DRAFT PROGRAMMATIC QUALITY ASSURANCE PROJECT PLAN

SUPPORTING COMPLIANCE MONITORING AND SPECIAL STUDIES RELATED TO THE HARBOR TOXICS TOTAL MAXIMUM DAILY LOAD

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January 2013

DOCUMENT TITLE

Draft Programmatic Quality Assurance Project Plan Supporting Compliance Monitoring and Special Studies Related to the Harbor Toxics Total Maximum Daily Load

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LIST OF ACRONYMS AND ABBREVIATIONS

ADR	Automated Data Review
CLP	Contract Laboratory Program
COC	chain-of-custody
DQOs	data quality objectives
eCOC	electronic chain-of-custody
EDD	Electronic Data Deliverable
EDL	estimated detection limit
EMPC	estimated maximum potential concentration
Harbor Toxics TMDL	*Final Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants Total Maximum Daily Load*
HAZWOPER	Hazardous Waste Operations and Emergency Response
HDPE	high-density polyethylene
LOD	limit of detection
MDL	method detection limit
MRL	method reporting limit
NFG	National Functional Guideline
NIST	National Institute of Standards and Technology
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
POLA	Port of Los Angeles
POLB	Port of Long Beach
Ports	Ports of Los Angeles and Long Beach
PQAPP	Programmatic Quality Assurance Project Plan
PTFE	polytetrafluoroethylene
QA	quality assurance
QC	quality control
SAP	Sampling and Analysis Plan
SQO	Sediment Quality Objectives
SOP	standard operating procedure

SRM	standard reference material
SWAMP	Surface Water Ambient Monitoring Program
TMDL	total maximum daily load
USEPA	U.S. Environmental Protection Agency

1 INTRODUCTION

This section includes an overview of the *Final Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants Total Maximum Daily Load* (Harbor Toxics TMDL; RWQCB and USEPA 2011), a brief description of studies required to support its implementation, and the rationale and intent of a Programmatic Quality Assurance Project Plan (PQAPP) for ensuring data quality as part of upcoming TMDL compliance monitoring studies and other special studies.

1.1 Background

The Harbor Toxics TMDL has been established to protect marine life and minimize human health risks from the consumption of fish in the Los Angeles and Long Beach Harbors and adjacent water bodies. The Harbor Toxics TMDL includes annual contaminant limits in surface sediment, stormwater effluent, and fish tissues in these waterbodies. These limits are defined as target loads or concentrations for compliance by 2032 within the Harbor Toxics TMDL. The City of Los Angeles (including the Port of Los Angeles [POLA]) and the City of Long Beach (including the Port of Long Beach [POLB]) are identified in the Harbor Toxics TMDL as two of the responsible parties. Consequently, the Ports of Los Angeles and Long Beach (Ports) are responsible, together with other stakeholders, for complying with the TMDL and ultimately identifying and reducing sediment and fish tissue concentrations in harbor waters to levels that do not cause further social or environmental harm.

To assist with the long-term goal of compliance, the Harbor Toxics TMDL includes a phased Implementation Plan which specifies implementation actions required to meet the goals of the TMDL. It is recognized, however, that implementation will be iterative, and information acquired during each phase of implementation will be used to inform later phases. The TMDL requires that the first phase of implementation include the development and initiation of the required compliance monitoring program. Monitoring must be initiated in May of 2014 at specific locations and frequencies for water column chemistry (annually), sediment chemistry (every 2 years), Sediment Quality Objectives (SQO) evaluation (every 5 years) and fish tissue chemistry (every 2 years). Specific locations and analytes to be monitored are provided in the Harbor Toxics TMDL (Section 7.6.2) and will be detailed in the Compliance Monitoring and Reporting Plan. The Harbor Toxics TMDL also states that

"All samples will be collected in accordance with California Surface Water Ambient Monitoring Program (SWAMP) protocols."

In addition to compliance monitoring and as part of Phase I implementation, the Ports' plan is to perform special studies to support TMDL compliance and site-specific management strategies and their implementation, which are required as Phase II and III TMDL implementation activities. The planned special studies have been designed to determine the causes of elevated fish tissue concentrations (e.g., site-specific harbor sediments, ongoing sources, and off-site regional sources) and the necessary reductions of these sources that will effectively reduce fish tissue concentrations. To identify these causes, the Ports' plans include using scientific- and data-based models of the conditions in the harbor and the food web. Specifically, hydrodynamic, sediment transport, chemical fate, and bioaccumulation models will be integrated and used to evaluate the effectiveness of specific remedial actions, and the impact of out-of-harbor sources (e.g., Palos Verdes Shelf) Calibration and validation of these models will require the collection of physical, chemical, and biological data to fill current data gaps.

1.2 Rationale and Intent of the Programmatic Quality Assurance Project Plan

A PQAPP is necessary to support all sampling and analysis activities planned as part of either the required compliance monitoring or the special studies needed to support model development. Specifically, the intent of this PQAPP is to:

- Provide a user-friendly QAPP that will provide consistency and will result in cost savings through the use of a standardized, pre-defined data collection and reporting process, which can be easily followed by contractors performing monitoring or other special studies for the Ports
- Provide the necessary procedures to ensure that data collection and analysis is standardized, efficient, and of high quality, regardless of study type or the port contractors/subcontractors involved in data collection, testing, or analysis
- Ensure that all field and laboratory data are defensible and meet specified data quality objectives (DQOs) which are based on the SWAMP protocols (SWRCB 2008), U.S. Environmental Protection Agency (USEPA) SW-846 (2004a), and the USEPA

National Functional Guideline (NFG) validation criteria (USEPA 1999, 2004, 2005, 2008), and other applicable analytical method guidance

- Outline the data management steps that will allow for quality-ensured, integrated, and efficient data management including import of collected data to an EQuIS database, processing, and final export to Ports and State databases

Given the extent and variety of sampling and analysis activities planned in the next 5 years, it is essential that this PQAPP be programmatic in nature and not targeted at one study. It is anticipated that each study will have its own Sampling and Analysis Plan (SAP) specifying study-specific details that have not yet been defined. This programmatic approach will allow for an overall data collection program that provides high quality data and is highly efficient due to standardization of sample collection, nomenclature, analysis, data review/validation, processing, storage, management, and seamless data export to Ports and State databases, regardless of study type or contractors performing the work. Consequently, while this PQAPP complies with SWAMP protocols and is SWAMP compatible, it is not written in the format of a SWAMP QAPP with elements specified as A1 through D3. This format is not possible because sampling and analysis details (i.e., equipment and instrument types) will vary by study type and contractor, which have not been identified at this time. Therefore, those elements not covered in this document will be covered in the Compliance Monitoring and Reporting Plan and in every SAP associated with a special study. Table 1 summarizes the recommended SWAMP QAPP elements and indicates whether each element is included in this PQAPP or will be included in the corresponding Compliance Monitoring Plan or special study SAPs.

1.3 Updates

The intent of this PQAPP is to ensure data quality as part of all sampling and analysis activities associated with compliance monitoring or the special studies mentioned above. However, updates to the document may be required to address any unanticipated special programs with methods currently not described herein, improvements in analytical methods or detection limits over time, or changes associated with monitoring requirements that may occur as part of the TMDL reopener process.

2 PROGRAM MANAGEMENT

This section identifies the specific roles and responsibilities of the team members and describes the process through which field and analytical data will be processed, reduced, and stored in EQuIS 5 by Anchor QEA, LLC. A project organization chart is presented in Figure 1.

2.1 Roles and Responsibilities

The specific roles and responsibilities of project managers, data managers, and laboratory project managers are shown in Figure 1. The contact information for the key members of the TMDL Study Team are provided in Table 2.

2.1.1 Project Managers

The POLA TMDL program project managers are Kathryn Curtis and Andrew Jirik, and the POLB TMDL program project manager is Matt Arms. The Ports project managers will be responsible for project administration and will serve as the lead contacts for TMDL compliance monitoring and TMDL-related special studies. The Ports project managers will also serve as the point of contact between the Ports and the consulting team and will manage all project activities.

The Anchor QEA TMDL study project manager is Shelly Anghera. Dr. Anghera will be responsible for:

- Managing the overall TMDL program
- Ensuring the project and the Ports' objectives are met throughout the conduct of project activities
- Coordinating internal communications with the Ports, the Ports' contractors, Anchor QEA data manager, and Anchor QEA quality assurance (QA) manager
- Overseeing all project deliverables
- Performing the administrative tasks needed to ensure timely and successful completion of the TMDL program studies
- Resolution of project concerns or conflicts related to technical matters

For each compliance monitoring event or special study, the Ports will select a contractor to be the special study/monitoring study project manager. This project manager will be identified in the sampling and analysis plan that is prepared prior to conducting the study. The special study/monitoring study project manager will be responsible for study, oversight, overall study project, progress reports and communication with the TMDL study project manager and Ports, organization of field staff, coordination with subcontract laboratories, scheduling of sampling days, installation and maintenance of field sampling equipment, sample handling and transport, data transmittal in accordance with this PQAPP, and study reporting.

2.1.2 Field Coordinator

For each compliance monitoring event or special study, a field coordinator will be identified in the sampling and analysis plan prepared by the contractor awarded the work. The field coordinator for each sampling program will be responsible for day-to-day technical and quality assurance and quality control (QA/QC) oversight. He or she will ensure that appropriate protocols for sample collection, preservation, and holding times are observed, and will submit environmental samples to the designated laboratories for chemical and physical analyses. He or she will also be responsible for submitting the finalized field data to the QA manager in a pre-determined format, as discussed in Section 2.2.

2.1.3 Laboratory Project Managers

The laboratory manager of any laboratory testing samples for the Ports will oversee all laboratory operations associated with the receipt of the environmental samples, chemical/physical analyses, and laboratory report preparation for this project. The laboratory manager will review all laboratory reports and prepare case narratives describing any anomalies and exceptions that occurred during analysis.

The analytical testing laboratories will be responsible for the following:

- Delivering sample confirmation receipt notifications to the field coordinator and QA manager
- Performing the analytical methods described in this PQAPP
- Following documentation, custody, and sample logbook procedures

- Ensuring that personnel engaged in preparation and analysis tasks have appropriate, documented training
- Meeting all reporting and QA/QC requirements
- Delivering electronic data files as specified in this PQAPP
- Meeting turnaround times for deliverables

2.1.4 Data Managers

Anchor QEA's QA manager is Joy Dunay. She, or her designee, will provide QA oversight for both the field sampling and laboratory programs associated with the TMDL study, ensuring that samples are collected and documented appropriately, coordinating with the analytical laboratories, ensuring data quality, overseeing data validation, and supervising project QA coordination.

Anchor QEA's database manager is Laurel Menoche. She, or her designee, will compile field observations and analytical data from laboratories into a database, review the data for completeness and consistency, append the database with qualifiers assigned by the Data Validator, and ensure that the data obtained is in a format suitable for inclusion in the appropriate databases and delivery to various agencies.

Anchor QEA's designated Data Validator is Cindy Fields. She, or her designee, will be responsible for verifying and validating all analytical data and submitting assigned data qualifiers to the database manager.

2.2 Overview of Data Management Process

Figures 2a and 2b provide an overview of the data flow process. Two different flow paths are provided depending on the means used for capturing field data. This will allow the Ports' contractors flexibility in recording and reporting data. The analytical data flow, including validation, is the same for each of the two flow paths. These two options are described in detail in Section 3.3.2 and briefly summarized below.

After each field event, field data will be imported into the EQuIS database either by direct import using AQFieldScribe (Figure 2a) or manual submittal of a field Electronic Data

Deliverable (EDD) containing all information from field collection logs (Figure 2b). These field data will undergo quality control checks such as sample identification code review, transcription error review, and completeness verification. Independent of the field data, laboratory data will be submitted to the QA manager in specified PDF and EDD formats. This data will undergo verification and validation using Automated Data Review (ADR) software and then will be uploaded into the EQuIS database with the applied final validation qualifiers. These two sets of data will be linked in the database so corresponding field data for each sample will be retained. Data exports can be generated from EQuIS in custom formats to meet agency requirements.

3 FIELD SAMPLING DATA QUALITY OBJECTIVES

This section includes detailed information on field collection requirements including sample processing, handling, and identification; sample custody and shipping requirements; and field quality control protocols.

3.1 Sample Processing, Handling, and Identification

Field personnel will identify and label samples in a consistent manner to ensure that field samples are traceable and that labels provide all information necessary for the laboratory to conduct required analyses properly. Samples will be placed in appropriate containers and preserved for shipment to the laboratory.

3.1.1 Sample Processing

Sample containers, instruments, working surfaces, technician protective gear, and other items that may come into contact with sample material must meet high standards of cleanliness. All equipment and instruments used that are in direct contact with various media collected for chemical analysis must be made of glass, stainless steel, high-density polyethylene (HDPE) or polytetrafluoroethylene (PTFE) and will be cleaned prior to each day's use and between sampling or compositing events. The decontamination procedure is as follows:

1. Pre-wash rinse with tap or site water.
2. Wash with solution of warm tap water or site water and Alconox™ soap.
3. Rinse with tap or site water.
4. Rinse thoroughly with organic-free water.
5. Cover (no contact) all decontaminated items with aluminum foil.
6. Store in a clean, closed container for next use.

3.1.2 Sample Containers

Sample containers and preservatives will be provided by the laboratory. The laboratory will maintain documentation certifying the cleanliness of bottles and the purity of preservatives provided. Specific container requirements are included in Table 3.

3.1.3 Sample Identification and Labels

Each sample will have an adhesive plastic or waterproof paper label affixed to the container and will be labeled at the time of collection. The following information will be recorded on the container label at the time of collection:

- Project name
- Sample identification (sample identification code)
- Date and time of sample collection
- Preservative type (if applicable)
- Analysis to be performed

The sample nomenclature should include the identifiers listed below. A catalogue of identification codes is provided in Table 4. The identification codes shown below should be used when they are applicable; however, it is recognized that there may be additional identification code requirements for special studies not yet defined and consequently, minor modifications to the recommended identification codes will be acceptable in these cases.

- Waterbody or site as shown in Table 4 (i.e., TMDL waterbody or other site in which sample was collected within each port jurisdiction)
- Media or sampling method code
- Organism common name, if applicable
- Station number
- Depth interval, if applicable
- Date of collection
- Indication of field duplicate (i.e., add 1000 to station number)

For equipment rinsate blank or field blank samples, "EB" or "FB" will be used, respectively, in place of the waterbody or site and station number. The date of sample collection will be added to end in YYYYMMDD format.

An example sample identification code for a sediment core at 0-15 cm, station number 54 from Outer Harbor – Los Angeles on July 31, 2013:

OA-SC-54-0-15-20130731

An example sample identification code for an equipment blank of the decontaminated sample processing equipment after sample collection of the above sample would be:

EB-20130731

An example sample identification code for a sediment core at 0-15 cm, station number 54 from Outer Harbor – Los Angeles on July 31, 2013, that is a field duplicate:

OA-SC-1054-0-15-20130731

An example sample identification code for a white croaker fish fillet skin off, station number 23 from Inner Harbor – Long Beach on July 31, 2013:

IB-FF-WC-23-20130731

3.2 Sample Custody and Shipping Requirements

Samples are considered to be in one's custody if they are: 1) in the custodian's possession or view; 2) in a secured location (under lock) with restricted access; or 3) in a container that is secured with an official seal(s) so that the sample cannot be reached without breaking the seal(s).

Chain-of-custody (COC) procedures will be followed for all samples throughout the collection, handling, and analysis process. The principal document used to track possession and transfer of samples is the COC form. Each sample will be represented on a COC form the day it is collected. All manual data entries will be made using an indelible ink pen. Corrections will be made by drawing a single line through the error, writing in the correct information, then dating and initialing the change. Blank lines and spaces on the COC form will be lined out, dated, and initialed by the individual maintaining custody. Electronic COC (eCOC) forms generated from AQFieldScribe will be emailed directly to the laboratory and QA manager.

A COC form will accompany each container of samples to the analytical laboratories. Each person in custody of samples will sign the COC form and ensure the samples are not left unattended unless properly secured. Copies of all COC forms will be retained in the project files.

All samples will be shipped or hand delivered to the analytical laboratory no later than the day after collection. Samples collected on Friday may be held until the following Monday for shipment provided that this delay does not jeopardize any hold time requirements. Specific sample shipping procedures are as follows:

- Each cooler or container containing the samples for analysis will be shipped via overnight delivery to the laboratory. In the event that Saturday delivery is required, the field coordinator will contact the analytical laboratory before 3 p.m. on Friday to ensure that the laboratory is aware of the number of containers shipped and the airbill tracking numbers for those containers. Following each shipment, the field coordinator will call the laboratory and verify that the shipment from the day before has been received and is in good condition.
- Coolant ice will be sealed in separate double plastic bags and placed in the shipping containers.
- Individual sample containers will be placed in a sealable plastic bag, packed to prevent breakage, and transported in a sealed ice chest or other suitable container.
- Glass jars will be separated in the shipping container by shock-absorbent material (e.g., bubble wrap) to prevent breakage.
- The shipping containers will be clearly labeled with sufficient information (name of project, time and date container was sealed, person sealing the container, and consultant's office name and address) to enable positive identification.
- The shipping waybill number will be documented on all COC forms accompanying the samples.
- A sealed envelope containing COC forms will be enclosed in a plastic bag and taped to the inside lid of the cooler.
- A minimum of two signed and dated custody seals will be placed on adjacent sides of each cooler prior to shipping.

- Each cooler will be wrapped securely with strapping tape, labeled "Glass – Fragile" and "This End Up," and will be clearly labeled with the laboratory's shipping address and the consultant's return address.

Upon transfer of sample possession to the analytical laboratory, the persons transferring custody of the sample container will sign the COC form. Upon receipt of samples at the laboratory, the custody seals will be broken, and the receiver will record the condition of the samples on a sample receipt form. COC forms will be used internally in the laboratory to track sample handling and final disposition.

3.3 Field Quality Assurance and Quality Control

This section describes Field QA/QC sampling and analysis procedures that will be conducted as part of Compliance Monitoring or special studies conducted by contractors for the Ports and describes the steps that will be taken to ensure all field records are retained and submitted accurately as part of the data flow process described above (Section 2.2, Figure 2).

3.3.1 Field Quality Assurance and Quality Control Sampling and Analysis

Field QA/QC samples will be collected along with environmental samples. Field QA/QC samples are useful in identifying possible problems resulting from sample collection or sample processing in the field. The collection of field QA/QC samples will follow SWAMP guidance and may include field (homogenization) duplicates, rinsate (equipment) blanks, and/or field blanks (SWRCB 2008). Field duplicates will be collected at a frequency of 5 percent of total project sample count. Rinsate blanks or field blanks will be collected as needed (e.g., when low level contamination is suspected). Field QA/QC sample frequencies and performance criteria are presented in Table 5.

Additional sample volume will be collected to ensure that the laboratory has sufficient sample volume to run the program-required analytical QA/QC samples for analysis, as specified in Section 4.2.

3.3.2 Field Records

All collected field samples will be documented using AQFieldScribe or field collection logs that will be manually converted to a Field EDD prior to data submittal. Additionally, the field coordinator or designee will keep a daily record of significant events, observations, and measurements on a daily log. Entries for each day will begin on a new page. The person recording information must enter the date and time and initial each entry. In general, sufficient information will be recorded during sampling so that reconstruction of the event can occur without relying on the memory of the field personnel.

