilis (B)	290.4	64.1	33.3
	Marenzelleria viridis (P)	174.2	77.1	33.3
	Cyathura polita (Is)	55.6	81.3	33.3
	Anthozoa	48.0	84.9	33.3
Lower South	*Leptocheirus plumulosus (A)*	929.9	37.8	100.0
	Heteromastus filiformis (P)	751.9	68.3	100.0
	Neanthes succinea (P)	265.2	79.1	100.0
	Tubificidae (O)	157.2	85.5	100.0
	Macoma balthica (B)	121.2	90.4	100.0
Lower Rhode	*Marenzelleria viridis (P)*	618.7	22.5	100.0
	Leptocheirus plumulosus (A)	593.4	44.0	100.0
	Heteromastus filiformis (P)	558.1	64.3	100.0
	Cyathura polita (Is)	272.7	74.2	100.0
	Neanthes succinea (P)	234.8	82.7	66.7

Table 8 (continued).

River System	Taxon	Mean No. Individuals m^{-2}	Cumulative %	% Stations Where Found
Poquosin/L. Mobjack	*Streblospio benedicti (P)*	768.2	37.6	100.0
	Paraprionospio pinnata (P)	430.3	58.7	100.0
	Mediomastus ambiseta (P)	422.7	79.4	100.0
	Glycinde solitaria (P)	47.0	81.7	100.0
	Tubificidae (O)	34.8	83.4	40.0
Back/L. Mobjack	*Paraprionospio pinnata (P)*	201.5	20.5	80.0
	Paraonis fulgens (P)	107.6	31.4	20.0
	Gemma gemma (B)	106.1	42.2	40.0
	Glycinde solitaria (P)	69.7	49.2	100.0
	Phoronis (Ph)	66.7	56.0	80.0

Table 9. Summary by station of sediment quality triad results.

River System	Segment	Station	Hit		
			B-IBI*	Contaminants*	Toxicity*
Chester River	1	P01			
		P02			+
		P03			+
		P04			+
		P05	+		+
	2	P06	+		+
		P07	+		+
		A08			
		A09			+
		P10	+		+
	3	P11			+
		P12			
		P13			
		P14			
		P15	+		
Nanticoke River	1	P16			+
		P17	+	+	
		P18			+
		P19	+		
		P20	+		
	2	P21	+		+
		P22			
		P23	+		+
		P24	+		
		P25	+		+
	3	P26	+		
		P27	+		
		P28	+		+
		P29	+		
		P30			
Pocomoke River	1	P31	+	+	+
		P32			+
		P33	+		
	2	P34	+	+	+
		P35			
		P36			+
	3	P37			
		A38			
		P39			
		P40			

Table 9 (continued).

River System	Segment	Station	Hit		
			B-IBI*	Contaminants*	Toxicity*
Rhode/South River	1	P51	+	+	
		P52	+	+	
		P53			
	2	P54		+	
		P55	+	+	+
		P56		+	
		P57			
	3	P58			
		P59		+	
		P60			
L. Mobjack Bay	1	P41	+		
		P42	+		
		P43	+		
		P44	+		
		P45			
	2	P46			
		P47			
		P48	+		
		P49	+		
		P50			

* Benthic hits include B-IBI scores in both the intermediate and degraded ranges; contaminant hits are defined as ≥ 1 ERM exceedance or mean ERM quotient > 0.098; toxicity hits are defined as significant toxicity in both the 10-day juvenile clam and *Leptocheirus* amphipod assays.

Table 10. Estimates of percent area (± 95% C. I.) corresponding to the various stress categories depicted in Figure 7 for each of the five river systems. Also shown is the number of stations in each river displaying a particular condition category relative to the total number of stations in that same river.

River System	Stress Category			
	Green Zone	Yellow Zone	Orange Zone	Red Zone
Chester River	51.6 ± 38.5 5/15	38.0 ± 38.5 6/15	10.3 ± 7.7 4/15	0.0 ± 0.0 0/15
Nanticoke River	18.2 ± 29.6 2/15	54.7 ± 36.1 8/15	27.0 ± 30.2 5/15	0.0 ± 0.0 0/15
Pocomoke River	97.5 ± 0.9 5/10	1.5 ± 1.3 3/10	0.0 ± 0.0 0/10	1.0 ± 1.3 2/10
Rhode/South River	38.1 ±33.6 4/10	31.5 ± 30.9 3/10	19.0 ± 18.6 2/10	11.4 ± 22.4 1/10
L. Mobjack Bay	41.6 ± 31.6 4/10	58.4 ± 31.6 6/10	0.0 ± 0.0 0/10	0.0 ± 0.0 0/10

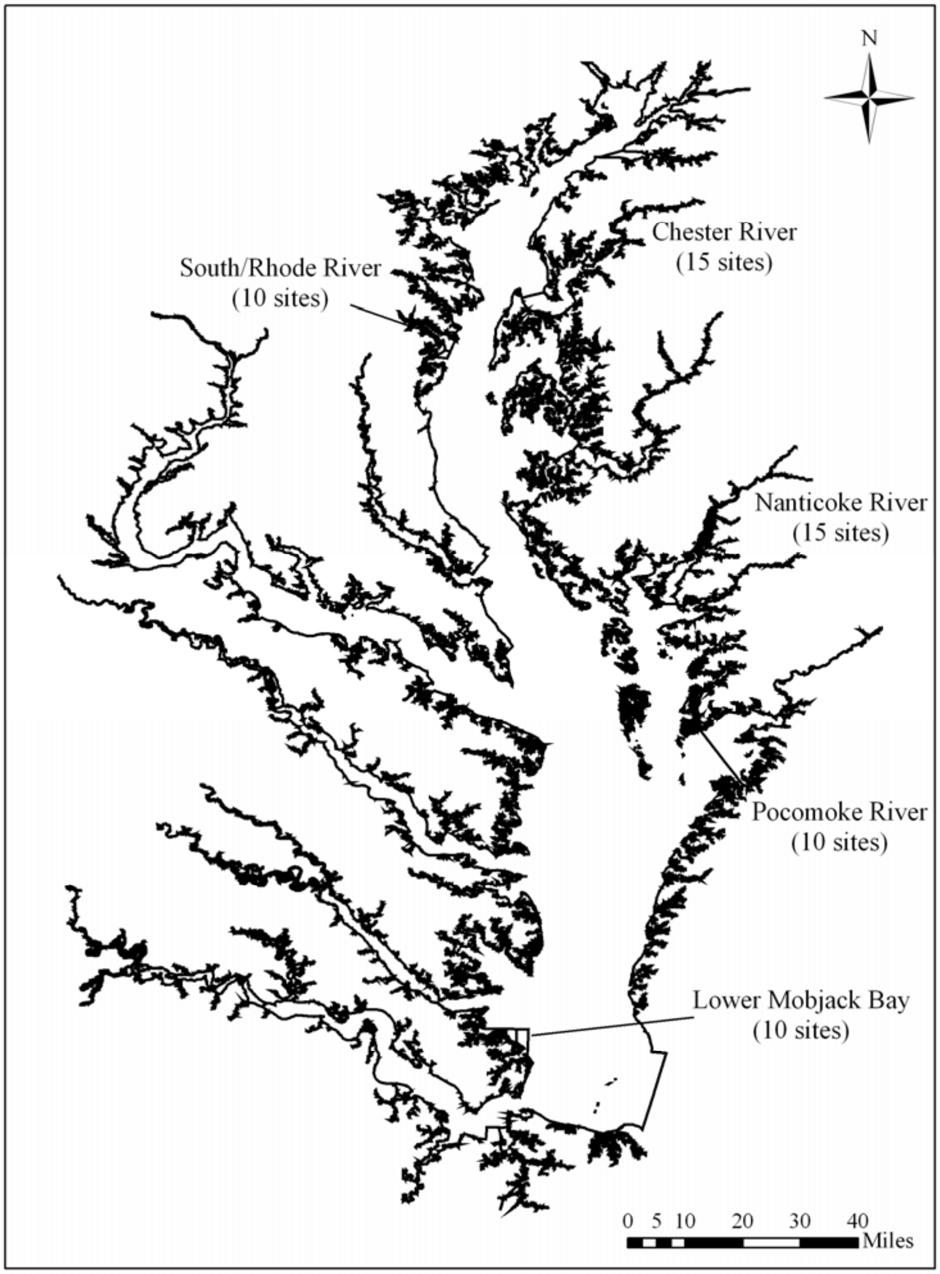


Figure 1. Map of Chesapeake Bay showing study locations.

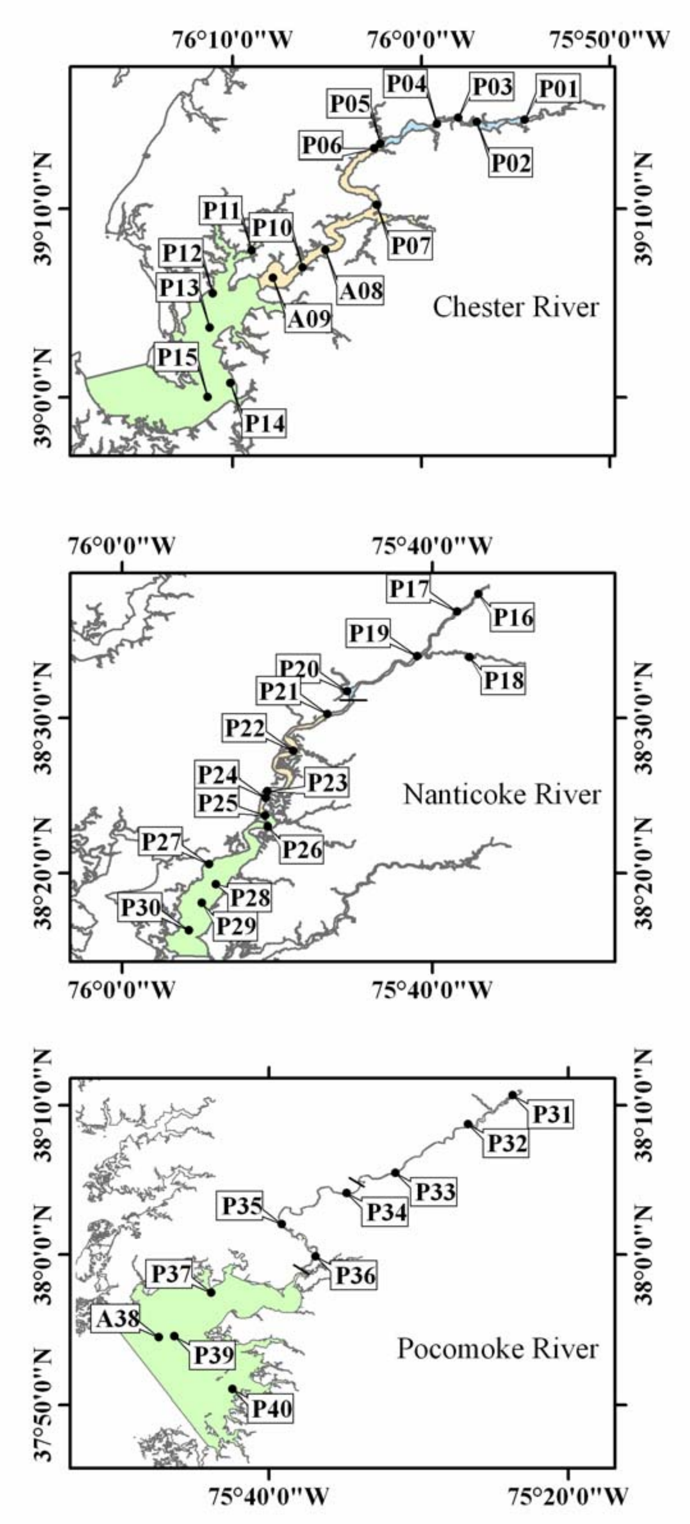
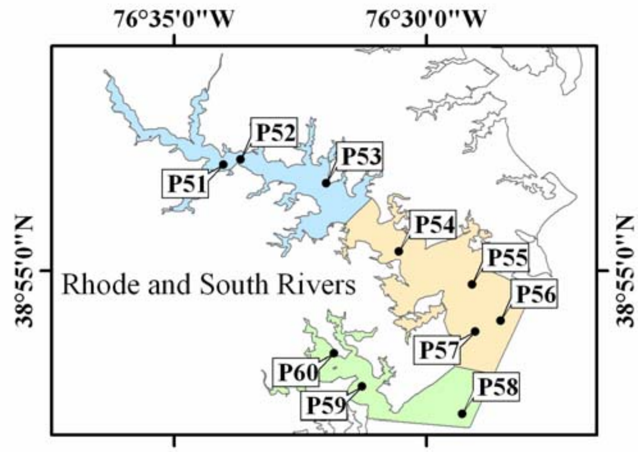


Figure 2. The five river systems with corresponding sampling sites. River segments are differentiated by color.



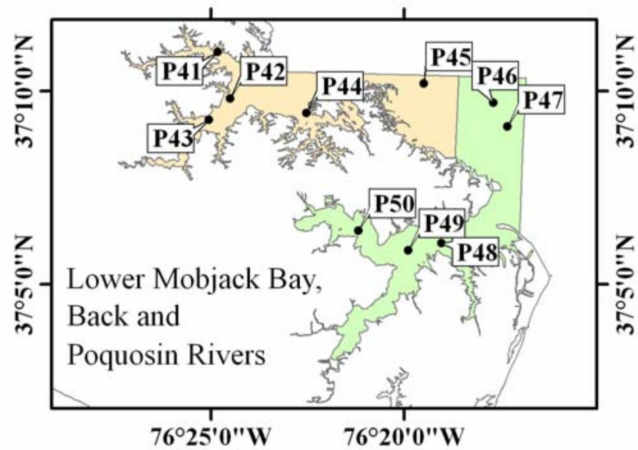


Figure 2 (continued).

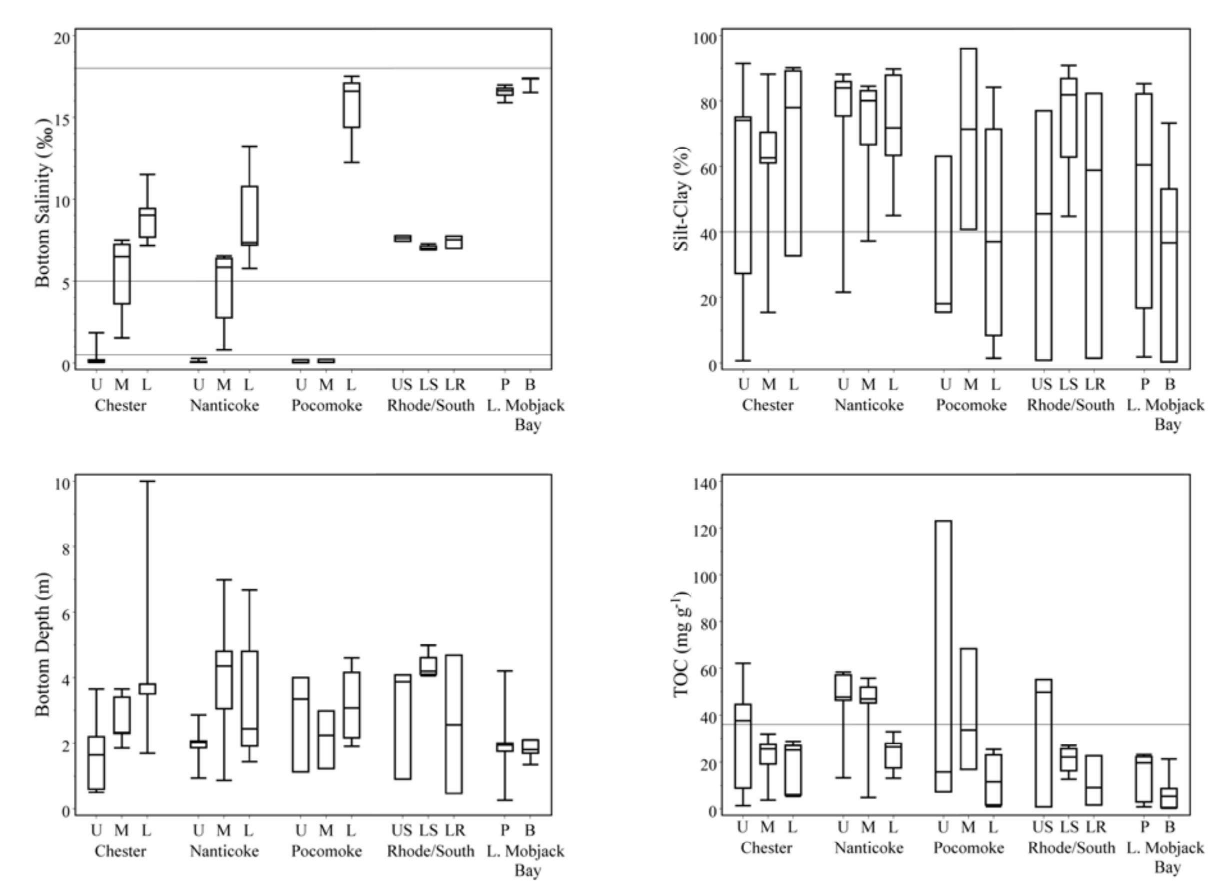


Figure 3. Box and whisker plots of abiotic variables (salinity, % silt-clay, total organic carbon (TOC), dissolved oxygen (DO), mean Effects Range Median (ERM) quotient, and AVS) by river segment for each of the five river systems. Boxes are interquartile ranges, horizontal lines within boxes are medians, and whisker endpoints are extreme values. Horizontal lines (where shown) extending across entire graph indicate relevant management thresholds as described elsewhere in text.

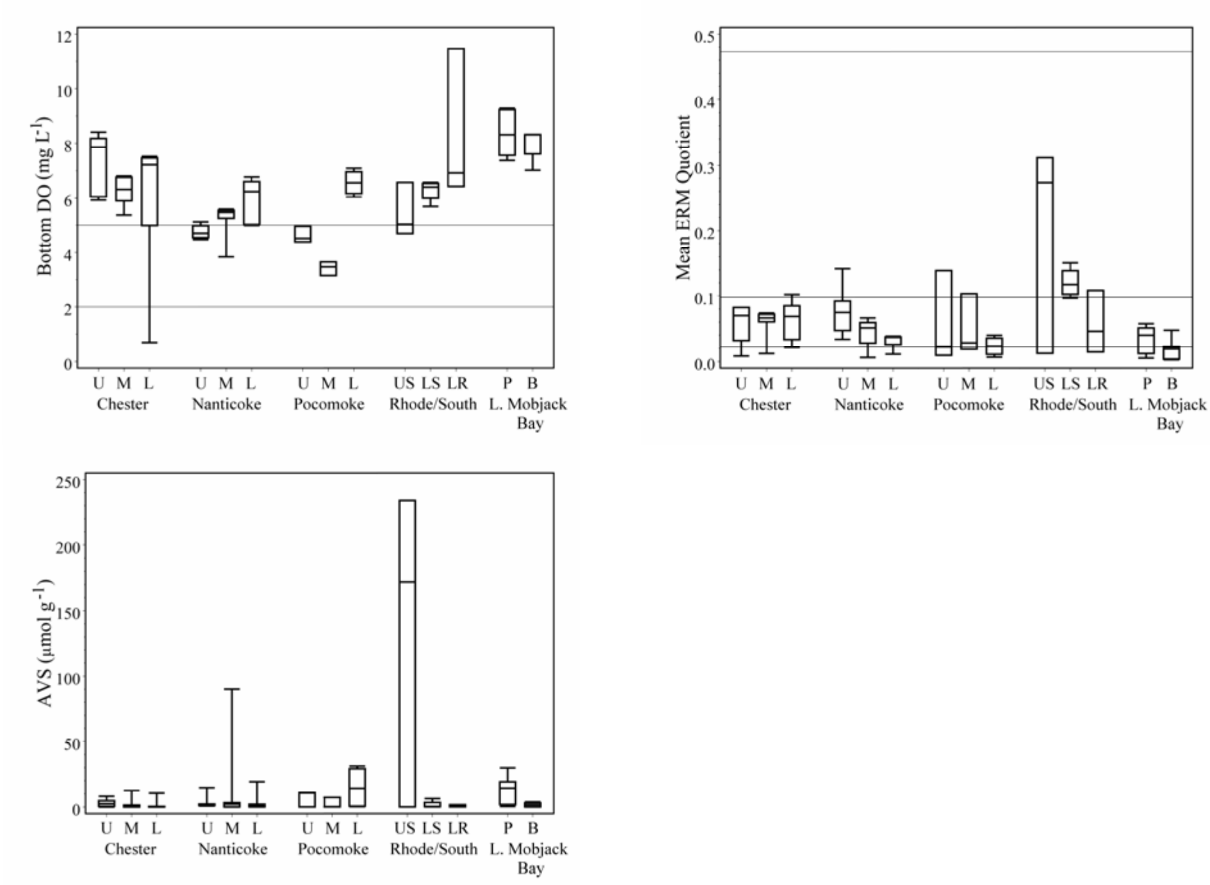


Figure 3. (continued).

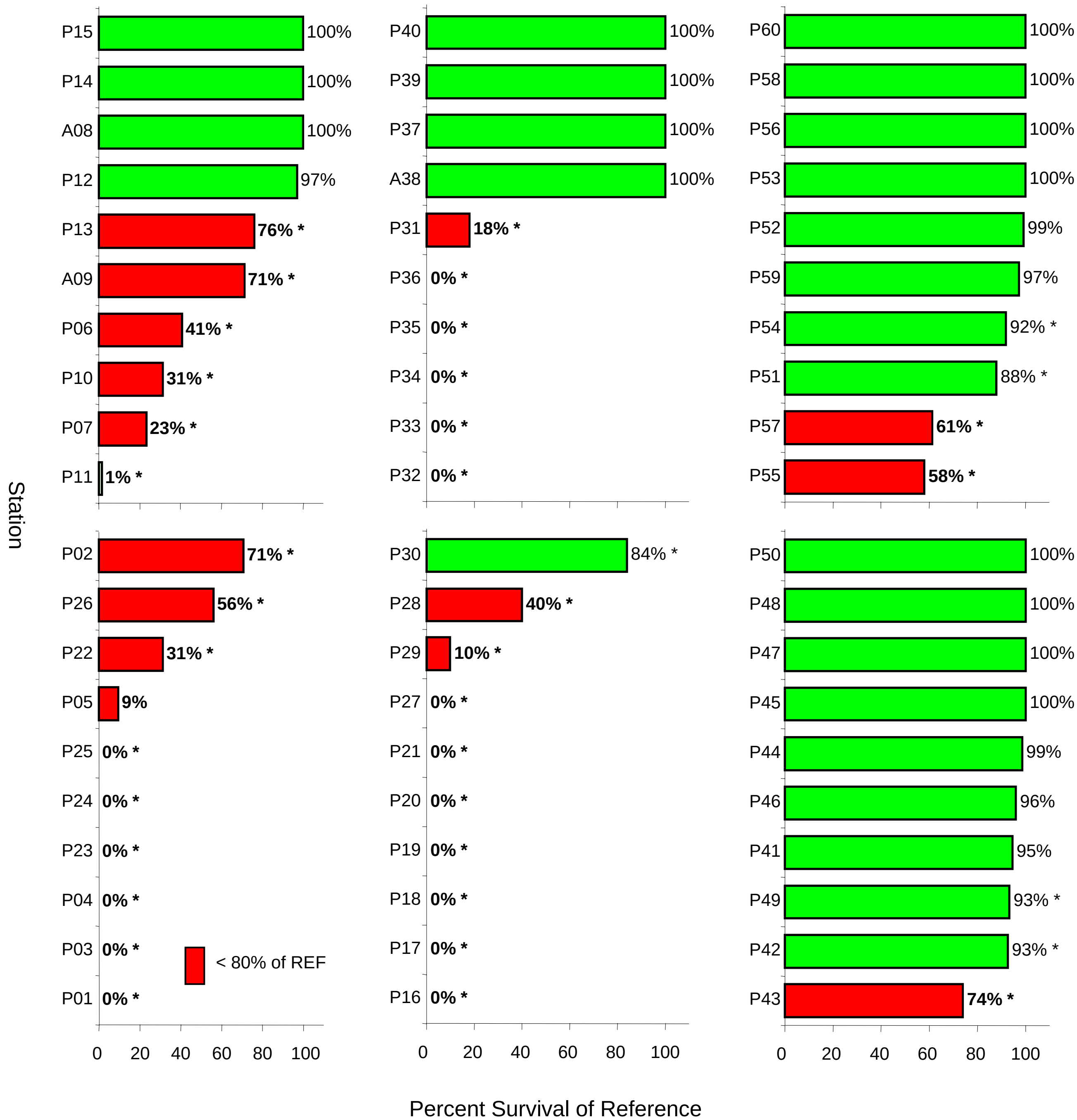


Figure 4. Clam survival in study site sediments in comparison to that in reference site sediments. Red and/or bold indicates survival <80 % and statistically different from that in reference site sediments.