The daily log will contain the following information, at a minimum:

- Project name
- Field personnel on site
- Site visitors
- Weather conditions
- Field observations
- Maps and/or drawings
- Date and time sample collected
- Sampling method and description of activities
- Identification or serial numbers of instruments or equipment used
- Deviations from the PQAPP and SAP
- Conferences associated with field sampling activities

After each field event, field data will be imported into the EQuIS database either by direct import using AQFieldScribe (Figure 2a) or manual submittal of a field EDD containing information from field collection logs (Figure 2b). The field data collection and management options are described below along with field EDD requirements.

3.3.2.1 Field Data Option 1: AQFieldScribe

AQFieldScribe is a custom application that provides electronic data entry forms for field information and generates field collection logs, sample labels, and eCOCs. AQFieldScribe improves data quality by minimizing hand-written errors and through the use of required data entry elements and controlled, unique identifiers for locations, samples, and analytical

test requests. In addition, it promotes efficiency in the field and provides electronic forms for laboratory sample check-in and for loading field information to Anchor QEA's data management system, further reducing transcription errors. When AQFieldScribe is used in place of field collection logs, all information and generated forms are backed up to removable storage devices and should be emailed as well to the QA manager at the end of each field day, for data security. The same elements required for the field logs described in Sections 3.3.2.1 would be captured in AQFieldScribe. To utilize this application, the field coordinator should coordinate with the QA manager.

3.3.2.2 Field Data Option 2: Field Collection Logs

All field sample collection information will be recorded on field collection logs maintained by the field coordinator, or designee, for each activity. Key information should be recorded for each sample such as sample station, station coordinates, sample identification code, and sample matrix. The information recorded during sample collection should fulfill the requirements of the Field EDD described in Section 3.3.2.3.

Notes will be taken in indelible, waterproof blue or black ink. Errors will be corrected by crossing out with a single line, dating, and initialing. Each field collection log will be marked with the project name, number, and date. The field logs will be will be scanned at the end of each field day and emailed to the special study/monitoring study project manager.

3.3.2.3 Field Electronic Data Deliverable Requirements

Field data collection, including observations, field measurements, and sample generation, will be facilitated by the use of Anchor QEA's AQFieldScribe or submittal of a Field EDD generated from field collection logs. If AQFieldScribe is used, an export of the field data can be generated at the end of each sampling effort. This export should be reviewed for accuracy by the field coordinator and then submitted to FieldData@anchorqea.com. If AQFieldScribe is not utilized for sample collection, field data must be manually entered into a Field EDD and then submitted to FieldData@anchorqea.com. It is imperative that the field sample data match the field forms and the COC documents. The Field EDD template (excel workbook format) will be provided by the QA manager upon request. Required, conditional, and optional fields will be identified in the Field EDD template along with defined valid values.

Required fields must be filled out prior to submittal of field data. Conditional fields are required for specific matrices, collection methods, or if a field QC sample is collected. Optional fields may be populated at the field coordinator's discretion. Columns may be left blank but should not be deleted. Any questions with regards to filling out the Field EDD should be directed to the QA manager.

4 LABORATORY DATA QUALITY OBJECTIVES

It is critical to ensure that the data collected are of acceptable quality so that the project objectives for each special study or monitoring program sampling are achievable. Guidance for DQOs is derived from the SWAMP guidance (SWRCB 2008). The quality of the laboratory data are assessed by precision, accuracy, representativeness, comparability, completeness, and sensitivity. Applicable quantitative goals for laboratory precision, accuracy, and completeness are described in Section 4.3. The definitions for the data quality indicators are as follows:

- Precision is the ability of an analytical method or instrument to reproduce its own measurement. It is a measure of the variability, or random error, in sampling, sample handling, and laboratory analysis.
- Accuracy is a measure of the closeness of an individual measurement (or an average of multiple measurements) to the true or expected value.
- Representativeness expresses the degree to which data accurately and precisely represent an environmental condition. For the sampling program, the analyte lists presented in Section 4.1 have been identified to provide a comprehensive assessment of sediment, water, and tissue quality at the Ports.
- Comparability expresses the confidence with which one dataset can be evaluated in relation to another dataset. For this program, comparability of data will be established through the use of standard analytical methodologies and reporting formats, and of common traceable calibration and reference materials.
- Completeness is a measure of the amount of data that is determined to be valid in proportion to the amount of data collected.
- Sensitivity is related to the instrument calibration low level standard, method detection limits (MDLs), and/or estimated detection limits (EDLs). For each study, analytical methods will be selected to achieve reporting limits that comply with, or are close to, target detection limits.

4.1 Analyte Lists, Analytical Methods, and Reporting Limits

Analyte lists and target reporting limits for sediment, water, and tissues are identified in Tables 6, 7, and 8, respectively. Analytical methods and target detection limits were selected to comply with SWAMP guidance (SWRCB 2008). The analyte list for sediments includes

the recommended chemical analytes needed to calculate the chemistry exposure line of evidence for application of the California sediment quality assessment framework (SWRCB 2009). For some analyte groups (e.g., polychlorinated biphenyls [PCBs]), several methodologies have been included to allow for flexibility of method selection based on the DQOs for compliance monitoring and special studies.

For high resolution isotope dilution methods, the EDL and estimated maximum potential concentration should be calculated and reported for each target compound. For all other methods, the laboratory should report detected compounds down to the MDL, if applicable. Laboratories should also provide the instrument verified limit of detection (LOD) for each analyte in the lab report and EDD. Reported values between the MDL and method reporting limit (MRL) should be qualified with a "J." Non-detects should be reported at the lowest calibration level (typically the MRL) or LOD, whichever is lower.

4.2 Laboratory Quality Control Sample Requirements

Laboratory QA/QC definitions are identified in Table 9. Laboratory QC frequency requirements were derived from SWAMP guidance (SWRCB 2008) and are identified in Table 10.

4.3 Performance Criteria

Applicable quantitative goals for precision, accuracy, and completeness are derived from SWAMP guidance (SWRCB 2008) and provided in Table 11.

4.4 Laboratory Record Requirements

Analytical data records (bookmarked PDF and EDD formats) will be generated by the laboratory and submitted to labdata@anchorqea.com upon completion. If the files are too large to be emailed, a notification email with download instructions can be sent to labdata@anchorqea.com. The data package level will depend on the sampling event. The field coordinator or QA manager will identify the required data package level on the COC.

The analytical laboratory will be required to report the following, where applicable:

- **Case Narrative.** This summary will discuss problems encountered during any aspect of analysis, if any. It should discuss, but is not be limited to, QC issues, sample shipment, sample storage, and analytical difficulties. Any problems encountered, actual or perceived, and their resolutions will be documented in as much detail as appropriate. Analytical QC samples that exceed project performance criteria and/or lab performance criteria should also be discussed in the case narrative.
- **COC Records.** Legible copies of the COC forms will be provided as part of the data package. This documentation will include the time of receipt and condition of each sample received by the laboratory. Additional internal tracking of sample custody by the laboratory will also be documented on a sample receipt form. The form must include all sample shipping container temperatures measured at the time of sample receipt.
- **Sample Results.** The data package will summarize the results for each sample analyzed. The summary will include the following information when applicable:
  - Field sample identification code and corresponding laboratory identification code
  - Sample matrix
  - Date and time of sample extraction
  - Date and time of analysis
  - Final concentration volumes and dilution factors
  - Instrument and analyst identification
  - MRLs and MDLs accounting for sample-specific factors (e.g., dilution and total solids)
  - Analytical results with reporting units identified
  - Data qualifiers and their definitions
  - Raw data including instrument printouts, chromatograms, and bench sheets (required for full data packages)
- **QA/QC Summaries.** Contract Laboratory Program (CLP)-like form summaries should be generated for all required laboratory QC components and samples (e.g., method blanks, instrument daily tunes, surrogate spikes, internal standards, laboratory control samples, etc.). These summaries should include spike volumes, parent sample concentrations, percent recoveries, relative percent differences, area counts, and

laboratory control limits as applicable. For full data packages, the associated raw data files should be included.

- **Instrument Calibration Data.** CLP-like form summaries of calibration data (i.e., initial calibration, initial calibration verification, and continuing calibration verification) should be included in all data packages. For full data packages, the associated raw data files should be included.

All instrument data shall be fully restorable at the laboratory from electronic backup. Laboratories will be required to maintain all records relevant to project analyses for a minimum of 5 years.

4.5 Laboratory Electronic Deliverable Requirements

EDDs will be submitted by the lab in the ADR format. ADR software is a tool used to streamline data validation by automatically evaluating the laboratory QC samples to the performance criteria established in this PQAPP. A1 and A3 files will be required. Specifications and valid values can be found in Attachment 1. An ADR electronic QAPP will be developed and distributed to the laboratories as required prior to project implementation. Updates to the specifications, valid values, and electronic QAPPs will occur over time and will be distributed to the laboratories when they become available.

5 ASSESSMENTS AND OVERSIGHT

The following sections describe the types of assessments that may be conducted for this project and how these assessments will be reported to project management.

5.1 Assessments and Response Actions

Laboratory and field performance audits consist of on-site reviews of QA systems and equipment for sampling, calibration, and measurement. The field coordinator is responsible for assessment of field activities and has the authority to issue a stop work order on sample collection. The TMDL study project manager or designee provides additional oversight on all field and laboratory activities and consequently may also issue a stop work order on sample collection if warranted. Laboratory audits are not anticipated to be conducted as part of this study; however, all laboratory audit reports will be made available to the project QA manager upon request. The laboratory is required to have written procedures addressing internal QA/QC (i.e., QA Plan), which will be reviewed by the project QA manager to ensure compliance with the project SAP. The laboratory must ensure that personnel engaged in sampling and analysis tasks have appropriate training. As part of the audit process, the laboratory will provide written details of any and all method modifications planned for consultant's review. Laboratory non-conformances will be documented and submitted to the QA manager for review. All non-conformances will be discussed in the final data report.

5.2 Corrective Actions

The following sections identify the responsibilities of key project team members and actions to be taken in the event of an error, problem, or nonconformance to protocols identified in this document.

5.2.1 Field Activities

The field coordinators will be responsible for correcting equipment malfunctions during the field sampling effort. The project QA manager will be responsible for resolving situations identified by the field coordinators that may result in noncompliance with this SAP. All corrective measures will be immediately documented in the field logbook.

5.2.2 Laboratory

The laboratory is required to comply with their standard operating procedures (SOPs). The laboratory manager will be responsible for ensuring that appropriate corrective actions are initiated as required for conformance with this PQAPP. All laboratory personnel will be responsible for reporting problems that may compromise the quality of the data.

The laboratory project manager will be notified immediately if any QC sample exceeds the laboratory in-house control limits. The analyst will identify and correct the anomaly before continuing with the sample analysis. The laboratory manager will document the corrective action taken in a memorandum submitted to the QA manager within 5 days of the initial notification. A narrative describing the anomaly, the steps taken to identify and correct the anomaly, and the treatment of the relevant sample batch (i.e., recalculation, reanalysis, and re-extraction) will be submitted with the data package.

5.3 Reports to Management

QA reports to management will include verbal status reports, written reports on field sampling activities and laboratory processes, data validation reports, and final project reports. These reports shall be the responsibility of the TMDL study project manager.

Progress reports will be prepared by the field coordinators and delivered to the TMDL study Project manager following each sampling event. These progress reports will contain final versions (peer reviewed) of field logs, field notebooks, COCs, observations, etc.

6 DATA VALIDATION AND USABILITY

The following sections describe the processes that will be used to review project data quality.

6.1 Data Review, Validation, and Verification

During the validation process, analytical data will be electronically and/or manually evaluated for method and laboratory QC compliance, and their validity and applicability for program purposes will be determined.

Based on the findings of the validation process, data validation qualifiers may be assigned. The validated project data, including qualifiers, will be entered into the project database, thus enabling this information to be retained or retrieved, as needed.

6.2 Verification and Validation Methods

Data verification includes a review for completeness and accuracy by the field coordinator and laboratory manager; review by the data managers for outliers and omissions; and the use of performance criteria to identify laboratory quality control sample outliers. For this program, completeness checks (target analyte lists, etc.), holding time compliance and laboratory QC sample performance evaluations (method blank detections, surrogate recoveries, laboratory control sample recoveries, etc.) will be conducted with ADR software. ADR will generate a report of all results that are outside of the performance criteria presented in this PQAPP. Data validation is then conducted by the Data Validator and consists of accepting, rejecting, or applying qualifiers to data based on the ADR verification findings, analytical method criteria, NFG data validation guidance (USEPA 1999, 2004, 2005, 2008), and professional judgment. A data validation report will be generated to document qualifications applied to data. All validated data will be entered into the EQuIS database, and a final data file will be exported. Ten percent verification of the database export against the PDF data report will be performed by the QA manager or designee. Any errors found in the data file export will be corrected in the database and reviewed for systemic reporting errors. Once all discrepancies are resolved, the database will be established.

All laboratory data will receive a Stage 2A validation (USEPA 2009). The recommended QC checks identified in a Stage 2A validation are as follows:

- Completeness
- Holding times
- Requested methods were performed
- MRL/EDLs project requirements were met
- Sample-related QC data were analyzed at the required frequencies
- QC performance criteria were met for the following:
  - Laboratory control samples
  - Matrix spike/matrix spike duplicate
  - Standard reference material
  - Surrogate recoveries
  - Method blanks
- Field QC samples

The project QA manager will be responsible for the final review of all data generated from analyses of samples.

6.3 Reconciliation with User Requirements

The QA manager will review data at the completion of each task to determine if DQOs have been met. If data do not meet the project's specifications, the QA manager will review the errors and determine if the problem is due to calibration/maintenance, sampling techniques, or other factors and will suggest corrective action, if appropriate. It is expected that the problem would be able to be corrected by retraining, revision of techniques, or replacement of supplies/equipment; if not, the DQOs will be reviewed for feasibility. If specific DQOs are not achievable, the QA manager will recommend appropriate modifications. If matrix interference is suspected to have attributed to the exceedance, adequate laboratory documentation must be presented to demonstrate that instrument performance and/or laboratory technique did not bias the result. In cases where the DQOs have been exceeded and corrective actions did not resolve the outlier, data will be qualified per *USEPA National Functional Guidelines* (USEPA 1999, 2004, 2005, 2008). In these instances, the usability of

the data will be determined by the extent of the exceedance. Rejected data will be assigned an "R" qualifier and will not be used for any purposes.

7 ADDITIONAL QUALITY ASSURANCE PROJECT PLAN ELEMENTS

The following sections provide general guidance on special training and certifications; documentation and record keeping; and instrument/equipment maintenance and calibration protocols. More specific requirements for special training and certifications may be included in the Compliance Monitoring Plan or Special Study SAPs; if provided, these documents would supersede the information provided below.

7.1 Special Training Requirements/Certifications

For sample preparation tasks, it is important that field crews are trained in standardized sample collection requirements so that the samples collected and the data generated from the samples are consistent among the field crew. The field coordinator must ensure that all field crew are fully trained in the collection and processing of sediment, surface water, tissues, decontamination protocols, and sample transport and COC procedures.

Some special studies may require that all sampling personnel have 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training and the 8-hour refresher course, as necessary, to meet the 29 Code of Federal Regulations 1910.120 Occupational Safety and Health Administration (OSHA) regulations. The Ports will determine if this training is necessary..

7.2 Documentation and Records

Document requirements for field records and laboratory reports are provided in Sections 3.3.2 and 4.5, respectively. Each project team member (field coordinator, QA manager, etc.) is responsible for documenting all necessary project information and should maintain files for individual tasks, but must provide such files to the TMDL project manager upon completion of each sampling event. A central project file will be maintained by Anchor QEA. Hard copy documents will be kept on file at Anchor QEA or at a document storage facility throughout the duration of the project. All electronic documents and work products will be stored in a project-specific directory on the secured and backed-up Anchor QEA server. All electronic analytical data will be maintained in central database at Anchor QEA.

7.3 Instrument/Equipment Testing, Inspection, and Maintenance Requirements

This section describes procedures for testing, inspection, and maintenance of field and laboratory equipment.

7.3.1 Field Instruments/Equipment

The field coordinator or designee will maintain inventories of field instruments and equipment and will be responsible for the preparation, documentation, and implementation of preventative maintenance. The frequency and types of maintenance will be based on the manufacturer's recommendations and/or previous experience with the equipment. The frequency of maintenance is dependent on the type and stability of the equipment, the methods used, the intended use of the equipment, and the recommendations of the manufacturer. Detailed information regarding the calibration and frequency of equipment calibration is provided in specific manufacturer's instruction manuals.

The field coordinator or designee will also be responsible for navigation and will confirm proper operation of the navigation equipment daily. This verification may consist of internal diagnostics or visiting a location with known coordinates to confirm the coordinates indicated by the navigation system. The samplers will be inspected daily for any mechanical problems. Any problems will be noted in the field logbook and corrected prior to continuing sampling operations.

7.3.2 Laboratory Instruments/Equipment

The selected laboratories will maintain an inventory of instruments and equipment and the frequency of maintenance will be based on the manufacturer's recommendations and/or previous experience with the equipment.

The selected laboratories will have a preventative maintenance program, as detailed in their QA Plans, organized to maintain proper instrument and equipment performance, and to prevent instrument and equipment failure during use. The program considers instrumentation, equipment, and parts that are subject to wear, deterioration, or other changes in operational characteristics, the availability of spare parts, and the frequency at

which maintenance is required. Any equipment that has been overloaded, mishandled, shown to give suspect results, determined to be defective will be taken out of service, or tagged with the discrepancy note, will be stored in a designated area until the equipment has been repaired. After repair, the equipment will be tested to ensure that it is in proper operational condition. The QA manager will be promptly notified in writing if defective equipment casts doubt on the validity of analytical data. The QA manager will also be notified immediately regarding any delays due to instrument malfunctions that could impact holding times. Laboratories will be responsible for the preparation, documentation, and implementation of the preventative maintenance program. All maintenance records will be checked according to the schedule on an annual basis and recorded by the responsible individual. A laboratory QA/QC manager or designee shall be responsible for verifying compliance.

7.4 Instrument/Equipment Calibration

Proper calibration of equipment and instrumentation is an integral part of the process that provides quality data. Instrumentation and equipment used to generate data must be calibrated at a frequency that ensures sufficient and consistent accuracy and reproducibility.

7.4.1 Field Instrument/Equipment Calibration

Field equipment will be calibrated prior to the sampling event according to manufacturer's recommendations using manufacturer's standards. A calibration check will be performed at the beginning of each day. The equipment, calibration, and maintenance information will be documented in the instrument calibration log. The frequency of calibration is dependent on the type and stability of the equipment, the methods used the intended use of the equipment, and the recommendations of the manufacturer. Detailed information regarding the calibration and frequency of equipment calibration is provided in specific manufacturer's instruction manuals. Equipment that fails calibration will be recalibrated prior to use.

7.4.2 Laboratory Instrument/Equipment Calibration

As part of their QC program, the selected chemistry laboratories will perform two types of calibrations. A periodic calibration is performed at prescribed intervals for relevant instruments and laboratory equipment (i.e., balances, drying ovens, refrigerators, and

thermometers), and operational calibrations are performed daily, at a specified frequency, or prior to analysis (i.e., initial calibrations) according to method requirements. Calibration procedures and frequency are discussed in the laboratory QA Plan. Calibrations are discussed in the laboratory SOPs for analyses.