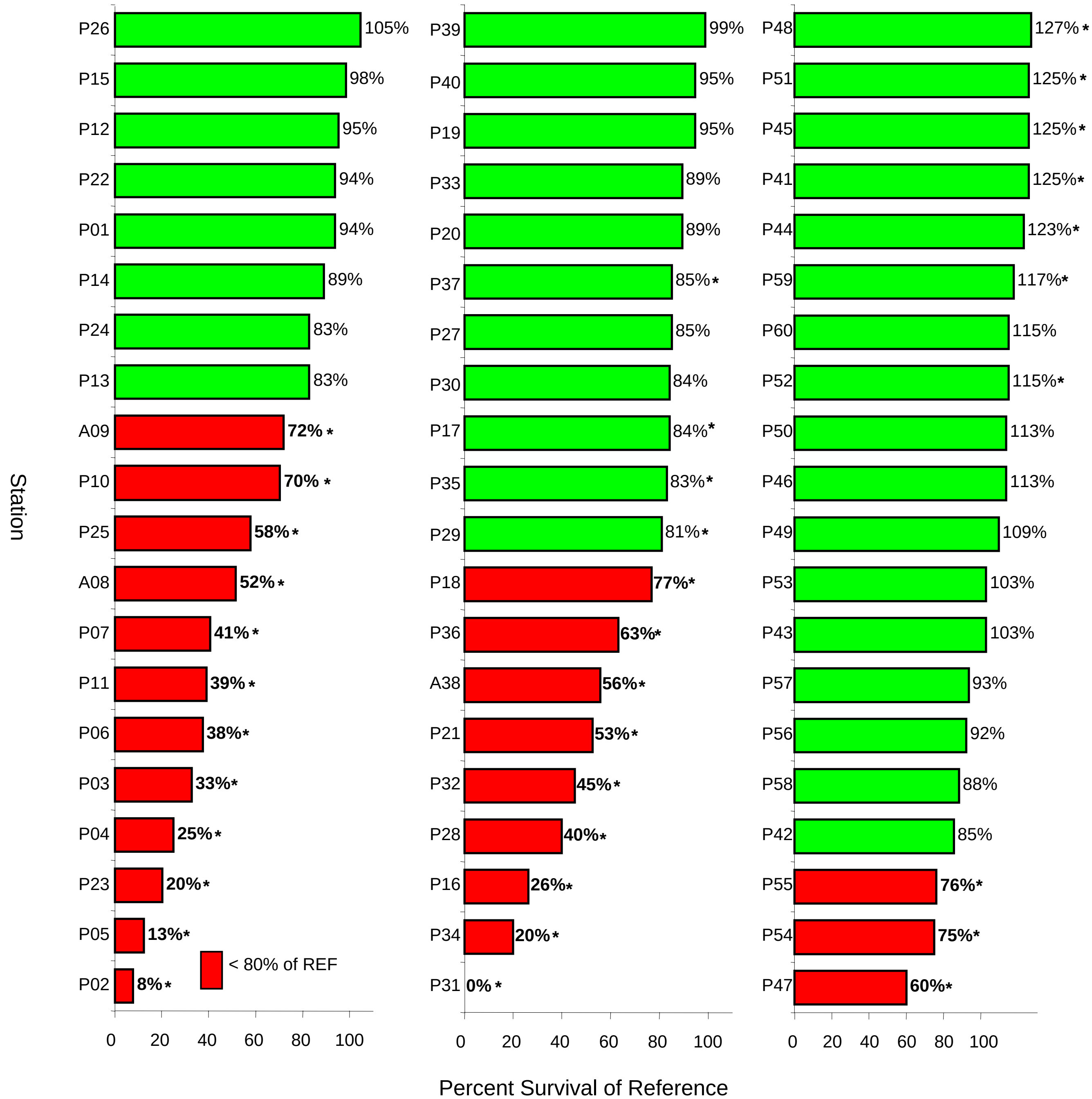


Figure 5. Amphipod survival in study site sediments in comparison to that in reference site sediments. Red and/or bold indicates survival <80 % and statistically different from that in reference site sediments.

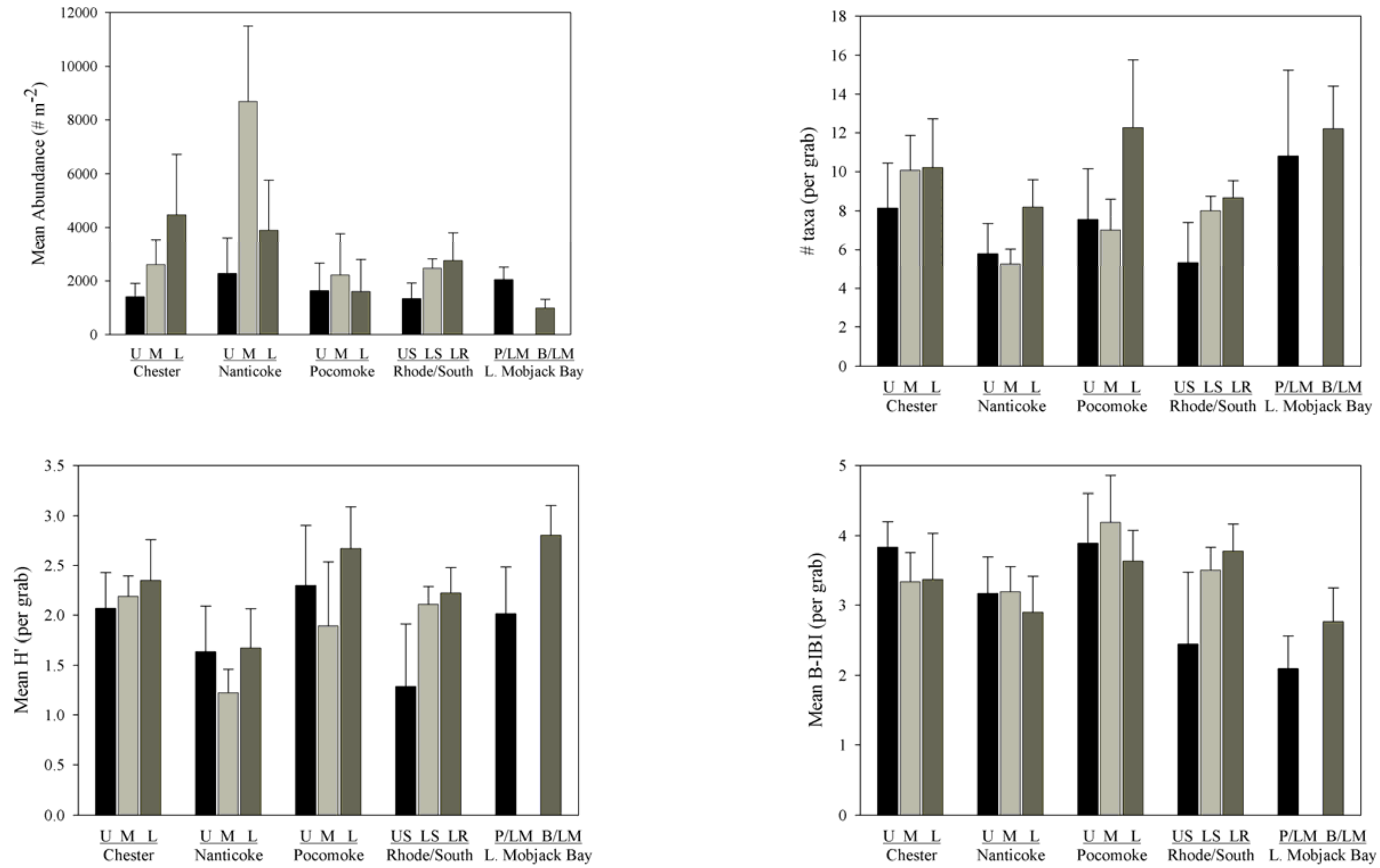


Figure 6. Comparison of mean values (± 95% C.I.) of abundance, # taxa, H' diversity (base 2 logs), and benthic index (B-IBI, Weisberg et al. 1997, Llanso et al. 2002) by river segment for each of the five river systems.

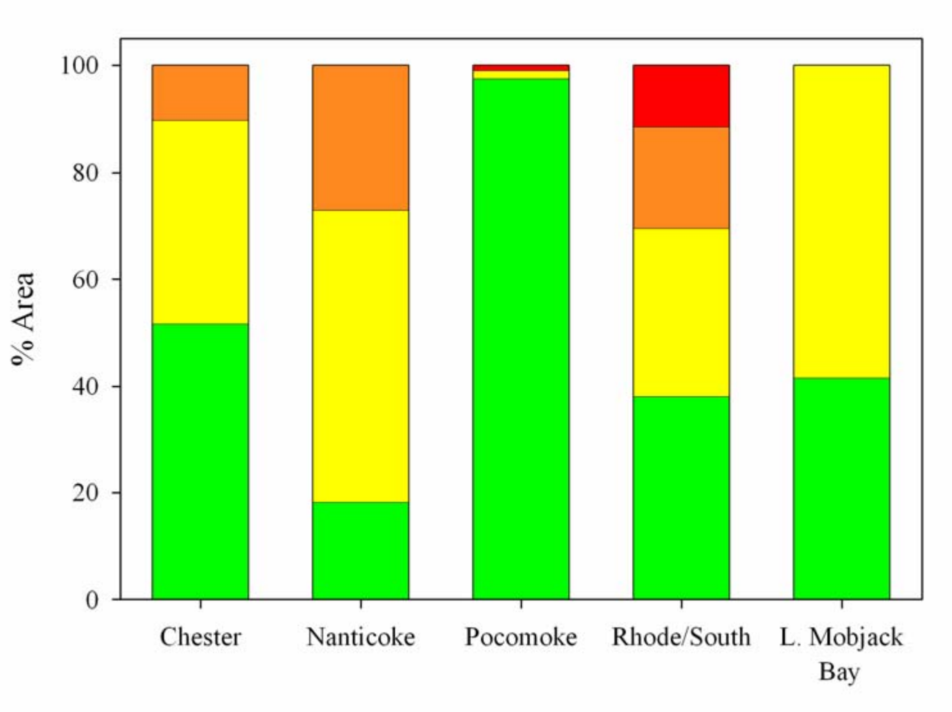


Figure 7. Comparison of sediment quality among the five rivers based on combined measures of benthic condition (B-IBI, Weisberg et al. 1997, Llanso et al. 2002), sediment toxicity (significant toxicity in both the 10-day juvenile clam and *Leptocheirus* amphipod assays), and sediment contamination (≥ 1 ERM exceedance or mean ERM-Q > 0.098). Green bars represent no hits (healthy benthos, no contamination, and no toxicity); yellow bars represent 1 hit (either benthos, contamination, or toxicity); orange bars represent hits in any 2 indicators; red bars represent hits in all 3 categories.

Appendix 1. Summary of station locations, depth, water quality, and sediment characteristics.

River	River Segment	Station	Latitude	Longitude	Depth (m)	Salinity (‰)	DO (mg L^{-1})	pH	T (ºC)	Silt (%)	Clay (%)	Sand (%)	Silt-Clay (%)	phi	TOC (mg g^{-1})
Chester	Upper	P01	39.2449	-75.9089	0.5	0.04	8.4	7.3	25.2	68.59	22.89	8.52	91.5	6.3	44.5
		P02	39.2430	-75.9508	1.7	0.05	8.2	6.9	25.5	NR*	NR	98.91	0.7	1.5	1.3
		P03	39.2464	-75.9675	0.6	0.09	7.9	6.9	25.9	11.86	15.47	69.62	27.3	1.9	8.9
		P04	39.2413	-75.9863	2.2	0.19	5.9	6.6	25.7	45.67	29.39	24.85	75.1	6.0	62.1
		P05	39.2237	-76.0360	3.7	1.86	6.0	7.0	26.4	49.06	25.01	25.75	74.1	5.5	37.6
	Mid	P06	39.2196	-76.0418	2.3	6.48	6.8	6.9	27.4	47.44	22.95	29.47	15.5	1.6	3.7
		P07	39.1699	-76.0395	2.3	7.49	5.9	6.9	27.0	46.77	41.44	11.74	61.1	5.1	19.2
		A08	39.1301	-76.0849	3.4	1.54	6.3	6.8	26.2	5.77	9.69	84.27	70.4	5.2	25.7
		A09	39.1055	-76.1309	3.7	3.62	6.8	6.9	27.0	34.05	27.01	38.93	88.2	7.1	31.9
		P10	39.1147	-76.1050	1.9	7.23	5.4	6.8	26.5	45.67	16.93	37.22	62.6	4.5	27.6
	Lower	P11	39.1296	-76.1500	3.5	7.16	7.5	6.5	28.3	57.07	33.09	9.84	90.2	6.4	25.2
		P12	39.0919	-76.1844	1.7	7.67	7.5	6.9	27.6	14.7	17.96	67.34	32.7	3.5	5.9
		P13	39.0614	-76.1871	3.8	9.42	5.0	7.0	26.3	50.7	27.25	22.05	78.0	5.7	27.1
		P14	39.0125	-76.1688	3.5	9.01	7.2	7.3	26.6	24.15	8.5	67.35	32.7	3.7	5.3
		P15	39.0000	-76.1886	10.0	11.51	0.7	7.0	25.8	58.69	30.51	10.8	89.2	6.4	28.8
Nanticoke	Upper	P16	38.6329	-75.6172	1.9	0.05	4.5	6.4	28.2	12.46	9.2	78.34	21.7	2.5	46.3
		P17	38.6140	-75.6400	0.9	0.05	4.7	6.5	28.1	73.25	10.75	16	84.0	5.3	13.3
		P18	38.5648	-75.6270	2.1	0.05	5.1	6.5	26.6	72.75	13.19	14.06	85.9	5.6	57.1
		P19	38.5660	-75.6833	2.9	0.08	4.5	6.4	27.3	73.6	14.57	11.76	88.2	5.7	58.3
		P20	38.5280	-75.7583	2.0	0.28	5.0	6.6	26.9	63.09	12.33	24.58	75.4	5.0	47.6
	Mid	P21	38.5036	-75.7796	0.9	0.80	3.8	6.6	26.4	56.01	28.51	15.42	84.5	6.8	46.8
		P22	38.4641	-75.8164	4.4	2.77	5.3	6.8	27.2	34.23	2.94	40.62	37.2	1.4	4.8
		P23	38.4214	-75.8442	7.0	6.52	5.5	7.0	27.0	63.11	20.05	16.84	83.2	5.7	55.7
		P24	38.4141	-75.8459	3.1	6.37	5.6	7.0	27.0	55.88	10.78	33.34	66.7	5.0	51.9
		P25	38.3950	-75.8460	4.8	5.84	5.5	6.9	26.9	63.48	16.56	19.89	80.0	5.0	45.1
	Lower	P26	38.3833	-75.8434	4.8	5.77	5.0	6.9	NR	40.54	4.4	50.34	44.9	2.4	13.1
		P27	38.3426	-75.9064	1.4	7.19	6.8	7.6	25.9	54.79	16.95	28.26	71.7	5.1	26.5
		P28	38.3212	-75.8991	1.9	7.34	6.6	7.6	26.1	74.35	15.44	10.21	89.8	5.3	32.9
		P29	38.3008	-75.9143	2.4	10.77	6.2	7.7	25.9	72.87	15.03	12.1	87.9	5.2	27.9
		P30	38.2717	-75.9282	6.7	13.22	5.0	7.7	26.4	45.19	18.16	36.65	63.4	5.0	17.5

Appendix 1. (continued)

River	River Segment	Station	Latitude	Longitude	Depth (m)	Salinity (‰)	DO (mg L^{-1})	pH	T (ºC)	Silt (%)	Clay (%)	Sand (%)	Silt-Clay (%)	phi	TOC (mg g^{-1})
Pocomoke	Upper	P31	38.1775	-75.4013	1.1	0.20	5.0	5.9	22.7	47.5	15.58	36.92	63.1	5.0	123.0
		P32	38.1452	-75.4511	4.0	0.02	4.5	5.9	23.3	9.68	8.43	77.42	18.1	1.5	15.8
		P33	38.0908	-75.5318	3.3	0.04	4.4	6.5	26.4	10.02	5.51	84.47	15.5	1.9	7.3
	Mid	P34	38.0685	-75.5861	3.0	0.04	3.7	6.4	25.9	56.13	15.2	28.67	71.3	5.6	68.3
		P35	38.0336	-75.6583	1.2	0.05	3.5	6.5	26.5	56.16	39.84	4	96.0	7.2	33.6
		P36	37.9980	-75.6207	2.2	0.22	3.2	6.7	27.1	19.88	20.82	52.58	40.7	2.5	16.9
	Lower	P37	37.9576	-75.7371	1.9	12.24	6.3	8.0	28.7	6.28	9.14	84.58	15.4	1.7	2.4
		A38	37.9079	-75.7951	4.6	16.67	6.0	8.1	27.9	39.23	19.26	35.89	58.5	4.6	25.5
		P39	37.9087	-75.7781	3.7	16.53	6.8	8.1	28.0	61.76	22.45	15.79	84.2	6.0	20.7
		P40	37.8499	-75.7134	2.4	17.51	7.1	8.1	27.9	NR	NR	91.83	1.4	1.0	0.9
Rhode/ South	U. South	P51	38.9517	-76.5671	3.9	7.42	4.7	7.7	25.0	38.2	38.77	23.04	77.0	6.6	55.1
		P52	38.9535	-76.5615	4.1	7.60	5.0	7.7	25.2	21.27	24.21	54.53	45.5	3.7	49.7
		P53	38.9455	-76.5332	0.9	7.75	6.6	8.0	24.9	NR	NR	99.18	0.8	1.8	0.8
	L. South	P54	38.9229	-76.5091	4.2	7.26	5.7	7.9	25.1	46.84	34.11	19.05	81.0	6.6	27.1
		P55	38.9119	-76.4850	5.0	6.97	6.3	7.9	24.9	60.77	22.1	17.13	82.9	5.3	12.7
		P56	38.8999	-76.4756	4.1	6.89	6.6	8.0	25.0	33.83	10.87	55.29	44.7	3.8	24.4
		P57	38.8964	-76.4840	4.2	6.92	6.5	8.0	24.9	68.75	22.09	9.16	90.8	5.4	19.9
	L. Rhode	P58	38.8691	-76.4882	4.7	6.98	6.4	7.9	24.8	47.17	11.66	41.17	58.8	4.3	9.1
		P59	38.8781	-76.5214	2.6	7.51	6.9	8.2	25.4	56.68	25.66	17.66	82.3	5.6	22.7
		P60	38.8891	-76.5306	0.5	7.73	11.5	8.7	26.4	NR	NR	98.02	1.5	2.2	1.6
Lower Mobjack	Poquosin/ L. Bay	P41	37.1834	-76.4138	0.3	16.98	7.4	8.1	26.1	59.49	22.71	17.79	82.2	5.6	22.3
		P42	37.1634	-76.4084	2.0	16.36	9.3	8.3	25.5	48.97	11.47	39.56	60.4	4.3	19.7
		P43	37.1542	-76.4175	1.8	16.78	7.6	8.1	25.4	56.03	29.25	14.72	85.3	6.1	23.2
		P44	37.1570	-76.3755	4.2	16.63	9.2	8.3	25.6	7.91	8.88	83.2	16.8	2.4	2.9
		P45	37.1697	-76.3249	2.0	15.89	8.3	8.3	24.5	NR	NR	98.17	1.8	2.1	0.8
	Back/ L. Bay	P46	37.1615	-76.2949	2.1	16.52	8.3	8.3	24.5	NR	NR	99.45	0.3	2.3	0.5
		P47	37.1512	-76.2887	2.1	17.39	7.6	8.1	24.7	NR	NR	98.41	0.3	1.3	0.2
		P48	37.1011	-76.3172	1.4	17.35	8.3	8.1	25.2	37.65	15.44	46.91	53.1	4.1	8.7
		P49	37.0979	-76.3316	1.8	17.38	8.3	8.1	24.9	27.22	9.38	63.41	36.6	3.8	5.3
		P50	37.1065	-76.3530	1.7	17.37	7.0	8.0	24.8	57.14	16.09	24.85	73.2	4.7	21.3

* NR =Not Reported

Appendix 2. Chemical contaminant results for metals, PAHs, PBDEs, PCBs and Pesticides.

Station ID	Aluminum %	Arsenic ug/g dry wt	Cadmium ug/g dry wt	Chromium ug/g dry wt	Copper ug/g dry wt	Iron %	Lead ug/g dry wt
P01	4.58	7.66	0.773	66	14.7	3.95	33.9
P02	0.336	0.986	<0.091	14.9	<6.23	<0.505	5.72
P03	1.71	3.25	0.257	24.9	<6.15	1.3	13.8
P04	4.91	16.8	0.703	72.1	19.4	5.04	42.2
P05	4.34	10.9	0.439	74.5	13.8	4.01	39.1
P06	4.72	11.7	0.584	67.6	17	4.19	39.4
P07	6.22	12.2	0.411	78	20	4.72	42.9
A08	0.737	2.09	<0.091	13.9	<6.16	<0.500	7.52
A09	4.1	13.1	0.387	69	18.4	3.75	33.2
P10	4.65	11.9	0.391	80.2	18.3	4.1	31.1
P11	4.45	9.28	0.319	68.9	21.6	3.54	36.1
P12	1.39	3.43	0.137	24.6	<6.13	0.924	11.8
P13	4.4	11.9	0.436	64.7	24.4	3.76	34.2
P14	1.53	3.78	0.163	30	<6.12	1.12	12.7
P15	5.16	9.85	0.395	59.6	24.7	3.17	32.6
P16	3.47	7.74	1.13	47	16.4	3.05	32.6
P17	3.66	10.1	1.21	44.2	22.5	3.39	28.1
P18	3.53	8.15	0.465	43.4	11.1	2.83	22.3
P19	3.41	7.94	0.254	44.7	7.21	2.63	21.7
P20	2.5	7.04	0.207	38.5	8.24	1.8	17.6
P21	4.34	10.7	0.52	53.1	18.8	3.04	26.7
P22	2.67	8.96	0.611	46	14.1	2.63	23.7
P23	4.28	11.2	0.39	54.4	11.8	3.77	27.6
P24	1.09	2.42	0.46	15.7	7.09	0.735	17.6
P25	3.6	15.4	1.49	51.2	45.7	3.74	37.9
P26	1.36	3.54	<0.093	21.8	<6.33	0.902	10.3
P27	3.78	9.09	0.228	47	8	2.69	22.9
P28	3.84	8.13	0.255	46.5	11.7	2.42	22.2
P29	3.97	10.5	0.154	51.7	6.88	2.77	15.6
P30	0.716	1.41	<0.091	6.35	<6.21	<0.503	4.43
P31	4.46	11.8	1.67	38.1	19.6	5.35	34.2
P32	0.69	2.3	0.12	6.26	<6.11	1.49	9.12
P33	0.71	<0.925	<0.091	10.3	<6.18	<0.501	7.05
P34	3.89	7.46	0.495	47.1	10.1	3.13	26.8
P35	4.42	8.07	0.093	51.1	<6.14	3.11	16.3
P36	1.44	3.94	<0.0905	25.4	<6.16	1.22	27.4
P37	0.691	2.78	<0.091	9.32	19.5	0.857	5.23
A38	2.52	7.19	0.248	39.4	8.77	1.62	16.4
P39	4.61	8.1	0.422	46.5	13.1	2.19	21.3
P40	0.679	<0.926	<0.090	15.3	<6.15	<0.499	6.65
P41	4.03	11.1	0.325	63.6	40.3	3.03	28.3
P42	3.34	9.39	0.301	51.4	20.9	2.73	22.2
P43	4.3	11.7	0.288	58.8	31.6	3.25	25.5
P44	0.9	2.73	<0.092	16.4	<6.24	0.641	7.88
P45	0.364	<0.924	<0.092	15.8	<6.23	0.512	4.93
P46	0.448	<0.921	<0.093	10.9	<6.31	<0.512	4.46
P47	0.202	<0.931	<0.094	3.17	<6.38	<0.518	2.68
P48	1.85	4.16	0.204	30.3	7.62	1.3	15.7
P49	1.39	3.88	0.226	28.3	6.74	1.07	14.4
P50	3.05	8.97	0.271	57.1	15.8	2.09	27.2
P51	5.1	25.7	2.59	151	118	5.65	63.4
P52	5.16	25.1	1.99	144	117	7.01	65.5
P53	0.5	1.72	<0.091	20.1	<6.16	<0.500	4.56
P54	4.57	16.7	0.364	119	34.6	6.41	47.00
P55	4.43	18.2	0.35	102	34.5	5.97	40.4
P56	2.31	13.9	0.219	89.3	13.9	4.5	24.8
P57	3.97	14.9	0.342	86.6	24.2	4.05	39.7
P58	2.13	6.04	0.222	44.4	11.3	1.71	18.6
P59	4.5	12.3	0.409	93.1	32.5	4.4	42.8
P60	0.866	3.1	0.286	43.3	<6.18	1.6	7.65
Leadenwah Reference	1.54	2.38	<0.092	14.2	<6.24	0.716	8.03
Folly River Reference	0.824	1.77	<0.091	14.4	<6.19	0.633	8.75
Folly River Reference	0.606	2.16	<0.091	10.5	<6.19	0.535	9.43
Folly River Reference	0.581	1.51	<0.092	12.7	<6.23	<0.505	9.62
Lab Blank	0.856	1.59	<0.093	12.5	<6.35	<0.515	9.4
Lab Blank	0.433	1.69	<0.092	11.6	<6.30	<0.510	9.68
Field Blank from Station P31	0.419	1.72	<0.093	13.5	<6.35	<0.515	9.39
Field Blank from Station P48	0.378	1.79	<0.093	14	<6.32	0.645	9.73
Field Blank from Station P60	0.425	1.75	<0.093	12.5	<6.32	0.533	9.51
Field Blank from Station P47	0.785	1.74	<0.093	14.2	<6.32	<0.513	9.4
Field Blank from Station P57	0.272	1.54	<0.093	12.6	<6.34	<0.514	9.76
Leadenwah Reference	0.964	1.5	<0.094	12.7	<6.38	0.547	5.94
Leadenwah Reference	1.11	2.04	<0.091	13.3	<6.24	0.573	6.87

Appendix 2. (continued)

Station ID	Manganese ug/g dry wt	Mercury ug/g dry wt	Nickel ug/g dry wt	Selenium ug/g dry wt	Silver ug/g dry wt	Tin ug/g dry wt	Zinc ug/g dry wt	Total Metals (except Al, Fe) ug/g dry wt
P01	861	0.0918	28	1.24	<0.265	3.18	160	1177
P02	102	0.0038	1.96	<0.16	<0.268	0.463	<15.9	126
P03	332	0.0244	9.36	0.481	<0.265	0.972	44.6	430
P04	3450	0.0692	31.6	1.47	<0.265	3.79	158	3796
P05	2300	0.0718	27.4	1.05	<0.267	3.8	136	2607
P06	2770	0.0657	27.1	1.1	<0.263	3.41	140	3078
P07	6440	0.0715	38.3	1.14	<0.265	3.66	185	6822
A08	920	0.0075	5.01	0.255	<0.265	0.434	18.7	968
A09	5050	0.0483	32.6	0.966	<0.267	2.8	146	5367
P10	2590	0.0674	28.3	0.96	<0.264	2.72	125	2889
P11	1590	0.0571	29.9	0.829	<0.266	3.21	130	1890
P12	970	0.0165	10	0.381	<0.264	1.05	43.8	1065
P13	2760	0.0594	36.3	1.01	<0.265	3.44	173	3109
P14	928	0.0172	10.5	0.412	<0.263	1.27	78.9	1066
P15	1010	0.0742	33.2	0.914	<0.263	3.29	169	1344
P16	675	0.0408	25.7	1.15	<0.265	3.55	195	1005
P17	766	0.0804	29.8	0.999	<0.265	2.94	204	1110
P18	759	0.052	20.8	0.736	<0.266	2.12	82.1	950
P19	523	0.0373	17.7	0.75	<0.265	2.05	84.5	710
P20	307	0.0308	14	0.503	<0.269	1.7	30.7	426
P21	966	0.0584	24.2	0.922	<0.267	2.43	121	1224
P22	792	0.0445	23.3	0.91	<0.264	2.52	134	1046
P23	833	0.0445	24.7	0.919	<0.264	2.67	111	1078
P24	135	0.0269	8.26	0.335	<0.268	1.73	29.8	218
P25	687	0.113	36.7	1.02	0.266	4.56	241	1122
P26	125	0.0099	7.04	0.391	<0.272	0.903	<16.2	169
P27	328	0.0278	17.1	0.752	<0.265	2.11	83.4	519
P28	510	0.0405	19.2	0.721	<0.266	2.17	75.8	697
P29	334	0.0136	20.3	0.696	<0.266	1.93	36.9	479
P30	191	0.0048	2.9	<0.163	<0.267	0.171	<15.9	206
P31	433	0.0734	25.6	1.49	<0.266	3.48	227	796
P32	110	0.029	3.87	0.188	<0.263	0.497	26.3	159
P33	68	0.0094	2.68	0.172	<0.266	0.637	<15.8	88.8
P34	411	0.0619	18.9	0.837	<0.266	3.21	96.3	622
P35	150	0.0078	19.6	0.55	<0.264	2.1	66.7	315
P36	122	0.0110	6.79	0.252	<0.265	1.03	18.6	205
P37	123	0.0062	3.33	0.166	<0.267	0.397	42.9	207
A38	301	0.0330	13.9	0.704	<0.272	1.74	78.3	468
P39	286	0.0327	19.3	0.687	<0.263	2.29	116	514
P40	60.2	0.0034	1.82	<0.163	<0.265	0.799	<15.7	84.8
P41	152	0.0755	19.6	0.898	<0.268	2.92	102	421
P42	145	0.0462	16.5	0.857	<0.273	2.14	94.1	363
P43	170	0.0611	20.2	0.909	<0.275	2.63	113	435
P44	47.3	0.0114	4.32	0.22	<0.269	0.599	28.1	107
P45	42.3	0.0038	1.64	<0.162	<0.268	0.611	<15.9	65.3
P46	32.3	0.00185	<1.11	<0.162	<0.272	0.37	<16.1	48.0
P47	17	<0.0015	<1.12	<0.164	<0.275	0.238	<16.3	23.1
P48	107	0.0245	8.51	0.453	<0.265	1.38	20.8	196
P49	94.4	0.0226	6.24	0.335	<0.267	1.17	<15.9	155
P50	185	0.0346	14.1	0.793	0.454	2.05	64.9	377
P51	772	0.193	54.7	1.83	<0.266	4.83	400	1594
P52	784	0.111	52	1.76	<0.266	4.85	409	1605
P53	97.5	0.0035	2.02	<0.164	<0.265	0.513	38.1	164
P54	956	0.104	38.5	0.953	0.293	3.99	258	1476
P55	1300	0.0643	39.8	0.868	<0.266	3.7	249	1789
P56	5710	0.0383	25.5	0.603	<0.266	2.71	176	6057
P57	6800	0.045	34.5	0.962	<0.265	3.49	239	7244
P58	574	0.032	16	0.436	<0.266	1.97	108	781
P59	411	0.0916	30.3	0.933	<0.268	3.97	193	820
P60	61.8	0.0092	4.32	0.22	<0.266	0.894	<15.8	122
Leadenwah Reference	64.9	0.012	3.4	0.239	<0.269	0.687	<15.9	*93.9*
Folly River Reference	75.3	0.0017	1.7	0.216	<0.266	0.482	<15.8	*103*
Folly River Reference	68.3	0.0018	1.55	0.214	<0.266	0.457	<15.8	*92.6*
Folly River Reference	78.6	0.0013	1.43	0.199	<0.268	0.424	<15.9	*104*
Lab Blank	79.6	0.0018	2.46	0.206	<0.273	0.447	<16.2	*106*
Lab Blank	69.2	0.0019	2.03	0.203	<0.271	0.473	<16.1	*94.9*
Field Blank from Station P31	69.1	0.002	1.79	0.241	<0.273	0.522	<16.2	*96.3*
Field Blank from Station P48	80.8	0.0019	2.19	0.208	<0.272	0.448	<16.5	*208*
Field Blank from Station P60	63.3	0.0019	1.91	0.204	<0.272	0.603	<16.1	*89.8*
Field Blank from Station P47	76.3	0.0018	2.35	0.193	<0.272	0.432	<16.2	*104*
Field Blank from Station P57	59	0.0019	1.48	0.192	<0.273	0.42	<16.2	*85.0*
Leadenwah Reference	59.7	0.0057	2.22	0.174	<0.275	0.536	<16.3	*82.8*
Leadenwah Reference	53.3	0.0083	2.69	0.233	<0.269	0.559	<15.9	*79.0*

Appendix 2. (continued)

Station ID	Napthalene ng/g dry	2-MethylNapthalene ng/g dry	1-MethylNapthalene ng/g dry	biphenyl ng/g dry	2,6-dimethylnaphthalene ng/g dry	acenaphthylene ng/g dry
P01	63.4	53.0	30.8	19.1	41.6	0.7
P02	5.93	<0.051	0.47	5.22	9.3	<0.73
P03	98.0	112	64.1	20.1	29.4	2.3
P04	61.2	53.1	24.7	26.3	35.0	<0.73
P05	62.5	45.8	23.5	20.5	30.7	7.5
P06	79.7	72.7	37.9	23.7	37.3	13.7
P07	76.4	51.8	24.8	22.5	30.7	2.9
A08	27.4	26.5	13.6	9.60	15.1	<0.73
A09	80.5	51.9	18.6	23.4	28.3	6.2
P10	113.9	101	48.6	36.2	43.4	5.9
P11	115.2	94.6	45.0	34.7	40.3	7.7
P12	36.4	27.7	11.2	12.7	15.7	1.7
P13	212	141	65.7	42.2	43.8	15.0
P14	64.5	67.3	33.5	24.4	26.1	1.8
P15	280	219	101	69.3	67.7	23.2
P16	16.7	17.8	16.0	351	10.0	5.1
P17	60.0	66.2	45.3	3,575	43.5	15.3
P18	33.3	35.2	37.2	220	22.3	6.5
P19	56.9	55.1	35.4	696	22.6	8.8
P20	30.0	20.8	12.6	66.8	8.4	1.7
P21	23.4	13.8	9.62	6.62	9.1	<0.82
P22	17.5	17.9	9.33	12.7	13.9	<0.73
P23	17.3	18.3	15.8	51.1	<0.82	3.4
P24	40.6	31.9	30.4	106	16.3	6.3
P25	35.7	41.4	38.1	44.3	19.3	1.4
P26	13.1	10.0	5.50	13.3	13.7	<0.73
P27	31.6	25.4	17.0	12.3	10.3	1.3
P28	23.3	16.2	9.74	21.3	8.3	1.6
P29	24.9	16.5	10.9	16.5	7.7	<0.82
P30	26.0	19.7	12.0	8.94	6.4	<0.82
P31	74.0	69.2	51.3	1.73	29.5	41.4
P32	9.31	9.07	8.13	0.24	5.5	1.6
P33	13.5	15.5	11.3	0.06	5.6	3.0
P34	45.3	46.4	34.1	5.68	17.2	15.9
P35	23.5	18.2	15.0	2.38	9.5	0.9
P36	24.6	25.9	17.9	2.40	9.5	1.2
P37	33.1	32.0	20.2	2.53	7.1	<0.82
A38	19.2	20.5	13.6	1.00	10.5	<0.82
P39	39.0	35.2	22.2	2.69	13.5	<0.82
P40	14.0	18.4	10.8	<0.03	5.2	<0.82
P41	12.3	3.37	<0.14	1.55	5.9	22.2
P42	<0.09	4.92	<0.12	0.92	4.7	2.9
P43	32.9	26.8	11.8	2.91	8.9	7.6
P44	<0.05	<0.061	<0.07	<0.03	2.0	<0.61
P45	2.43	3.50	0.62	<0.03	2.5	<0.61
P46	<0.04	<0.052	<0.06	<0.03	0.7	<0.61
P47	0.39	1.53	<0.05	<0.03	2.2	<0.61
P48	10.2	14.8	3.04	0.60	3.4	3.0
P49	<0.05	<0.062	<0.07	<0.04	2.0	1.7
P50	6.99	17.9	3.75	1.34	1.3	3.5
P51	612	356	170	87.7	74.2	179
P52	595	338	165	82.8	75.0	167
P53	10.7	9.77	5.64	0.38	4.9	<0.82
P54	294	158	69.6	35.9	34.0	35.0
P55	239	128	61.1	26.3	28.2	22.4
P56	118	52.1	25.3	11.4	13.7	74.5
P57	208	116	56.0	23.7	24.3	25.2
P58	80.5	51.8	25.7	9.34	13.9	9.7
P59	278	167	78.3	32.5	37.1	36.6
P60	18.6	14.9	8.01	0.60	5.3	<0.82
Leadenwah Reference	15.0	13.8	6.56	7.38	13.9	<0.73
Folly River Reference	12.1	11.4	8.07	<0.03	5.4	<0.82
Folly River Reference	5.91	4.14	2.57	<0.030	4.0	<0.82
Folly River Reference	0.098	0.37	<0.06	<0.03	<0.61	<0.61
Lab Blank	3.22	2.63	1.48	<0.03	1.1	<0.61
Lab Blank		PAH SAMPLE LOST				
Field Blank from Station P31	2.81	2.26	1.06	<0.03	0.7	<0.61
Field Blank from Station P48	<0.04	<0.052	<0.06	<0.03	<0.61	<0.61
Field Blank from Station P60	<0.04	<0.051	<0.06	<0.03	1.7	<0.61
Field Blank from Station P47	1.06	1.34	1.24	<0.03	2.9	<0.61
Field Blank from Station P57	1.12	1.17	0.83	<0.03	3.4	<0.61
Leadenwah Reference	26.0	26.6	16.2	0.3	6.1	<0.82
Leadenwah Reference	5.79	5.47	3.25	<0.03	3.8	<0.61

Appendix 2. (continued)

Station ID	acenaphthene ng/g dry	1,6,7-trimethylnaphthalene ng/g dry	flourene ng/g dry	dibenzothiophene ng/g dry	phenanthrene ng/g dry	anthracene ng/g dry	1-methylphenanthrene ng/g dry
P01	<0.62	<0.97	21.1	<1.34	<3.12	8.9	<1.34
P02	<0.62	<0.97	<0.53	<1.34	<3.12	1.6	<1.34
P03	<0.62	<0.97	8.8	<1.34	<3.12	4.9	<1.34
P04	<0.62	<0.97	29.4	<1.34	13.9	15.6	<1.34
P05	6.0	<0.97	18.9	<1.34	25.4	18.2	<1.34
P06	<0.62	<0.97	20.9	<1.34	34.4	17.5	<1.34
P07	<0.62	<0.97	16.0	<1.34	<3.12	12.9	<1.34
A08	<0.62	<0.97	4.1	<1.34	<3.12	3.1	<1.34
A09	<0.62	<0.97	21.5	<1.34	40.1	19.9	<1.34
P10	26.1	<0.97	41.4	<1.34	92.1	20.1	2.4
P11	20.4	<0.97	37.9	<1.34	86.3	22.7	1.5
P12	4.5	<0.97	9.6	<1.34	12.3	8.2	<1.34
P13	19.8	<0.97	44.1	<1.34	125	40.9	2.2
P14	19.3	<0.97	30.8	<1.34	59.0	6.7	<1.34
P15	46.9	<0.97	82.4	<1.34	227	60.6	16.3
P16	15.0	5.4	27.1	2.0	90.7	24.9	15.4
P17	55.3	27.1	94.9	7.3	250	14.2	50.2
P18	16.5	6.4	25.3	1.6	72.1	23.1	12.0
P19	22.9	10.6	51.1	3.0	127	36.2	22.2
P20	<1.04	2.3	22.0	1.4	44.4	13.7	10.4
P21	<1.04	2.9	8.3	0.5	20.2	3.9	4.5
P22	<0.62	<0.97	4.7	<1.34	<3.12	<0.48	<1.34
P23	7.7	4.2	24.8	2.0	57.2	19.0	11.7
P24	9.8	5.3	34.9	2.0	70.6	21.6	15.1
P25	8.3	6.4	19.3	1.3	33.0	8.4	8.0
P26	<0.62	<0.97	4.6	<1.34	<3.12	<0.48	<1.34
P27	<1.04	3.5	5.7	0.6	18.5	5.3	4.2
P28	<1.04	3.0	10.4	0.7	22.8	8.8	6.0
P29	<1.04	<1.02	6.8	0.7	22.6	7.9	5.3
P30	<1.04	1.4	4.6	0.5	16.8	4.4	3.6
P31	25.2	10.5	33.8	2.6	138	55.6	43.2
P32	<1.04	1.3	1.5	<0.29	8.8	3.5	1.7
P33	<1.04	1.5	2.8	<0.29	15.9	3.3	2.5
P34	24.4	8.2	31.0	4.2	292	112	43.6
P35	<1.04	2.3	9.3	0.4	20.1	4.9	5.3
P36	<1.04	3.1	4.3	0.5	13.4	5.0	2.3
P37	<1.04	1.7	2.5	<0.29	5.0	<0.50	<0.91
A38	<1.04	3.8	5.5	0.4	12.5	3.5	2.3
P39	<1.04	2.9	4.1	0.3	14.9	3.5	2.8
P40	<1.04	<1.02	<0.68	<0.29	1.6	<0.50	<0.91
P41	<0.61	1.6	7.8	0.9	36.2	20.7	11.1
P42	<0.61	<0.61	4.1	<0.61	21.2	8.8	4.5
P43	<0.61	3.3	4.6	0.6	25.8	10.7	7.4
P44	<0.61	<0.61	0.9	<0.61	5.4	<0.61	<0.61
P45	<0.61	<0.61	0.7	<0.61	4.2	<0.61	<0.61
P46	<0.61	<0.61	1.1	<0.61	4.6	<0.61	<0.61
P47	<0.61	<0.61	0.6	<0.61	3.9	<0.61	<0.61
P48	<0.61	<0.61	4.9	<0.61	17.1	5.9	4.4
P49	<0.61	<0.61	2.7	<0.61	22.6	7.2	3.4
P50	<0.61	<0.61	4.4	0.6	25.5	7.2	4.9
P51	60.9	25.6	157	15.3	492	305	117
P52	52.2	23.9	134	12.9	444	251	81.2
P53	<1.04	2.2	5.1	0.3	13.8	1.9	1.6
P54	22.3	10.6	57.6	5.6	179	73.2	37.2
P55	19.3	8.7	45.3	4.2	140	52.9	28.7
P56	10.4	6.5	28.3	3.6	135	102	60.4
P57	17.8	8.5	38.5	3.9	130	48.6	27.0
P58	8.7	4.9	19.0	1.7	63.3	26.1	12.7
P59	23.0	11.3	51.5	5.3	153	70.9	35.4
P60	<1.04	<1.02	2.3	0.3	13.0	3.7	3.3
Leadenwah Reference	<0.62	<0.97	2.0	<1.34	<3.12	<0.48	<1.34
Folly River Reference	<1.04	1.4	1.3	<0.29	3.7	<0.50	<0.91
Folly River Reference	<1.04	<1.02	<0.68	<0.29	3.4	1.9	<0.91
Folly River Reference	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61
Lab Blank	<0.61	<0.61	1.0	<0.61	3.0	<0.61	<0.61
Lab Blank							
Field Blank from Station P31	<0.61	<0.61	<0.61	<0.61	3.3	<0.61	<0.61
Field Blank from Station P48	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61
Field Blank from Station P60	<0.61	<0.61	<0.61	<0.61	2.2	<0.61	<0.61
Field Blank from Station P47	<0.61	0.7	<0.61	<0.61	2.2	<0.61	<0.61
Field Blank from Station P57	<0.61	0.9	0.9	<0.61	3.0	<0.61	<0.61
Leadenwah Reference	<1.04	2.4	2.0	<0.29	5.8	1.8	1.3
Leadenwah Reference	<0.61	1.4	0.8	<0.61	4.2	<0.61	<0.61

Appendix 2. (continued)

Station ID	flouranthene ng/g dry	pyrene ng/g dry	benz(a)anthracene ng/g dry	chrysene+triphenylene ng/g dry	benzo(b)flouranthene ng/g dry	benzo(j+k)flouranthene ng/g dry
P01	69.0	62.0	97.9	69.0	<1.20	<1.21
P02	22.5	25.9	40.9	28.6	46.5	<1.21
P03	35.2	31.1	30.2	47.2	<1.20	<1.21
P04	87.8	78.3	94.2	65.6	<1.20	<1.21
P05	126	121	94.9	81.7	77.2	42.6
P06	122	158	116.5	89.0	101.0	41.1
P07	35.8	36.6	75.3	52.8	<1.20	<1.21
A08	9.1	7.1	31.7	21.0	<1.20	6.6
A09	46.6	42.0	63.8	44.4	<1.20	<1.21
P10	75.5	73.6	71.5	55.9	<1.20	<1.21
P11	79.0	71.5	71.1	54.1	<1.20	<1.21
P12	19.2	17.2	34.9	23.6	<1.20	<1.21
P13	94.9	84.5	77.9	64.6	<1.20	<1.21
P14	21.9	23.0	36.2	25.0	<1.20	<1.21
P15	143	131	100	81.8	70.5	<1.21
P16	144	118	16.9	49.1	24.5	46.4
P17	365	384	66.9	95.2	66.5	40.9
P18	137	130	38.4	59.3	44.5	43.7
P19	198	201	43.2	71.9	47.0	42.4
P20	78.1	67.9	19.7	26.8	24.4	11.1
P21	10.8	11.6	11.5	11.0	<1.93	<1.53
P22	4.8	3.8	<2.67	<2.76	<1.20	<1.21
P23	85.6	89.4	30.1	32.3	<1.93	<1.53
P24	113	96.8	27.3	59.0	28.5	30.8
P25	46.9	39.2	19.5	20.2	22.3	3.7
P26	6.1	4.4	30.2	20.1	<1.20	<1.21
P27	22.5	19.7	12.8	10.3	<1.93	<1.53
P28	36.6	32.3	17.0	16.1	20.8	12.6
P29	35.3	29.8	14.1	19.2	16.2	6.7
P30	21.6	17.7	10.7	9.5	12.8	2.9
P31	533	544	145	210	133	72.7
P32	16.7	25.8	10.3	11.9	12.8	11.3
P33	22.9	25.6	10.0	11.6	15.3	24.2
P34	685	581	166	223	145	173
P35	13.3	18.8	11.6	9.9	<1.93	<1.53
P36	20.3	18.0	9.9	9.9	12.2	4.9
P37	3.5	3.2	6.3	5.1	<1.93	<1.53
A38	9.4	8.2	10.6	10.2	12.8	<1.53
P39	19.2	18.1	14.4	13.7	17.9	2.9
P40	<1.44	1.8	5.4	4.0	<1.93	<1.53
P41	112	118	37.7	76.1	58.7	43.0
P42	40.7	38.3	19.3	24.8	19.7	15.9
P43	56.6	54.6	23.1	33.4	35.0	24.2
P44	5.1	4.3	<0.61	<0.61	<0.61	<0.61
P45	1.1	0.9	<0.61	<0.61	<0.61	<0.61
P46	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61
P47	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61
P48	38.5	35.9	14.0	21.6	19.4	<0.61
P49	38.2	34.6	13.7	18.5	18.9	<0.61
P50	50.6	47.4	17.9	25.8	25.3	16.2
P51	1279	1024	213	484	344	243
P52	936	743	156	326	281	487
P53	5.9	5.0	6.2	5.1	7.6	<1.53
P54	194	159	35.8	62.4	51.7	83.1
P55	142	125	29.5	44.8	38.8	<1.53
P56	1429	1305	401	532	257	536
P57	141	126	28.1	43.8	36.5	<1.53
P58	59.0	54.2	17.1	27.8	18.4	28.2
P59	173	147	37.7	56.3	39.2	<1.53
P60	10.5	8.6	7.0	6.3	8.6	<1.53
Leadenwah Reference	3.2	2.6	31.9	21.1	<1.20	<1.21
Folly River Reference	<1.44	<0.84	6.1	4.7	<1.93	<1.53
Folly River Reference	<1.44	<0.84	6.4	5.0	<1.93	<1.53
Folly River Reference	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61
Lab Blank	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61
Lab Blank						
Field Blank from Station P31	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61
Field Blank from Station P48	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61
Field Blank from Station P60	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61
Field Blank from Station P47	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61
Field Blank from Station P57	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61
Leadenwah Reference	5.3	5.3	<1.22	4.9	7.5	<1.53
Leadenwah Reference	2.3	1.7	6.4	4.6	<0.61	<0.61

Appendix 2. (continued)