The laboratory QA/QC manager will be responsible for ensuring that the laboratory instrumentation is calibrated in accordance with specifications. Implementation of the calibration program shall be the responsibility of the respective laboratory Group Supervisors. Recognized procedures (USEPA, ASTM, or manufacturer's instructions) shall be used when available.

Physical standards (i.e., weights or certified thermometers) shall be traceable to nationally recognized standards such as the National Institute of Standards and Technology (NIST). Chemical reference standards shall be NIST standard reference materials (SRMs) or vendor-certified materials traceable to these standards.

The calibration requirements for each method and respective corrective actions shall be accessible, either in the laboratory SOPs or the laboratory's QA Plan for each instrument or analytical method in use. An instrument that fails calibration will be recalibrated prior to use. All calibrations shall be preserved on electronic media.

8 REFERENCES

RWQCB and USEPA (Los Angeles Regional Water Quality Control Board and U.S. Environmental Protection Agency), 2011. *Final Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants Total Maximum Daily Loads*. June 2011.

SWRCB (State Water Resources Control Board), 2008. *Surface Water Ambient Monitoring Program Quality Assurance Program Plan.* Final Technical Report Version 1. September 2008.

SWRCB (State Water Resource Control Board), 2009. *Water Quality Control Plan for Enclosed Bays and Estuaries.* August 25, 2009.

USEPA (U.S. Environmental Protection Agency), 1999. *Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*. USEPA, Office of Emergency Response. USEPA 540/R-99/008. October 1999.

USEPA, 2004. *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*. USEPA540-R-04-004. October 2004.

USEPA, 2005. *National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins and Chlorinated Dibenzofurans Data Review*. OSWER 9240.1-51, USEPA-540-R-05-001. September 2005.

USEPA, 2008. *Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*. USEPA, Office of Emergency Response. USEPA 540/R-08-01. June 2008.

USEPA, 2009. *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use*. USEPA, Office of Solid Waste and Emergency Response. OSWER No. 9200.1-85. January 2009.

TABLES

Table 1
SWAMP-EPA-QAPP Review Checklist

SWAMP Element Number	Element Name and Review Aspect	PQAPP	Compliance Monitoring Plans, Sampling and Analysis Plans, or other documents
A	**PROJECT MANAGEMENT**		
A1.	**Title and Approval Sheet (s)**		
A1.1	Contains project title	X	X
A1.2	Indicates revision number, if applicable	X	X
A1.3	Indicates organization's name	X	
A1.4	Includes signature of organization's project manager	X	
A1.5	Includes signature block for organization's project manager	X	
A1.6	Includes signature block for organization's QA officer	X	
A1.7	Includes signature block for Port program managers	X	
A1.8	Includes signature block for RWQCB QA officer	N/A	N/A
A2.	**Table of Contents**		
A2.1	Lists QAPP information sections	X	X
A2.2	Includes document control information	X	X
A2.3	Provides lists of tables and figures	X	X
A2.4	Provides contents of each appendix	X	X
A2.5	Lists all attached standard operating procedures (with names, not just numbers)	N/P	
A3.	**Distribution List**		
A3.1	Includes all individuals who are to receive a copy of the QAPP, and identifies their organization	X	X
A4.	**Project/Task Organization**		
A4.1	Identifies key individuals involved in all major aspects of the project, including contractors	X	
A4.2	Discusses their responsibilities	X	
A4.3	Confirms that the project QA officer position is independent of data generation	X	
A4.4	Identifies individual responsible for maintaining the official, approved QAPP	X	
A4.5	Includes organizational chart that shows lines of authority and reporting responsibilities	X	
A4.6	Clearly identifies who is part of the project team and who is related to the project in an advisory role (but is not responsible for delivery of any product)	X	
A5.	**Problem Definition/Background**		
A5.1	States decisions to be made, actions to be taken, or outcomes expected from the information to be obtained	X	
A5.2	Clearly explains the reason (site background or historical context) for initiating this project	X	
A5.3	Identifies regulatory information, applicable criteria, or action limits necessary to the project		X
A6.	**Project/Task Description**		
A6.1	Summarizes work to be performed (e.g., measurements to be made, data files to be obtained)	X	X
A6.2	Provides a work schedule, indicating critical project points (e.g., start and completion dates for activities such as sampling, analysis, data reviews, assessments)		X
A6.3	Details geographical locations to be studied, including maps where possible		X
A6.4	Describes resource and time constraints, if applicable		X
A7.	**Quality Objectives and Criteria**		X
A7.1	Identifies measurement quality objectives that meet or exceed those mandated by SWAMP	X	
A7.2	Identifies project action limits for all parameters of interest	X	X
A7.3	Identifies acceptance criteria for all previously collected information	X	
A7.4	Discusses precision	X	X
A7.5	Addresses bias	X	X
A7.6	Discusses representativeness and how it will be assessed and controlled	X	X
A7.7	Identifies the need for completeness	X	X
A8.	**Special Training/Certifications**		X
A8.1	Identifies any specialized training or certifications required of project personnel	X	X
A8.2	Discusses how this training will be provided		X
A8.3	Identifies individual(s) responsible for ensuring sufficient training and certification	X	X
A8.4	Identifies where training and certification information is documented		X
A9.	**Documentation and Records**		
A9.1	Identifies report format and summarizes all data report package information	X	

Table 1
SWAMP-EPA-QAPP Review Checklist

SWAMP Element Number	Element Name and Review Aspect	PQAPP	Compliance Monitoring Plans, Sampling and Analysis Plans, or other documents
A9.2	Lists all other project documents, records, and electronic files that will be produced	X	
A9.3	Identifies where project information should be kept and for how long	X	
A9.4	Discusses backup plans for records stored electronically	X	
A9.5	States how the individuals identified in Element A3 will receive the most current copy of the approved QAPP, and identifies the individual(s) responsible for this	X	
B	**DATA GENERATION AND ACQUISITION**		
B01.	**Sampling Process Design (Sampling Design and Logistics)**		
B01.1	Provides the design information, or a reference to a specific document that contains it, with sufficient detail to assess data against project objectives		X
B01.2	Describes and justifies design strategy, indicating the size of the area and time period to be represented by a sample		X
B01.3	Details the type and total number of samples, matrices, and runs expected and needed		X
B01.4	Indicates where samples should be taken and how sites will be identified		X
B01.5	Discusses what to do if sampling sites become inaccessible		X
B01.6	Identifies project activity schedules (e.g., sampling events, shipping times)		X
B01.7	Specifies what information is critical and what is for informational purposes only		X
B01.8	Identifies sources of natural variability and how this variability should be reconciled with project information		X
B01.9	Identifies potential sources of bias or misrepresentation and how their contribution can be minimized		X
B02.	**Sampling (sample collection) Methods**		
B02.1	Identifies all sampling standard operating procedures by number, date, and regulatory citation, indicating sampling options or modifications to be taken. Non-SWAMP standard operating procedures should be attached		X
B02.2	If bioassessment sampling, implements the standard operating procedure *Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California*		X
B02.3	Indicates how each kind of matrix and each sample type should be collected		X
B02.4	Indicates how samples are to be homogenized, composited, split, or filtered		X
B02.5	Indicates what sample containers and sample volumes should be used		X
B02.6	Identifies whether samples should be preserved, and indicates methods that should be followed	X	X
B02.7	Describes how sampling equipment and samplers should be cleaned and decontaminated, including the disposal of byproducts	X	X
B02.8	Identifies any equipment and support facilities needed		X
B02.9	Addresses actions to be taken when problems occur, identifying individual(s) responsible for corrective action and how this should be documented	X	X
B03.	**Sample Handling and Custody**		
B03.1	For each parameter, states maximum holding times allowed from sample collection to preparation and analysis	X	X
B03.2	Identifies how samples should be physically handled, transported, received, and stored in the laboratory or office (including temperature upon receipt)	X	X
B03.3	Indicates how sample handling and custody information should be documented, identifying individual(s) responsible	X	X
B03.4	Identifies chain-of-custody procedures and includes form to track custody	X	X
B04.	**Analytical Methods and Field Measurements**		
B04.01	Identifies all standard operating procedures that should be followed by number, date, and regulatory citation, indicating options or modifications; standard operating procedures should be attached or referenced	N/P	X
B04.02	Lists all the instruments and kits that will be used in the field and describes their measurement principle (e.g., nephelometric or transparency) and major attributes (e.g., automatic temperature compensation, range and resolution)		X
B04.03	If in situ monitoring, indicates how instruments should be deployed and operated to avoid fouling and ensure maintenance of proper data		X
B04.04	If continuous monitoring, indicates how instruments should store and maintain raw data		X

Table 1
SWAMP-EPA-QAPP Review Checklist

SWAMP Element Number	Element Name and Review Aspect	PQAPP	Compliance Monitoring Plans, Sampling and Analysis Plans, or other documents
B04.05	Identifies all laboratory standard operating procedures that should be followed by number, date, and regulatory citation, indicating options or modifications to be taken (e.g., such as sub-sampling and extraction procedures)	N/P	X
B04.06	Identifies equipment or instrumentation needed for laboratory analyses	X	
B04.07	Specifies any specific method performance criteria	X	X
B04.08	Provides target analytical reporting limits or method detection limits	X	X
B04.09	Identifies procedures to follow when failures occur, identifying individual(s) responsible for corrective action and associated documentation	X	X
B04.10	Identifies sample disposal procedures		X
B04.11	Specifies laboratory turnaround times needed		X
B04.12	Provides documentation for the use of non-standard methods		X
B05.	**Quality Control**		
B05.1	For each parameter, identifies quality control activities (e.g., blanks, spikes, duplicates) that meet those mandated by SWAMP	X	X
B05.2	Details what should be done when control limits are exceeded and how corrective actions will be assessed and documented	X	X
B05.3	Identifies procedures and formulas for calculating quality control results (e.g., precision, bias)	X	
B06.	**Instrument/Equipment Testing, Inspection, and Maintenance**		
B06.1	Identifies field and laboratory equipment needing periodic maintenance and the associated schedule	X	X
B06.2	Identifies testing criteria; this information is instrument-specific and may be included in the standard operating procedure for each instrument	X	X
B06.3	Notes availability and location of spare parts	X	X
B06.4	Indicates procedures in place for inspecting equipment before usage (this information is instrument-specific and may be already included in the standard operating procedure for each Instrument)	X	X
B06.5	Identifies individual(s) responsible for testing, inspection, and maintenance	X	X
B06.6	Indicates how deficiencies should be resolved, and how corrective actions should be assessed and documented	X	X
B07.	**Instrument/Equipment Calibration and Frequency**		
B07.1	Identifies equipment, tools, and instruments that should be calibrated, and the frequency for this calibration		X
B07.2	Describes how calibrations should be performed and documented, indicating test criteria and standards or certified equipment (this information is instrument-specific and may be already included in the standard operating procedure for each Instrument)		X
B07.3	Identifies how deficiencies should be resolved and documented		X
B08.	**Inspection/Acceptance for supplies and Consumables**		
B08.1	Identifies critical field and laboratory supplies and consumables; noting supply source, acceptance criteria, and procedures for tracking, storing, and retrieving these materials		X
B08.2	Identifies the individual(s) responsible for this task		X
B09	**Non-direct Measurements**		
B09.1	Identifies data sources (e.g., computer databases, literature files, models) that should be assessed and used		X
B09.2	Describes the intended use of this information and the rationale for their selection		X
B09.3	Indicates the acceptance criteria for these data sources or models		X
B09.4	Identifies key resources and support facilities needed		X
B09.5	Describes how limits to validity and operating conditions should be determined (e.g., internal checks, beta testing)		X
B10.	**Data Management**		
B10.01	Describes the data management scheme from field to final use and storage	X	
B10.02	Verifies that all continuous monitoring raw data will be kept in the original sonde file (and stored on a PC); Endpoints (e.g., averages) can be calculated after downloading and trimming records		X
B10.03	Describes the filing and document control system, or cites documentation such as standard operating procedures	X	

Table 1
SWAMP-EPA-QAPP Review Checklist

SWAMP Element Number	Element Name and Review Aspect	PQAPP	Compliance Monitoring Plans, Sampling and Analysis Plans, or other documents
B10.04	Identifies data handling equipment and procedures that should be used to process, compile, analyze, and transmit data reliably and accurately	X	
B10.05	Describes how field and laboratory data will be formatted and entered into SWAMP's Information Management System	X	
B10.06	Identifies individual(s) responsible for each step and task	X	
B10.09	Describes procedures to demonstrate the acceptability of hardware and software configurations	X	
B10.10	Attaches checklists and forms that should be used (or refers to standard operating procedures)	X	
C	**ASSESSMENT AND OVERSIGHT**		
C1.	**Assessments and Response Actions**		
C1.1	Lists the number, frequency, and type of assessment activities that should be conducted, including approximate dates	X	X
C1.2	Identifies individual(s) responsible for conducting assessments; including their authority to issue stop work orders	X	X
C1.3	Describes how and to whom assessment information should be reported	X	X
C1.4	Identifies how corrective actions should be addressed and by whom, and how they should be verified and documented	X	X
C2.	**Reports to Management**		
C2.1	Identifies what project quality assurance reports are needed and how frequently		X
C2.2	Identifies who should write and receive these reports		X
D	**DATA VALIDATION AND USABILITY**		
D1.	**Data Review, Verification, and Validation**		
D1.1	Describes SWAMP criteria that should be used for accepting, rejecting, or qualifying project data (or refers to Element 7)	X	
D2	**Verification and Validation Methods**		
D2.1	Describes processes for data verification and validation, including standard operating procedures and data validation software	X	
D2.2	Identifies who is responsible for verifying and validating different components of project information (e.g., chain-of-custody forms, receipt logs, calibration information)	X	
D2.3	Describes the issue resolution process, and individual(s) responsible for conveying results to data users	X	
D2.4	Attaches checklists, forms, and calculations (including electronic formulae if using spreadsheets)	X	
D3.	**Reconciliation with User Requirements**		
D3.1	Describes procedures used to evaluate the uncertainty of the validated data (or refers to previous elements)	X	
D3.2	Describes how limitations on data use should be reported to the data users	X	
D3.3	Identifies how the data will be used in the context of the various SWAMP components, including the SWAMP Information Management System	X	
Notes:			
N/A	not applicable		
N/P	not provided		
Port	Port of Los Angeles/Long Beach		
QA	Quality Assurance		
QAPP	Quality Assurance Project Plan		
RWQCB	Regional Water Quality Control Board		
SWAMP	Surface Water Ambient Monitoring Program		

Table 2

Contact Information

Name	Title/Position	Organization	Phone Number	Email	Mailing Address
Kathryn Curtis Andrew Jirik	POLA Project Managers	Port of Los Angeles Environmental Management Division	(310) 732-3681	kcurtis@portla.org ajirik@portla.org	425 S. Palos Verdes Street San Pedro, California 90731
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Table 3
Sample Containers, Holding Times, and Preservation Methods

Parameter	Sample Size	Container Size and Type	Holding Time	Preservative
Sediments				
Bulk density	50 g	4-oz glass	None established	Ambient
Specific gravity	100 g	16-oz glass	None established	Ambient
Total solids	10 g	8-oz glass	14 days	Cool ≤6°C
Grain size	300 g	16-oz plastic	6 months	Cool ≤6°C
Dissolved organic carbon in porewater	1- 2 L sediment[a]	2 X 1-L amber glass	48 hours for extraction, filtration and preservation	H_2SO_4; pH < 2; Cool ≤6°C
Total organic carbon	10 g	4-oz glass	28 days	H_2SO_4; pH < 2;Cool ≤6°C
			1 year, if frozen within 28 days of collection	Freeze -20°C
Total Metals and Mercury	100 g	4-oz glass	6 months	None
			1 year; samples must be analyzed within 14 days of thawing	Freeze -20°C[c]
Polycyclic aromatic hydrocarbons/DDT and derivatives	500 g	Two 8-oz glass	14 days to extraction	Cool ≤6°C
			1 year to extraction; samples must be extracted within 14 days of thawing	Freeze -20°C
			40 days after extraction	Cool ≤6°C
PCB Congeners	500 g	Two 8-oz glass	None[a]	Cool ≤6°C
				Freeze -20°C
Tissues				
Lipids	200 g	Split taken from sample for chemistry analyses	1 year	Freeze -20°C
DDT and derivatives	200 g	Polyethylene bags or 8-oz glass	14 days to extraction	Cool ≤6°C
			1 year to extraction; samples must be extracted within 14 days of thawing	Freeze -20°C
			40 days after extraction	Cool ≤6°C
PCB Congeners	200 g	Polyethylene bags or 8-oz glass	None[b]	Cool ≤6°C
				Freeze -20°C
Waters				
Particle size determination	1 L	1-L HDPE	7 days	Cool ≤6°C

Table 3
Sample Containers, Holding Times, and Preservation Methods

Parameter	Sample Size	Container Size and Type	Holding Time	Preservative
Total suspended solids	1 L	1-L HDPE	7 days	Cool ≤6°C
Total dissolved solids	1 L	1-L HDPE	7 days	Cool ≤6°C
Total organic carbon (TOC)	40 mL	250 mL amber glass or 3 x 40 mL VOA vials	28 days	Cool ≤6°C and dark; HCl or H2SO4 to pH<2
Dissolved organic carbon (DOC)	200 mL	3 x 250mL glass	48 hours to filtration; 28 days to analysis	Cool ≤6°C and dark; HCl or H2SO4 to pH<2 after filtration
Particulate organic carbon (POC)	2 - 5 L[d]	10L	48 hours to filtration; 28 days to analysis	Cool ≤6°C
Total Metals	100 mL	250 mL HDPE	48 hours until preservation	Cool ≤6°C
			6 months to analysis	Ambient; HNO3 to pH<2
Dissolved metals	100 mL	250 mL HDPE	Field filter; 48 hours until preservation	Cool ≤6°C
			6 months to analysis	Ambient; HNO_3 to pH<2 after filtration
DDT and derivatives	1 to 2 L	2 X 1-L amber glass	14 days to extraction	Cool ≤6°C; pH 5-9
			40 days after extraction	Cool ≤6°C
PCB Congeners	1 to 2 L	2 X 1-L amber glass	None[b]	Cool ≤6°C

Notes:
Some criteria may differ from SWAMP guidance; however are consistent with analytical method criteria.
Recommendations are intended as guidance only. The selection of sample container and amount of sample required may vary per contracted laboratory sampling requirements.
a = Volume of sediment collected must be sufficient to produce a minimum of 40mL of porewater.
b = PCB hold time was removed in SW-846, Chapter 4, Revision 4, February 2007 for aqueous and solid samples stored cool ≤6°C.
c = Mercury will be analyzed prior to freezing.
d = POC solids are analyzed for TOC by USEPA 9060. The volume of water collected must be sufficient to produce a minimum of 10g of suspended sediment. Water may be field filtered.
^{o}C = degrees Celsius
DDT = dichlorodiphenyltrichloroethane
DOC = dissolved organic carbon
g = gram
HDPE = high-density polyethylene
L = liter
mL = milliliter
oz = ounce
PCB = polychlorinated biphenyl
POC = particulate organic carbon
SWAMP = California Surface Water Ambient Monitoring Program
TOC = total organic carbon
USEPA = U.S. Environmental Protection Agency
VOA = volatile organic analysis