Station ID	benzo(e)pyrene ng/g dry	benzo(a)pyrene ng/g dry	perylene ng/g dry	Indeno (1,2,3-cd) pyrene ng/g dry	dibenz(a,h)anthracene ng/g dry	benzo(g,h,i)perylene ng/g dry	Total PAH ng/g dry
P01	20.2	<0.66	172	<3.77	<3.67	<5.56	729
P02	19.1	48.2	15.7	<3.77	<3.67	<5.56	270
P03	13.3	23.4	80.2	<3.77	<3.67	<5.56	600
P04	20.5	34.4	450	<3.77	<3.67	<5.56	1090
P05	39.7	64.8	132	92.0	80.3	29.6	1242
P06	44.0	92.0	138	102.2	<3.67	59.4	1400
P07	17.5	<0.66	19.3	<3.77	<3.67	<5.56	475
A08	<1.66	<0.66	<2.75	<3.77	<3.67	<5.56	175
A09	17.8	20.7	<2.75	<3.77	<3.67	<5.56	526
P10	17.8	41.4	<2.75	<3.77	<3.67	<5.56	867
P11	22.1	32.9	<2.75	<3.77	<3.67	<5.56	837
P12	<1.66	<0.66	<2.75	<3.77	<3.67	<5.56	235
P13	<1.66	<0.66	<2.75	<3.77	<3.67	<5.56	1074
P14	<1.66	<0.66	<2.75	<3.77	<3.67	<5.56	440
P15	26.8	45.8	4.6	<3.77	<3.67	<5.56	1797
P16	17.8	22.9	88.6	17.1	<3.59	11.2	1153
P17	42.8	59.5	242	42.7	18.7	35.4	5763
P18	41.9	47.1	255	32.0	<3.59	23.1	1363
P19	36.1	39.8	213	<6.65	<3.59	<1.69	2041
P20	18.6	<3.23	228	<6.65	<3.59	<1.69	709
P21	<1.88	<3.23	760	<6.65	<3.59	<1.69	908
P22	<1.66	<0.66	<2.75	<3.77	<3.67	<5.56	84.8
P23	26.1	<3.23	64.6	22.4	16.6	26.1	626
P24	26.4	44.1	215.7	23.6	18.1	23.5	1098
P25	<1.88	<3.23	135	<6.65	<3.59	<1.69	552
P26	<1.66	<0.66	<2.75	<3.77	<3.67	<5.56	121
P27	<1.88	<3.23	25.4	<6.65	<3.59	<1.69	226
P28	15.0	19.3	35.3	<6.65	<3.59	<1.69	337
P29	13.1	18.7	29.2	12.0	<3.59	10.1	324
P30	12.2	13.5	27.3	<6.65	<3.59	<1.69	232
P31	109	164	774	95.8	38.9	55.6	3451
P32	10.1	12.6	245	10.2	<3.59	9.1	427
P33	13.6	14.6	108	13.6	<3.59	9.9	345
P34	72.1	112.9	391	72.9	48.7	51.3	3402
P35	<1.88	<3.23	292	9.9	<3.59	<1.69	468
P36	10.1	<3.23	35.8	<6.65	<3.59	<1.69	231
P37	<1.88	<3.23	<2.02	<6.65	<3.59	<1.69	122
A38	10.8	<3.23	14.1	<6.65	<3.59	<1.69	169
P39	<1.88	<3.23	<2.02	<6.65	<3.59	<1.69	227
P40	<1.88	<3.23	<2.02	<6.65	<3.59	<1.69	61
P41	39.8	41.2	21.4	22.6	14.2	18.4	727
P42	18.0	25.8	21.1	17.0	<0.61	<1.69	293
P43	22.7	29.1	19.5	17.5	<0.61	15.6	475
P44	<0.61	<0.61	<0.61	<0.61	<0.61	18.4	36.3
P45	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	15.9
P46	<0.61	<0.61	<0.61	<0.61	<0.61	15.6	22.1
P47	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	8.75
P48	14.6	15.5	14.7	12.6	<0.61	<0.61	254
P49	9.5	18.1	12.2	11.7	<0.61	<0.61	215
P50	17.3	22.9	16.5	16.4	<0.61	<0.61	334
P51	269	319	179	227	102	187	7523
P52	236	320	155	212	68.3	141	6482
P53	6.0	7.9	6.4	<6.65	<3.59	<1.69	106
P54	29.9	40.7	29.4	29.8	16.7	24.9	1769
P55	26.5	42.1	42.2	25.4	14.6	22.3	1358
P56	216	618	244	174	61.9	103	6518
P57	22.2	34.4	31.8	28.6	13.4	16.4	1249
P58	14.7	19.0	21.2	13.5	7.1	11.1	619
P59	32.7	37.9	24.7	32.1	15.6	25.2	1602
P60	<1.88	<3.23	<2.02	<6.65	<3.59	<1.69	111
Leadenwah Reference	<1.66	<0.66	<2.75	<3.77	<3.67	<5.56	*117*
Folly River Reference	<1.88	<3.23	<2.02	<6.65	<3.59	<1.69	*54.1*
Folly River Reference	<1.88	<3.23	<2.02	<6.65	<3.59	<1.69	*33.4*
Folly River Reference	<0.61	<0.61	<0.61	<0.61	<0.61	9.7	*10.2*
Lab Blank	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	*12.4*
Lab Blank							
Field Blank from Station P31	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	*10.1*
Field Blank from Station P48	<0.61	<0.61	<0.61	<0.61	<0.61	8.1	*8.08*
Field Blank from Station P60	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	*3.96*
Field Blank from Station P47	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	*9.44*
Field Blank from Station P57	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	*11.2*
Leadenwah Reference	<1.88	<3.23	9.6	<6.65	<3.59	<1.69	*121*
Leadenwah Reference	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	*39.6*

Appendix 2. (continued)

Station ID	PBDE 17 ng/g dry wt	PBDE 28 ng/g dry wt	PBDE 71 ng/g dry wt	PBDE 47 ng/g dry wt	PBDE 66 ng/g dry wt	PBDE 100 ng/g dry wt
P01	<0.453	<0.675	<0.598	<0.607	<0.571	<0.530
P02	<0.129	<0.193	<0.171	<0.173	<0.163	<0.151
P03	<0.176	<0.262	<0.232	<0.236	<0.222	<0.206
P04	<0.392	<0.584	<0.518	<0.526	<0.494	<0.459
P05	<0.309	<0.461	<0.408	<0.414	<0.390	<0.362
P06	<0.318	<0.474	<0.420	<0.426	<0.401	<0.372
P07	<0.332	<0.495	<0.439	<0.445	<0.419	<0.389
A08	<0.145	<0.216	<0.191	<0.194	<0.182	<0.169
A09	<0.275	<0.410	<0.363	<0.369	<0.347	<0.322
P10	<0.279	<0.416	<0.368	<0.374	<0.352	<0.326
P11	<0.283	<0.422	<0.374	<0.379	<0.357	<0.331
P12	<0.154	<0.229	<0.203	<0.206	<0.194	<0.180
P13	<0.314	<0.468	<0.415	<0.421	<0.396	<0.368
P14	<0.159	<0.237	<0.210	<0.214	<0.201	<0.186
P15	<0.353	<0.526	<0.466	<0.473	<0.445	<0.413
P16	<0.158	<0.235	<0.208	<0.211	<0.199	<0.185
P17	<0.334	<0.498	<0.441	<0.448	<0.421	<0.391
P18	<0.416	<0.620	<0.549	<0.557	<0.524	<0.487
P19	<0.410	<0.611	<0.542	<0.550	<0.517	<0.480
P20	<0.304	<0.452	<0.401	<0.407	<0.383	<0.355
P21	<0.245	<0.365	<0.323	<0.328	<0.309	<0.286
P22	<0.136	<0.203	<0.180	<0.182	<0.171	<0.159
P23	<0.357	<0.532	<0.472	<0.479	<0.450	<0.418
P24	<0.307	<0.457	<0.405	<0.411	<0.386	<0.359
P25	<0.346	<0.515	<0.456	<0.463	<0.436	<0.405
P26	<0.141	<0.210	<0.186	<0.189	<0.178	<0.165
P27	<0.235	<0.350	<0.310	<0.315	<0.296	<0.275
P28	<0.253	<0.377	<0.334	<0.339	<0.319	<0.296
P29	<0.230	<0.343	<0.304	<0.309	<0.290	<0.270
P30	<0.202	<0.302	<0.267	<0.271	<0.255	<0.237
P31	<0.696	<1.04	<0.919	<0.933	<0.878	<0.815
P32	<0.161	<0.240	<0.213	<0.216	<0.203	<0.189
P33	<0.143	<0.214	<0.189	<0.192	<0.181	<0.168
P34	<0.337	<0.503	<0.445	<0.452	<0.425	<0.395
P35	<0.215	<0.321	<0.284	<0.289	<0.271	<0.252
P36	<0.167	<0.248	<0.220	<0.223	<0.210	<0.195
P37	<0.132	<0.197	<0.175	<0.178	<0.167	<0.155
A38	<0.214	<0.319	<0.283	<0.287	<0.270	<0.251
P39	<0.266	<0.396	<0.351	<0.356	<0.335	<0.311
P40	<0.124	<0.185	<0.164	<0.167	<0.157	<0.146
P41	<0.303	<0.452	<0.400	<0.406	<0.382	<0.355
P42	<0.276	<0.411	<0.364	<0.370	<0.348	<0.323
P43	<0.310	<0.461	<0.409	<0.415	<0.390	<0.362
P44	<0.154	<0.229	<0.203	<0.206	<0.194	<0.180
P45	<0.129	<0.192	<0.170	<0.173	<0.163	<0.151
P46	<0.131	<0.195	<0.173	<0.175	<0.165	<0.153
P47	<0.122	<0.181	<0.161	<0.163	<0.153	<0.142
P48	<0.176	<0.263	<0.233	<0.236	<0.222	<0.206
P49	<0.157	<0.233	<0.207	<0.210	<0.197	<0.183
P50	<0.228	<0.339	<0.300	<0.305	<0.287	<0.266
P51	<0.740	<1.10	<0.976	<0.991	<0.932	<0.865
P52	<0.590	<0.880	<0.779	<0.791	<0.744	<0.691
P53	<0.132	<0.197	<0.175	<0.178	<0.167	<0.155
P54	<0.282	<0.421	<0.373	<0.378	<0.356	<0.330
P55	<0.255	<0.380	<0.336	<0.342	<0.321	<0.298
P56	<0.183	<0.273	<0.242	<0.246	<0.231	<0.214
P57	<0.227	<0.338	<0.300	<0.304	<0.286	<0.266
P58	<0.164	<0.244	<0.216	<0.220	<0.207	<0.192
P59	<0.288	<0.430	<0.381	<0.386	<0.363	<0.337
P60	<0.137	<0.203	<0.180	<0.183	<0.172	<0.160
Leadenwah Reference	<0.152	<0.227	<0.201	<0.204	<0.192	<0.178
Folly River Reference	<0.139	<0.207	<0.184	<0.187	<0.175	<0.163
Folly River Reference	<0.137	<0.205	<0.181	<0.184	<0.173	<0.161
Folly River Reference	<0.136	<0.202	<0.179	<0.182	<0.171	<0.159
Lab Blank	<0.130	<0.193	<0.171	<0.174	<0.163	<0.152
Lab Blank	<0.127	<0.189	<0.167	<0.170	<0.160	<0.148
Field Blank from Station P31	<0.135	<0.201	<0.178	<0.181	<0.170	<0.158
Field Blank from Station P48	<0.132	<0.196	<0.174	<0.177	<0.166	<0.154
Field Blank from Station P60	<0.128	<0.191	<0.169	<0.172	<0.161	<0.150
Field Blank from Station P47	<0.129	<0.192	<0.170	<0.172	<0.162	<0.151
Field Blank from Station P57	<0.128	<0.191	<0.169	<0.172	<0.162	<0.150
Leadenwah Reference	<0.132	<0.197	<0.175	<0.177	<0.167	<0.155
Leadenwah Reference	<0.146	<0.217	<0.193	<0.195	<0.184	<0.171

Appendix 2. (continued)

Station ID	PBDE 99 ng/g dry wt	PBDE 85 ng/g dry wt	PBDE 154 ng/g dry wt	PBDE 153 ng/g dry wt	PBDE 138 ng/g dry wt	PBDE 183 ng/g dry wt	PBDE 190 ng/g dry wt	Total PBDE ng/g dry wt
P01	<0.571	<3.12	<2.92	<0.507	<1.58	<0.752	<3.13	0
P02	<0.163	<0.890	<0.832	<0.145	<0.452	<0.214	<0.893	0
P03	<0.222	<1.21	<1.13	<0.197	<0.616	<0.292	<1.22	0
P04	<0.494	<2.70	<2.53	<0.439	<1.37	<0.651	<2.71	0
P05	<0.390	<2.13	<1.99	<0.346	<1.08	<0.513	<2.14	0
P06	<0.401	<2.19	<2.05	<0.356	<1.11	<0.528	<2.20	0
P07	<0.419	<2.29	<2.14	<0.372	<1.16	<0.552	<2.30	0
A08	<0.182	<0.997	<0.931	<0.162	<0.506	<0.240	<0.999	0
A09	<0.347	<1.90	<1.77	<0.308	<0.964	<0.457	<1.90	0
P10	<0.352	<1.92	<1.80	<0.313	<0.977	<0.463	<1.93	0
P11	<0.357	<1.95	<1.82	<0.317	<0.991	<0.470	<1.96	0
P12	<0.194	<1.06	<0.989	<0.172	<0.538	<0.255	<1.06	0
P13	<0.396	<2.16	<2.02	<0.352	<1.10	<0.522	<2.17	0
P14	<0.201	<1.10	<1.03	<0.179	<0.558	<0.265	<1.10	0
P15	<0.445	<2.43	<2.27	<0.396	<1.24	<0.586	<2.44	0
P16	<0.199	<1.09	<1.02	<0.177	<0.552	<0.262	<1.09	0
P17	<0.421	<2.30	<2.15	<0.374	<1.17	<0.554	<2.31	0
P18	<0.524	<2.87	<2.68	<0.466	<1.46	<0.690	<2.87	0
P19	<0.517	<2.83	<2.64	<0.460	<1.44	<0.681	<2.84	0
P20	<0.383	<2.09	<1.96	<0.340	<1.06	<0.504	<2.10	0
P21	<0.309	<1.69	<1.58	<0.274	<0.857	<0.406	<1.69	0
P22	<0.171	<0.937	<0.876	<0.152	<0.476	<0.226	<0.940	0
P23	<0.450	<2.46	<2.30	<0.400	<1.25	<0.593	<2.47	0
P24	<0.386	<2.11	<1.98	<0.344	<1.07	<0.509	<2.12	0
P25	<0.436	<2.38	<2.23	<0.387	<1.21	<0.574	<2.39	0
P26	<0.178	<0.972	<0.909	<0.158	<0.494	<0.234	<0.975	0
P27	<0.296	<1.62	<1.51	<0.263	<0.823	<0.390	<1.63	0
P28	<0.319	<1.74	<1.63	<0.283	<0.886	<0.420	<1.75	0
P29	<0.290	<1.59	<1.48	<0.258	<0.807	<0.383	<1.59	0
P30	<0.255	<1.39	<1.30	<0.227	<0.708	<0.336	<1.40	0
P31	<0.878	<4.80	<4.49	<0.780	<2.44	<1.16	<4.81	0
P32	<0.203	<1.11	<1.04	<0.181	<0.564	<0.268	<1.11	0
P33	<0.181	<0.988	<0.924	<0.161	<0.502	<0.238	<0.991	0
P34	<0.425	<2.32	<2.17	<0.378	<1.18	<0.560	<2.33	0
P35	<0.271	<1.48	<1.39	<0.241	<0.754	<0.358	<1.49	0
P36	<0.210	<1.15	<1.07	<0.187	<0.583	<0.276	<1.15	0
P37	<0.167	<0.913	<0.853	<0.148	<0.464	<0.220	<0.916	0
A38	<0.270	<1.48	<1.38	<0.240	<0.750	<0.356	<1.48	0
P39	<0.335	<1.83	<1.71	<0.298	<0.931	<0.442	<1.84	0
P40	<0.157	<0.857	<0.801	<0.139	<0.435	<0.206	<0.859	0
P41	<0.382	<2.09	<1.95	<0.340	<1.06	<0.503	<2.10	0
P42	<0.348	<1.90	<1.78	<0.309	<0.966	<0.458	<1.91	0
P43	<0.390	<2.13	<1.99	<0.347	<1.08	<0.514	<2.14	0
P44	<0.194	<1.06	<0.991	<0.172	<0.539	<0.255	<1.06	0
P45	<0.163	<0.889	<0.831	<0.145	<0.452	<0.214	<0.892	0
P46	<0.165	<0.902	<0.843	<0.147	<0.458	<0.217	<0.905	0
P47	<0.153	<0.838	<0.783	<0.136	<0.426	<0.202	<0.840	0
P48	<0.222	<1.21	<1.14	<0.197	<0.617	<0.293	<1.22	0
P49	<0.197	<1.08	<1.01	<0.175	<0.548	<0.260	<1.08	0
P50	<0.287	<1.57	<1.47	<0.255	<0.796	<0.378	<1.57	0
P51	<0.932	<5.10	<4.76	<0.828	<2.59	<1.23	<5.11	0
P52	<0.744	<4.07	<3.80	<0.661	<2.07	<0.980	<4.08	0
P53	<0.167	<0.913	<0.853	<0.148	<0.464	<0.220	<0.916	0
P54	<0.356	<1.95	<1.82	<0.316	<0.988	<0.469	<1.95	0
P55	<0.321	<1.76	<1.64	<0.285	<0.892	<0.423	<1.76	0
P56	<0.231	<1.26	<1.18	<0.205	<0.642	<0.304	<1.27	0
P57	<0.286	<1.56	<1.46	<0.254	<0.795	<0.377	<1.57	0
P58	<0.207	<1.13	<1.06	<0.184	<0.574	<0.272	<1.13	0
P59	<0.363	<1.99	<1.86	<0.323	<1.01	<0.479	<1.99	0
P60	<0.172	<0.940	<0.879	<0.153	<0.478	<0.227	<0.943	0
Leadenwah Reference	<0.192	<1.05	<0.981	<0.171	<0.533	<0.253	<1.05	*0*
Folly River Reference	<0.175	<0.959	<0.897	<0.156	<0.487	<0.231	<0.962	*0*
Folly River Reference	<0.173	<0.946	<0.884	<0.154	<0.481	<0.228	<0.949	*0*
Folly River Reference	<0.171	<0.936	<0.875	<0.152	<0.475	<0.225	<0.939	*0*
Lab Blank	<0.163	<0.893	<0.835	<0.145	<0.454	<0.215	<0.896	*0*
Lab Blank	<0.160	<0.874	<0.817	<0.142	<0.444	<0.211	<0.877	*0*
Field Blank from Station P31	<0.170	<0.930	<0.869	<0.151	<0.472	<0.224	<0.932	*0*
Field Blank from Station P48	<0.166	<0.908	<0.849	<0.148	<0.461	<0.219	<0.911	*0*
Field Blank from Station P60	<0.161	<0.883	<0.825	<0.144	<0.449	<0.213	<0.886	*0*
Field Blank from Station P47	<0.162	<0.887	<0.829	<0.144	<0.450	<0.214	<0.889	*0*
Field Blank from Station P57	<0.162	<0.884	<0.826	<0.144	<0.449	<0.213	<0.887	*0*
Leadenwah Reference	<0.167	<0.912	<0.852	<0.148	<0.463	<0.220	<0.914	*0*
Leadenwah Reference	<0.184	<1.01	<0.939	<0.163	<0.511	<0.242	<1.01	*0*

Appendix 2. (continued)

Station ID	PCB 103	PCB 104	PCB 105	PCB 106/118	PCB 107/108	PCB 110	PCB 114	PCB 119	PCB 12
	ng g dry wt	ng g dry wt	ng g dry wt	ng g dry wt	ng g dry wt	ng g dry wt	ng g dry wt	ng g dry wt	ng g dry wt
P01	<0.629	<0.543	<0.598	<2.07	<1.16	<0.838	<0.983	<0.996	<0.806
P02	<0.180	<0.155	<0.171	<0.589	<0.331	<0.239	<0.280	<0.284	<0.230
P03	<0.245	<0.211	<0.232	<0.803	<0.451	<0.326	<0.382	<0.387	<0.313
P04	<0.545	<0.471	<0.518	<1.79	<1.00	0.726	<0.851	<0.863	<0.698
P05	<0.430	<0.371	<0.408	<1.41	<0.791	<0.572	<0.671	<0.680	<0.550
P06	<0.442	<0.382	<0.420	<1.45	<0.814	<0.589	<0.690	<0.700	<0.566
P07	<0.462	<0.399	<0.439	<1.52	<0.851	<0.615	<0.721	<0.731	<0.592
A08	<0.201	<0.174	<0.191	<0.660	<0.370	<0.268	<0.314	<0.318	<0.257
A09	<0.383	<0.330	<0.363	<1.26	<0.705	<0.509	<0.598	<0.606	<0.490
P10	<0.388	<0.335	<0.368	<1.27	<0.714	<0.516	<0.606	<0.614	<0.497
P11	<0.394	<0.340	<0.374	<1.29	<0.725	<0.524	<0.614	<0.623	<0.504
P12	<0.214	<0.184	<0.203	<0.700	<0.393	<0.284	<0.333	<0.338	<0.273
P13	<0.437	<0.377	<0.415	<1.43	<0.804	<0.581	<0.682	<0.691	<0.559
P14	<0.222	<0.191	<0.210	<0.727	<0.408	<0.295	<0.346	<0.351	<0.284
P15	<0.491	<0.424	<0.466	<1.61	<0.904	<0.653	<0.766	<0.777	<0.629
P16	<0.219	<0.189	<0.208	<0.719	<0.404	<0.292	<0.342	<0.347	<0.281
P17	<0.464	<0.401	<0.441	<1.52	<0.855	2	<0.725	<0.735	<0.595
P18	<0.578	<0.499	<0.549	<1.90	<1.06	<0.769	<0.902	<0.915	<0.740
P19	<0.570	<0.492	<0.542	<1.87	<1.05	0.833	<0.890	<0.903	<0.730
P20	<0.422	<0.364	<0.401	<1.38	<0.777	<0.562	<0.659	<0.668	<0.540
P21	<0.340	<0.294	<0.323	<1.12	<0.627	<0.453	<0.531	<0.539	<0.436
P22	<0.189	<0.163	<0.180	<0.620	<0.348	<0.252	<0.295	<0.299	<0.242
P23	<0.497	<0.429	<0.472	<1.63	<0.915	<0.661	<0.775	<0.786	<0.636
P24	<0.426	<0.368	<0.405	<1.40	<0.785	<0.567	<0.666	<0.675	<0.546
P25	<0.481	<0.415	<0.456	<1.58	<0.885	<0.640	<0.750	<0.761	<0.615
P26	<0.196	<0.169	<0.186	<0.643	<0.361	<0.261	<0.306	<0.310	<0.251
P27	<0.327	<0.282	<0.310	<1.07	<0.602	<0.435	<0.510	<0.517	<0.419
P28	<0.352	<0.304	<0.334	<1.15	<0.648	<0.468	<0.549	<0.557	<0.450
P29	<0.320	<0.277	<0.304	<1.05	<0.590	<0.426	<0.500	<0.507	<0.410
P30	<0.281	<0.243	<0.267	<0.923	<0.518	<0.374	<0.439	<0.445	<0.360
P31	<0.968	<0.836	<0.919	<3.18	<1.78	<1.29	<1.51	<1.53	<1.24
P32	<0.224	<0.194	<0.213	<0.735	<0.413	<0.298	<0.350	<0.355	<0.287
P33	<0.199	<0.172	<0.189	<0.654	<0.367	<0.265	<0.311	<0.316	<0.255
P34	<0.469	<0.405	<0.445	<1.54	<0.863	<0.624	<0.732	<0.742	<0.600
P35	<0.299	<0.258	<0.284	<0.982	<0.551	<0.398	<0.467	<0.474	<0.383
P36	<0.231	<0.200	<0.220	<0.759	<0.426	<0.308	<0.361	<0.366	<0.296
P37	<0.184	<0.159	<0.175	<0.604	<0.339	<0.245	<0.288	<0.291	<0.236
A38	<0.298	<0.257	<0.283	<0.977	<0.548	<0.396	<0.465	<0.471	<0.381
P39	<0.370	<0.319	<0.351	<1.21	<0.681	<0.492	<0.577	<0.585	<0.474
P40	<0.173	<0.149	<0.164	<0.567	<0.318	<0.230	<0.270	<0.274	<0.221
P41	<0.422	<0.364	<0.400	<1.38	<0.776	<0.561	<0.658	<0.667	<0.540
P42	<0.384	<0.331	<0.364	<1.26	<0.707	<0.511	<0.599	<0.607	<0.491
P43	<0.430	<0.372	<0.409	<1.41	<0.793	<0.573	<0.672	<0.681	<0.551
P44	<0.214	<0.185	<0.203	<0.702	<0.394	<0.285	<0.334	<0.339	<0.274
P45	<0.179	<0.155	<0.170	<0.589	<0.330	<0.239	<0.280	<0.284	<0.230
P46	<0.182	<0.157	<0.173	<0.597	<0.335	<0.242	<0.284	<0.288	<0.233
P47	<0.169	<0.146	<0.161	<0.554	<0.311	<0.225	<0.264	<0.268	<0.216
P48	<0.245	<0.212	<0.233	<0.804	<0.451	<0.326	<0.383	<0.388	<0.314
P49	<0.218	<0.188	<0.207	<0.715	<0.401	<0.290	<0.340	<0.345	<0.279
P50	<0.316	<0.273	<0.300	<1.04	<0.583	<0.421	<0.494	<0.501	<0.405
P51	<1.03	<0.887	<0.976	<3.37	<1.89	2.85	<1.60	<1.63	<1.32
P52	<0.820	<0.708	<0.779	<2.69	<1.51	2.07	<1.28	<1.30	<1.05
P53	<0.184	<0.159	<0.175	<0.604	<0.339	<0.245	<0.288	<0.291	<0.236
P54	<0.392	<0.339	<0.373	<1.29	<0.723	0.641	<0.613	<0.621	<0.503
P55	<0.354	<0.306	<0.336	<1.16	<0.653	<0.472	<0.553	<0.561	<0.454
P56	<0.255	<0.220	<0.242	<0.836	<0.469	<0.339	<0.398	<0.403	<0.326
P57	<0.316	<0.272	<0.300	<1.04	<0.581	0.44	<0.493	<0.499	<0.404
P58	<0.228	<0.197	<0.216	<0.748	<0.420	<0.303	<0.356	<0.361	<0.292
P59	<0.401	<0.346	<0.381	<1.31	<0.738	0.536	<0.626	<0.634	<0.513
P60	<0.190	<0.164	<0.180	<0.622	<0.349	<0.253	<0.296	<0.300	<0.243
Leadenwah Reference	<0.212	<0.183	<0.201	<0.694	<0.390	<0.282	<0.330	<0.335	<0.271
Folly River Reference	<0.194	<0.167	<0.184	<0.635	<0.356	<0.258	<0.302	<0.306	<0.248
Folly River Reference	<0.191	<0.165	<0.181	<0.626	<0.352	<0.254	<0.298	<0.302	<0.244
Folly River Reference	<0.189	<0.163	<0.179	<0.619	<0.348	<0.251	<0.295	<0.299	<0.242
Lab Blank	<0.180	<0.156	<0.171	<0.591	<0.332	<0.240	<0.281	<0.285	<0.231
Lab Blank	<0.176	<0.152	<0.167	<0.579	<0.325	<0.235	<0.275	<0.279	<0.226
Field Blank from Station P31	<0.188	<0.162	<0.178	<0.615	<0.345	<0.250	<0.293	<0.297	<0.240
Field Blank from Station P48	<0.183	<0.158	<0.174	<0.601	<0.338	<0.244	<0.286	<0.290	<0.235
Field Blank from Station P60	<0.178	<0.154	<0.169	<0.584	<0.328	<0.237	<0.278	<0.282	<0.228
Field Blank from Station P47	<0.179	<0.154	<0.170	<0.587	<0.329	<0.238	<0.279	<0.283	<0.229
Field Blank from Station P57	<0.178	<0.154	<0.169	<0.585	<0.329	<0.237	<0.278	<0.282	<0.228
Leadenwah Reference	<0.184	<0.159	<0.175	<0.603	<0.339	<0.245	<0.287	<0.291	<0.236
Leadenwah Reference	<0.203	<0.175	<0.193	<0.665	<0.373	<0.270	<0.317	<0.321	<0.260