Table 4
Sample Nomenclature

Waterbody or Other Area Codes		Media Codes		Organism (Common Name)		Station Number		Depth (if applicable)		Date of Collection	
Outer Harbor- LB	OA	Surface Sediment	SS	White Croaker	WC	1	1	0-15 cm	0-15	1-Jul-13	20130701
Outer Harbor- LB	OB	Sediment Core	SC	Top smelt	TS			15-60 cm	15-60		
Inner Harbor - LA	IA	Overlying Water	OW	Queenfish	QF			1-2 ft	1-2		
Inner Harbor - LB	IB	Mid Water	MW	California Halibut	CH						
Consolidated Slip	CS	Surface Water	SW	Chub Mackerel	CM						
Fish Harbor	FH	Porewater	PW	Barred Sand Bass	BS						
Cabrillo Marina	CM	Stormwater	SW	Kelp Bass	KB						
Cabrillo Beach	CB	Whole Organism	WO								
San Pedro Bay	SP	Fish Fillet skin off (muscle)	FF								
Dominguez Channel	DC	Other Tissue	OT								
Cabrillo Pier	CP	Field Blank	FB								
		Equipment rinsate blank	EB								

Table 5
Frequencies and Performance Criteria for Field Quality Assurance/Quality Control Samples

Analysis Type	Field Duplicate	Field Duplicate Performance Criteria[1,2]	Field and Rinse Blank[3]	Field and Rinse Performance Criteria[4]
Total solids	5% of total project sample count	≤25%RPD if both result(s) are >5x RL. Difference ≤2x RL if result(s) are ≤5x RL.	NA	NA
Lipids	5% of total project sample count	≤25%RPD if both result(s) are >5x RL. Difference ≤2x RL if result(s) are ≤5x RL.	NA	NA
Grain size	5% of total project sample count	≤25%RPD if both result(s) are >5x RL. Difference ≤2x RL if result(s) are ≤5x RL.	NA	NA
Particle size determination for suspended solids	5% of total project sample count	≤25%RPD if both result(s) are >5x RL. Difference ≤2x RL if result(s) are ≤5x RL.	NA	NA
Total suspended and dissolved solids	5% of total project sample count	≤25%RPD if both result(s) are >5x RL. Difference ≤2x RL if result(s) are ≤5x RL.	NA	NA
Total and dissolved organic carbon	5% of total project sample count	≤25%RPD if both result(s) are >5x RL. Difference ≤2x RL if result(s) are ≤5x RL.	Not a method requirement. Task specific	<RL
Particulate organic carbon	5% of total project sample count	≤25%RPD if both result(s) are >5x RL. Difference ≤2x RL if result(s) are ≤5x RL.	Not a method requirement. Task specific	<RL
Total metals	5% of total project sample count	≤25%RPD if both result(s) are >5x RL. Difference ≤2x RL if result(s) are ≤5x RL.	Not a method requirement. Task specific	<RL
Polycyclic aromatic hydrocarbons	5% of total project sample count	≤25%RPD if both result(s) are >5x RL. Difference ≤2x RL if result(s) are ≤5x RL.	Not a method requirement. Task specific	<RL
DDT and derivatives	5% of total project sample count	≤25%RPD if both result(s) are >5x RL. Difference ≤2x RL if result(s) are ≤5x RL.	Not a method requirement. Task specific	<RL
PCB Congeners	5% of total project sample count	≤25%RPD if both result(s) are >5x RL. Difference ≤2x RL if result(s) are ≤5x RL.	Not a method requirement. Task specific	<RL

Notes:
1 Field duplicate RPD exceedances alone would not result in data qualification. Further evaluation into the sample collection procedures should be conducted.
2 This criteria is a slight deviation from SWAMP due to the ultra low detection levels utilized for these studies.
3 If low level contamination could potentially bias results, field blanks and/or rinse (equipment) blanks should be collected
4 The determination to qualify results based on field and/or rinse blank concentrations will be made by the QA Manager as part of the overall data usability assessment
DDT = dichlorodiphenyltrichloroethane
NA = not applicable
PCB = polychlorinated biphenyl
RL = reporting limit
RPD = relative percent difference
SWAMP = California Surface Water Ambient Monitoring Program

Table 6
Sediment Analytical Methods and Target Detection Limits

Parameter[a,b]	Analytical Method[c]	SGS RLs	Vista Analytical	Calscience RLs	Physis RLs - standard	Physis RLs - custom	Target RL[d]
Conventional Parameters							
Ammonia (mg/kg)	SM 4500-HN_3 B/C (M)	--	--	0.20	--	--	0.20
Sulfide (mg/kg)	EPA 376.2	--	--	0.50	--	--	0.50
Bulk density	ASTM D7263	--	--	--	--	--	--
Specific gravity	ASTM D854	--	--	--	--	--	--
Total solids (% wet weight)	SM 2540B / USEPA 160.3	--	--	0.1	--	--	0.1
Grain size (% retained)	ASTM D442 / SM 2560	--	--	0.1	--	--	1%
Total organic carbon (%)	SM 5310B / USEPA 9060A	--	--	0.05	0.02	--	0.01% OC
Sediment porewater dissolved organic carbon (mg/	USEPA 9060M	--	--	0.5	0.5	--	0.5
Metals (µg/g or mg/kg)							
Cadmium	USEPA 6010B/6020	--	--	0.01	0.05	--	0.01
Chromium	USEPA 6010B/6020	--	--	0.1	0.05	--	0.1
Copper	USEPA 6010B/6020	--	--	0.01	0.05	--	0.01
Lead	USEPA 6010B/6020	--	--	0.01	0.05	--	0.01
Mercury	USEPA 7471A /245.7	--	--	0.03	0.00002	--	0.03
Zinc	USEPA 6010B/6020	--	--	0.10	0.05	--	0.10
Polycyclic Aromatic Hydrocarbons (ng/g)							
Acenaphthene	USEPA 8270C / 8270D - SIM	--	--	10	5.0	0.5	20
Anthracene	USEPA 8270C / 8270D - SIM	--	--	10	5.0	0.5	20
Biphenyl	USEPA 8270C / 8270D - SIM	--	--	10	5.0	0.5	20
Naphthalene	USEPA 8270C / 8270D - SIM	--	--	10	5.0	0.5	20
2,6-Dimethylnaphthalene	USEPA 8270C / 8270D - SIM	--	--	10	5.0	0.5	20
Fluorene	USEPA 8270C / 8270D - SIM	--	--	10	5.0	0.5	20
1-Methylnaphthalene	USEPA 8270C / 8270D - SIM	--	--	10	5.0	0.5	20
2-Methylnaphthalene	USEPA 8270C / 8270D - SIM	--	--	10	5.0	0.5	20
1-Methylphenanthrene	USEPA 8270C / 8270D - SIM	--	--	10	5.0	0.5	20
Phenanthrene	USEPA 8270C / 8270D - SIM	--	--	10	5.0	0.5	20
Benz[a]anthracene	USEPA 8270C / 8270D - SIM	--	--	10	5.0	0.5	20
Benzo[a]pyrene	USEPA 8270C / 8270D - SIM	--	--	10	5.0	0.5	20
Benzo(e)pyrene	USEPA 8270C / 8270D - SIM	--	--	10	5.0	0.5	20
Chrysene	USEPA 8270C / 8270D - SIM	--	--	10	5.0	0.5	20
Dibenz[a,h]anthracene	USEPA 8270C / 8270D - SIM	--	--	10	5.0	0.5	20
Fluoranthene	USEPA 8270C / 8270D - SIM	--	--	10	5.0	0.5	20
Perylene	USEPA 8270C / 8270D - SIM	--	--	10	5.0	0.5	20
Pyrene	USEPA 8270C / 8270D - SIM	--	--	10	5.0	0.5	20
DDT and derivatives (ng/g) - Low Resolution Analytical Methods							
Total Chlordane[d]	USEPA 8081A / 8270C	--	--	10.0	calc.	calc.	--
alpha-Chlordane (cis-chlordane)	USEPA 8081A / 8270C	--	--	1.0	5.0	0.5	2.0
gamma-Chlordane (trans-chlordane)	USEPA 8081A / 8270C	--	--	1.0	5.0	0.5	2.0
Oxychlordane	USEPA 8081A / 8270C	--	--	1.0	5.0	0.5	1.0
cis-Nonachlor	USEPA 8081A / 8270C	--	--	1.0	5.0	0.5	2.0
trans-Nonachlor	USEPA 8081A / 8270C	--	--	1.0	5.0	0.5	1.0
Dieldrin	USEPA 8081A / 8270C	--	--	1.0	5.0	0.5	2.0
Toxaphene	USEPA 8081A / 8270C	--	--	20.0	50.0	5	20.0
2,4′-DDD	USEPA 8081A / 8270C	--	--	1.0	5.0	0.5	2.0
2,4′-DDE	USEPA 8081A / 8270C	--	--	1.0	5.0	0.5	2.0
2,4′-DDT	USEPA 8081A / 8270C	--	--	1.0	5.0	0.5	3.0
4,4′-DDD	USEPA 8081A / 8270C	--	--	1.0	5.0	0.5	2.0
4,4′-DDE	USEPA 8081A / 8270C	--	--	1.0	5.0	0.5	2.0
4,4′-DDT	USEPA 8081A / 8270C	--	--	1.0	5.0	0.5	5.0
DDMU	USEPA 8081A / 8270C	--	--	5.0	5.0	0.5	5.0
DDT and derivatives (ng/g) - High Resolution Analytical Methods							
Total Chlordane[e]	USEPA 1699	--	--	--	--	--	--
alpha-Chlordane (cis-chlordane)	USEPA 1699	0.02	0.04	--	--	--	2.0
gamma-Chlordane (trans-chlordane)	USEPA 1699	0.02	0.04	--	--	--	2.0
Oxychlordane	USEPA 1699	0.02	0.04	--	--	--	1.0
cis-Nonachlor	USEPA 1699	0.02	0.04	--	--	--	2.0
trans-Nonachlor	USEPA 1699	0.02	0.04	--	--	--	1.0
Dieldrin	USEPA 1699	0.02	0.04	--	--	--	2.0
Toxaphene	USEPA 1699	5.0	TBD	--	--	--	20.0
2,4′-DDD	USEPA 1699	0.02	0.04	--	--	--	2.0
2,4′-DDE	USEPA 1699	0.02	0.08	--	--	--	2.0
2,4′-DDT	USEPA 1699	0.02	0.08	--	--	--	3.0
4,4′-DDD	USEPA 1699	0.02	0.04	--	--	--	2.0
4,4′-DDE	USEPA 1699	0.02	0.08	--	--	--	2.0
4,4′-DDT	USEPA 1699	0.02	0.08	--	--	--	5.0
4,4'-DDMU	USEPA 1699	TBD	0.08	--	--	--	5.0
PCB Aroclors (ng/g)							
Aroclor-1016	USEPA 8082 / 8270C	--	--	10.0	20.0	2.0	TBD
Aroclor-1221	USEPA 8082 / 8270C	--	--	10.0	20.0	2.0	TBD
Aroclor-1232	USEPA 8082 / 8270C	--	--	10.0	20.0	2.0	TBD
Aroclor-1242	USEPA 8082 / 8270C	--	--	10.0	20.0	2.0	TBD
Aroclor-1248	USEPA 8082 / 8270C	--	--	10.0	20.0	2.0	TBD
Aroclor-1254	USEPA 8082 / 8270C	--	--	10.0	20.0	2.0	TBD
Aroclor-1260	USEPA 8082 / 8270C	--	--	10.0	20.0	2.0	TBD
Aroclor-1262	USEPA 8082 / 8270C	--	--	10.0	20.0	2.0	TBD
Aroclor-1268	USEPA 8082 / 8270C	--	--	TBD	20.0	2.0	TBD
PCB Congeners (ng/g)[f] - Low Resolution Analytical Methods							
CL1-PCB-3	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL2-PCB-5	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL2-PCB-8	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL2-PCB-15	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL3-PCB-18	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL3-PCB-27	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL3-PCB-28	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL3-PCB-29	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL3-PCB-31	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL3-PCB-33	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL3-PCB-37	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL4-PCB-44	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL4-PCB-49	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL4-PCB-52	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL4-PCB-56	USEPA 8270C / 8270D-SIM	--	--	0.2	10 (PCB 60/56)	0.5	0.2

Table 6
Sediment Analytical Methods and Target Detection Limits

Parameter[a,b]	Analytical Method[c]	SGS RLs	Vista Analytical	Calscience RLs	Physis RLs - standard	Physis RLs - custom	Target RL[d]
CL4-PCB-60	USEPA 8270C / 8270D-SIM	--	--	0.2	10 (PCB 60/56)	0.5	0.2
CL4-PCB-66	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL4-PCB-70	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL4-PCB-74	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL4-PCB-77	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL4-PCB-81	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL5-PCB-87	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL5-PCB-95	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL5-PCB-97	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL5-PCB-99	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL5-PCB-101	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL5-PCB-105	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL5-PCB-110	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL5-PCB-114	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL5-PCB-118	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL5-PCB-119	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL5-PCB-123	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL5-PCB-126	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL6-PCB-128	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL6-PCB-137	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL6-PCB-138	USEPA 8270C / 8270D-SIM	--	--	0.4 (PCB 138/158)	5.0	0.5	0.2
CL6-PCB-141	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL6-PCB-149	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL6-PCB-151	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL6-PCB-153	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL6-PCB-156	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL6-PCB-157	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL6-PCB-158	USEPA 8270C / 8270D-SIM	--	--	0.4 (PCB 138/158)	5.0	0.5	0.2
CL6-PCB-167	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL6-PCB-168	USEPA 8270C / 8270D-SIM	--	--	0.2	10.0 (PCB 168/132)	0.5	0.2
CL6-PCB-169	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL7-PCB-170	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL7-PCB-174	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL7-PCB-177	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL7-PCB-180	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL7-PCB-183	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL7-PCB-187	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL7-PCB-189	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	10.0
CL8-PCB-194	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL8-PCB-195	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL8-PCB-200	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL8-PCB-201	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL8-PCB-203	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL9-PCB-206	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
CL10-PCB-209	USEPA 8270C / 8270D-SIM	--	--	0.2	5.0	0.5	0.2
PCB Congeners (ng/g)[f] - High Resolution Analytical Methods							
CL1-PCB-1	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL1-PCB-2	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL1-PCB-3	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL2-PCB-4	USEPA 1668	0.001	0.0100 (PCB 4/10)	--	--	--	TBD
CL2-PCB-5	USEPA 1668	0.001	0.0100 (PCB 5/8)	--	--	--	TBD
CL2-PCB-6	USEPA 1668	0.001	0.0050	--	--	--	TBD
CL2-PCB-7	USEPA 1668	0.001	0.0100 (PCB 7/9)	--	--	--	TBD
CL2-PCB-8	USEPA 1668	0.001	0.0100 (PCB 5/8)	--	--	--	TBD
CL2-PCB-9	USEPA 1668	0.001	0.0100 (PCB 7/9)	--	--	--	TBD
CL2-PCB-10	USEPA 1668	0.001	0.0100 (PCB 4/10)	--	--	--	TBD
CL2-PCB-11	USEPA 1668	0.001	0.005	--	--	--	TBD
CL2-PCB-12	USEPA 1668	0.002 (PCB 12/13)	0.0100 (PCB 12/13)	--	--	--	TBD
CL2-PCB-13	USEPA 1668	0.002 (PCB 12/13)	0.0100 (PCB 12/13)	--	--	--	TBD
CL2-PCB-14	USEPA 1668	0.001	0.005	--	--	--	TBD
CL2-PCB-15	USEPA 1668	0.001	0.005	--	--	--	TBD
CL3-PCB-16	USEPA 1668	0.001	0.0050 (PCB 16/32)	--	--	--	TBD
CL3-PCB-17	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL3-PCB-18	USEPA 1668	0.002 (PCB 30/18)	0.0025	--	--	--	TBD
CL3-PCB-19	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL3-PCB-20	USEPA 1668	0.002 (PCB 18/30)	0.0075 (PCB 20/21/33)	--	--	--	TBD
CL3-PCB-21	USEPA 1668	0.002 (PCB 21/33)	0.0075 (PCB 20/21/33)	--	--	--	TBD
CL3-PCB-22	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL3-PCB-23	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL3-PCB-24	USEPA 1668	0.001	0.0050 (PCB 24/27)	--	--	--	TBD
CL3-PCB-25	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL3-PCB-26	USEPA 1668	0.002 (PCB 26/29)	0.0025	--	--	--	TBD
CL3-PCB-27	USEPA 1668	0.001	0.005 (PCB 24/27)	--	--	--	TBD
CL3-PCB-28	USEPA 1668	0.002 (PCB 28/20)	0.0025	--	--	--	TBD
CL3-PCB-29	USEPA 1668	0.002 (PCB 26/29)	0.0025	--	--	--	TBD
CL3-PCB-30	USEPA 1668	0.002 (PCB 18/30)	0.0025	--	--	--	TBD
CL3-PCB-31	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL3-PCB-32	USEPA 1668	0.001	0.0050 (PCB 16/32)	--	--	--	TBD
CL3-PCB-33	USEPA 1668	0.002 (PCB 21/33)	0.0075 (PCB 20/21/33)	--	--	--	TBD
CL3-PCB-34	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL3-PCB-35	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL3-PCB-36	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL3-PCB-37	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL3-PCB-38	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL3-PCB-39	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL4-PCB-40	USEPA 1668	0.002 (PCB 40/71)	0.0025	--	--	--	TBD
CL4-PCB-41	USEPA 1668	0.001	0.0100 (PCB 41/64/71/72)	--	--	--	TBD
CL4-PCB-42	USEPA 1668	0.001	0.0050 (PCB 42/59)	--	--	--	TBD
CL4-PCB-43	USEPA 1668	0.001	0.0050 (PCB 43/49)	--	--	--	TBD
CL4-PCB-44	USEPA 1668	0.003 (PCB 44/47/65)	0.0025	--	--	--	TBD
CL4-PCB-45	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL4-PCB-46	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL4-PCB-47	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL4-PCB-48	USEPA 1668	0.001	0.0050 (PCB 48/75)	--	--	--	TBD
CL4-PCB-49	USEPA 1668	0.002 (PCB 69/49)	0.0050 (PCB 43/49)	--	--	--	TBD

Table 6
Sediment Analytical Methods and Target Detection Limits

Parameter[a,b]	Analytical Method[c]	SGS RLs	Vista Analytical	Calscience RLs	Physis RLs - standard	Physis RLs - custom	Target RL[d]
CL4-PCB-50	USEPA 1668	0.002 (PCB 50/53)	0.0025	--	--	--	TBD
CL4-PCB-51	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL4-PCB-52	USEPA 1668	0.001	0.0050 (PCB 52/69)	--	--	--	TBD
CL4-PCB-53	USEPA 1668	0.002 (PCB 50/53)	0.0025	--	--	--	TBD
CL4-PCB-54	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL4-PCB-55	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL4-PCB-56	USEPA 1668	0.001	0.0050 (PCB 56/60)	--	--	--	TBD
CL4-PCB-57	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL4-PCB-58	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL4-PCB-59	USEPA 1668	0.003 (PCB 59/62/75)	0.0050 (PCB 42/59)	--	--	--	TBD
CL4-PCB-60	USEPA 1668	0.001	0.0050 (PCB 56/60)	--	--	--	TBD
CL4-PCB-61	USEPA 1668	0.004 (PCB 61/70/74/76)	0.0050 (PCB 61/70)	--	--	--	TBD
CL4-PCB-62	USEPA 1668	0.003 (PCB 59/62/75)	0.0025	--	--	--	TBD
CL4-PCB-63	USEPA 1668	0.001	0.0100 (PCB 41/64/71/72)	--	--	--	TBD
CL4-PCB-64	USEPA 1668	0.001	0.0100 (PCB 41/64/71/72)	--	--	--	TBD
CL4-PCB-65	USEPA 1668	0.003 (PCB 44/47/65)	0.0025	--	--	--	TBD
CL4-PCB-66	USEPA 1668	0.001	0.0050 (PCB 76/66)	--	--	--	TBD
CL4-PCB-67	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL4-PCB-68	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL4-PCB-69	USEPA 1668	0.002 (PCB 69/49)	0.0050 (PCB 52/69)	--	--	--	TBD
CL4-PCB-70	USEPA 1668	0.004 (PCB 61/70/74/76)	0.0050 (PCB 61/70)	--	--	--	TBD
CL4-PCB-71	USEPA 1668	0.002 (PCB 40/71)	0.0100 (PCB 41/64/71/72)	--	--	--	TBD
CL4-PCB-72	USEPA 1668	0.001	0.0100 (PCB 41/64/71/72)	--	--	--	TBD
CL4-PCB-73	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL4-PCB-74	USEPA 1668	0.004 (PCB 61/70/74/76)	0.0025	--	--	--	TBD
CL4-PCB-75	USEPA 1668	0.003 (PCB 59/62/75)	0.0050 (PCB 48/75)	--	--	--	TBD
CL4-PCB-76	USEPA 1668	0.004 (PCB 61/70/74/76)	0.0050 (PCB 76/66)	--	--	--	TBD
CL4-PCB-77	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL4-PCB-78	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL4-PCB-79	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL4-PCB-80	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL4-PCB-81	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL5-PCB-82	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL5-PCB-83	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL5-PCB-84	USEPA 1668	0.001	0.0050 (PCB 84/92)	--	--	--	TBD
CL5-PCB-85	USEPA 1668	0.002 (PCB 85/116)	0.0050 (PCB 85/116)	--	--	--	TBD
CL5-PCB-86	USEPA 1668	0.006 (PCB 108/119/86/97/125/87)	0.0025	--	--	--	TBD
CL5-PCB-87	USEPA 1668	0.006 (PCB 108/119/86/97/125/87)	0.0075 (PCB 87/117/125)	--	--	--	TBD
CL5-PCB-88	USEPA 1668	0.001	0.0050 (PCB 88/91)	--	--	--	TBD
CL5-PCB-89	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL5-PCB-90	USEPA 1668	0.003 (PCB 90/101/113)	0.0050 (PCB 90/101)	--	--	--	TBD
CL5-PCB-91	USEPA 1668	0.001	0.0050 (PCB 88/91)	--	--	--	TBD
CL5-PCB-92	USEPA 1668	0.001	0.0050 (PCB 84/92)	--	--	--	TBD
CL5-PCB-93	USEPA 1668	0.002 (PCB 100/93)	0.0025	--	--	--	TBD
CL5-PCB-94	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL5-PCB-95	USEPA 1668	0.001	0.0075 (PCB 95/98/102)	--	--	--	TBD
CL5-PCB-96	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL5-PCB-97	USEPA 1668	0.006 (PCB 108/119/86/97/125/87)	0.0025	--	--	--	TBD
CL5-PCB-98	USEPA 1668	0.001	0.0075 (PCB 95/98/102)	--	--	--	TBD
CL5-PCB-99	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL5-PCB-100	USEPA 1668	0.002 (PCB 100/93)	0.0025	--	--	--	TBD
CL5-PCB-101	USEPA 1668	0.003 (PCB 90/101/113)	0.0050 (PCB 90/101)	--	--	--	TBD
CL5-PCB-102	USEPA 1668	0.001	0.0075 (PCB 95/98/102)	--	--	--	TBD
CL5-PCB-103	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL5-PCB-104	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL5-PCB-105	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL5-PCB-106	USEPA 1668	0.001	0.0050 (PCB 106/118)	--	--	--	TBD
CL5-PCB-107	USEPA 1668	0.002 (PCB 107/124)	0.0050 (PCB 107/109)	--	--	--	TBD
CL5-PCB-108	USEPA 1668	0.006 (PCB 108/119/86/97/125/87)	0.0050 (PCB 108/112)	--	--	--	TBD
CL5-PCB-109	USEPA 1668	0.001	0.0050 (PCB 107/109)	--	--	--	TBD
CL5-PCB-110	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL5-PCB-111	USEPA 1668	0.001	0.0050 (PCB 111/115)	--	--	--	TBD
CL5-PCB-112	USEPA 1668	0.001	0.0050 (PCB 108/112)	--	--	--	TBD
CL5-PCB-113	USEPA 1668	0.003 (PCB 90/101/113)	0.0025	--	--	--	TBD
CL5-PCB-114	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL5-PCB-115	USEPA 1668	0.001	0.0050 (PCB 111/115)	--	--	--	TBD
CL5-PCB-116	USEPA 1668	0.002 (PCB 85/116)	0.0050 (PCB 85/116)	--	--	--	TBD
CL5-PCB-117	USEPA 1668	0.001	0.0075 (PCB 87/117/125)	--	--	--	TBD
CL5-PCB-118	USEPA 1668	0.001	0.0050 (PCB 106/118)	--	--	--	TBD
CL5-PCB-119	USEPA 1668	0.006 (PCB 108/119/86/97/125/87)	0.0025	--	--	--	TBD
CL5-PCB-120	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL5-PCB-121	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL5-PCB-122	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL5-PCB-123	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL5-PCB-124	USEPA 1668	0.002 (PCB 107/124)	0.0025	--	--	--	TBD
CL5-PCB-125	USEPA 1668	0.006 (PCB 108/119/86/97/125/87)	0.0075 (PCB 87/117/125)	--	--	--	TBD
CL5-PCB-126	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL5-PCB-127	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL6-PCB-128	USEPA 1668	0.002 (PCB-128/166)	0.0050 (PCB 128/162)	--	--	--	TBD
CL6-PCB-129	USEPA 1668	0.003 (PCB 163/138/129)	0.0025	--	--	--	TBD
CL6-PCB-130	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL6-PCB-131	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL6-PCB-132	USEPA 1668	0.001	0.0050 (PCB 132/161)	--	--	--	TBD
CL6-PCB-133	USEPA 1668	0.001	0.0050 (PCB 133/142)	--	--	--	TBD
CL6-PCB-134	USEPA 1668	0.001	0.0050 (PCB 134/143)	--	--	--	TBD
CL6-PCB-135	USEPA 1668	0.002 (PCB 151/135)	0.0025	--	--	--	TBD
CL6-PCB-136	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL6-PCB-137	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL6-PCB-138	USEPA 1668	0.003 (PCB 163/138/129)	0.0075 (PCB 138/163/164)	--	--	--	TBD
CL6-PCB-139	USEPA 1668	0.002 (PCB 139/140)	0.0050 (PCB 139/149)	--	--	--	TBD
CL6-PCB-140	USEPA 1668	0.002 (PCB 139/140)	0.0025	--	--	--	TBD
CL6-PCB-141	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL6-PCB-142	USEPA 1668	0.001	0.0050 (PCB 133/142)	--	--	--	TBD
CL6-PCB-143	USEPA 1668	0.001	0.0050 (PCB 134/143)	--	--	--	TBD
CL6-PCB-144	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL6-PCB-145	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL6-PCB-146	USEPA 1668	0.001	0.0050 (PCB 146/165)	--	--	--	TBD

Table 6
Sediment Analytical Methods and Target Detection Limits

Parameter[a,b]	Analytical Method[c]	SGS RLs	Vista Analytical	Calscience RLs	Physis RLs - standard	Physis RLs - custom	Target RL[d]
CL6-PCB-147	USEPA 1668	0.002 (PCB 147/149)	0.0025	--	--	--	TBD
CL6-PCB-148	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL6-PCB-149	USEPA 1668	0.002 (PCB-147/149)	0.0050 (PCB 139/149)	--	--	--	TBD
CL6-PCB-150	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL6-PCB-151	USEPA 1668	0.002 (PCB-151/135)	0.0025	--	--	--	TBD
CL6-PCB-152	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL6-PCB-153	USEPA 1668	0.002 (PCB-153/168)	0.0025	--	--	--	TBD
CL6-PCB-154	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL6-PCB-155	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL6-PCB-156	USEPA 1668	0.002 (PCB-156/157)	0.0025	--	--	--	TBD
CL6-PCB-157	USEPA 1668	0.002 (PCB-156/157)	0.0025	--	--	--	TBD
CL6-PCB-158	USEPA 1668	0.001	0.0050 (PCB 158/160)	--	--	--	TBD
CL6-PCB-159	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL6-PCB-160	USEPA 1668	0.001	0.0050 (PCB 158/160)	--	--	--	TBD
CL6-PCB-161	USEPA 1668	0.001	0.0050 (PCB 132/161)	--	--	--	TBD
CL6-PCB-162	USEPA 1668	0.001	0.0050 (PCB 128/162)	--	--	--	TBD
CL6-PCB-163	USEPA 1668	0.003 (PCB 163/138/129)	0.0075 (PCB 138/163/164)	--	--	--	TBD
CL6-PCB-164	USEPA 1668	0.001	0.0075 (PCB 138/163/164)	--	--	--	TBD
CL6-PCB-165	USEPA 1668	0.001	0.0050 (PCB 146/165)	--	--	--	TBD
CL6-PCB-166	USEPA 1668	0.002 (PCB 128/166)	0.0025	--	--	--	TBD
CL6-PCB-167	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL6-PCB-168	USEPA 1668	0.002 (PCB-153/168)	0.0025	--	--	--	TBD
CL6-PCB-169	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL7-PCB-170	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL7-PCB-171	USEPA 1668	0.002 (PCB 171/173)	0.0025	--	--	--	TBD
CL7-PCB-172	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL7-PCB-173	USEPA 1668	0.002 (PCB 171/173)	0.0025	--	--	--	TBD
CL7-PCB-174	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL7-PCB-175	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL7-PCB-176	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL7-PCB-177	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL7-PCB-178	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL7-PCB-179	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL7-PCB-180	USEPA 1668	0.002 (PCB-180/193)	0.0025	--	--	--	TBD
CL7-PCB-181	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL7-PCB-182	USEPA 1668	0.001	0.0050 (PCB 182/187)	--	--	--	TBD
CL7-PCB-183	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL7-PCB-184	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL7-PCB-185	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL7-PCB-186	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL7-PCB-187	USEPA 1668	0.001	0.0050 (PCB 182/187)	--	--	--	TBD
CL7-PCB-188	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL7-PCB-189	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL7-PCB-190	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL7-PCB-191	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL7-PCB-192	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL7-PCB-193	USEPA 1668	0.002 (PCB 180/193)	0.0025	--	--	--	TBD
CL8-PCB-194	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL8-PCB-195	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL8-PCB-196	USEPA 1668	0.001	0.0050 (PCB 196/203)	--	--	--	TBD
CL8-PCB-197	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL8-PCB-198	USEPA 1668	0.002 (PCB 198/199)	0.0025	--	--	--	TBD
CL8-PCB-199	USEPA 1668	0.002 (PCB 198/199)	0.0025	--	--	--	TBD
CL8-PCB-200	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL8-PCB-201	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL8-PCB-202	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL8-PCB-203	USEPA 1668	0.001	0.0050 (PCB 196/203)	--	--	--	TBD
CL8-PCB-204	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL8-PCB-205	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL9-PCB-206	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL9-PCB-207	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL9-PCB-208	USEPA 1668	0.001	0.0025	--	--	--	TBD
CL10-PCB-209	USEPA 1668	0.001	0.0025	--	--	--	TBD

Notes:
a = Specific analytes used for each study conducted for the Ports may vary by waterbody, according to the listings.
b = Units in dry weight unless otherwise noted. Specific analytes used for each study conducted for the Ports may vary by waterbody, according to the listings.
c = Laboratories may use different versions of recommended methods (i.e. USEPA 8270C) as long as the QA/QC elements identified in this QAPP are met.
d = Matrix interference, total solid concentrations and/or dilutions due to non-target analytes may increase target reporting limits. The method detection limit (MDL) should be at least three times lower than the reporting limit (40 CFR part 136) but will vary per instrument by MDL study.
e = Total chlordane is calculated using the following compounds: alpha-chlordane, gamma-chlordane, oxychlordane, cis-nonachlor, and trans-nonachlor.
f = PCB co-elutions will vary by instrument and column, and may increase reporting limits for some congeners.
µg/g = microgram per gram
calc. = calculated
DDT = dichlorodiphenyltrichloroethane
DDD = dichlorodiphenyldichloroethane
DDE = dichlorodiphenyldichloroethylene
MDL = method detection limit
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
N/A = not applicable
ng/g = nanogram per gram
OC = organic carbon
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyl
RL = reporting limit
SQO = sediment quality objectives
SWAMP = California Surface Water Ambient Monitoring Program
TBD = to be determined
USEPA = U.S. Environmental Protection Agency
wt = weight

Table 7
Water Analytical Methods and Target Detection Limits

Parameter[a]	Analytical Method[b]	SGS RLs	Vista RLs	Calscience RLs	Physis RLs - standard	Physis RLs - custom	Target RL[c]
Conventionals							
Total dissolved solids (mg/L)	USEPA 160.1 / SM 2540 C	--	--	1.0	5	--	10.0
Total suspended solids (mg/L)	USEPA 160.2 / SM 2540 D	--	--	1.0	1	--	0.5
Hardness (mg $CaCO_3$ / L)[d]	SM2340B	--	--	2.0	0.5	--	1
Total and dissolved organic carbon (mg/L)	9060M	--	--	0.5	0.5	--	0.6
Particulate organic carbon (mg/L)	9060 Modified/Lloyd Kahn with filtrate	--	--	TBD	TBD	--	0.1
Particle size determination (%)	Laser diffraction (ASTM D4464M) or SSC (ASTM 3977)	--	--	0.1	0.2	--	--
Freshwater Total and Dissolved Metals (µg/L)							
Cadmium	USEPA 6010A/6020/200.8	--	--	1	0.05	--	0.01
Chromium	USEPA 6010A/6020/200.8	--	--	1	0.05	--	0.1
Copper	USEPA 6010A/6020/200.8	--	--	1	0.25	--	0.01
Lead	USEPA 6010A/6020/200.8	--	--	1	0.03	--	0.01
Mercury	USEPA 7470A/245.7	--	--	0.2	0.02	--	0.0002
Mercury	USEPA 1631	--	--	--	0.001	--	0.0002
Zinc	USEPA 6010A/6020/200.8	--	--	5	0.1	--	0.10
Seawater (and Freshwater) Total and Dissolved Metals (µg/L)							
Cadmium	USEPA 1640	--	--	0.0300	0.01	--	0.01
Chromium	USEPA 1640	--	--	0.200	0.05	--	0.1
Copper	USEPA 1640	--	--	0.0300	0.02	--	0.01
Lead	USEPA 1640	--	--	0.0300	0.01	--	0.01
Zinc	USEPA 1640	--	--	1.00	0.01	--	0.10
DDT and derivatives (ng/L) - Low Resolution Analytical Methods							
Total Chlordane[e]	USEPA 8081A / 625	--	--	500	calc.	calc.	--
alpha-Chlordane (cis-chlordane)	USEPA 8081A / 625	--	--	50	5	0.5	2.0
gamma-Chlordane (trans-chlordane)	USEPA 8081A / 625	--	--	50	5	0.5	2.0
Oxychlordane	USEPA 8081A / 625	--	--	50	5	0.5	2.0
cis-Nonachlor	USEPA 8081A / 625	--	--	50	5	0.5	2.0
trans-Nonachlor	USEPA 8081A / 625	--	--	50	5	0.5	2.0
Dieldrin	USEPA 8081A / 625	--	--	50	5	0.5	2.0
Toxaphene	USEPA 8081A / 625	--	--	2000	50	5	TBD
2,4'-DDD	USEPA 8081A / 625	--	--	50	5	0.5	2.0
2,4'-DDE	USEPA 8081A / 625	--	--	50	5	0.5	2.0
2,4'-DDT	USEPA 8081A / 625	--	--	50	5	0.5	2.0
4,4'-DDD	USEPA 8081A / 625	--	--	50	5	0.5	2.0
4,4'-DDE	USEPA 8081A / 625	--	--	50	5	0.5	2.0
4,4'-DDT	USEPA 8081A / 625	--	--	50	5	0.5	5.0
4,4'-DDMU	USEPA 8081A / 625	--	--		5	0.5	5.0
DDT and derivatives (ng/L) - High Resolution Analytical Method							
Total Chlordane[e]	USEPA 1699	--	--	--	--	--	2.0
alpha-Chlordane (cis-chlordane)	USEPA 1699	0.1	0.04	--	--	--	2.0
gamma-Chlordane (trans-chlordane)	USEPA 1699	0.1	0.04	--	--	--	2.0
Oxychlordane	USEPA 1699	0.1	0.04	--	--	--	2.0
cis-Nonachlor	USEPA 1699	0.1	0.04	--	--	--	2.0
trans-Nonachlor	USEPA 1699	0.1	0.04	--	--	--	2.0
Dieldrin	USEPA 1699	0.1	0.04	--	--	--	2.0
Toxaphene	USEPA 1699	25	TBD	--	--	--	2.0
2,4'-DDD	USEPA 1699	0.1	0.04	--	--	--	2.0
2,4'-DDE	USEPA 1699	0.1	0.08	--	--	--	2.0
2,4'-DDT	USEPA 1699	0.1	0.08	--	--	--	2.0
4,4'-DDD	USEPA 1699	0.1	0.04	--	--	--	2.0
4,4'-DDE	USEPA 1699	0.1	0.08	--	--	--	2.0
4,4'-DDT	USEPA 1699	0.1	0.08	--	--	--	2.0
4,4'-DDMU	USEPA 1699	TBD	0.08	--	--	--	2.0
PCB Aroclors (ng/L) - Low Resolution Analytical Method							
Aroclor-1016	USEAP 8082 / USEPA 625	--	--	1000	20	2	TBD
Aroclor-1221	USEAP 8082 / USEPA 625	--	--	1000	20	2	TBD
Aroclor-1232	USEAP 8082 / USEPA 625	--	--	1000	20	2	TBD
Aroclor-1242	USEAP 8082 / USEPA 625	--	--	1000	20	2	TBD
Aroclor-1248	USEAP 8082 / USEPA 625	--	--	1000	20	2	TBD
Aroclor-1254	USEAP 8082 / USEPA 625	--	--	1000	20	2	TBD
Aroclor-1260	USEAP 8082 / USEPA 625	--	--	1000	20	2	TBD
Aroclor-1262	USEAP 8082 / USEPA 625	--	--	1000	20	2	TBD
Aroclor-1268	USEAP 8082 / USEPA 625	--	--	TBD	20	2	TBD
PCB Congeners (ng/L)[f] - Low Resolution Analytical Methods							
CL1-PCB-3	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL2-PCB-5	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL2-PCB-8	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL2-PCB-15	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL3-PCB-18	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL3-PCB-27	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL3-PCB-28	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL3-PCB-29	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL3-PCB-31	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL3-PCB-33	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL3-PCB-37	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL4-PCB-44	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL4-PCB-49	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL4-PCB-52	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL4-PCB-56	EPA 8270C SIM / EPA 625	--	--	2	5 (PCB 56/60)	0.5 (PCB 56/60)	2.0
CL4-PCB-60	EPA 8270C SIM / EPA 625	--	--	2	5 (PCB 56/60)	0.5 (PCB 56/60)	2.0
CL4-PCB-66	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL4-PCB-70	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL4-PCB-74	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL4-PCB-77	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL4-PCB-81	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL5-PCB-87	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL5-PCB-95	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL5-PCB-97	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL5-PCB-99	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0