Appendix 2. (continued)

Station ID	PCB 123 ng g dry wt	PCB 126 ng g dry wt	PCB 128/167 ng g dry wt	PCB 130 ng g dry wt	PCB 132/168 ng g dry wt	PCB 138/163/164 ng g dry wt	PCB 141 ng g dry wt	PCB 146 ng g dry wt
P01	<3.94	<0.697	<0.408	<0.743	<0.684	<0.380	<0.534	<2.02
P02	<1.13	<0.199	<0.116	<0.212	<0.195	<0.109	<0.152	<0.575
P03	<1.53	<0.271	<0.158	<0.289	<0.266	<0.148	<0.208	<0.784
P04	<3.42	<0.604	<0.353	<0.643	<0.592	0.655	<0.463	<1.75
P05	<2.69	<0.476	<0.278	<0.507	<0.467	0.325	<0.365	<1.38
P06	<2.77	<0.490	<0.286	<0.522	<0.480	<0.267	<0.375	<1.42
P07	<2.89	<0.512	<0.299	<0.545	<0.502	<0.279	<0.392	<1.48
A08	<1.26	<0.223	<0.130	<0.237	<0.218	<0.121	<0.171	<0.644
A09	<2.40	<0.424	<0.248	<0.452	<0.416	<0.231	<0.325	<1.23
P10	<2.43	<0.430	<0.251	<0.458	<0.421	<0.234	<0.329	<1.24
P11	<2.47	<0.436	<0.255	<0.464	<0.428	0.317	<0.334	<1.26
P12	<1.34	<0.237	<0.138	<0.252	<0.232	<0.129	<0.181	<0.684
P13	<2.74	<0.484	<0.283	<0.515	<0.474	0.346	<0.371	<1.40
P14	<1.39	<0.245	<0.143	<0.261	<0.241	<0.134	<0.188	<0.709
P15	<3.08	<0.544	<0.318	<0.579	<0.533	<0.297	<0.417	<1.57
P16	<1.37	<0.243	<0.142	<0.259	<0.238	0.303	<0.186	<0.702
P17	<2.91	<0.514	0.374	<0.548	<0.504	2.29	0.534	<1.49
P18	<3.62	<0.640	<0.374	<0.682	<0.628	0.462	0.578	<1.85
P19	<3.57	<0.632	<0.369	<0.673	<0.620	0.784	0.948	<1.83
P20	<2.64	<0.468	<0.273	<0.498	<0.458	<0.255	<0.358	<1.35
P21	<2.13	<0.377	<0.220	<0.402	<0.370	<0.206	<0.289	<1.09
P22	<1.18	<0.209	<0.122	<0.223	<0.205	<0.114	<0.160	<0.605
P23	<3.11	<0.550	<0.322	<0.586	<0.540	<0.300	<0.422	<1.59
P24	<2.67	<0.472	<0.276	<0.503	<0.463	0.31	<0.362	<1.36
P25	<3.01	<0.532	<0.311	<0.567	<0.522	<0.290	<0.408	<1.54
P26	<1.23	<0.217	<0.127	<0.231	<0.213	<0.119	<0.167	<0.628
P27	<2.05	<0.362	<0.212	<0.386	<0.355	<0.198	<0.278	<1.05
P28	<2.20	<0.390	<0.228	<0.415	<0.382	0.291	0.342	<1.13
P29	<2.01	<0.355	<0.207	<0.378	<0.348	<0.194	<0.272	<1.03
P30	<1.76	<0.312	<0.182	<0.332	<0.306	<0.170	<0.239	<0.901
P31	<6.07	<1.07	<0.627	<1.14	<1.05	1.07	<0.822	<3.10
P32	<1.40	<0.248	<0.145	<0.264	<0.244	0.174	0.19	<0.718
P33	<1.25	<0.221	<0.129	<0.235	<0.217	<0.121	<0.169	<0.638
P34	<2.94	<0.519	<0.304	<0.553	<0.509	0.482	<0.398	<1.50
P35	<1.88	<0.332	<0.194	<0.353	<0.325	<0.181	<0.254	<0.959
P36	<1.45	<0.256	<0.150	<0.273	<0.251	<0.140	<0.196	<0.741
P37	<1.15	<0.204	<0.119	<0.217	<0.200	<0.111	<0.156	<0.590
A38	<1.87	<0.330	<0.193	<0.351	<0.323	<0.180	<0.253	<0.953
P39	<2.32	<0.410	<0.239	<0.436	<0.402	<0.223	<0.314	<1.18
P40	<1.08	<0.192	<0.112	<0.204	<0.188	<0.104	<0.147	<0.553
P41	<2.64	<0.467	<0.273	<0.497	<0.458	<0.255	<0.358	<1.35
P42	<2.40	<0.425	<0.248	<0.453	<0.417	<0.232	<0.326	<1.23
P43	<2.70	<0.477	<0.279	<0.508	<0.468	<0.260	<0.365	<1.38
P44	<1.34	<0.237	<0.139	<0.252	<0.232	<0.129	<0.182	<0.685
P45	<1.12	<0.199	<0.116	<0.212	<0.195	<0.108	<0.152	<0.574
P46	<1.14	<0.202	<0.118	<0.215	<0.198	<0.110	<0.154	<0.583
P47	<1.06	<0.187	<0.109	<0.199	<0.184	<0.102	<0.143	<0.541
P48	<1.54	<0.271	<0.159	<0.289	<0.266	<0.148	<0.208	<0.784
P49	<1.36	<0.241	<0.141	<0.257	<0.237	<0.132	<0.185	<0.697
P50	<1.98	<0.350	<0.205	<0.373	<0.344	0.321	<0.269	<1.01
P51	<6.44	<1.14	<0.666	<1.21	<1.12	3.18	1.07	<3.29
P52	<5.14	<0.909	<0.531	<0.968	<0.891	2.38	1.31	<2.63
P53	<1.15	<0.204	<0.119	<0.217	<0.200	<0.111	<0.156	<0.590
P54	<2.46	<0.435	<0.254	<0.463	<0.426	0.618	0.401	<1.26
P55	<2.22	<0.393	<0.229	<0.418	<0.385	0.415	0.387	<1.13
P56	<1.60	<0.282	<0.165	<0.301	<0.277	0.227	<0.216	<0.816
P57	<1.98	<0.350	<0.204	<0.372	<0.343	0.459	0.288	<1.01
P58	<1.43	<0.253	<0.148	<0.269	<0.248	0.189	<0.194	<0.730
P59	<2.51	<0.444	<0.260	<0.473	<0.435	0.585	<0.340	<1.28
P60	<1.19	<0.210	<0.123	<0.224	<0.206	<0.115	<0.161	<0.607
Leadenwah Reference	<1.33	<0.234	<0.137	<0.250	<0.230	<0.128	<0.180	<0.678
Folly River Reference	<1.21	<0.214	<0.125	<0.228	<0.210	<0.117	0.27	<0.620
Folly River Reference	<1.20	<0.211	<0.124	<0.225	<0.207	<0.115	<0.162	<0.611
Folly River Reference	<1.18	<0.209	<0.122	<0.223	<0.205	<0.114	<0.160	<0.604
Lab Blank	<1.13	<0.200	<0.117	<0.213	<0.196	<0.109	<0.153	<0.577
Lab Blank	<1.11	<0.195	<0.114	<0.208	<0.192	<0.107	<0.150	<0.565
Field Blank from Station P31	<1.18	<0.208	<0.121	<0.221	<0.204	<0.113	<0.159	<0.600
Field Blank from Station P48	<1.15	<0.203	<0.119	<0.216	<0.199	<0.111	<0.156	<0.587
Field Blank from Station P60	<1.12	<0.197	<0.115	<0.210	<0.194	<0.108	<0.151	<0.570
Field Blank from Station P47	<1.12	<0.198	<0.116	<0.211	<0.194	<0.108	<0.152	<0.573
Field Blank from Station P57	<1.12	<0.198	<0.115	<0.210	<0.194	<0.108	<0.151	<0.571
Leadenwah Reference	<1.15	<0.204	<0.119	<0.217	<0.200	<0.111	<0.156	<0.589
Leadenwah Reference	<1.27	<0.225	<0.131	<0.239	<0.220	<0.123	<0.172	<0.649

Appendix 2. (continued)

Station ID	PCB 149 ng g dry wt	PCB 15 ng g dry wt	PCB 151 ng g dry wt	PCB 153 ng g dry wt	PCB 154 ng g dry wt	PCB 156 ng g dry wt	PCB 157 ng g dry wt	PCB 158 ng g dry wt	PCB 159 ng g dry wt
P01	<1.36	<0.702	<0.643	<1.68	<0.598	<0.512	<0.466	<0.779	<0.385
P02	<0.388	<0.200	<0.183	<0.479	<0.171	<0.146	<0.133	<0.222	<0.110
P03	<0.528	<0.273	<0.250	<0.653	<0.232	<0.199	<0.181	<0.303	<0.150
P04	<1.18	<0.608	<0.557	<1.45	<0.518	<0.443	<0.404	<0.675	<0.333
P05	<0.928	<0.479	<0.439	<1.15	<0.408	<0.349	<0.318	<0.532	<0.263
P06	<0.954	<0.493	<0.452	<1.18	<0.420	<0.359	<0.328	<0.547	<0.270
P07	<0.997	<0.515	<0.472	<1.23	<0.439	<0.376	<0.342	<0.572	<0.282
A08	<0.434	<0.224	<0.205	<0.537	<0.191	<0.163	<0.149	<0.249	<0.123
A09	<0.826	<0.427	<0.391	<1.02	<0.363	<0.311	<0.284	<0.474	<0.234
P10	<0.837	<0.433	<0.396	<1.04	<0.368	<0.315	<0.287	<0.480	<0.237
P11	<0.849	<0.439	<0.402	<1.05	<0.374	<0.320	<0.292	<0.487	<0.241
P12	<0.461	<0.238	<0.218	<0.570	<0.203	<0.174	<0.158	<0.264	<0.131
P13	<0.942	<0.487	<0.446	<1.17	<0.415	<0.355	<0.324	<0.540	<0.267
P14	<0.478	<0.247	<0.226	<0.591	<0.210	<0.180	<0.164	<0.274	<0.135
P15	<1.06	<0.547	<0.501	<1.31	<0.466	<0.399	<0.364	<0.607	<0.300
P16	<0.473	<0.245	<0.224	<0.585	<0.208	<0.178	<0.163	<0.271	<0.134
P17	1.93	<0.518	0.541	2.22	<0.441	<0.377	<0.344	<0.574	<0.284
P18	<1.25	<0.645	<0.590	<1.54	<0.549	<0.470	<0.428	<0.715	<0.353
P19	<1.23	<0.636	<0.583	<1.52	<0.542	<0.464	<0.423	<0.706	<0.349
P20	<0.911	<0.471	<0.431	<1.13	<0.401	<0.343	<0.313	<0.522	<0.258
P21	<0.735	<0.380	<0.348	<0.908	<0.323	<0.277	<0.252	<0.421	<0.208
P22	<0.408	<0.211	<0.193	<0.505	<0.180	<0.154	<0.140	<0.234	<0.116
P23	<1.07	<0.554	<0.507	<1.33	<0.472	<0.404	<0.368	<0.615	<0.304
P24	<0.920	<0.475	<0.436	<1.14	<0.405	<0.347	<0.316	<0.528	<0.261
P25	<1.04	<0.536	<0.491	<1.28	<0.456	<0.391	<0.356	<0.595	<0.294
P26	<0.423	<0.219	<0.200	<0.523	<0.186	<0.159	<0.145	<0.243	<0.120
P27	<0.706	<0.365	<0.334	<0.873	<0.310	<0.266	<0.242	<0.405	<0.200
P28	<0.759	<0.392	<0.359	<0.939	<0.334	<0.286	<0.261	<0.435	<0.215
P29	<0.691	<0.357	<0.327	<0.855	<0.304	<0.260	<0.237	<0.396	<0.196
P30	<0.607	<0.314	<0.287	<0.751	<0.267	<0.229	<0.208	<0.348	<0.172
P31	<2.09	<1.08	<0.989	<2.58	<0.919	<0.787	<0.717	<1.20	<0.592
P32	<0.484	<0.250	<0.229	<0.598	<0.213	<0.182	<0.166	<0.277	<0.137
P33	<0.430	<0.222	<0.204	<0.532	<0.189	<0.162	<0.148	<0.247	<0.122
P34	<1.01	<0.523	<0.479	<1.25	<0.445	<0.381	<0.347	<0.580	<0.287
P35	<0.646	<0.334	<0.306	<0.799	<0.284	<0.243	<0.222	<0.370	<0.183
P36	<0.500	<0.258	<0.236	<0.618	<0.220	<0.188	<0.172	<0.286	<0.142
P37	<0.397	<0.205	<0.188	<0.492	<0.175	<0.150	<0.136	<0.228	<0.113
A38	<0.643	<0.332	<0.304	<0.795	<0.283	<0.242	<0.221	<0.368	<0.182
P39	<0.798	<0.412	<0.378	<0.987	<0.351	<0.301	<0.274	<0.458	<0.226
P40	<0.373	<0.193	<0.177	<0.461	<0.164	<0.141	<0.128	<0.214	<0.106
P41	<0.910	<0.470	<0.431	<1.13	<0.400	<0.343	<0.312	<0.522	<0.258
P42	<0.828	<0.428	<0.392	<1.02	<0.364	<0.312	<0.284	<0.475	<0.235
P43	<0.929	<0.480	<0.440	<1.15	<0.409	<0.350	<0.319	<0.533	<0.263
P44	<0.462	<0.239	<0.219	<0.571	<0.203	<0.174	<0.159	<0.265	<0.131
P45	<0.387	<0.200	<0.183	<0.479	<0.170	<0.146	<0.133	<0.222	<0.110
P46	<0.393	<0.203	<0.186	<0.486	<0.173	<0.148	<0.135	<0.225	<0.111
P47	<0.365	<0.188	<0.173	<0.451	<0.161	<0.137	<0.125	<0.209	<0.103
P48	<0.529	<0.273	<0.250	<0.654	<0.233	<0.199	<0.182	<0.303	<0.150
P49	<0.470	<0.243	<0.223	<0.581	<0.207	<0.177	<0.161	<0.270	<0.133
P50	<0.683	<0.353	<0.323	<0.844	<0.300	<0.257	<0.234	<0.391	<0.193
P51	2.24	<1.15	<1.05	4.57	<0.976	<0.836	<0.762	<1.27	<0.629
P52	1.81	<0.915	<0.838	3.15	<0.779	<0.667	<0.608	<1.02	<0.502
P53	<0.397	<0.205	<0.188	<0.492	<0.175	<0.150	<0.136	<0.228	<0.113
P54	<0.847	<0.438	<0.401	<1.05	<0.373	<0.319	<0.291	<0.486	<0.240
P55	<0.765	<0.395	<0.362	<0.946	<0.336	<0.288	<0.263	<0.438	<0.217
P56	<0.550	<0.284	<0.260	<0.680	<0.242	<0.207	<0.189	<0.315	<0.156
P57	<0.681	<0.352	<0.322	<0.842	<0.300	<0.257	<0.234	<0.390	<0.193
P58	<0.492	<0.254	<0.233	<0.608	<0.216	<0.185	<0.169	<0.282	<0.139
P59	<0.865	<0.447	<0.409	<1.07	<0.381	<0.326	<0.297	<0.496	<0.245
P60	<0.410	<0.212	<0.194	<0.506	<0.180	<0.154	<0.141	<0.235	<0.116
Leadenwah Reference	<0.457	<0.236	<0.216	<0.565	<0.201	<0.172	<0.157	<0.262	<0.129
Folly River Reference	<0.418	<0.216	<0.198	<0.517	<0.184	<0.157	<0.143	<0.240	<0.118
Folly River Reference	<0.412	<0.213	<0.195	<0.510	<0.181	<0.155	<0.141	<0.236	<0.117
Folly River Reference	<0.407	<0.211	<0.193	<0.504	<0.179	<0.153	<0.140	<0.234	<0.115
Lab Blank	<0.389	<0.201	<0.184	<0.481	<0.171	<0.147	<0.134	<0.223	<0.110
Lab Blank	<0.381	<0.197	<0.180	<0.471	<0.167	<0.143	<0.131	<0.218	<0.108
Field Blank from Station P31	<0.405	<0.209	<0.192	<0.501	<0.178	<0.152	<0.139	<0.232	<0.115
Field Blank from Station P48	<0.396	<0.204	<0.187	<0.489	<0.174	<0.149	<0.136	<0.227	<0.112
Field Blank from Station P60	<0.384	<0.199	<0.182	<0.475	<0.169	<0.145	<0.132	<0.220	<0.109
Field Blank from Station P47	<0.386	<0.199	<0.183	<0.477	<0.170	<0.145	<0.133	<0.221	<0.109
Field Blank from Station P57	<0.385	<0.199	<0.182	<0.476	<0.169	<0.145	<0.132	<0.221	<0.109
Leadenwah Reference	<0.397	<0.205	<0.188	<0.491	<0.175	<0.150	<0.136	<0.228	<0.112
Leadenwah Reference	<0.438	<0.226	<0.207	<0.541	<0.193	<0.165	<0.150	<0.251	<0.124

Appendix 2. (continued)

Station ID	PCB 169 ng g dry wt	PCB 170/190 ng g dry wt	PCB 172 ng g dry wt	PCB 174 ng g dry wt	PCB 177 ng g dry wt	PCB 18 ng g dry wt	PCB 180 ng g dry wt	PCB 183 ng g dry wt	PCB 184 ng g dry wt
P01	<0.507	<0.598	<0.552	<0.657	<0.720	<1.80	0.634	<0.634	<0.435
P02	<0.145	<0.171	<0.158	<0.187	<0.205	<0.513	<0.140	<0.181	<0.124
P03	<0.197	<0.232	<0.215	<0.255	<0.280	<0.699	<0.190	<0.247	<0.169
P04	<0.439	<0.518	<0.478	<0.569	<0.624	<1.56	<0.424	<0.549	<0.376
P05	<0.346	<0.408	<0.377	<0.448	<0.492	<1.23	<0.334	<0.433	<0.297
P06	<0.356	<0.420	<0.388	<0.461	<0.506	<1.26	<0.344	<0.445	<0.305
P07	<0.372	<0.439	<0.405	<0.482	<0.528	<1.32	<0.359	<0.465	<0.319
A08	<0.162	<0.191	<0.176	<0.210	<0.230	<0.574	<0.156	<0.202	<0.139
A09	<0.308	<0.363	<0.336	<0.399	<0.438	<1.09	<0.297	<0.385	<0.264
P10	<0.313	<0.368	<0.340	<0.405	<0.444	<1.11	<0.301	<0.391	<0.268
P11	<0.317	<0.374	<0.345	<0.411	<0.450	<1.12	<0.306	<0.396	<0.272
P12	<0.172	<0.203	<0.187	<0.223	<0.244	<0.610	<0.166	<0.215	<0.147
P13	<0.352	<0.415	<0.383	<0.456	<0.500	<1.25	<0.339	<0.440	<0.302
P14	<0.179	<0.210	<0.194	<0.231	<0.253	<0.633	<0.172	<0.223	<0.153
P15	<0.396	<0.466	<0.431	<0.512	<0.562	<1.40	<0.381	<0.494	<0.339
P16	<0.177	<0.208	<0.192	<0.229	<0.251	<0.626	<0.170	<0.221	<0.151
P17	<0.374	0.461	<0.407	0.568	<0.531	<1.33	1.29	<0.468	<0.321
P18	<0.466	<0.549	<0.507	<0.603	<0.661	<1.65	<0.449	<0.582	<0.399
P19	<0.460	<0.542	<0.501	<0.595	<0.652	<1.63	0.484	<0.574	<0.394
P20	<0.340	<0.401	<0.370	<0.440	<0.483	<1.21	0.337	<0.425	<0.291
P21	<0.274	<0.323	<0.299	<0.355	<0.389	<0.972	<0.264	<0.343	<0.235
P22	<0.152	<0.180	<0.166	<0.197	<0.216	<0.540	<0.147	<0.190	<0.131
P23	<0.400	<0.472	<0.436	<0.518	<0.568	<1.42	<0.386	<0.500	<0.343
P24	<0.344	<0.405	<0.374	<0.445	<0.488	<1.22	<0.331	<0.429	<0.294
P25	<0.387	<0.456	<0.422	<0.501	<0.550	<1.37	<0.373	<0.484	<0.332
P26	<0.158	<0.186	<0.172	<0.205	<0.224	<0.560	<0.152	<0.198	<0.135
P27	<0.263	<0.310	<0.287	<0.341	<0.374	<0.934	<0.254	<0.329	<0.226
P28	<0.283	<0.334	<0.309	<0.367	<0.402	<1.00	<0.273	<0.354	<0.243
P29	<0.258	<0.304	<0.281	<0.334	<0.366	<0.915	<0.249	<0.323	<0.221
P30	<0.227	<0.267	<0.247	<0.293	<0.322	<0.803	<0.219	<0.283	<0.194
P31	<0.780	<0.919	<0.850	<1.01	<1.11	<2.76	<0.752	<0.975	<0.669
P32	<0.181	<0.213	<0.197	<0.234	<0.256	<0.640	<0.174	<0.226	<0.155
P33	<0.161	<0.189	<0.175	<0.208	<0.228	<0.570	<0.155	<0.201	<0.138
P34	<0.378	<0.445	<0.411	<0.489	<0.536	<1.34	0.388	<0.472	<0.324
P35	<0.241	<0.284	<0.263	<0.312	<0.342	<0.855	<0.233	<0.302	<0.207
P36	<0.187	<0.220	<0.203	<0.241	<0.265	<0.661	<0.180	<0.233	<0.160
P37	<0.148	<0.175	<0.162	<0.192	<0.211	<0.526	<0.143	<0.185	<0.127
A38	<0.240	<0.283	<0.261	<0.311	<0.341	<0.850	<0.231	<0.300	<0.206
P39	<0.298	<0.351	<0.325	<0.386	<0.423	<1.06	<0.287	<0.372	<0.255
P40	<0.139	<0.164	<0.152	<0.180	<0.198	<0.494	<0.134	<0.174	<0.119
P41	<0.340	<0.400	<0.370	<0.440	<0.482	<1.20	<0.328	<0.425	<0.291
P42	<0.309	<0.364	<0.337	<0.400	<0.439	<1.10	<0.298	<0.386	<0.265
P43	<0.347	<0.409	<0.378	<0.449	<0.492	<1.23	<0.334	<0.433	<0.297
P44	<0.172	<0.203	<0.188	<0.223	<0.245	<0.611	<0.166	<0.215	<0.148
P45	<0.145	<0.170	<0.157	<0.187	<0.205	<0.513	<0.139	<0.181	<0.124
P46	<0.147	<0.173	<0.160	<0.190	<0.208	<0.520	<0.141	<0.183	<0.126
P47	<0.136	<0.161	<0.148	<0.176	<0.193	<0.483	<0.131	<0.170	<0.117
P48	<0.197	<0.233	<0.215	<0.256	<0.280	<0.700	<0.190	<0.247	<0.169
P49	<0.175	<0.207	<0.191	<0.227	<0.249	<0.622	<0.169	<0.219	<0.150
P50	<0.255	<0.300	<0.278	<0.330	<0.362	<0.903	<0.246	<0.319	<0.218
P51	<0.828	<0.976	<0.902	<1.07	<1.18	<2.94	1.95	<1.04	<0.710
P52	<0.661	<0.779	<0.720	<0.856	<0.939	<2.34	1.38	<0.826	<0.567
P53	<0.148	<0.175	<0.162	<0.192	<0.211	<0.526	<0.143	<0.185	<0.127
P54	<0.316	<0.373	<0.344	<0.409	<0.449	<1.12	0.313	<0.395	<0.271
P55	<0.285	<0.336	<0.311	<0.370	<0.405	<1.01	0.382	<0.357	<0.245
P56	<0.205	<0.242	<0.224	<0.266	<0.291	<0.728	<0.198	<0.257	<0.176
P57	<0.254	<0.300	<0.277	<0.329	<0.361	<0.901	0.279	<0.318	<0.218
P58	<0.184	<0.216	<0.200	<0.238	<0.261	<0.651	<0.177	<0.230	<0.157
P59	<0.323	<0.381	<0.352	<0.418	<0.458	<1.14	0.343	<0.404	<0.277
P60	<0.153	<0.180	<0.167	<0.198	<0.217	<0.542	<0.147	<0.191	<0.131
Leadenwah Reference	<0.171	<0.201	<0.186	<0.221	<0.242	<0.604	<0.164	<0.213	<0.146
Folly River Reference	<0.156	<0.184	<0.170	<0.202	<0.221	<0.553	<0.150	<0.195	<0.134
Folly River Reference	<0.154	<0.181	<0.168	<0.199	<0.218	<0.545	<0.148	<0.192	<0.132
Folly River Reference	<0.152	<0.179	<0.166	<0.197	<0.216	<0.539	<0.147	<0.190	<0.130
Lab Blank	<0.145	<0.171	<0.158	<0.188	<0.206	<0.515	<0.140	<0.182	<0.124
Lab Blank	<0.142	<0.167	<0.155	<0.184	<0.202	<0.504	<0.137	<0.178	<0.122
Field Blank from Station P31	<0.151	<0.178	<0.165	<0.196	<0.215	<0.536	<0.146	<0.189	<0.130
Field Blank from Station P48	<0.148	<0.174	<0.161	<0.191	<0.210	<0.523	<0.142	<0.185	<0.127
Field Blank from Station P60	<0.144	<0.169	<0.156	<0.186	<0.204	<0.509	<0.138	<0.179	<0.123
Field Blank from Station P47	<0.144	<0.170	<0.157	<0.187	<0.205	<0.511	<0.139	<0.180	<0.124
Field Blank from Station P57	<0.144	<0.169	<0.157	<0.186	<0.204	<0.509	<0.139	<0.180	<0.123
Leadenwah Reference	<0.148	<0.175	<0.161	<0.192	<0.210	<0.525	<0.143	<0.185	<0.127
Leadenwah Reference	<0.163	<0.193	<0.178	<0.212	<0.232	<0.579	<0.158	<0.204	<0.140