Table 7
Water Analytical Methods and Target Detection Limits

Parameter[a]	Analytical Method[b]	SGS RLs	Vista RLs	Calscience RLs	Physis RLs - standard	Physis RLs - custom	Target RL[c]
CL5-PCB-101	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL5-PCB-105	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL5-PCB-110	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL5-PCB-114	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL5-PCB-118	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL5-PCB-119	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL5-PCB-123	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL5-PCB-126	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL6-PCB-128	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL6-PCB-137	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL6-PCB-138	EPA 8270C SIM / EPA 625	--	--	4(PCB-138/158)	5.00	0.50	2.0
CL6-PCB-141	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL6-PCB-149	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL6-PCB-151	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL6-PCB-153	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL6-PCB-156	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL6-PCB-157	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL6-PCB-158	EPA 8270C SIM / EPA 625	--	--	4 (PCB-138/158)	5.00	0.50	2.0
CL6-PCB-167	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL6-PCB-168	EPA 8270C SIM / EPA 625	--	--	2	5.00 (PCB-168/132)	0.5 (PCB-168/132)	2.0
CL6-PCB-169	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL7-PCB-170	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL7-PCB-174	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL7-PCB-177	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL7-PCB-180	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL7-PCB-183	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL7-PCB-187	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL7-PCB-189	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	10.0
CL8-PCB-194	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL8-PCB-195	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL8-PCB-200	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL8-PCB-201	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL8-PCB-203	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL9-PCB-206	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
CL10-PCB-209	EPA 8270C SIM / EPA 625	--	--	2	5.00	0.50	2.0
PCB Congeners (ng/L) [f,g] - High Resolution Analytical Method							
CL1-PCB-1	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL1-PCB-2	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL1-PCB-3	USEPA 1668B	0.005	0.0025	--	--	--	TBD
CL2-PCB-4	USEPA 1668B	0.005	0.05 (PCB 4/10)	--	--	--	TBD
CL2-PCB-5	USEPA 1668B	0.005	0.05 (PCB 5/8)	--	--	--	TBD
CL2-PCB-6	USEPA 1668B	0.005	0.05	--	--	--	TBD
CL2-PCB-7	USEPA 1668B	0.005	0.05 (PCB 7/9)	--	--	--	TBD
CL2-PCB-8	USEPA 1668B	0.005	0.05 (PCB 5/8)	--	--	--	TBD
CL2-PCB-9	USEPA 1668B	0.005	0.05 (PCB 7/9)	--	--	--	TBD
CL2-PCB-10	USEPA 1668B	0.005	0.05 (PCB 4/10)	--	--	--	TBD
CL2-PCB-11	USEPA 1668B	0.005	0.05	--	--	--	TBD
CL2-PCB-12	USEPA 1668B	0.010 (PCB-13/12)	0.05 (PCB 12/13)	--	--	--	TBD
CL2-PCB-13	USEPA 1668B	0.010 (PCB-13/12)	0.05 (PCB 12/13)	--	--	--	TBD
CL2-PCB-14	USEPA 1668B	0.005	0.05	--	--	--	TBD
CL2-PCB-15	USEPA 1668B	0.005	0.05	--	--	--	TBD
CL3-PCB-16	USEPA 1668B	0.005	0.025 (PCB 16/32)	--	--	--	TBD
CL3-PCB-17	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL3-PCB-18	USEPA 1668B	0.010 (PCB-30/18)	0.025	--	--	--	TBD
CL3-PCB-19	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL3-PCB-20	USEPA 1668B	0.010 (PCB-28/20)	0.025 (PCB 20/21/33)	--	--	--	TBD
CL3-PCB-21	USEPA 1668B	0.010 (PCB-21/33)	0.025 (PCB 20/21/33)	--	--	--	TBD
CL3-PCB-22	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL3-PCB-23	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL3-PCB-24	USEPA 1668B	0.005	0.025 (PCB 24/27)	--	--	--	TBD
CL3-PCB-25	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL3-PCB-26	USEPA 1668B	0.010 (PCB-26/29)	0.025	--	--	--	TBD
CL3-PCB-27	USEPA 1668B	0.005	0.025 (PCB 24/27)	--	--	--	TBD
CL3-PCB-28	USEPA 1668B	0.010 (PCB-28/20)	0.025	--	--	--	TBD
CL3-PCB-29	USEPA 1668B	0.010 (PCB 26/29)	0.025	--	--	--	TBD
CL3-PCB-30	USEPA 1668B	0.010 (PCB-30/18)	0.025	--	--	--	TBD
CL3-PCB-31	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL3-PCB-32	USEPA 1668B	0.005	0.025 (PCB 16/32)	--	--	--	TBD
CL3-PCB-33	USEPA 1668B	0.010 (PCB-21/33)	0.025 (PCB 20/21/33)	--	--	--	TBD
CL3-PCB-34	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL3-PCB-35	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL3-PCB-36	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL3-PCB-37	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL3-PCB-38	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL3-PCB-39	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL4-PCB-40	USEPA 1668B	0.010 (PCB-71/40)	0.025	--	--	--	TBD
CL4-PCB-41	USEPA 1668B	0.005	0.025 (PCB 41/64/71/72)	--	--	--	TBD
CL4-PCB-42	USEPA 1668B	0.005	0.025 (PCB 42/59)	--	--	--	TBD
CL4-PCB-43	USEPA 1668B	0.005	0.025 (PCB 43/49)	--	--	--	TBD
CL4-PCB-44	USEPA 1668B	0.015 (PCB-44/47/65)	0.025	--	--	--	TBD
CL4-PCB-45	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL4-PCB-46	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL4-PCB-47	USEPA 1668B	0.015 (PCB-44/47/65)	0.025	--	--	--	TBD
CL4-PCB-48	USEPA 1668B	0.005	0.025 (PCB 48/75)	--	--	--	TBD
CL4-PCB-49	USEPA 1668B	0.010 (PCB-69/49)	0.025 (PCB 43/49)	--	--	--	TBD
CL4-PCB-50	USEPA 1668B	0.010 (PCB-50/53)	0.025	--	--	--	TBD
CL4-PCB-51	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL4-PCB-52	USEPA 1668B	0.005	0.025 (PCB 52/69)	--	--	--	TBD
CL4-PCB-53	USEPA 1668B	0.010 (PCB-50/53)	0.025	--	--	--	TBD
CL4-PCB-54	USEPA 1668B	0.005	0.025	--	--	--	TBD

Table 7
Water Analytical Methods and Target Detection Limits

Parameter[a]	Analytical Method[b]	SGS RLs	Vista RLs	Calscience RLs	Physis RLs - standard	Physis RLs - custom	Target RL[c]
CL4-PCB-55	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL4-PCB-56	USEPA 1668B	0.005	0.025 (PCB 56/60)	--	--	--	TBD
CL4-PCB-57	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL4-PCB-58	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL4-PCB-59	USEPA 1668B	0.015 (PCB-59/62/75)	0.025 (PCB 42/59)	--	--	--	TBD
CL4-PCB-60	USEPA 1668B	0.005	0.025 (PCB 56/60)	--	--	--	TBD
CL4-PCB-61	USEPA 1668B	0.020 (PCB-61/70/74/76)	0.025 (PCB 61/70)	--	--	--	TBD
CL4-PCB-62	USEPA 1668B	0.015 (PCB-59/62/75)	0.025	--	--	--	TBD
CL4-PCB-63	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL4-PCB-64	USEPA 1668B	0.005	0.025 (PCB 41/64/71/72)	--	--	--	TBD
CL4-PCB-65	USEPA 1668B	0.015 (PCB-44/47/65)	0.025	--	--	--	TBD
CL4-PCB-66	USEPA 1668B	0.005	0.005 (PCB 76/66)	--	--	--	TBD
CL4-PCB-67	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL4-PCB-68	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL4-PCB-69	USEPA 1668B	0.010 (PCB-69/49)	0.025 (PCB 52/69)	--	--	--	TBD
CL4-PCB-70	USEPA 1668B	0.020 (PCB-61/70/74/76)	0.025 (PCB 61/70)	--	--	--	TBD
CL4-PCB-71	USEPA 1668B	0.010 (PCB-71/40)	0.025 (PCB 41/64/71/72)	--	--	--	TBD
CL4-PCB-72	USEPA 1668B	0.005	0.025 (PCB 41/64/71/72)	--	--	--	TBD
CL4-PCB-73	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL4-PCB-74	USEPA 1668B	0.020 (PCB-61/70/74/76)	0.025	--	--	--	TBD
CL4-PCB-75	USEPA 1668B	0.015 (PCB-59/62/75)	0.025 (PCB 48/75)	--	--	--	TBD
CL4-PCB-76	USEPA 1668B	0.020 (PCB-61/70/74/76)	0.025 (PCB 76/66)	--	--	--	TBD
CL4-PCB-77	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL4-PCB-78	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL4-PCB-79	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL4-PCB-80	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL4-PCB-81	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL5-PCB-82	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL5-PCB-83	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL5-PCB-84	USEPA 1668B	0.005	0.025 (PCB 84/92)	--	--	--	TBD
CL5-PCB-85	USEPA 1668B	0.010 (PCB-116/85)	0.025 (85/116)	--	--	--	TBD
CL5-PCB-86	USEPA 1668B	0.030 (PCB-108/119/86/97/125/87)	0.025	--	--	--	TBD
CL5-PCB-87	USEPA 1668B	0.030 (PCB-108/119/86/97/125/87)	0.025 (PCB 87/117/125)	--	--	--	TBD
CL5-PCB-88	USEPA 1668B	0.005	0.025 (PCB 88/91)	--	--	--	TBD
CL5-PCB-89	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL5-PCB-90	USEPA 1668B	0.015 (PCB-113/90/101)	0.025 (PCB 90/101)	--	--	--	TBD
CL5-PCB-91	USEPA 1668B	0.005	0.025 (PCB 88/91)	--	--	--	TBD
CL5-PCB-92	USEPA 1668B	0.005	0.025 (PCB 84/92)	--	--	--	TBD
CL5-PCB-93	USEPA 1668B	0.010 (PCB-100/93)	0.025	--	--	--	TBD
CL5-PCB-94	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL5-PCB-95	USEPA 1668B	0.005	0.025 (PCB 95/98/102)	--	--	--	TBD
CL5-PCB-96	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL5-PCB-97	USEPA 1668B	0.030 (PCB-108/119/86/97/125/87)	0.025	--	--	--	TBD
CL5-PCB-98	USEPA 1668B	0.005	0.025 (PCB 95/98/102)	--	--	--	TBD
CL5-PCB-99	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL5-PCB-100	USEPA 1668B	0.010 (PCB-100/93)	0.025	--	--	--	TBD
CL5-PCB-101	USEPA 1668B	0.015 (PCB-113/90/101)	0.025 (PCB 90/101)	--	--	--	TBD
CL5-PCB-102	USEPA 1668B	0.005	0.025 (PCB 95/98/102)	--	--	--	TBD
CL5-PCB-103	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL5-PCB-104	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL5-PCB-105	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL5-PCB-106	USEPA 1668B	0.005	0.025 (PCB 106/118)	--	--	--	TBD
CL5-PCB-107	USEPA 1668B	0.010 (PCB-107/124)	0.025 (PCB 107/109)	--	--	--	TBD
CL5-PCB-108	USEPA 1668B	0.030 (PCB-108/119/86/97/125/87)	0.025 (PCB 108/112)	--	--	--	TBD
CL5-PCB-109	USEPA 1668B	0.005	0.025 (PCB 107/109)	--	--	--	TBD
CL5-PCB-110	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL5-PCB-111	USEPA 1668B	0.005	0.025 (PCB111/115)	--	--	--	TBD
CL5-PCB-112	USEPA 1668B	0.005	0.025 (PCB 108/112)	--	--	--	TBD
CL5-PCB-113	USEPA 1668B	0.015 (PCB-113/90/101)	0.025	--	--	--	TBD
CL5-PCB-114	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL5-PCB-115	USEPA 1668B	0.005	0.025 (PCB111/115)	--	--	--	TBD
CL5-PCB-116	USEPA 1668B	0.010 (PCB-116/85)	0.025 (85/116)	--	--	--	TBD
CL5-PCB-117	USEPA 1668B	0.005	0.025 (PCB 87/117/125)	--	--	--	TBD
CL5-PCB-118	USEPA 1668B	0.005	0.025 (PCB 106/118)	--	--	--	TBD
CL5-PCB-119	USEPA 1668B	0.030 (PCB-108/119/86/97/125/87)	0.025	--	--	--	TBD
CL5-PCB-120	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL5-PCB-121	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL5-PCB-122	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL5-PCB-123	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL5-PCB-124	USEPA 1668B	0.010 (PCB-107/124)	0.025	--	--	--	TBD
CL5-PCB-125	USEPA 1668B	0.030 (PCB-108/119/86/97/125/87)	0.025 (PCB 87/117/125)	--	--	--	TBD
CL5-PCB-126	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL5-PCB-127	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL6-PCB-128	USEPA 1668B	0.010 (PCB-128/166)	0.025 (PCB 128/162)	--	--	--	TBD
CL6-PCB-129	USEPA 1668B	0.015 (PCB-163/138/129)	0.025	--	--	--	TBD
CL6-PCB-130	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL6-PCB-131	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL6-PCB-132	USEPA 1668B	0.005	0.025 (PCB 132/161)	--	--	--	TBD
CL6-PCB-133	USEPA 1668B	0.005	0.025 (PCB 133/142)	--	--	--	TBD
CL6-PCB-134	USEPA 1668B	0.005	0.025 (PCB 134/143)	--	--	--	TBD
CL6-PCB-135	USEPA 1668B	0.010 (PCB-151/135)	0.025	--	--	--	TBD
CL6-PCB-136	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL6-PCB-137	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL6-PCB-138	USEPA 1668B	0.015 (PCB-163/138/129)	0.025 (PCB 138/163/164)	--	--	--	TBD
CL6-PCB-139	USEPA 1668B	0.010 (PCB-139/140)	0.025 (PCB 139/149)	--	--	--	TBD
CL6-PCB-140	USEPA 1668B	0.010 (PCB-139/140)	0.025	--	--	--	TBD
CL6-PCB-141	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL6-PCB-142	USEPA 1668B	0.005	0.025 (PCB 133/142)	--	--	--	TBD
CL6-PCB-143	USEPA 1668B	0.005	0.025 (PCB 134/143)	--	--	--	TBD
CL6-PCB-144	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL6-PCB-145	USEPA 1668B	0.005	0.025	--	--	--	TBD

Table 7
Water Analytical Methods and Target Detection Limits

Parameter[a]	Analytical Method[b]	SGS RLs	Vista RLs	Calscience RLs	Physis RLs - standard	Physis RLs - custom	Target RL[c]
CL6-PCB-146	USEPA 1668B	0.005	0.025 (PCB 146/165)	--	--	--	TBD
CL6-PCB-147	USEPA 1668B	0.010 (PCB-147/149)	0.025	--	--	--	TBD
CL6-PCB-148	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL6-PCB-149	USEPA 1668B	0.010 (PCB-147/149)	0.025 (PCB 139/149)	--	--	--	TBD
CL6-PCB-150	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL6-PCB-151	USEPA 1668B	0.010 (PCB-151/135)	0.025	--	--	--	TBD
CL6-PCB-152	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL6-PCB-153	USEPA 1668B	0.010 (PCB-153/168)	0.025	--	--	--	TBD
CL6-PCB-154	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL6-PCB-155	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL6-PCB-156	USEPA 1668B	0.010 (PCB-156/157)	0.025	--	--	--	TBD
CL6-PCB-157	USEPA 1668B	0.010 (PCB-156/157)	0.025	--	--	--	TBD
CL6-PCB-158	USEPA 1668B	0.005	0.025 (PCB 158/160)	--	--	--	TBD
CL6-PCB-159	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL6-PCB-160	USEPA 1668B	0.005	0.025 (PCB 158/160)	--	--	--	TBD
CL6-PCB-161	USEPA 1668B	0.005	0.025 (PCB 132/161)	--	--	--	TBD
CL6-PCB-162	USEPA 1668B	0.005	0.025 (PCB 128/162)	--	--	--	TBD
CL6-PCB-163	USEPA 1668B	0.015 (PCB-163/138/129)	0.025 (PCB 138/163/164)	--	--	--	TBD
CL6-PCB-164	USEPA 1668B	0.005	0.025 (PCB 138/163/164)	--	--	--	TBD
CL6-PCB-165	USEPA 1668B	0.005	0.025 (PCB 146/165)	--	--	--	TBD
CL6-PCB-166	USEPA 1668B	0.010 (PCB-128/166)	0.025	--	--	--	TBD
CL6-PCB-167	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL6-PCB-168	USEPA 1668B	0.010 (PCB-153/168)	0.025	--	--	--	TBD
CL6-PCB-169	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL7-PCB-170	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL7-PCB-171	USEPA 1668B	0.010 (PCB-171/173)	0.025	--	--	--	TBD
CL7-PCB-172	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL7-PCB-173	USEPA 1668B	0.010 (PCB-171/173)	0.025	--	--	--	TBD
CL7-PCB-174	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL7-PCB-175	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL7-PCB-176	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL7-PCB-177	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL7-PCB-178	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL7-PCB-179	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL7-PCB-180	USEPA 1668B	0.010 (PCB-180/193)	0.025	--	--	--	TBD
CL7-PCB-181	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL7-PCB-182	USEPA 1668B	0.005	0.025 (PCB 182/187)	--	--	--	TBD
CL7-PCB-183	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL7-PCB-184	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL7-PCB-185	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL7-PCB-186	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL7-PCB-187	USEPA 1668B	0.005	0.005 (PCB 182/187)	--	--	--	TBD
CL7-PCB-188	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL7-PCB-189	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL7-PCB-190	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL7-PCB-191	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL7-PCB-192	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL7-PCB-193	USEPA 1668B	0.010 (PCB-180/193)	0.025	--	--	--	TBD
CL8-PCB-194	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL8-PCB-195	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL8-PCB-196	USEPA 1668B	0.005	0.025 (PCB 196/203)	--	--	--	TBD
CL8-PCB-197	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL8-PCB-198	USEPA 1668B	0.010 (PCB-198/199)	0.025	--	--	--	TBD
CL8-PCB-199	USEPA 1668B	0.010 (PCB-198/199)	0.025	--	--	--	TBD
CL8-PCB-200	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL8-PCB-201	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL8-PCB-202	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL8-PCB-203	USEPA 1668B	0.005	0.025 (PCB 196/203)	--	--	--	TBD
CL8-PCB-204	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL8-PCB-205	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL9-PCB-206	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL9-PCB-207	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL9-PCB-208	USEPA 1668B	0.005	0.025	--	--	--	TBD
CL10-PCB-209	USEPA 1668B	0.005	0.025	--	--	--	TBD