Appendix 2. (continued)

Station ID	PCB 184 ng g dry wt	PCB 187 ng g dry wt	PCB 188 ng g dry wt	PCB 189 ng g dry wt	PCB 193 ng g dry wt	PCB 194 ng g dry wt
P01	<0.435	<0.367	<0.394	<0.548	<0.815	<0.371
P02	<0.124	<0.105	<0.112	<0.156	<0.233	<0.106
P03	<0.169	<0.143	<0.153	<0.213	<0.317	<0.144
P04	<0.376	<0.318	<0.341	<0.475	<0.706	<0.322
P05	<0.297	<0.250	<0.269	<0.374	<0.557	<0.254
P06	<0.305	<0.258	<0.277	<0.385	<0.573	<0.261
P07	<0.319	<0.269	<0.289	<0.402	<0.598	<0.273
A08	<0.139	<0.117	<0.126	<0.175	<0.260	<0.119
A09	<0.264	<0.223	<0.240	<0.333	<0.496	<0.226
P10	<0.268	<0.226	<0.243	<0.338	<0.502	<0.229
P11	<0.272	<0.229	<0.246	<0.343	<0.510	<0.232
P12	<0.147	<0.124	<0.134	<0.186	<0.276	<0.126
P13	<0.302	<0.254	<0.273	<0.380	<0.565	<0.258
P14	<0.153	<0.129	<0.139	<0.193	<0.287	<0.131
P15	<0.339	<0.286	<0.307	<0.427	<0.636	<0.290
P16	<0.151	<0.128	<0.137	<0.191	<0.284	<0.129
P17	<0.321	0.755	<0.291	<0.404	<0.601	0.291
P18	<0.399	<0.337	<0.362	<0.503	<0.749	<0.341
P19	<0.394	<0.332	<0.357	<0.496	<0.738	<0.336
P20	<0.291	<0.246	<0.264	<0.367	<0.546	<0.249
P21	<0.235	<0.198	<0.213	<0.296	<0.441	<0.201
P22	<0.131	<0.110	<0.118	<0.165	<0.245	<0.112
P23	<0.343	<0.289	<0.311	<0.432	<0.643	<0.293
P24	<0.294	<0.248	<0.267	<0.371	<0.552	<0.251
P25	<0.332	<0.280	<0.301	<0.418	<0.622	<0.284
P26	<0.135	<0.114	<0.123	<0.171	<0.254	<0.116
P27	<0.226	<0.191	<0.205	<0.285	<0.423	<0.193
P28	<0.243	<0.205	<0.220	<0.306	<0.455	<0.207
P29	<0.221	<0.187	<0.201	<0.279	<0.415	<0.189
P30	<0.194	<0.164	<0.176	<0.245	<0.364	<0.166
P31	<0.669	<0.564	<0.606	<0.843	<1.25	<0.571
P32	<0.155	<0.131	<0.140	<0.195	<0.290	<0.132
P33	<0.138	<0.116	<0.125	<0.174	<0.258	<0.118
P34	<0.324	<0.273	<0.293	<0.408	<0.607	<0.277
P35	<0.207	<0.174	<0.187	<0.261	<0.388	<0.177
P36	<0.160	<0.135	<0.145	<0.201	<0.300	<0.137
P37	<0.127	<0.107	<0.115	<0.160	<0.238	<0.109
A38	<0.206	<0.174	<0.186	<0.259	<0.386	<0.176
P39	<0.255	<0.215	<0.231	<0.322	<0.479	<0.218
P40	<0.119	<0.101	<0.108	<0.150	<0.224	<0.102
P41	<0.291	<0.246	<0.264	<0.367	<0.546	<0.249
P42	<0.265	<0.224	<0.240	<0.334	<0.497	<0.226
P43	<0.297	<0.251	<0.269	<0.375	<0.557	<0.254
P44	<0.148	<0.125	<0.134	<0.186	<0.277	<0.126
P45	<0.124	<0.105	<0.112	<0.156	<0.232	<0.106
P46	<0.126	<0.106	<0.114	<0.158	<0.236	<0.107
P47	<0.117	<0.0985	<0.106	<0.147	<0.219	<0.0997
P48	<0.169	<0.143	<0.153	<0.213	<0.317	<0.145
P49	<0.150	<0.127	<0.136	<0.190	<0.282	<0.128
P50	<0.218	<0.184	<0.198	<0.275	<0.410	<0.187
P51	<0.710	1.11	<0.643	<0.895	<1.33	<0.606
P52	<0.567	0.915	<0.514	<0.714	<1.06	<0.484
P53	<0.127	<0.107	<0.115	<0.160	<0.238	<0.109
P54	<0.271	<0.229	<0.246	<0.342	<0.508	<0.232
P55	<0.245	<0.206	<0.222	<0.308	<0.459	<0.209
P56	<0.176	<0.148	<0.159	<0.222	<0.330	<0.150
P57	<0.218	<0.184	<0.197	<0.275	<0.409	<0.186
P58	<0.157	<0.133	<0.143	<0.198	<0.295	<0.134
P59	<0.277	<0.234	<0.251	<0.349	<0.519	<0.236
P60	<0.131	<0.111	<0.119	<0.165	<0.246	<0.112
Leadenwah Reference	<0.146	<0.123	<0.132	<0.184	<0.274	<0.125
Folly River Reference	<0.134	<0.113	<0.121	<0.169	<0.251	<0.114
Folly River Reference	<0.132	<0.111	<0.119	<0.166	<0.247	<0.113
Folly River Reference	<0.130	<0.110	<0.118	<0.164	<0.244	<0.111
Lab Blank	<0.124	<0.105	<0.113	<0.157	<0.233	<0.106
Lab Blank	<0.122	<0.103	<0.110	<0.154	<0.228	<0.104
Field Blank from Station P31	<0.130	<0.109	<0.117	<0.163	<0.243	<0.111
Field Blank from Station P48	<0.127	<0.107	<0.115	<0.160	<0.237	<0.108
Field Blank from Station P60	<0.123	<0.104	<0.112	<0.155	<0.231	<0.105
Field Blank from Station P47	<0.124	<0.104	<0.112	<0.156	<0.232	<0.106
Field Blank from Station P57	<0.123	<0.104	<0.112	<0.155	<0.231	<0.105
Leadenwah Reference	<0.127	<0.107	<0.115	<0.160	<0.238	<0.109
Leadenwah Reference	<0.140	<0.118	<0.127	<0.177	<0.263	<0.120

Appendix 2. (continued)

Station ID	PCB 195 ng/g dry wt	PCB 198 ng/g dry wt	PCB 2 ng/g dry wt	PCB 20 ng/g dry wt	PCB 200/201 ng/g dry wt	PCB 202 ng/g dry wt	PCB 206 ng/g dry wt	PCB 207 ng/g dry wt
P01	<1.08	<0.738	<0.620	<0.571	<0.498	<0.489	<0.439	<1.26
P02	<0.309	<0.211	<0.177	<0.163	<0.142	<0.140	<0.125	<0.359
P03	<0.421	<0.287	<0.241	<0.222	<0.194	<0.190	<0.171	<0.490
P04	<0.937	<0.639	<0.537	<0.494	<0.431	<0.424	<0.380	<1.09
P05	<0.739	<0.504	<0.424	<0.390	<0.340	<0.334	<0.300	<0.859
P06	<0.760	<0.519	<0.436	<0.401	<0.350	<0.344	<0.309	<0.884
P07	<0.794	<0.542	<0.455	<0.419	<0.366	<0.359	<0.322	<0.924
A08	<0.346	<0.236	<0.198	<0.182	<0.159	<0.156	<0.140	<0.402
A09	<0.658	<0.449	<0.377	<0.347	<0.303	<0.297	<0.267	<0.765
P10	<0.667	<0.455	<0.382	<0.352	<0.307	<0.301	<0.271	<0.776
P11	<0.677	<0.462	<0.388	<0.357	<0.311	<0.306	<0.275	<0.787
P12	<0.367	<0.250	<0.210	<0.194	<0.169	<0.166	<0.149	<0.427
P13	<0.751	<0.512	<0.430	<0.396	<0.346	<0.339	0.569	<0.873
P14	<0.381	<0.260	<0.218	<0.201	<0.175	<0.172	<0.155	<0.443
P15	<0.844	<0.576	<0.484	<0.445	<0.388	<0.381	0.915	<0.982
P16	<0.377	<0.257	<0.216	<0.199	<0.174	<0.170	<0.153	<0.439
P17	<0.798	<0.544	<0.458	<0.421	<0.367	<0.361	<0.324	<0.929
P18	<0.994	<0.678	<0.570	<0.524	<0.457	<0.449	<0.403	<1.16
P19	<0.981	<0.669	<0.562	<0.517	<0.451	<0.443	<0.398	<1.14
P20	<0.726	<0.495	<0.416	<0.383	<0.334	<0.328	<0.294	<0.844
P21	<0.585	<0.399	<0.335	<0.309	<0.269	<0.264	<0.238	<0.681
P22	<0.325	<0.222	<0.186	<0.171	<0.150	<0.147	<0.132	<0.378
P23	<0.854	<0.582	<0.490	<0.450	<0.393	<0.386	<0.347	<0.993
P24	<0.733	<0.500	<0.420	<0.386	<0.337	<0.331	<0.297	<0.853
P25	<0.826	<0.564	<0.474	<0.436	<0.380	<0.373	<0.335	<0.961
P26	<0.337	<0.230	<0.193	<0.178	<0.155	<0.152	<0.137	<0.392
P27	<0.562	<0.383	<0.322	<0.296	<0.259	<0.254	<0.228	<0.654
P28	<0.605	<0.412	<0.347	<0.319	<0.278	<0.273	<0.245	<0.703
P29	<0.551	<0.376	<0.316	<0.290	<0.254	<0.249	<0.224	<0.641
P30	<0.484	<0.330	<0.277	<0.255	<0.223	<0.219	<0.196	<0.563
P31	<1.66	<1.14	<0.954	<0.878	<0.766	<0.752	<0.676	<1.94
P32	<0.385	<0.263	<0.221	<0.203	<0.177	<0.174	<0.156	<0.448
P33	<0.343	<0.234	<0.197	<0.181	<0.158	<0.155	<0.139	<0.399
P34	<0.806	<0.550	<0.462	<0.425	<0.371	<0.364	<0.327	<0.938
P35	<0.515	<0.351	<0.295	<0.271	<0.237	<0.233	<0.209	<0.599
P36	<0.398	<0.271	<0.228	<0.210	<0.183	<0.180	<0.162	<0.463
P37	<0.317	<0.216	<0.182	<0.167	<0.146	<0.143	<0.129	<0.368
A38	<0.512	<0.349	<0.293	<0.270	<0.236	<0.231	<0.208	<0.596
P39	<0.636	<0.434	<0.364	<0.335	<0.293	<0.287	<0.258	<0.740
P40	<0.297	<0.203	<0.170	<0.157	<0.137	<0.134	<0.121	<0.346
P41	<0.725	<0.494	<0.415	<0.382	<0.334	<0.328	<0.294	<0.843
P42	<0.660	<0.450	<0.378	<0.348	<0.304	<0.298	<0.268	<0.767
P43	<0.740	<0.505	<0.424	<0.390	<0.341	<0.334	<0.300	<0.861
P44	<0.368	<0.251	<0.211	<0.194	<0.169	<0.166	<0.149	<0.428
P45	<0.309	<0.210	<0.177	<0.163	<0.142	<0.139	<0.125	<0.359
P46	<0.313	<0.213	<0.179	<0.165	<0.144	<0.141	<0.127	<0.364
P47	<0.291	<0.198	<0.167	<0.153	<0.134	<0.131	<0.118	<0.338
P48	<0.421	<0.287	<0.242	<0.222	<0.194	<0.190	<0.171	<0.490
P49	<0.374	<0.255	<0.215	<0.197	<0.172	<0.169	<0.152	<0.436
P50	<0.544	<0.371	<0.312	<0.287	<0.250	<0.246	<0.221	<0.633
P51	<1.77	<1.21	<1.01	<0.932	<0.813	<0.799	1.88	<2.06
P52	<1.41	<0.962	<0.809	<0.744	<0.649	<0.638	1.49	<1.64
P53	<0.317	<0.216	<0.182	<0.167	<0.146	<0.143	<0.129	<0.368
P54	<0.675	<0.460	<0.387	<0.356	<0.311	<0.305	0.734	<0.785
P55	<0.609	<0.415	<0.349	<0.321	<0.280	<0.275	0.645	<0.709
P56	<0.438	<0.299	<0.251	<0.231	<0.202	<0.198	0.409	<0.510
P57	<0.543	<0.370	<0.311	<0.286	<0.250	<0.245	0.701	<0.631
P58	<0.392	<0.267	<0.225	<0.207	<0.180	<0.177	0.339	<0.456
P59	<0.689	<0.470	<0.395	<0.363	<0.317	<0.311	0.698	<0.802
P60	<0.326	<0.222	<0.187	<0.172	<0.150	<0.147	<0.132	<0.379
Leadenwah Reference	<0.364	<0.248	<0.209	<0.192	<0.167	<0.164	<0.148	<0.423
Folly River Reference	<0.333	<0.227	<0.191	<0.175	<0.153	<0.150	<0.135	<0.387
Folly River Reference	<0.328	<0.224	<0.188	<0.173	<0.151	<0.148	<0.133	<0.382
Folly River Reference	<0.325	<0.221	<0.186	<0.171	<0.149	<0.147	<0.132	<0.378
Lab Blank	<0.310	<0.211	<0.178	<0.163	<0.143	<0.140	<0.126	<0.360
Lab Blank	<0.303	<0.207	<0.174	<0.160	<0.140	<0.137	<0.123	<0.353
Field Blank from Station P31	<0.322	<0.220	<0.185	<0.170	<0.148	<0.146	<0.131	<0.375
Field Blank from Station P48	<0.315	<0.215	<0.181	<0.166	<0.145	<0.142	<0.128	<0.367
Field Blank from Station P60	<0.306	<0.209	<0.176	<0.161	<0.141	<0.138	<0.124	<0.356
Field Blank from Station P47	<0.308	<0.210	<0.176	<0.162	<0.142	<0.139	<0.125	<0.358
Field Blank from Station P57	<0.307	<0.209	<0.176	<0.162	<0.141	<0.139	<0.124	<0.357
Leadenwah Reference	<0.316	<0.216	<0.181	<0.167	<0.146	<0.143	<0.128	<0.368
Leadenwah Reference	<0.349	<0.238	<0.200	<0.184	<0.160	<0.158	<0.142	<0.406

Appendix 2. (continued)

Station ID	PCB 209 ng/g dry wt	PCB 26 ng/g dry wt	PCB 28 ng/g dry wt	PCB 29 ng/g dry wt	PCB 3 ng/g dry wt	PCB 31 ng/g dry wt	PCB 37 ng/g dry wt	PCB 44 ng/g dry wt
P01	<0.494	<0.534	<1.63	<0.956	0.53	<1.39	<0.783	<0.494
P02	<0.141	<0.152	<0.465	<0.273	<0.120	<0.395	<0.224	<0.141
P03	<0.192	<0.208	<0.634	<0.372	<0.164	<0.539	<0.305	<0.192
P04	<0.427	<0.463	<1.41	<0.827	2.1	<1.20	<0.678	<0.427
P05	<0.337	<0.365	<1.11	<0.652	3.65	<0.946	<0.535	<0.337
P06	<0.347	<0.375	<1.15	<0.671	<0.296	<0.973	<0.550	<0.347
P07	<0.362	<0.392	<1.20	<0.701	<0.309	<1.02	<0.575	<0.362
A08	<0.158	<0.171	<0.521	<0.305	<0.135	<0.443	<0.250	<0.158
A09	0.518	<0.325	<0.991	<0.581	1.58	<0.843	<0.476	<0.300
P10	0.43	<0.329	<1.00	<0.589	<0.260	<0.854	<0.483	<0.304
P11	0.456	<0.334	<1.02	<0.597	<0.263	<0.866	<0.490	<0.309
P12	0.198	<0.181	<0.553	<0.324	0.166	<0.470	<0.266	<0.167
P13	1.18	<0.371	<1.13	<0.663	<0.292	<0.961	<0.544	<0.342
P14	0.245	<0.188	<0.574	<0.336	<0.148	<0.488	<0.276	<0.174
P15	1.96	<0.417	<1.27	<0.745	<0.328	<1.08	<0.611	<0.385
P16	<0.172	<0.186	<0.568	<0.333	0.185	<0.483	<0.273	<0.172
P17	0.678	<0.394	<1.20	<0.705	0.715	<1.02	<0.578	<0.364
P18	<0.453	<0.491	<1.50	<0.877	<0.387	<1.27	<0.719	<0.453
P19	<0.447	<0.484	<1.48	<0.866	<0.382	<1.26	<0.710	<0.447
P20	<0.331	<0.358	<1.09	<0.641	0.486	<0.929	<0.525	<0.331
P21	<0.267	<0.289	<0.882	<0.517	<0.228	<0.749	<0.424	<0.267
P22	<0.148	<0.160	<0.490	<0.287	<0.126	<0.416	<0.235	<0.148
P23	<0.389	<0.422	<1.29	<0.754	0.836	<1.09	<0.618	<0.389
P24	<0.334	<0.362	<1.10	<0.647	0.417	<0.939	<0.531	<0.334
P25	<0.377	<0.408	<1.24	<0.730	<0.322	<1.06	<0.598	<0.377
P26	<0.154	<0.167	<0.508	<0.298	0.131	<0.432	<0.244	<0.154
P27	<0.256	<0.278	<0.847	<0.496	1.06	<0.720	<0.407	<0.256
P28	<0.276	<0.299	<0.911	<0.534	1.55	<0.774	<0.438	<0.276
P29	<0.251	<0.272	<0.830	<0.486	3.52	<0.705	<0.399	<0.251
P30	<0.221	<0.239	<0.729	<0.427	<0.188	<0.619	<0.350	<0.221
P31	<0.759	<0.822	<2.51	<1.47	<0.648	<2.13	<1.20	<0.759
P32	<0.176	<0.190	<0.581	<0.340	<0.150	<0.493	<0.279	<0.176
P33	<0.156	<0.169	<0.516	<0.303	<0.133	<0.439	<0.248	<0.156
P34	<0.368	<0.398	<1.21	<0.712	<0.314	<1.03	<0.583	<0.368
P35	<0.235	<0.254	<0.775	<0.454	<0.200	<0.659	<0.373	<0.235
P36	<0.182	<0.196	<0.599	<0.351	0.18	<0.510	<0.288	<0.182
P37	<0.144	<0.156	<0.477	<0.280	<0.123	<0.405	<0.229	<0.144
A38	<0.234	<0.253	<0.771	<0.452	<0.199	<0.656	<0.371	<0.234
P39	<0.290	<0.314	<0.958	<0.561	<0.247	<0.814	<0.460	<0.290
P40	<0.136	<0.147	<0.448	<0.262	3.48	<0.381	<0.215	<0.136
P41	<0.331	<0.358	<1.09	<0.640	<0.282	<0.928	<0.525	<0.331
P42	<0.301	<0.326	<0.994	<0.582	<0.257	<0.845	<0.478	<0.301
P43	<0.337	<0.365	<1.11	<0.653	<0.288	<0.947	<0.536	<0.337
P44	<0.168	<0.182	<0.554	<0.325	8.47	<0.471	<0.266	<0.168
P45	<0.141	<0.152	<0.465	<0.272	1.57	<0.395	<0.223	<0.141
P46	<0.143	<0.154	<0.471	<0.276	<0.122	<0.401	<0.226	<0.143
P47	<0.133	<0.143	<0.438	<0.257	<0.113	<0.372	<0.210	<0.133
P48	<0.192	<0.208	<0.635	<0.372	<0.164	<0.539	<0.305	<0.192
P49	<0.171	<0.185	<0.564	<0.331	6.35	<0.479	<0.271	<0.171
P50	<0.248	<0.269	<0.819	<0.480	<0.212	<0.696	<0.394	<0.248
P51	4.03	<0.873	<2.66	<1.56	<0.688	<2.26	<1.28	<0.806
P52	3.44	<0.697	<2.13	<1.25	<0.549	<1.81	<1.02	<0.643
P53	<0.144	<0.156	<0.477	<0.280	2.1	<0.405	<0.229	<0.144
P54	1.69	<0.333	<1.02	<0.596	<0.263	<0.864	<0.488	<0.308
P55	1.39	<0.301	<0.918	<0.538	7.41	<0.780	<0.441	<0.278
P56	0.902	<0.216	<0.660	<0.387	1.24	<0.561	<0.317	<0.200
P57	1.59	<0.268	<0.817	<0.479	3.05	<0.695	<0.393	<0.247
P58	0.759	<0.194	<0.590	<0.346	1.58	<0.502	<0.284	<0.179
P59	1.61	<0.340	<1.04	<0.608	10.8	<0.882	<0.499	<0.314
P60	<0.149	<0.161	<0.491	<0.288	2.48	<0.418	<0.236	<0.149
Leadenwah Reference	<0.166	<0.180	<0.548	<0.321	0.391	<0.466	<0.263	<0.166
Folly River Reference	<0.152	<0.164	<0.501	<0.294	<0.130	<0.426	<0.241	<0.152
Folly River Reference	<0.150	<0.162	<0.494	<0.290	0.24	<0.420	<0.238	<0.150
Folly River Reference	<0.148	<0.160	<0.489	<0.287	0.178	<0.416	<0.235	<0.148
Lab Blank	<0.141	<0.153	<0.467	<0.274	<0.121	<0.397	<0.224	<0.141
Lab Blank	<0.138	<0.150	<0.457	<0.268	<0.118	<0.388	<0.220	<0.138
Field Blank from Station P31	<0.147	<0.159	<0.486	<0.285	<0.125	<0.413	<0.233	<0.147
Field Blank from Station P48	<0.144	<0.156	<0.475	<0.278	<0.123	<0.403	<0.228	<0.144
Field Blank from Station P60	<0.140	<0.151	<0.461	<0.270	<0.119	<0.392	<0.222	<0.140
Field Blank from Station P47	<0.140	<0.152	<0.463	<0.272	<0.120	<0.394	<0.223	<0.140
Field Blank from Station P57	<0.140	<0.151	<0.462	<0.271	<0.119	<0.393	<0.222	<0.140
Leadenwah Reference	<0.144	<0.156	<0.476	<0.279	0.359	<0.405	<0.229	<0.144
Leadenwah Reference	<0.159	<0.172	<0.525	<0.308	<0.136	<0.446	<0.252	<0.159

Appendix 2. (continued)