Notes:

High volume alternative sampling techniques may be used to achieve lower reporting limits for these analyses.

a = Specific analytes used for each study conducted for the Ports may vary by waterbody, according to the listings.

b = Laboratories may use different versions of recommended methods (i.e. USEPA 8270C) as long as the QA/QC elements identified in this QAPP are met.

c = Matrix interference and/or dilutions due to non-target analytes may increase target reporting limits. The method detection limit (MDL) should be at least three times lower than the reporting limit (40 CFR part 136) but will vary per instrument by MD

d = Hardness is calculated from individual results for calcium and magnesium analyzed by methods 6010, 6020, or 200.8.

e = Total chlordane is calculated using the following compounds: alpha-chlordane, gamma-chlordane, oxychlordane, cis-nonachlor, and trans-nonachlor.

f = PCB co-elutions will vary by instrument and column, and may increase reporting limits for some congeners.

g = PCB congener high resolution reporting limits are based on a 2 liter sample size.

mg/L = milligram per liter

µg/L = microgram per liter

ng/L = nanogram per liter

pg/L = picogram per liter

DDT = dichlorodiphenyltrichloroethane

DDD = dichlorodiphenyldichloroethane

DDE = dichlorodiphenyldichloroethylene

MDL = method detection limit

RL = reporting limit

PCB = polychlorinated biphenyl

TBD = to be determined

wt = weight

Table 8
Tissue Analytical Methods and Target Detection Limits

Parameter[a]	Analytical Method[b]	SGS RLs	Vista RLs	Calscience RLs	Physis RLs - standard	Physis RLs - custom	Target RLs[c]
Conventionals (%)							
Lipids	NOAA 1993a / Gravimetric	--	--	0.1	0.01	--	0.5
DDT and derivatives (ng/g wet weight) - Low Resolution Analytical Methods							
Total Chlordane[d]	USEPA 8081A / 8270C	--	--	**20**	calc.	calc.	--
alpha-Chlordane (cis-chlordane)	USEPA 8081A / 8270C	--	--	2.0	5	0.5	4.0
gamma-Chlordane (trans-chlordane)	USEPA 8081A / 8270C	--	--	2.0	5	0.5	4.0
Oxychlordane	USEPA 8081A / 8270C	--	--	2.0	5	0.5	2.0
cis-Nonachlor	USEPA 8081A / 8270C	--	--	2.0	5	0.5	4.0
trans-Nonachlor	USEPA 8081A / 8270C	--	--	2.0	5	0.5	2.0
Dieldrin	USEPA 8081A / 8270C	--	--	2.0	5	0.5	4.0
Toxaphene	USEPA 8081A / 8270C	--	--	40.0	50	5	40.0
2,4'-DDD	USEPA 8081A / 8270C	--	--	2.0	5	0.5	4.0
2,4'-DDE	USEPA 8081A / 8270C	--	--	2.0	5	0.5	4.0
2,4'-DDT	USEPA 8081A / 8270C	--	--	2.0	5	0.5	6.0
4,4'-DDD	USEPA 8081A / 8270C	--	--	2.0	5	0.5	4.0
4,4'-DDE	USEPA 8081A / 8270C	--	--	2.0	5	0.5	4.0
4,4'-DDT	USEPA 8081A / 8270C	--	--	2.0	5	0.5	10.0
4,4'-DDMU	USEPA 8081A / 8270C	--	--	TBD	5	0.5	10.0
DDT and derivatives (ng/g wet weight) - High Resolution Analytical Method							
Total Chlordane[d]	USEPA 1699	calc.	calc.	--	--	--	--
alpha-Chlordane (cis-chlordane)	USEPA 1699	0.02	0.04	--	--	--	4.0
gamma-Chlordane (trans-chlordane)	USEPA 1699	0.02	0.04	--	--	--	4.0
Oxychlordane	USEPA 1699	0.02	0.04	--	--	--	2.0
cis-Nonachlor	USEPA 1699	0.02	0.04	--	--	--	4.0
trans-Nonachlor	USEPA 1699	0.02	0.04	--	--	--	2.0
Dieldrin	USEPA 1699	0.02	0.04	--	--	--	4.0
Toxaphene	USEPA 1699	5	TBD	--	--	--	40.0
2,4'-DDD	USEPA 1699	0.02	0.04	--	--	--	4.0
2,4'-DDE	USEPA 1699	0.02	0.08	--	--	--	4.0
2,4'-DDT	USEPA 1699	0.02	0.08	--	--	--	6.0
4,4'-DDD	USEPA 1699	0.02	0.04	--	--	--	4.0
4,4'-DDE	USEPA 1699	0.02	0.08	--	--	--	4.0
4,4'-DDT	USEPA 1699	0.02	0.08	--	--	--	10.0
4,4'-DDMU	USEPA 1699	TBD	0.08	--	--	--	4.0
PCB Aroclors (ng/g)							
Aroclor-1016	USEPA 8082 / USEPA 8270C	--	--	10	20.0	2.0	TBD
Aroclor-1221	USEPA 8082 / USEPA 8270C	--	--	25	20.0	2.0	TBD
Aroclor-1232	USEPA 8082 / USEPA 8270C	--	--	10	20.0	2.0	TBD
Aroclor-1242	USEPA 8082 / USEPA 8270C	--	--	10	20.0	2.0	TBD
Aroclor-1248	USEPA 8082 / USEPA 8270C	--	--	10	20.0	2.0	TBD
Aroclor-1254	USEPA 8082 / USEPA 8270C	--	--	10	20.0	2.0	TBD
Aroclor-1260	USEPA 8082 / USEPA 8270C	--	--	10	20.0	2.0	TBD
Aroclor-1262	USEPA 8082 / USEPA 8270C	--	--	10	20.0	2.0	TBD
Aroclor-1268	USEPA 8082 / USEPA 8270C	--	--	TBD	20.0	2.0	TBD
PCB Congeners (ng/g wet weight) - Low Resolution Analytical Methods							
CL1-PCB-3	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL2-PCB-5	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL2-PCB-8	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL2-PCB-15	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL3-PCB-18	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL3-PCB-27	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL3-PCB-28	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL3-PCB-29	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL3-PCB-31	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL3-PCB-33	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL3-PCB-37	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL4-PCB-44	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL4-PCB-49	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL4-PCB-52	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL4-PCB-56	USEPA 8270C / 8270D	--	--	0.5	10.0 (PCB 56/60)	1.0 (PCB 56/60)	0.4
CL4-PCB-60	USEPA 8270C / 8270D	--	--	0.5	10.0 (PCB 56/60)	1.0 (PCB 56/60)	0.4
CL4-PCB-66	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL4-PCB-70	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL4-PCB-74	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL4-PCB-77	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL4-PCB-81	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL5-PCB-87	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL5-PCB-95	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL5-PCB-97	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL5-PCB-99	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL5-PCB-101	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL5-PCB-105	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL5-PCB-110	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL5-PCB-114	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL5-PCB-118	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL5-PCB-119	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL5-PCB-123	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4

Table 8
Tissue Analytical Methods and Target Detection Limits

Parameter[a]	Analytical Method[b]	SGS RLs	Vista RLs	Calscience RLs	Physis RLs - standard	Physis RLs - custom	Target RLs[c]
CL5-PCB-126	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL6-PCB-128	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL6-PCB-137	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL6-PCB-138	USEPA 8270C / 8270D	--	--	1.0 (PCB 138/158)	5.0	0.5	0.4
CL6-PCB-141	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL6-PCB-149	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL6-PCB-151	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL6-PCB-153	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL6-PCB-156	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL6-PCB-157	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL6-PCB-158	USEPA 8270C / 8270D	--	--	1.0 (PCB 138/158)	5.0	0.5	0.4
CL6-PCB-167	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL6-PCB-168	USEPA 8270C / 8270D	--	--	0.5	10.0 (PCB 168/132)	1.0 (PCB 168/132)	0.4
CL6-PCB-169	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL7-PCB-170	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL7-PCB-174	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL7-PCB-177	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL7-PCB-180	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL7-PCB-183	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL7-PCB-187	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL7-PCB-189	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	20.0
CL8-PCB-194	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL8-PCB-195	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL8-PCB-200	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL8-PCB-201	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL8-PCB-203	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL9-PCB-206	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
CL10-PCB-209	USEPA 8270C / 8270D	--	--	0.5	5.0	0.5	0.4
PCB Congeners (ng/g)[e] - High Resolution Analytical Methods							
CL1-PCB-1	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL1-PCB-2	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL1-PCB-3	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL2-PCB-4	USEPA 1668	0.001	0.0100 (PCB 4/10)	--	--	--	0.4
CL2-PCB-5	USEPA 1668	0.001	0.0100 (PCB 5/8)	--	--	--	0.4
CL2-PCB-6	USEPA 1668	0.001	0.0050	--	--	--	0.4
CL2-PCB-7	USEPA 1668	0.001	0.0100 (PCB 7/9)	--	--	--	0.4
CL2-PCB-8	USEPA 1668	0.001	0.0100 (PCB 5/8)	--	--	--	0.4
CL2-PCB-9	USEPA 1668	0.001	0.0100 (PCB 7/9)	--	--	--	0.4
CL2-PCB-10	USEPA 1668	0.001	0.0100 (PCB 4/10)	--	--	--	0.4
CL2-PCB-11	USEPA 1668	0.001	0.005	--	--	--	0.4
CL2-PCB-12	USEPA 1668	0.002 (PCB 12/13)	0.0100 (PCB 12/13)	--	--	--	0.4
CL2-PCB-13	USEPA 1668	0.002 (PCB 12/13)	0.0100 (PCB 12/13)	--	--	--	0.4
CL2-PCB-14	USEPA 1668	0.001	0.005	--	--	--	0.4
CL2-PCB-15	USEPA 1668	0.001	0.005	--	--	--	0.4
CL3-PCB-16	USEPA 1668	0.001	0.0050 (PCB 16/32)	--	--	--	0.4
CL3-PCB-17	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL3-PCB-18	USEPA 1668	0.002 (PCB 30/18)	0.0025	--	--	--	0.4
CL3-PCB-19	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL3-PCB-20	USEPA 1668	0.002 (PCB 18/30)	0.0075 (PCB 20/21/33)	--	--	--	0.4
CL3-PCB-21	USEPA 1668	0.002 (PCB 21/33)	0.0075 (PCB 20/21/33)	--	--	--	0.4
CL3-PCB-22	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL3-PCB-23	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL3-PCB-24	USEPA 1668	0.001	0.0050 (PCB 24/27)	--	--	--	0.4
CL3-PCB-25	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL3-PCB-26	USEPA 1668	0.002 (PCB 26/29)	0.0025	--	--	--	0.4
CL3-PCB-27	USEPA 1668	0.001	0.005 (PCB 24/27)	--	--	--	0.4
CL3-PCB-28	USEPA 1668	0.002 (PCB 28/20)	0.0025	--	--	--	0.4
CL3-PCB-29	USEPA 1668	0.002 (PCB 26/29)	0.0025	--	--	--	0.4
CL3-PCB-30	USEPA 1668	0.002 (PCB 18/30)	0.0025	--	--	--	0.4
CL3-PCB-31	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL3-PCB-32	USEPA 1668	0.001	0.0050 (PCB 16/32)	--	--	--	0.4
CL3-PCB-33	USEPA 1668	0.002 (PCB 21/33)	0.0075 (PCB 20/21/33)	--	--	--	0.4
CL3-PCB-34	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL3-PCB-35	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL3-PCB-36	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL3-PCB-37	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL3-PCB-38	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL3-PCB-39	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL4-PCB-40	USEPA 1668	0.002 (PCB 40/71)	0.0025	--	--	--	0.4
CL4-PCB-41	USEPA 1668	0.001	0.0100 (PCB 41/64/71/72)	--	--	--	0.4
CL4-PCB-42	USEPA 1668	0.001	0.0050 (PCB 42/59)	--	--	--	0.4
CL4-PCB-43	USEPA 1668	0.001	0.0050 (PCB 43/49)	--	--	--	0.4
CL4-PCB-44	USEPA 1668	0.003 (PCB 44/47/65)	0.0025	--	--	--	0.4
CL4-PCB-45	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL4-PCB-46	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL4-PCB-47	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL4-PCB-48	USEPA 1668	0.001	0.0050 (PCB 48/75)	--	--	--	0.4
CL4-PCB-49	USEPA 1668	0.002 (PCB 69/49)	0.0050 (PCB 43/49)	--	--	--	0.4
CL4-PCB-50	USEPA 1668	0.002 (PCB 50/53)	0.0025	--	--	--	0.4
CL4-PCB-51	USEPA 1668	0.001	0.0025	--	--	--	0.4

Table 8
Tissue Analytical Methods and Target Detection Limits

Parameter[a]	Analytical Method[b]	SGS RLs	Vista RLs	Calscience RLs	Physis RLs - standard	Physis RLs - custom	Target RLs[c]
CL4-PCB-52	USEPA 1668	0.001	0.0050 (PCB 52/69)	--	--	--	0.4
CL4-PCB-53	USEPA 1668	0.002 (PCB 50/53)	0.0025	--	--	--	0.4
CL4-PCB-54	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL4-PCB-55	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL4-PCB-56	USEPA 1668	0.001	0.0050 (PCB 56/60)	--	--	--	0.4
CL4-PCB-57	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL4-PCB-58	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL4-PCB-59	USEPA 1668	0.003 (PCB 59/62/75)	0.0050 (PCB 42/59)	--	--	--	0.4
CL4-PCB-60	USEPA 1668	0.001	0.0050 (PCB 56/60)	--	--	--	0.4
CL4-PCB-61	USEPA 1668	0.004 (PCB 61/70/74/76)	0.0050 (PCB 61/70)	--	--	--	0.4
CL4-PCB-62	USEPA 1668	0.003 (PCB 59/62/75)	0.0025	--	--	--	0.4
CL4-PCB-63	USEPA 1668	0.001	0.0100 (PCB 41/64/71/72)	--	--	--	0.4
CL4-PCB-64	USEPA 1668	0.001	0.0100 (PCB 41/64/71/72)	--	--	--	0.4
CL4-PCB-65	USEPA 1668	0.003 (PCB 44/47/65)	0.0025	--	--	--	0.4
CL4-PCB-66	USEPA 1668	0.001	0.0050 (PCB 76/66)	--	--	--	0.4
CL4-PCB-67	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL4-PCB-68	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL4-PCB-69	USEPA 1668	0.002 (PCB 69/49)	0.0050 (PCB 52/69)	--	--	--	0.4
CL4-PCB-70	USEPA 1668	0.004 (PCB 61/70/74/76)	0.0050 (PCB 61/70)	--	--	--	0.4
CL4-PCB-71	USEPA 1668	0.002 (PCB 40/71)	0.0100 (PCB 41/64/71/72)	--	--	--	0.4
CL4-PCB-72	USEPA 1668	0.001	0.0100 (PCB 41/64/71/72)	--	--	--	0.4
CL4-PCB-73	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL4-PCB-74	USEPA 1668	0.004 (PCB 61/70/74/76)	0.0025	--	--	--	0.4
CL4-PCB-75	USEPA 1668	0.003 (PCB 59/62/75)	0.0050 (PCB 48/75)	--	--	--	0.4
CL4-PCB-76	USEPA 1668	0.004 (PCB 61/70/74/76)	0.0050 (PCB 76/66)	--	--	--	0.4
CL4-PCB-77	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL4-PCB-78	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL4-PCB-79	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL4-PCB-80	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL4-PCB-81	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL5-PCB-82	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL5-PCB-83	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL5-PCB-84	USEPA 1668	0.001	0.0050 (PCB 84/92)	--	--	--	0.4
CL5-PCB-85	USEPA 1668	0.002 (PCB 85/116)	0.0050 (PCB 85/116)	--	--	--	0.4
CL5-PCB-86	USEPA 1668	0.006 (PCB 108/119/86/97/125/87)	0.0025	--	--	--	0.4
CL5-PCB-87	USEPA 1668	0.006 (PCB 108/119/86/97/125/87)	0.0075 (PCB 87/117/125)	--	--	--	0.4
CL5-PCB-88	USEPA 1668	0.001	0.0050 (PCB 88/91)	--	--	--	0.4
CL5-PCB-89	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL5-PCB-90	USEPA 1668	0.003 (PCB 90/101/113)	0.0050 (PCB 90/101)	--	--	--	0.4
CL5-PCB-91	USEPA 1668	0.001	0.0050 (PCB 88/91)	--	--	--	0.4
CL5-PCB-92	USEPA 1668	0.001	0.0050 (PCB 84/92)	--	--	--	0.4
CL5-PCB-93	USEPA 1668	0.002 (PCB 100/93)	0.0025	--	--	--	0.4
CL5-PCB-94	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL5-PCB-95	USEPA 1668	0.001	0.0075 (PCB 95/98/102)	--	--	--	0.4
CL5-PCB-96	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL5-PCB-97	USEPA 1668	0.006 (PCB 108/119/86/97/125/87)	0.0025	--	--	--	0.4
CL5-PCB-98	USEPA 1668	0.001	0.0075 (PCB 95/98/102)	--	--	--	0.4
CL5-PCB-99	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL5-PCB-100	USEPA 1668	0.002 (PCB 100/93)	0.0025	--	--	--	0.4
CL5-PCB-101	USEPA 1668	0.003 (PCB 90/101/113)	0.0050 (PCB 90/101)	--	--	--	0.4
CL5-PCB-102	USEPA 1668	0.001	0.0075 (PCB 95/98/102)	--	--	--	0.4
CL5-PCB-103	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL5-PCB-104	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL5-PCB-105	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL5-PCB-106	USEPA 1668	0.001	0.0050 (PCB 106/118)	--	--	--	0.4
CL5-PCB-107	USEPA 1668	0.002 (PCB 107/124)	0.0050 (PCB 107/109)	--	--	--	0.4
CL5-PCB-108	USEPA 1668	0.006 (PCB 108/119/86/97/125/87)	0.0050 (PCB 108/112)	--	--	--	0.4
CL5-PCB-109	USEPA 1668	0.001	0.0050 (PCB 107/109)	--	--	--	0.4
CL5-PCB-110	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL5-PCB-111	USEPA 1668	0.001	0.0050 (PCB 111/115)	--	--	--	0.4
CL5-PCB-112	USEPA 1668	0.001	0.0050 (PCB 108/112)	--	--	--	0.4
CL5-PCB-113	USEPA 1668	0.003 (PCB 90/101/113)	0.0025	--	--	--	0.4
CL5-PCB-114	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL5-PCB-115	USEPA 1668	0.001	0.0050 (PCB 111/115)	--	--	--	0.4
CL5-PCB-116	USEPA 1668	0.002 (PCB 85/116)	0.0050 (PCB 85/116)	--	--	--	0.4
CL5-PCB-117	USEPA 1668	0.001	0.0075 (PCB 87/117/125)	--	--	--	0.4
CL5-PCB-118	USEPA 1668	0.001	0.0050 (PCB 106/118)	--	--	--	0.4
CL5-PCB-119	USEPA 1668	0.006 (PCB 108/119/86/97/125/87)	0.0025	--	--	--	0.4
CL5-PCB-120	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL5-PCB-121	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL5-PCB-122	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL5-PCB-123	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL5-PCB-124	USEPA 1668	0.002 (PCB 107/124)	0.0025	--	--	--	0.4
CL5-PCB-125	USEPA 1668	0.006 (PCB 108/119/86/97/125/87)	0.0075 (PCB 87/117/125)	--	--	--	0.4