Station ID	PCB 45 ng/g dry wt	PCB 48 ng/g dry wt	PCB 5/8 ng/g dry wt	PCB 50 ng/g dry wt	PCB 52 ng/g dry wt	PCB 56/60 ng/g dry wt	PCB 61/74 ng/g dry wt	PCB 63 ng/g dry wt
P01	<0.983	<0.457	<1.56	<0.897	<0.620	<0.919	<1.21	<0.928
P02	<0.280	<0.131	<0.446	<0.256	<0.177	<0.262	<0.346	<0.265
P03	<0.382	<0.178	<0.607	<0.349	<0.241	<0.357	<0.472	<0.361
P04	<0.851	<0.396	<1.35	<0.777	<0.537	<0.796	<1.05	<0.804
P05	<0.671	<0.312	<1.07	<0.612	<0.424	<0.628	<0.829	<0.634
P06	<0.690	<0.321	<1.10	<0.630	<0.436	<0.646	<0.853	<0.652
P07	<0.721	<0.336	<1.15	<0.658	<0.455	<0.675	<0.891	<0.681
A08	<0.314	<0.146	<0.499	<0.286	<0.198	<0.294	<0.388	<0.297
A09	<0.598	<0.278	<0.950	<0.545	<0.377	<0.559	<0.738	<0.564
P10	<0.606	<0.282	<0.963	<0.553	<0.382	<0.566	<0.748	<0.572
P11	<0.614	<0.286	<0.977	<0.561	<0.388	<0.575	<0.759	<0.580
P12	<0.333	<0.155	<0.530	<0.304	<0.210	<0.312	<0.412	<0.315
P13	<0.682	<0.317	<1.08	<0.622	<0.430	<0.638	<0.842	<0.644
P14	<0.346	<0.161	<0.550	<0.316	<0.218	<0.324	<0.427	<0.327
P15	<0.766	<0.357	<1.22	<0.699	<0.484	<0.717	<0.946	<0.724
P16	<0.342	<0.159	<0.544	<0.312	<0.216	<0.320	<0.423	<0.323
P17	<0.725	0.528	<1.15	<0.661	3.18	<0.678	<0.895	<0.685
P18	<0.902	<0.420	<1.43	<0.823	<0.570	<0.844	<1.11	<0.852
P19	<0.890	<0.414	<1.42	<0.812	0.587	<0.833	<1.10	<0.841
P20	<0.659	<0.307	<1.05	<0.601	<0.416	<0.616	<0.814	<0.622
P21	<0.531	<0.247	<0.845	<0.485	<0.335	<0.497	<0.656	<0.502
P22	<0.295	<0.137	<0.469	<0.269	<0.186	<0.276	<0.365	<0.279
P23	<0.775	<0.361	<1.23	<0.708	<0.490	<0.725	<0.958	<0.733
P24	<0.666	<0.310	<1.06	<0.607	<0.420	<0.623	<0.822	<0.629
P25	<0.750	<0.349	<1.19	<0.685	<0.474	<0.702	<0.927	<0.709
P26	<0.306	<0.143	<0.487	<0.279	<0.193	<0.286	<0.378	<0.289
P27	<0.510	<0.238	<0.811	<0.466	<0.322	<0.477	<0.630	<0.482
P28	<0.549	<0.256	<0.873	<0.501	<0.347	<0.514	<0.678	<0.519
P29	<0.500	<0.233	<0.795	<0.456	<0.316	<0.468	<0.618	<0.473
P30	<0.439	<0.204	<0.698	<0.401	<0.277	<0.411	<0.542	<0.415
P31	<1.51	<0.703	<2.40	<1.38	<0.954	<1.41	<1.87	<1.43
P32	<0.350	<0.163	<0.556	<0.319	<0.221	<0.327	<0.432	<0.331
P33	<0.311	<0.145	<0.495	<0.284	<0.197	<0.291	<0.384	<0.294
P34	<0.732	<0.341	<1.16	<0.668	<0.462	<0.685	<0.904	<0.691
P35	<0.467	<0.218	<0.743	<0.426	<0.295	<0.437	<0.577	<0.442
P36	<0.361	<0.168	<0.575	<0.330	<0.228	<0.338	<0.446	<0.341
P37	<0.288	<0.134	<0.457	<0.262	<0.182	<0.269	<0.355	<0.272
A38	<0.465	<0.216	<0.739	<0.424	<0.293	<0.435	<0.574	<0.439
P39	<0.577	<0.269	<0.918	<0.527	<0.364	<0.540	<0.713	<0.545
P40	<0.270	<0.126	<0.429	<0.246	<0.170	<0.252	<0.333	<0.255
P41	<0.658	<0.306	<1.05	<0.600	<0.415	<0.616	<0.813	<0.622
P42	<0.599	<0.279	<0.952	<0.547	<0.378	<0.560	<0.740	<0.566
P43	<0.672	<0.313	<1.07	<0.613	<0.424	<0.629	<0.830	<0.635
P44	<0.334	<0.155	<0.531	<0.305	<0.211	<0.312	<0.412	<0.316
P45	<0.280	<0.130	<0.445	<0.256	<0.177	<0.262	<0.346	<0.265
P46	<0.284	<0.132	<0.452	<0.259	<0.179	<0.266	<0.351	<0.268
P47	<0.264	<0.123	<0.420	<0.241	<0.167	<0.247	<0.326	<0.249
P48	<0.383	<0.178	<0.608	<0.349	<0.242	<0.358	<0.472	<0.361
P49	<0.340	<0.158	<0.541	<0.310	<0.215	<0.318	<0.420	<0.321
P50	<0.494	<0.230	<0.785	<0.451	<0.312	<0.462	<0.610	<0.466
P51	<1.60	<0.747	<2.55	<1.46	1.69	1.75	<1.98	<1.52
P52	<1.28	<0.596	<2.04	<1.17	1.32	<1.20	<1.58	<1.21
P53	<0.288	<0.134	<0.457	<0.262	<0.182	<0.269	<0.355	<0.272
P54	<0.613	<0.285	<0.974	<0.559	<0.387	<0.573	<0.757	<0.579
P55	<0.553	<0.257	<0.879	<0.505	<0.349	<0.517	<0.683	<0.523
P56	<0.398	<0.185	<0.632	<0.363	<0.251	<0.372	<0.491	<0.376
P57	<0.493	<0.229	<0.783	<0.449	<0.311	<0.461	<0.608	<0.465
P58	<0.356	<0.166	<0.566	<0.325	<0.225	<0.333	<0.439	<0.336
P59	<0.626	<0.291	<0.995	<0.571	<0.395	<0.585	<0.773	<0.591
P60	<0.296	<0.138	<0.471	<0.270	<0.187	<0.277	<0.366	<0.280
Leadenwah Reference	<0.330	<0.154	<0.525	<0.301	<0.209	<0.309	<0.408	<0.312
Folly River Reference	<0.302	<0.141	<0.480	<0.276	<0.191	<0.283	<0.373	<0.285
Folly River Reference	<0.298	<0.139	<0.474	<0.272	<0.188	<0.279	<0.368	<0.282
Folly River Reference	<0.295	<0.137	<0.469	<0.269	<0.186	<0.276	<0.364	<0.278
Lab Blank	<0.281	<0.131	<0.447	<0.257	<0.178	<0.263	<0.347	<0.266
Lab Blank	<0.275	<0.128	<0.438	<0.251	<0.174	<0.258	<0.340	<0.260
Field Blank from Station P31	<0.293	<0.136	<0.466	<0.267	<0.185	<0.274	<0.362	<0.277
Field Blank from Station P48	<0.286	<0.133	<0.455	<0.261	<0.181	<0.268	<0.353	<0.270
Field Blank from Station P60	<0.278	<0.129	<0.442	<0.254	<0.176	<0.260	<0.343	<0.263
Field Blank from Station P47	<0.279	<0.130	<0.444	<0.255	<0.176	<0.261	<0.345	<0.264
Field Blank from Station P57	<0.278	<0.130	<0.443	<0.254	<0.176	<0.260	<0.344	<0.263
Leadenwah Reference	<0.287	<0.134	<0.457	<0.262	<0.181	<0.269	<0.355	<0.271
Leadenwah Reference	<0.317	<0.147	<0.503	<0.289	<0.200	<0.296	<0.391	<0.299

Appendix 2. (continued)

Station ID	PCB 66 ng/g dry wt	PCB 69 ng/g dry wt	PCB 70 ng/g dry wt	PCB 76 ng/g dry wt	PCB 77 ng/g dry wt	PCB 81 ng/g dry wt	PCB 82 ng/g dry wt	PCB 84 ng/g dry wt
P01	1.81	<1.58	<1.87	<1.25	<0.666	<0.802	<0.915	<1.46
P02	0.571	<0.452	<0.535	<0.355	<0.190	<0.229	<0.261	<0.416
P03	0.586	<0.616	<0.729	<0.484	<0.259	<0.312	<0.356	<0.567
P04	1.14	<1.37	<1.62	<1.08	<0.576	<0.694	<0.792	<1.26
P05	0.637	<1.08	<1.28	<0.850	<0.454	<0.547	<0.625	<0.996
P06	<0.643	<1.11	<1.32	<0.875	<0.468	<0.563	<0.643	<1.02
P07	<0.671	<1.16	<1.38	<0.914	<0.489	<0.588	<0.671	<1.07
A08	<0.292	<0.506	<0.599	<0.398	<0.213	<0.256	<0.292	<0.466
A09	<0.556	<0.964	<1.14	<0.757	<0.405	<0.487	<0.556	<0.887
P10	<0.564	<0.977	<1.16	<0.767	<0.410	<0.494	<0.564	<0.899
P11	<0.572	<0.991	<1.17	<0.779	<0.416	<0.501	<0.572	<0.912
P12	<0.310	<0.538	<0.636	<0.422	<0.226	<0.272	<0.310	<0.495
P13	<0.635	<1.10	<1.30	<0.864	<0.462	<0.556	<0.635	<1.01
P14	<0.322	<0.558	<0.660	<0.438	<0.234	<0.282	<0.322	<0.513
P15	<0.713	<1.24	<1.46	<0.971	<0.519	<0.625	<0.713	<1.14
P16	<0.319	<0.552	<0.653	<0.434	<0.232	<0.279	<0.319	<0.508
P17	<0.675	<1.17	<1.38	<0.919	<0.491	0.962	<0.675	<1.08
P18	<0.840	<1.46	<1.72	<1.14	<0.611	<0.736	<0.840	<1.34
P19	<0.829	<1.44	<1.70	<1.13	<0.603	<0.726	<0.829	<1.32
P20	<0.613	<1.06	<1.26	<0.835	<0.446	<0.537	<0.613	<0.978
P21	<0.495	<0.857	<1.01	<0.673	<0.360	<0.433	<0.495	<0.788
P22	<0.275	<0.476	<0.563	<0.374	<0.200	<0.241	<0.275	<0.438
P23	<0.722	<1.25	<1.48	<0.983	<0.525	<0.632	<0.722	<1.15
P24	<0.620	<1.07	<1.27	<0.843	<0.451	<0.543	<0.620	<0.988
P25	<0.698	<1.21	<1.43	<0.951	<0.508	<0.612	<0.698	<1.11
P26	<0.285	<0.494	<0.584	<0.388	<0.207	<0.250	<0.285	<0.454
P27	<0.475	<0.823	<0.974	<0.647	<0.346	<0.416	<0.475	<0.757
P28	<0.511	<0.886	<1.05	<0.696	<0.372	<0.448	<0.511	<0.815
P29	<0.466	<0.807	<0.954	<0.634	<0.339	<0.408	<0.466	<0.742
P30	<0.409	<0.708	<0.838	<0.557	<0.298	<0.358	<0.409	<0.652
P31	<1.41	<2.44	<2.88	<1.92	<1.02	<1.23	<1.41	<2.24
P32	<0.326	<0.564	<0.668	<0.443	<0.237	<0.285	<0.326	<0.519
P33	<0.290	<0.502	<0.594	<0.394	<0.211	<0.254	<0.290	<0.462
P34	<0.681	<1.18	<1.40	<0.927	<0.496	<0.597	<0.681	<1.09
P35	<0.435	<0.754	<0.892	<0.592	<0.317	<0.381	<0.435	<0.694
P36	<0.336	<0.583	<0.689	<0.458	<0.245	<0.295	<0.336	<0.536
P37	<0.268	<0.464	<0.549	<0.364	<0.195	<0.235	<0.268	<0.427
A38	<0.433	<0.750	<0.887	<0.589	<0.315	<0.379	<0.433	<0.690
P39	<0.537	<0.931	<1.10	<0.732	<0.391	<0.471	<0.537	<0.857
P40	<0.251	<0.435	<0.515	<0.342	<0.183	<0.220	<0.251	<0.400
P41	<0.613	<1.06	<1.26	<0.834	<0.446	<0.537	<0.613	<0.977
P42	<0.558	<0.966	<1.14	<0.759	<0.406	<0.489	<0.558	<0.889
P43	<0.625	<1.08	<1.28	<0.851	<0.455	<0.548	<0.625	<0.997
P44	<0.311	<0.539	<0.637	<0.423	<0.226	<0.272	<0.311	<0.496
P45	<0.261	<0.452	<0.534	<0.355	<0.190	<0.229	<0.261	<0.416
P46	<0.264	<0.458	<0.542	<0.360	<0.192	<0.232	<0.264	<0.422
P47	<0.246	<0.426	<0.503	<0.334	<0.179	<0.215	<0.246	<0.392
P48	<0.356	<0.617	<0.730	<0.485	<0.259	<0.312	<0.356	<0.568
P49	<0.317	<0.548	<0.649	<0.431	<0.230	<0.277	<0.317	<0.505
P50	<0.460	<0.796	<0.942	<0.626	<0.335	<0.403	<0.460	<0.733
P51	<1.49	<2.59	<3.06	<2.03	<1.09	<1.31	<1.49	<2.38
P52	<1.19	<2.07	<2.44	<1.62	<0.868	<1.04	<1.19	<1.90
P53	<0.268	<0.464	<0.549	<0.364	<0.195	<0.235	<0.268	<0.427
P54	<0.570	<0.988	<1.17	<0.776	<0.415	<0.500	<0.570	<0.909
P55	<0.515	<0.892	<1.06	<0.701	<0.375	<0.451	<0.515	<0.821
P56	<0.370	<0.642	<0.759	<0.504	<0.269	<0.324	<0.370	<0.590
P57	<0.459	<0.795	<0.940	<0.624	<0.334	<0.402	<0.459	<0.731
P58	<0.331	<0.574	<0.679	<0.451	<0.241	<0.290	<0.331	<0.528
P59	<0.582	<1.01	<1.19	<0.793	<0.424	<0.510	<0.582	<0.929
P60	<0.276	<0.478	<0.565	<0.375	<0.201	<0.242	<0.276	<0.440
Leadenwah Reference	<0.308	<0.533	<0.630	<0.419	<0.224	<0.269	<0.308	<0.490
Folly River Reference	<0.281	<0.487	<0.577	<0.383	<0.205	<0.246	<0.281	<0.448
Folly River Reference	<0.277	<0.481	<0.569	<0.378	<0.202	<0.243	<0.277	<0.442
Folly River Reference	<0.274	<0.475	<0.562	<0.374	<0.200	<0.240	<0.274	<0.437
Lab Blank	<0.262	<0.454	<0.537	<0.357	<0.191	<0.229	<0.262	<0.417
Lab Blank	<0.256	<0.444	<0.525	<0.349	<0.187	<0.225	<0.256	<0.409
Field Blank from Station P31	<0.273	<0.472	<0.559	<0.371	<0.198	<0.239	<0.273	<0.434
Field Blank from Station P48	<0.266	<0.461	<0.546	<0.363	<0.194	<0.233	<0.266	<0.425
Field Blank from Station P60	<0.259	<0.449	<0.531	<0.352	<0.188	<0.227	<0.259	<0.413
Field Blank from Station P47	<0.260	<0.450	<0.533	<0.354	<0.189	<0.228	<0.260	<0.414
Field Blank from Station P57	<0.259	<0.449	<0.531	<0.353	<0.189	<0.227	<0.259	<0.413
Leadenwah Reference	<0.267	<0.463	<0.548	<0.364	<0.195	<0.234	<0.267	<0.426
Leadenwah Reference	<0.295	<0.511	<0.604	<0.401	<0.214	<0.258	<0.295	<0.470

Appendix 2. (continued)

Station ID	PCB 87/115 ng/g dry wt	PCB 88 ng/g dry wt	PCB 89/90/101 ng/g dry wt	PCB 9 ng/g dry wt	PCB 92 ng/g dry wt	PCB 95 ng/g dry wt	PCB 99 ng/g dry wt	Total PCB ng/g dry wt
P01	<0.865	<0.933	<0.670	<1.72	<0.571	<0.435	<0.774	2.97
P02	<0.247	<0.266	<0.191	<0.490	<0.163	<0.124	<0.221	0.571
P03	<0.336	<0.363	<0.261	<0.667	<0.222	<0.169	<0.301	0.586
P04	<0.749	<0.808	<0.580	<1.49	<0.494	0.529	0.694	5.84
P05	<0.591	<0.637	<0.458	<1.17	<0.390	<0.297	<0.529	4.61
P06	<0.608	<0.655	<0.471	<1.21	<0.401	<0.305	<0.544	0
P07	<0.635	<0.685	<0.492	<1.26	<0.419	<0.319	<0.568	0
A08	<0.276	<0.298	<0.214	<0.548	<0.182	<0.139	<0.247	0
A09	<0.526	<0.567	<0.408	<1.04	<0.347	<0.264	<0.471	2.10
P10	<0.533	<0.575	<0.413	<1.06	<0.352	<0.268	<0.477	0.43
P11	<0.541	<0.583	<0.419	<1.07	<0.357	<0.272	<0.484	0.773
P12	<0.293	<0.316	<0.227	<0.582	<0.194	<0.147	<0.263	0.364
P13	<0.600	<0.647	<0.465	<1.19	<0.396	<0.302	<0.537	2.10
P14	<0.304	<0.328	<0.236	<0.604	<0.201	<0.153	<0.273	0.245
P15	<0.675	<0.727	<0.523	<1.34	<0.445	<0.339	<0.604	2.875
P16	<0.301	<0.325	<0.234	<0.598	<0.199	0.164	<0.270	0.652
P17	0.701	<0.688	2.04	<1.27	<0.421	1.45	0.965	24.5
P18	<0.794	<0.857	<0.615	<1.58	<0.524	<0.399	<0.711	1.04
P19	<0.784	<0.845	<0.607	<1.55	<0.517	0.476	<0.702	4.11
P20	<0.580	<0.625	<0.449	<1.15	<0.383	<0.291	<0.519	0.823
P21	<0.468	<0.504	<0.362	<0.928	<0.309	<0.235	<0.419	0
P22	<0.260	<0.280	<0.201	<0.516	<0.171	<0.131	<0.233	0
P23	<0.682	<0.736	<0.529	<1.35	<0.450	<0.343	<0.611	0.836
P24	<0.586	<0.632	<0.454	<1.16	<0.386	<0.294	<0.524	0.727
P25	<0.660	<0.712	<0.512	<1.31	<0.436	<0.332	<0.591	0
P26	<0.270	<0.291	<0.209	<0.535	<0.178	<0.135	<0.241	0.131
P27	<0.449	<0.485	<0.348	<0.891	<0.296	<0.226	<0.402	1.06
P28	<0.483	<0.521	<0.374	<0.959	<0.319	<0.243	<0.433	2.18
P29	<0.440	<0.475	<0.341	<0.874	<0.290	<0.221	<0.394	3.52
P30	<0.387	<0.417	<0.300	<0.767	<0.255	<0.194	<0.346	0
P31	<1.33	<1.43	<1.03	<2.64	<0.878	<0.669	<1.19	1.07
P32	<0.308	<0.332	<0.239	<0.611	<0.203	<0.155	<0.276	0.36
P33	<0.274	<0.296	<0.212	<0.544	<0.181	<0.138	<0.245	0
P34	<0.644	<0.695	<0.499	<1.28	<0.425	0.368	<0.577	1.24
P35	<0.411	<0.444	<0.319	<0.816	<0.271	<0.207	<0.368	0
P36	<0.318	<0.343	<0.246	<0.631	<0.210	<0.160	<0.285	0.18
P37	<0.253	<0.273	<0.196	<0.502	<0.167	<0.127	<0.227	0
A38	<0.409	<0.441	<0.317	<0.812	<0.270	<0.206	<0.366	0
P39	<0.508	<0.548	<0.394	<1.01	<0.335	<0.255	<0.455	0
P40	<0.238	<0.256	<0.184	<0.471	<0.157	<0.119	<0.213	3.48
P41	<0.579	<0.625	<0.449	<1.15	<0.382	<0.291	<0.519	0
P42	<0.527	<0.569	<0.409	<1.05	<0.348	<0.265	<0.472	0
P43	<0.591	<0.638	<0.458	<1.17	<0.390	<0.297	<0.529	0
P44	<0.294	<0.317	<0.228	<0.583	<0.194	<0.148	<0.263	8.47
P45	<0.247	<0.266	<0.191	<0.489	<0.163	<0.124	<0.221	1.57
P46	<0.250	<0.270	<0.194	<0.496	<0.165	<0.126	<0.224	0
P47	<0.232	<0.250	<0.180	<0.461	<0.153	<0.117	<0.208	0
P48	<0.337	<0.363	<0.261	<0.668	<0.222	<0.169	<0.301	0
P49	<0.299	<0.323	<0.232	<0.594	<0.197	<0.150	<0.268	6.35
P50	<0.435	<0.469	<0.337	<0.862	<0.287	<0.218	<0.389	0.321
P51	<1.41	<1.52	2.77	<2.80	<0.932	1.5	1.95	32.5
P52	<1.13	<1.22	2.18	<2.24	<0.744	1.26	1.66	24.4
P53	<0.253	<0.273	<0.196	<0.502	<0.167	<0.127	<0.227	2.1
P54	<0.539	<0.582	0.477	<1.07	<0.356	0.319	<0.483	5.19
P55	<0.487	<0.525	<0.377	<0.966	<0.321	<0.245	<0.436	10.6
P56	<0.350	<0.378	<0.271	<0.695	<0.231	<0.176	<0.313	2.78
P57	<0.434	<0.468	0.375	<0.860	<0.286	0.232	<0.388	7.41
P58	<0.313	<0.338	<0.243	<0.622	<0.207	<0.157	<0.280	2.87
P59	<0.551	<0.594	0.447	<1.09	<0.363	0.294	<0.493	15.3
P60	<0.261	<0.281	<0.202	<0.517	<0.172	<0.131	<0.233	2.48
Leadenwah Reference	<0.291	<0.314	<0.225	<0.577	<0.192	<0.146	<0.260	0.391
Folly River Reference	<0.266	<0.287	<0.206	<0.528	<0.175	<0.134	<0.238	0.27
Folly River Reference	<0.262	<0.283	<0.203	<0.521	<0.173	<0.132	<0.235	0.24
Folly River Reference	<0.259	<0.280	<0.201	<0.515	<0.171	<0.130	<0.232	0.178
Lab Blank	<0.248	<0.267	<0.192	<0.491	<0.163	<0.124	<0.222	0
Lab Blank	<0.242	<0.261	<0.188	<0.481	<0.160	<0.122	<0.217	0
Field Blank from Station P31	<0.258	<0.278	<0.200	<0.511	<0.170	<0.130	<0.231	0
Field Blank from Station P48	<0.252	<0.272	<0.195	<0.500	<0.166	<0.127	<0.225	0
Field Blank from Station P60	<0.245	<0.264	<0.190	<0.486	<0.161	<0.123	<0.219	0
Field Blank from Station P47	<0.246	<0.265	<0.190	<0.488	<0.162	<0.124	<0.220	0
Field Blank from Station P57	<0.245	<0.264	<0.190	<0.486	<0.162	<0.123	<0.219	0
Leadenwah Reference	<0.253	<0.273	<0.196	<0.502	<0.167	<0.127	<0.226	0.359
Leadenwah Reference	<0.279	<0.301	<0.216	<0.553	<0.184	<0.140	<0.249	0

Appendix 2. (continued)

Station ID	2,4'-DDD ng/g dry wt	2,4'-DDE ng/g dry wt	2,4'-DDT ng/g dry wt	4,4'-DDD ng/g dry wt	4,4'-DDE ng/g dry wt	4,4'-DDT ng/g dry wt	Chlorpyrifos ng/g dry wt	Dieldrin ng/g dry wt
P01	<1.34	<0.335	<1.51	<1.13	2.69	<3.36	<0.190	<0.494
P02	<0.382	<0.0956	<0.432	<0.322	<0.319	<0.959	<0.0543	<0.141
P03	<0.521	<0.130	<0.588	<0.438	0.889	<1.31	<0.0740	<0.192
P04	<1.16	<0.290	<1.31	1.31	3.66	<2.91	<0.165	0.639
P05	<0.915	<0.229	<1.03	<0.770	1.71	<2.29	<0.130	<0.337
P06	<0.942	<0.235	<1.06	<0.792	1.76	<2.36	<0.134	<0.347
P07	<0.984	<0.246	<1.11	<0.828	<0.821	<2.47	<0.140	<0.362
A08	<0.428	<0.107	<0.483	<0.360	<0.357	<1.07	<0.0607	<0.158
A09	<0.815	<0.204	<0.920	<0.686	<0.680	<2.04	<0.116	<0.300
P10	<0.826	<0.206	<0.932	<0.695	0.832	<2.07	<0.117	<0.304
P11	<0.838	<0.210	<0.946	<0.705	0.784	<2.10	<0.119	<0.309
P12	<0.455	<0.114	<0.513	<0.382	<0.379	<1.14	<0.0645	<0.167
P13	<0.930	<0.232	<1.05	0.823	1.35	<2.33	<0.132	<0.342
P14	<0.472	<0.118	<0.532	<0.397	<0.394	<1.18	<0.0669	0.191
P15	<1.05	<0.261	<1.18	<0.879	1.47	<2.62	<0.148	<0.385
P16	<0.467	<0.117	<0.527	0.88	1.19	<1.17	<0.0663	0.792
P17	1.4	<0.247	<1.12	3.79	6.17	<2.48	0.15	2.35
P18	<1.23	<0.308	<1.39	1.27	2.84	<3.09	<0.175	0.528
P19	<1.21	<0.304	<1.37	1.86	4.18	<3.04	<0.172	2.08
P20	<0.899	<0.225	<1.01	<0.756	2.47	<2.25	<0.128	<0.331
P21	<0.725	<0.181	<0.818	<0.610	<0.605	<1.82	<0.103	<0.267
P22	<0.403	<0.101	<0.454	<0.339	<0.336	<1.01	<0.0571	<0.148
P23	<1.06	<0.264	<1.19	<0.890	1.71	<2.65	<0.150	0.515
P24	<0.908	<0.227	<1.02	1.06	2.18	<2.28	<0.129	1.17
P25	<1.02	<0.256	<1.15	<0.861	1.16	<2.57	<0.145	<0.377
P26	<0.418	<0.104	<0.471	<0.351	<0.349	<1.05	<0.0593	<0.154
P27	<0.696	<0.174	<0.786	<0.586	0.743	<1.75	<0.0988	<0.256
P28	<0.749	<0.187	<0.845	<0.630	0.878	<1.88	<0.106	<0.276
P29	<0.682	<0.171	<0.770	<0.574	0.703	<1.71	<0.0968	<0.251
P30	<0.599	<0.150	<0.676	<0.504	<0.500	<1.50	<0.0850	<0.221
P31	<2.06	<0.515	<2.33	3.7	8.93	<5.17	<0.293	1.87
P32	<0.477	<0.119	<0.539	1.94	2.86	<1.20	<0.0677	<0.176
P33	<0.425	<0.106	<0.479	<0.357	0.449	<1.06	<0.0603	<0.156
P34	<0.998	<0.250	<1.13	1.52	4.35	<2.50	<0.142	<0.368
P35	<0.638	<0.159	<0.719	<0.536	<0.532	<1.60	<0.0905	<0.235
P36	<0.493	<0.123	<0.556	<0.415	<0.411	<1.24	<0.0699	<0.182
P37	<0.392	<0.0980	<0.443	<0.330	<0.327	<0.983	<0.0556	<0.144
A38	<0.634	<0.159	<0.715	<0.533	<0.529	<1.59	<0.0900	<0.234
P39	<0.787	<0.197	<0.889	<0.662	<0.657	<1.97	<0.112	<0.290
P40	<0.368	<0.0920	<0.415	<0.310	<0.307	<0.923	<0.0522	<0.136
P41	<0.898	<0.224	<1.01	<0.755	<0.749	<2.25	<0.127	<0.331
P42	<0.817	<0.204	<0.922	<0.687	<0.682	<2.05	<0.116	<0.301
P43	<0.916	<0.229	<1.03	<0.771	<0.765	<2.30	<0.130	<0.337
P44	<0.456	<0.114	<0.514	<0.383	<0.380	<1.14	<0.0646	<0.168
P45	<0.382	<0.0955	<0.431	<0.321	<0.319	<0.958	<0.0542	<0.141
P46	<0.388	<0.0969	<0.437	<0.326	<0.323	<0.971	<0.0550	<0.143
P47	<0.360	<0.0900	<0.406	<0.303	<0.300	<0.902	<0.0511	<0.133
P48	<0.522	<0.130	<0.589	<0.439	0.483	<1.31	<0.0740	<0.192
P49	<0.464	<0.116	<0.523	<0.390	0.501	<1.16	<0.0658	<0.171
P50	<0.674	<0.168	<0.760	1.03	1.65	<1.69	<0.0956	<0.248
P51	<2.19	1.06	<2.47	2.35	5.66	<5.49	<0.311	<0.806
P52	<1.75	0.826	<1.97	2.25	4.75	<4.38	<0.248	<0.643
P53	<0.392	<0.0980	<0.443	<0.330	<0.327	<0.983	<0.0556	<0.144
P54	<0.836	<0.209	<0.943	0.94	1.61	<2.09	<0.119	0.635
P55	<0.755	<0.189	<0.851	0.688	1.19	<1.89	<0.107	<0.278
P56	<0.543	<0.136	<0.612	<0.456	1.32	<1.36	<0.0770	<0.200
P57	<0.672	<0.168	<0.758	0.731	1.11	<1.68	<0.0953	0.676
P58	<0.485	<0.121	<0.548	<0.408	0.569	<1.22	<0.0689	0.387
P59	<0.854	<0.213	<0.963	0.937	1.39	<2.14	<0.121	1.01
P60	<0.404	<0.101	<0.456	<0.340	<0.337	<1.01	<0.0573	<0.149
Leadenwah Reference	<0.451	<0.113	<0.509	<0.379	<0.376	<1.13	<0.0639	<0.166
Folly River Reference	<0.412	<0.103	<0.465	<0.347	<0.344	<1.03	<0.0585	<0.152
Folly River Reference	<0.407	<0.102	<0.459	<0.342	<0.339	<1.02	<0.0577	<0.150
Folly River Reference	<0.402	<0.101	<0.454	<0.338	<0.335	<1.01	<0.0570	<0.148
Lab Blank	<0.384	<0.0959	<0.433	<0.323	<0.320	<0.962	<0.0545	<0.141
Lab Blank	<0.376	<0.0939	<0.424	<0.316	<0.313	<0.942	<0.0533	<0.138
Field Blank from Station P31	<0.399	<0.0998	<0.451	<0.336	<0.333	<1.00	<0.0567	<0.147
Field Blank from Station P48	<0.390	<0.0976	<0.440	<0.328	<0.326	<0.978	<0.0554	<0.144
Field Blank from Station P60	<0.379	<0.0948	<0.428	<0.319	<0.317	<0.951	<0.0538	<0.140
Field Blank from Station P47	<0.381	<0.0952	<0.430	<0.320	<0.318	<0.955	<0.0540	<0.140
Field Blank from Station P57	<0.380	<0.0950	<0.429	<0.320	<0.317	<0.952	<0.0539	<0.140
Leadenwah Reference	<0.392	<0.0979	<0.442	<0.330	<0.327	<0.982	<0.0556	<0.144
Leadenwah Reference	<0.432	<0.108	<0.487	<0.363	<0.360	<1.08	<0.0613	<0.159

Appendix 2. (continued)

Station ID	Endosulfan I ng/g dry wt	Endosulfan II ng/g dry wt	Endosulfan Sulfate ng/g dry wt	Gamma-HCH (g-BHC, lindane) ng/g dry wt	Heptachlor ng/g dry wt	Hexachlorobenzene ng/g dry wt
P01	<0.539	<1.11	<1.62	<0.371	<0.874	<0.910
P02	<0.154	<0.317	<0.461	<0.106	<0.249	<0.260
P03	<0.210	<0.431	<0.629	<0.144	<0.340	<0.354
P04	<0.467	<0.961	<1.40	<0.322	<0.757	<0.788
P05	<0.368	<0.757	<1.10	<0.254	<0.597	<0.621
P06	<0.379	<0.779	<1.14	<0.261	<0.614	<0.639
P07	<0.395	<0.814	<1.19	<0.273	<0.641	<0.668
A08	<0.172	<0.354	<0.516	<0.119	<0.279	<0.291
A09	<0.328	<0.675	<0.983	<0.226	<0.531	<0.553
P10	<0.332	<0.684	<0.996	<0.229	<0.539	<0.561
P11	<0.337	<0.694	<1.01	<0.232	<0.546	<0.569
P12	<0.183	<0.376	<0.548	<0.126	<0.296	<0.309
P13	<0.374	<0.770	<1.12	<0.258	<0.606	<0.631
P14	<0.190	<0.390	<0.569	<0.131	<0.308	<0.320
P15	<0.420	<0.865	<1.26	<0.290	<0.682	<0.710
P16	<0.188	<0.387	<0.563	<0.129	<0.305	<0.317
P17	<0.397	<0.818	<1.19	<0.274	<0.645	<0.671
P18	<0.495	<1.02	<1.48	<0.341	<0.803	<0.836
P19	<0.488	<1.01	<1.46	<0.336	<0.792	<0.825
P20	<0.361	<0.744	<1.08	<0.249	<0.586	<0.610
P21	<0.291	<0.600	<0.874	<0.201	<0.473	<0.492
P22	<0.162	<0.333	<0.486	<0.112	<0.263	<0.273
P23	<0.425	<0.875	<1.28	<0.293	<0.690	<0.718
P24	<0.365	<0.751	<1.09	<0.251	<0.592	<0.616
P25	<0.411	<0.847	<1.23	<0.284	<0.667	<0.695
P26	<0.168	<0.346	<0.504	<0.116	<0.272	<0.284
P27	<0.280	<0.576	<0.840	<0.193	<0.454	<0.473
P28	<0.301	<0.620	<0.903	<0.207	<0.488	<0.509
P29	<0.274	<0.565	<0.823	<0.189	<0.445	<0.463
P30	<0.241	<0.496	<0.723	<0.166	<0.391	<0.407
P31	<0.829	<1.71	<2.49	<0.571	<1.34	<1.40
P32	<0.192	<0.395	<0.576	<0.132	<0.311	<0.324
P33	<0.171	<0.351	<0.512	<0.118	<0.277	<0.288
P34	<0.401	<0.826	<1.20	<0.277	<0.651	<0.678
P35	<0.256	<0.528	<0.769	<0.177	<0.416	<0.433
P36	<0.198	<0.408	<0.594	<0.137	<0.321	<0.335
P37	<0.158	<0.325	<0.473	<0.109	<0.256	<0.266
A38	<0.255	<0.525	<0.765	<0.176	<0.413	<0.431
P39	<0.317	<0.652	<0.950	<0.218	<0.513	<0.535
P40	<0.148	<0.305	<0.444	<0.102	<0.240	<0.250
P41	<0.361	<0.743	<1.08	<0.249	<0.585	<0.610
P42	<0.328	<0.676	<0.985	<0.226	<0.533	<0.555
P43	<0.368	<0.759	<1.11	<0.254	<0.598	<0.622
P44	<0.183	<0.377	<0.549	<0.126	<0.297	<0.309
P45	<0.154	<0.316	<0.461	<0.106	<0.249	<0.259
P46	<0.156	<0.321	<0.467	<0.107	<0.253	<0.263
P47	<0.145	<0.298	<0.434	<0.0997	<0.235	<0.244
P48	<0.210	<0.432	<0.629	<0.145	<0.340	<0.354
P49	<0.186	<0.384	<0.559	<0.128	<0.302	<0.315
P50	<0.271	<0.558	<0.812	<0.187	<0.439	<0.457
P51	<0.880	<1.81	<2.64	<0.606	<1.43	<1.49
P52	<0.702	<1.45	<2.11	<0.484	<1.14	<1.19
P53	<0.158	<0.325	<0.473	<0.109	<0.256	<0.266
P54	<0.336	<0.692	<1.01	<0.232	<0.545	<0.567
P55	<0.303	<0.625	<0.910	<0.209	<0.492	<0.512
P56	<0.218	<0.449	<0.654	<0.150	<0.354	<0.368
P57	<0.270	<0.556	<0.810	<0.186	<0.438	<0.456
P58	<0.195	<0.402	<0.585	<0.134	<0.316	<0.330
P59	<0.343	<0.706	<1.03	<0.236	<0.557	<0.580
P60	<0.162	<0.334	<0.487	<0.112	<0.263	<0.274
Leadenwah Reference	<0.181	<0.373	<0.544	<0.125	<0.294	<0.306
Folly River Reference	<0.166	<0.341	<0.497	<0.114	<0.269	<0.280
Folly River Reference	<0.163	<0.336	<0.490	<0.113	<0.265	<0.276
Folly River Reference	<0.162	<0.333	<0.485	<0.111	<0.262	<0.273
Lab Blank	<0.154	<0.318	<0.463	<0.106	<0.250	<0.261
Lab Blank	<0.151	<0.311	<0.453	<0.104	<0.245	<0.255
Field Blank from Station P31	<0.161	<0.331	<0.482	<0.111	<0.260	<0.271
Field Blank from Station P48	<0.157	<0.323	<0.471	<0.108	<0.254	<0.265
Field Blank from Station P60	<0.153	<0.314	<0.458	<0.105	<0.247	<0.258
Field Blank from Station P47	<0.153	<0.315	<0.459	<0.106	<0.248	<0.259
Field Blank from Station P57	<0.153	<0.314	<0.458	<0.105	<0.248	<0.258
Leadenwah Reference	<0.157	<0.324	<0.472	<0.109	<0.255	<0.266
Leadenwah Reference	<0.174	<0.357	<0.521	<0.120	<0.282	<0.293

Appendix 2. (continued)

Station ID	Hexachlorobenzene ng/g dry wt	Mirex ng/g dry wt	Trans-nonachlor ng/g dry wt	Total DDTs ng/g dry wt	Total Pesticides ng/g dry wt
P01	<0.910	<0.756	<6.09	2.69	2.69
P02	<0.260	<0.216	<1.74	0	0
P03	<0.354	<0.294	<2.37	0.889	0.889
P04	<0.788	<0.655	<5.27	4.97	5.609
P05	<0.621	<0.516	<4.16	1.71	1.71
P06	<0.639	<0.531	<4.28	1.76	1.76
P07	<0.668	<0.555	<4.47	0	0
A08	<0.291	1.11	<1.95	0	1.11
A09	<0.553	<0.460	<3.70	0	0
P10	<0.561	<0.466	<3.75	0.832	0.832
P11	<0.569	<0.473	<3.81	0.784	0.784
P12	<0.309	<0.257	<2.07	0	0
P13	<0.631	<0.525	<4.23	2.173	2.173
P14	<0.320	<0.266	<2.14	0	0.191
P15	<0.710	<0.590	<4.75	1.47	1.47
P16	<0.317	<0.263	<2.12	2.07	2.862
P17	<0.671	<0.558	<4.49	11.36	13.86
P18	<0.836	<0.694	<5.59	4.11	4.638
P19	<0.825	<0.685	<5.52	6.04	8.12
P20	<0.610	<0.507	<4.08	2.47	2.47
P21	<0.492	<0.409	<3.29	0	0
P22	<0.273	<0.227	<1.83	0	0
P23	<0.718	0.74	<4.81	1.71	2.965
P24	<0.616	<0.512	<4.13	3.24	4.41
P25	<0.695	<0.577	<4.65	1.16	1.16
P26	<0.284	<0.236	<1.90	0	0
P27	<0.473	<0.393	<3.16	0.743	0.743
P28	<0.509	1.62	<3.40	0.878	2.498
P29	<0.463	<0.385	<3.10	0.703	0.703
P30	<0.407	<0.338	<2.72	0	0
P31	<1.40	<1.16	<9.37	12.63	14.5
P32	<0.324	<0.269	<2.17	4.8	4.8
P33	<0.288	<0.240	<1.93	0.449	0.449
P34	<0.678	<0.563	<4.54	5.87	5.87
P35	<0.433	<0.360	<2.90	0	0
P36	<0.335	<0.278	<2.24	0	0
P37	<0.266	<0.221	<1.78	0	0
A38	<0.431	<0.358	<2.88	0	0
P39	<0.535	<0.444	<3.58	0	0
P40	<0.250	<0.208	<1.67	0	0
P41	<0.610	<0.506	<4.08	0	0
P42	<0.555	<0.461	<3.71	0	0
P43	<0.622	<0.517	<4.16	0	0
P44	<0.309	<0.257	<2.07	0	0
P45	<0.259	<0.216	<1.74	0	0
P46	<0.263	<0.219	<1.76	0	0
P47	<0.244	<0.203	<1.64	0	0
P48	<0.354	<0.294	<2.37	0.483	0.483
P49	<0.315	<0.262	<2.11	0.501	0.501
P50	<0.457	<0.380	<3.06	2.68	2.68
P51	<1.49	<1.24	<9.95	9.07	9.07
P52	<1.19	3.67	<7.94	7.826	11.496
P53	<0.266	<0.221	<1.78	0	0
P54	<0.567	<0.471	<3.80	2.55	3.185
P55	<0.512	<0.426	<3.43	1.878	1.878
P56	<0.368	<0.306	<2.47	1.32	1.32
P57	<0.456	<0.379	<3.05	1.841	2.517
P58	<0.330	<0.274	<2.21	0.569	0.956
P59	<0.580	<0.482	<3.88	2.327	3.337
P60	<0.274	0.587	<1.84	0	0.587
Leadenwah Reference	<0.306	<0.254	<2.05	0	0
Folly River Reference	<0.280	<0.233	<1.87	0	0
Folly River Reference	<0.276	<0.229	<1.85	0	0
Folly River Reference	<0.273	<0.227	<1.83	0	0
Lab Blank	<0.261	<0.217	<1.74	0	0
Lab Blank	<0.255	<0.212	<1.71	0	0
Field Blank from Station P31	<0.271	<0.225	<1.81	0	0
Field Blank from Station P48	<0.265	<0.220	<1.77	0	0
Field Blank from Station P60	<0.258	<0.214	<1.72	0	0
Field Blank from Station P47	<0.259	<0.215	<1.73	0	0
Field Blank from Station P57	<0.258	<0.214	<1.73	0	0
Leadenwah Reference	<0.266	<0.221	<1.78	0	0
Leadenwah Reference	<0.293	<0.244	<1.96	0	0

Appendix 3. Summary by station of mean ERM Quotients and the number of contaminants that exceeded corresponding ERM and ERL values (from Long et al. 1995).

River System	Segment	Station	Mean ERM Quotient	# ERM Exceed.	# ERL Exceed.
Chester River	Upper	P01	0.0647	0	4
		P02	0.0072	0	0
		P03	0.0296	0	1
		P04	0.0779	0	5
		P05	0.0788	0	3
	Mid	P06	0.0702	0	4
		P07	0.0624	0	2
		A08	0.0105	0	0
		A09	0.0573	0	2
		P10	0.0687	0	5
	Lower	P11	0.0654	0	4
		P12	0.0197	0	0
		P13	0.0813	0	7
		P14	0.0313	0	2
		P15	0.0980	0	6
Nanticoke River	Upper	P16	0.0315	0	2
		P17	0.1379	0	10
		P18	0.0699	0	5
		P19	0.0874	0	7
		P20	0.0434	0	3
	Mid	P21	0.0247	0	1
		P22	0.0046	0	0
		P23	0.0550	0	3
		P24	0.0627	0	4
		P25	0.0469	0	2
	Lower	P26	0.0095	0	0
		P27	0.0339	0	1
		P28	0.0353	0	0
		P29	0.0343	0	0
		P30	0.0229	0	0
Pocomoke River	Upper	P31	0.1306	0	7
		P32	0.0202	0	2
		P33	0.0078	0	0
	Mid	P34	0.0992	0	7
		P35	0.0255	0	0
		P36	0.0169	0	0
	Lower	P37	0.0137	0	0
		A38	0.0284	0	0
		P39	0.0365	0	0
		P40	0.0052	0	0

Appendix 3. (continued)

River System	Segment	Station	Mean ERM Quotient	# ERM Exceed.	# ERL Exceed.
Rhode/South River	U. South	P51	0.3029	1	21
		P52	0.2664	1	19
		P53	0.0110	0	0
	L. South	P54	0.1232	0	10
		P55	0.1052	0	9
		P56	0.1485	0	11
		P57	0.0939	0	8
	L. Rhode	P58	0.0439	0	1
		P59	0.1050	0	8
		P60	0.0130	0	0
Mobjack Bay	Poquosin/L. Bay	P41	0.0539	0	2
		P42	0.0367	0	1
		P43	0.0473	0	1
		P44	0.0108	0	0
		P45	0.0038	0	0
	Back/L. Bay	P46	0.0024	0	0
		P47	0.0011	0	0
		P48	0.0201	0	0
		P49	0.0175	0	0
		P50	0.0448	0	2

Appendix 4. Sub-lethal amphipod bioassay endpoints. Sites with (+) were < 80% and significantly ($p \leq 0.05$) different from reference site.

River System	Segment	Station	Growth Rate	Reproduction
Chester River	Upper	P01		
		P02	+	+
		P03	+	+
		P04	+	+
		P05	+	+
	Mid	P06	+	+
		P07		+
		A08		+
		A09	+	+
		P10	+	+
	Lower	P11		+
		P12	+	+
		P13	+	+
		P14	+	+
		P15		+
Nanticoke River	Upper	P16	+	+
		P17		+
		P18	+	
		P19	+	
		P20		
	Mid	P21	+	+
		P22	+	+
		P23	+	
		P24	+	+
		P25	+	+
	Lower	P26		+
		P27	+	+
		P28		+
		P29	+	+
		P30		+
Pocomoke River	Upper	P31		+
		P32		+
		P33		
	Mid	P34	+	+
		P35		+
		P36		+
	Lower	P37		
		A38		+
		P39		
		P40		

Appendix 4. (continued)

River System	Segment	Station	Growth Rate	Reproduction
Rhode/South River	U. South	P51		
		P52		
		P53		
	L. South	P54	+	+
		P55	+	+
		P56		+
		P57		+
	L. Rhode	P58		
		P59		
		P60		
L. Mobjack Bay	Poquosin/L. Bay	P41		
		P42		
		P43		
		P44		
		P45		
	Back/L. Bay	P46	+	+
		P47	+	+
		P48		
		P49		+
		P50		

Appendix 5. Summary by station of mean values of benthic infaunal abundance, # taxa, H' diversity (base 2 logs), and benthic index (BIBI, Weisberg et al. 1997, Llanso et al. 2002). Letters in parentheses next to each B-IBI value indicate non-degraded (N), degraded (D), or intermediate (I) condition (Llanso et al. 2003).

River	River Segment	Station	Station Mean* Total Abundance (m^{-2})	# taxa (per grab)	H' (per grab)	B-IBI (per grab)	
Chester	Upper	P01	1,280	5	1.6	3.7	(N)
		P02	2,242	13	2.8	4.5	(N)
		P03	1,621	10	2.6	4.3	(N)
		P04	432	5	1.6	3.7	(N)
		P05	1,432	9	1.7	3.0	(I)
	Mid	P06	326	6	2.2	2.7	(I)
		P07	3,447	9	1.6	3.0	(I)
		A08	4,629	14	2.4	4.2	(N)
		A09	1,417	9	2.3	4.2	(N)
		P10	3,189	12	2.4	2.7	(D)
	Lower	P11	917	7	2.3	3.7	(N)
		P12	6,598	12	2.8	4.2	(N)
		P13	3,712	12	2.2	3.8	(N)
		P14	10,697	16	3.2	4.0	(N)
		P15	439	4	1.2	1.2	(D)
Nanticoke	Upper	P16	3,227	10	2.3	3.7	(N)
		P17	333	2	0.6	1.7	(D)
		P18	856	6	2.2	4.0	(N)
		P19	568	6	2.1	3.3	(I)
		P20	6,364	6	1.0	3.3	(I)
	Mid	P21	2,485	5	1.4	3.3	(I)
		P22	13,811	6	0.9	3.8	(N)
		P23	8,742	5	1.1	3.2	(I)
		P24	9,538	5	1.3	3.0	(I)
		P25	8,917	5	1.5	2.7	(D)
	Lower	P26	9,053	4	0.9	3.0	(I)
		P27	5,879	9	1.2	1.8	(D)
		P28	1,485	9	1.7	2.7	(D)
		P29	1,333	9	1.9	2.5	(D)
		P30	1,735	10	2.7	4.5	(N)
Pocomoke	Upper	P31	591	7	2.5	3.7	(I)
		P32	2,591	9	2.5	4.7	(N)
		P33	1,727	7	2.0	3.5	(I)
	Mid	P34	1,034	5	0.8	3.3	(I)
		P35	939	8	2.5	4.5	(N)
		P36	4,295	8	2.0	4.5	(N)
	Lower	P37	1,288	12	2.8	3.4	(N)
		A38	3,409	15	2.5	3.4	(N)
		P39	197	5	2.1	3.4	(N)
		P40	1,515	17	3.3	4.3	(N)

Appendix 5. (continued)

River	River Segment	Station	Station Mean* Total Abundance (m^{-2})	# taxa (per grab)	H' (per grab)	B-IBI (per grab)	
Rhode/South	U. South	P51	1,477	3	0.5	1.7	(D)
		P52	545	4	1.3	1.5	(D)
		P53	1,985	8	2.1	4.2	(N)
	L. South	P54	1,902	8	1.8	3.8	(N)
		P55	2,795	8	2.3	2.8	(D)
		P56	3,008	8	2.0	3.5	(N)
		P57	2,144	8	2.3	3.8	(N)
	L. Rhode	P58	4,098	9	2.1	3.5	(N)
		P59	1,114	9	2.6	4.0	(N)
		P60	3,053	8	2.0	3.8	(N)
L. Mobjack Bay	Poquosin/ L. Bay	P41	977	5	1.5	1.3	(D)
		P42	2,455	6	1.4	1.7	(D)
		P43	2,288	6	1.3	1.9	(D)
		P44	2,091	14	2.7	2.2	(D)
		P45	2,394	24	3.2	3.4	(N)
	Back/ L. Bay	P46	811	13	3.2	3.4	(N)
		P47	2,038	19	3.5	3.9	(N)
		P48	621	9	2.1	1.8	(D)
		P49	856	10	2.5	1.9	(D)
		P50	598	10	2.7	2.7	(N)

Footnote

* Mean of 3 replicate 0.04m^2 grabs per station

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