Table 8
Tissue Analytical Methods and Target Detection Limits

Parameter[a]	Analytical Method[b]	SGS RLs	Vista RLs	Calscience RLs	Physis RLs - standard	Physis RLs - custom	Target RLs[c]
CL5-PCB-126	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL5-PCB-127	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL6-PCB-128	USEPA 1668	0.002 (PCB-128/166)	0.0050 (PCB 128/162)	--	--	--	0.4
CL6-PCB-129	USEPA 1668	0.003 (PCB 163/138/129)	0.0025	--	--	--	0.4
CL6-PCB-130	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL6-PCB-131	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL6-PCB-132	USEPA 1668	0.001	0.0050 (PCB 132/161)	--	--	--	0.4
CL6-PCB-133	USEPA 1668	0.001	0.0050 (PCB 133/142)	--	--	--	0.4
CL6-PCB-134	USEPA 1668	0.001	0.0050 (PCB 134/143)	--	--	--	0.4
CL6-PCB-135	USEPA 1668	0.002 (PCB 151/135)	0.0025	--	--	--	0.4
CL6-PCB-136	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL6-PCB-137	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL6-PCB-138	USEPA 1668	0.003 (PCB 163/138/129)	0.0075 (PCB 138/163/164)	--	--	--	0.4
CL6-PCB-139	USEPA 1668	0.002 (PCB 139/140)	0.0050 (PCB 139/149)	--	--	--	0.4
CL6-PCB-140	USEPA 1668	0.002 (PCB 139/140)	0.0025	--	--	--	0.4
CL6-PCB-141	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL6-PCB-142	USEPA 1668	0.001	0.0050 (PCB 133/142)	--	--	--	0.4
CL6-PCB-143	USEPA 1668	0.001	0.0050 (PCB 134/143)	--	--	--	0.4
CL6-PCB-144	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL6-PCB-145	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL6-PCB-146	USEPA 1668	0.001	0.0050 (PCB 146/165)	--	--	--	0.4
CL6-PCB-147	USEPA 1668	0.002 (PCB 147/149)	0.0025	--	--	--	0.4
CL6-PCB-148	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL6-PCB-149	USEPA 1668	0.002 (PCB-147/149)	0.0050 (PCB 139/149)	--	--	--	0.4
CL6-PCB-150	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL6-PCB-151	USEPA 1668	0.002 (PCB-151/135)	0.0025	--	--	--	0.4
CL6-PCB-152	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL6-PCB-153	USEPA 1668	0.002 (PCB-153/168)	0.0025	--	--	--	0.4
CL6-PCB-154	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL6-PCB-155	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL6-PCB-156	USEPA 1668	0.002 (PCB-156/157)	0.0025	--	--	--	0.4
CL6-PCB-157	USEPA 1668	0.002 (PCB-156/157)	0.0025	--	--	--	0.4
CL6-PCB-158	USEPA 1668	0.001	0.0050 (PCB 158/160)	--	--	--	0.4
CL6-PCB-159	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL6-PCB-160	USEPA 1668	0.001	0.0050 (PCB 158/160)	--	--	--	0.4
CL6-PCB-161	USEPA 1668	0.001	0.0050 (PCB 132/161)	--	--	--	0.4
CL6-PCB-162	USEPA 1668	0.001	0.0050 (PCB 128/162)	--	--	--	0.4
CL6-PCB-163	USEPA 1668	0.003 (PCB 163/138/129)	0.0075 (PCB 138/163/164)	--	--	--	0.4
CL6-PCB-164	USEPA 1668	0.001	0.0075 (PCB 138/163/164)	--	--	--	0.4
CL6-PCB-165	USEPA 1668	0.001	0.0050 (PCB 146/165)	--	--	--	0.4
CL6-PCB-166	USEPA 1668	0.002 (PCB 128/166)	0.0025	--	--	--	0.4
CL6-PCB-167	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL6-PCB-168	USEPA 1668	0.002 (PCB-153/168)	0.0025	--	--	--	0.4
CL6-PCB-169	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL7-PCB-170	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL7-PCB-171	USEPA 1668	0.002 (PCB 171/173)	0.0025	--	--	--	0.4
CL7-PCB-172	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL7-PCB-173	USEPA 1668	0.002 (PCB 171/173)	0.0025	--	--	--	0.4
CL7-PCB-174	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL7-PCB-175	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL7-PCB-176	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL7-PCB-177	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL7-PCB-178	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL7-PCB-179	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL7-PCB-180	USEPA 1668	0.002 (PCB-180/193)	0.0025	--	--	--	0.4
CL7-PCB-181	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL7-PCB-182	USEPA 1668	0.001	0.0050 (PCB 182/187)	--	--	--	0.4
CL7-PCB-183	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL7-PCB-184	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL7-PCB-185	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL7-PCB-186	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL7-PCB-187	USEPA 1668	0.001	0.0050 (PCB 182/187)	--	--	--	0.4
CL7-PCB-188	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL7-PCB-189	USEPA 1668	0.001	0.0025	--	--	--	20.0
CL7-PCB-190	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL7-PCB-191	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL7-PCB-192	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL7-PCB-193	USEPA 1668	0.002 (PCB 180/193)	0.0025	--	--	--	0.4
CL8-PCB-194	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL8-PCB-195	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL8-PCB-196	USEPA 1668	0.001	0.0050 (PCB 196/203)	--	--	--	0.4
CL8-PCB-197	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL8-PCB-198	USEPA 1668	0.002 (PCB 198/199)	0.0025	--	--	--	0.4
CL8-PCB-199	USEPA 1668	0.002 (PCB 198/199)	0.0025	--	--	--	0.4
CL8-PCB-200	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL8-PCB-201	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL8-PCB-202	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL8-PCB-203	USEPA 1668	0.001	0.0050 (PCB 196/203)	--	--	--	0.4
CL8-PCB-204	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL8-PCB-205	USEPA 1668	0.001	0.0025	--	--	--	0.4

Table 8
Tissue Analytical Methods and Target Detection Limits

Parameter[a]	Analytical Method[b]	SGS RLs	Vista RLs	Calscience RLs	Physis RLs - standard	Physis RLs - custom	Target RLs[c]
CL9-PCB-206	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL9-PCB-207	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL9-PCB-208	USEPA 1668	0.001	0.0025	--	--	--	0.4
CL10-PCB-209	USEPA 1668	0.001	0.0025	--	--	--	0.4

Notes:
Data will be reported uncorrected for lipid content.
a = Specific analytes used for each study conducted for the Ports may vary by waterbody, according to the listings.
b = Laboratories may use different versions of recommended methods (i.e. USEPA 8270C) as long as the QA/QC elements identified in this QAPP are met.
c = Matrix interference and/or dilutions due to non-target analytes may increase target reporting limits. The method detection limit (MDL) should be at least three times lower than the reporting limit (40 CFR part 136) but
d = Total chlordane is calculated using the following compounds: alpha-chlordane, gamma-chlordane, oxychlordane, cis-nonachlor, and trans-nonachlor.
e = PCB co-elutions will vary by instrument and column, and may increase reporting limits for some congeners.
calc. =
CFR = Code of Federal Regulations
DDT = dichlorodiphenyltrichloroethane
DDD = dichlorodiphenyldichloroethane
DDE = dichlorodiphenyldichloroethylene
ng/g = nanogram per gram
MDL = method detection limit
N/A = not applicable
NOAA = National Oceanic and Atmospheric Administration
QAPP = Quality Assurance Project Plan
QA/QC = quality assurance/quality control
RL = reporting limit
PCB = polychlorinated biphenyl
SWAMP = California Surface Water Ambient Monitoring Program
TBD = to be determined
USEPA = U.S. Environmental Protection Agency

Table 9
Laboratory Quality Assurance/Quality Control Definitions

Laboratory Quality Control	Definition
Calibration	A comparison of a measurement standard, instrument, or item with one having higher accuracy to detect, quantify, and record any inaccuracy or variation; the process by which an instrument setting is adjusted based on response to a standard to eliminate the inaccuracy.
Certified/Standard Reference Material	A substance whose property values are certified by a procedure that establishes its traceability and uncertainty at a stated level of confidence.
Continuing Calibration Verification	A periodic standard used to assess instrument drift between calibrations.
Internal Standard	Pure analyte(s) added to a sample, extract, or standard solution in known amount(s) and used to measure the relative responses of othermethod analytes that are components of the same sample or solution. The internal standard must be an analyte that is not a sample component.
Laboratory Replicate	Two or more representative portions taken from one homogeneous sample by the analyst and analyzed in the same testing facility.
Laboratory Control Sample	A specimen of known composition prepared using contaminant-free reagent water, or an inert solid, which is spiked with the analyte of interest at the midpoint of the calibration curve or at the level of concern, and then analyzed using the same preparation, reagents, and analytical methods employed for regular specimens and at the intervals set in the Quality Assurance Project Plan.
Matrix Spike	A test specimen prepared by adding a known concentration of the target analyte to a specified amount of a specific homogenized specimen where an estimate of the target concentration is available and subjected to the entire analytical protocol.
Matrix Spike Duplicate	A sample prepared simultaneously as a split with the matrix spike sample with each specimen being spiked with identical, known concentrations of targeted analyte.
Method Blank	A blank prepared to represent the sample matrix as closely as possible and analyzed exactly like the calibration standards, samples, and quality control (QC) samples. Results of method blanks provide an estimate of the within-batch variability of the blank response and an indication of bias introduced by the analytical procedure.
Sample Batch	Twenty or fewer field samples prepared and analyzed with a common set of quality assurance samples.
Surrogate	A pure substance with properties that mimics the analyte of interest (organics only) and which is unlikely to be found in environmental samples. It is added into a sample before sample preparation.

Table 10
Frequencies for Laboratory Quality Assurance/Quality Control Samples

Analysis Type	Initial Calibration[a,b]	Continuing Calibration Verification	LCS or SRM[c]	Replicates	Matrix Spikes	Matrix Spike Duplicates	Method Blanks	Surrogate Spikes	Internal Standard
Total solids	Daily or each batch	N/A	N/A	1 per 20 samples	N/A	N/A	N/A	N/A	N/A
Lipids	Daily or each batch	N/A	N/A	1 per 20 samples	N/A	N/A	N/A	N/A	N/A
Grain size	Daily or each batch	N/A	N/A	1 per 20 samples	N/A	N/A	N/A	N/A	N/A
Particle size determination	Daily or each batch	N/A	N/A	1 per 20 samples	N/A	N/A	N/A	N/A	N/A
Total suspended and dissolved solids	Daily or each batch	N/A	N/A	1 per 20 samples	N/A	N/A	N/A	N/A	N/A
Total and dissolved organic carbon	Daily or each batch	1 per 10 analytical runs	1 per 20 samples or 1 per batch	1 per 20 samples or 1 per batch	1 per 20 samples or 1 per batch	N/A	Each batch	N/A	N/A
Particulate organic carbon	Daily or each batch	1 per 10 samples	1 per 20 samples	1 per 20 samples	1 per 20 samples	N/A	Each batch	N/A	N/A
Total metals	Daily or each batch	Per 10 analytical runs	1 per 20 samples or 1 per batch	1 per 20 samples or 1 per batch	1 per 20 samples or 1 per batch	N/A	Each batch	N/A	Per method
PCB Congeners by low resolution method, PCB Aroclors	As needed	Every 12 hours	1 per 20 samples or 1 per batch	N/A	1 per 20 samples or 1 per batch	1 per 20 samples or 1 per batch	Each batch	Every sample	Every sample
PCB Congeners by high resolution method	As needed	Every 12 hours	1 per 20 samples	N/A	N/A[d]	N/A[d]	1 per 20 samples	N/A[d]	Every sample
Polycyclic aromatic hydrocarbons	As needed	Every 12 hours	1 per 20 samples or 1 per batch	N/A	1 per 20 samples or 1 per batch	1 per 20 samples or 1 per batch	Each batch	Every sample	Every sample
DDT and derivatives by low resolution method	As needed	Per 10 analytical runs	1 per 20 samples or 1 per batch	N/A	1 per 20 samples or 1 per batch	1 per 20 samples or 1 per batch	Each batch	Every sample	Every sample
DDT and derivatives by high resolution method	As needed	Every 12 hours	1 per 20 samples	N/A	N/A[d]	N/A[d]	1 per 20 samples	N/A[d]	Every sample

Notes:
Primary column is considered the column that contains the highest value with the least interference.
Values should have RPDs less than 40 percent or they are P flagged. ICALS = 20 percent or less and CCALS = 15 percent or less.
a = For physical tests, calibration and certification of drying ovens and weighing scales are conducted annually.
b = Calibrations should be conducted per analytical methods or instrument manufacturers specifications.
c = When a Standard Reference Material is not available, an LCS will be analyzed.
d = Isotope dilution quantitation technique accounts for matrix interferences thus MS/MSD are not required.
DDT = dichlorodiphenyltrichloroethane
LCS = Laboratory control sample
SRM = standard reference material
N/A = not applicable
PCB = polychlorinated biphenyl

Table 11
Laboratory and Reporting Data Quality Objectives

Parameter	Precision[a]	Accuracy[b]	Completeness[c]
Sediments			
Total solids	± 25% RPD	N/A	90%
Grain size	± 25% RPD	N/A	90%
Total organic carbon	± 25% RPD	80-120% R	90%
Total Metals	± 25% RPD	75-125% R	90%
Polycyclic aromatic hydrocarbons[d]	± 25% RPD	50-150% R	90%
DDT and derivatives[d]	± 25% RPD	50-150% R	90%
PCB Congeners[d]	± 25% RPD	50-150% R	90%
Tissues			
Lipids	± 25% RPD	N/A	90%
DDT and derivatives[d]	± 25% RPD	50-150% R	90%
PCB Congeners[d]	± 25% RPD	50-150% R	90%
Water			
Particle size determination	± 25% RPD	N/A	90%
Total suspended and dissolved solids	± 25% RPD	N/A	90%
Total and dissolved organic carbon	± 25% RPD	80-120% R	90%
Particulate organic carbon	± 25% RPD	80-120% R	90%
Total and Dissolved Metals	± 25% RPD	75-125% R	90%
DDT and derivatives[d]	± 25% RPD	50-150% R	90%
PCB Congeners[d]	± 25% RPD	50-150% R	90%

Notes:
CRM = certified reference material
DDT = dichlorodiphenyltrichloroethane
PCB = polychlorinated biphenyl
R = recovery
RPD = relative percent difference
a = not applicable if native concentration of either sample is <RL.
b = Laboratory control sample , CRM's, and matrix spike/matrix spike duplicate percent recovery
c = Percent of each class of analytes that are not rejected after data validation conducted in accordance with the Technical Support Manual (Bay et al. 2009)
d = The accuracy goal for semi-volatile compound CRM's is 70-130% R.

FIGURES

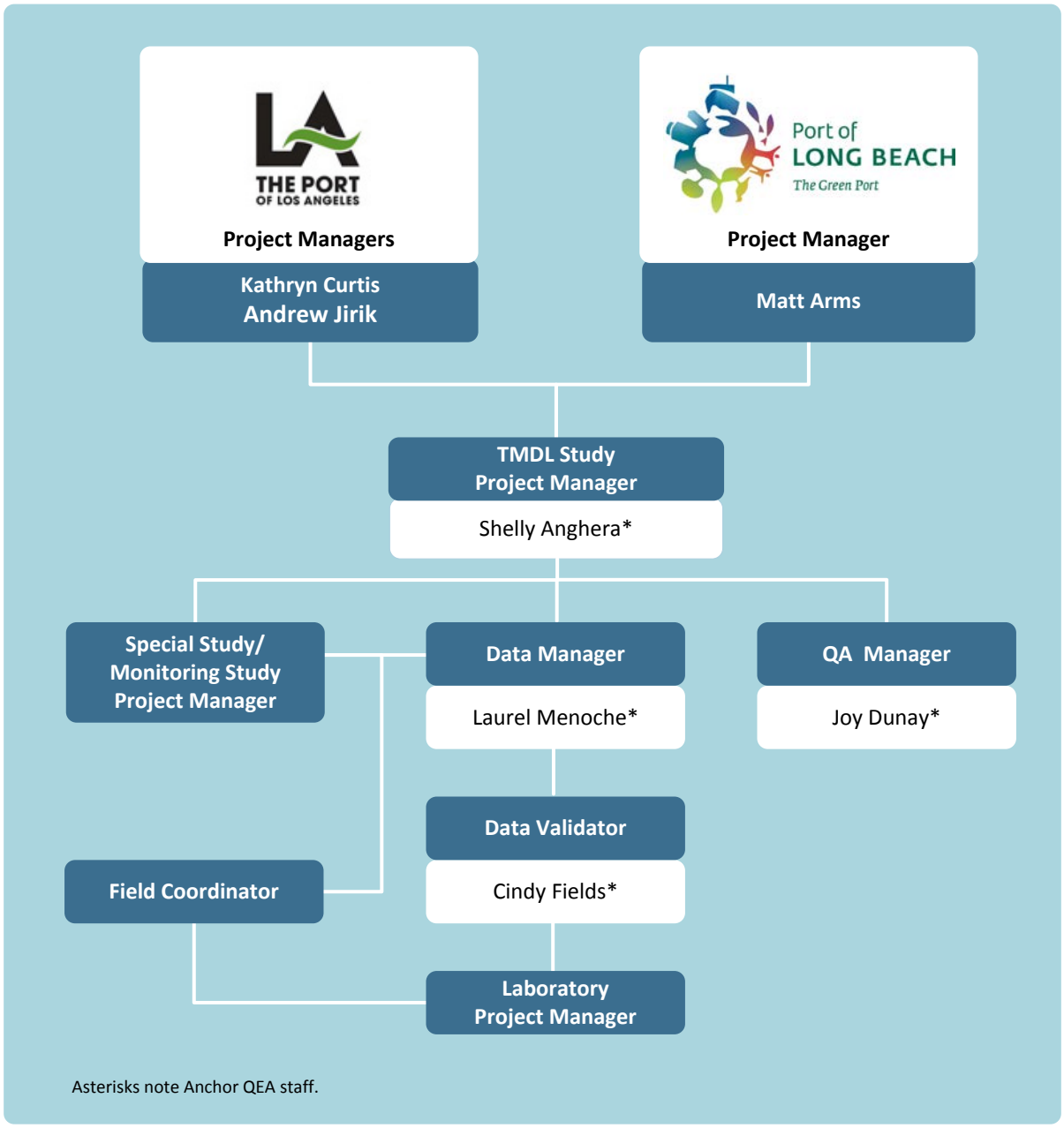
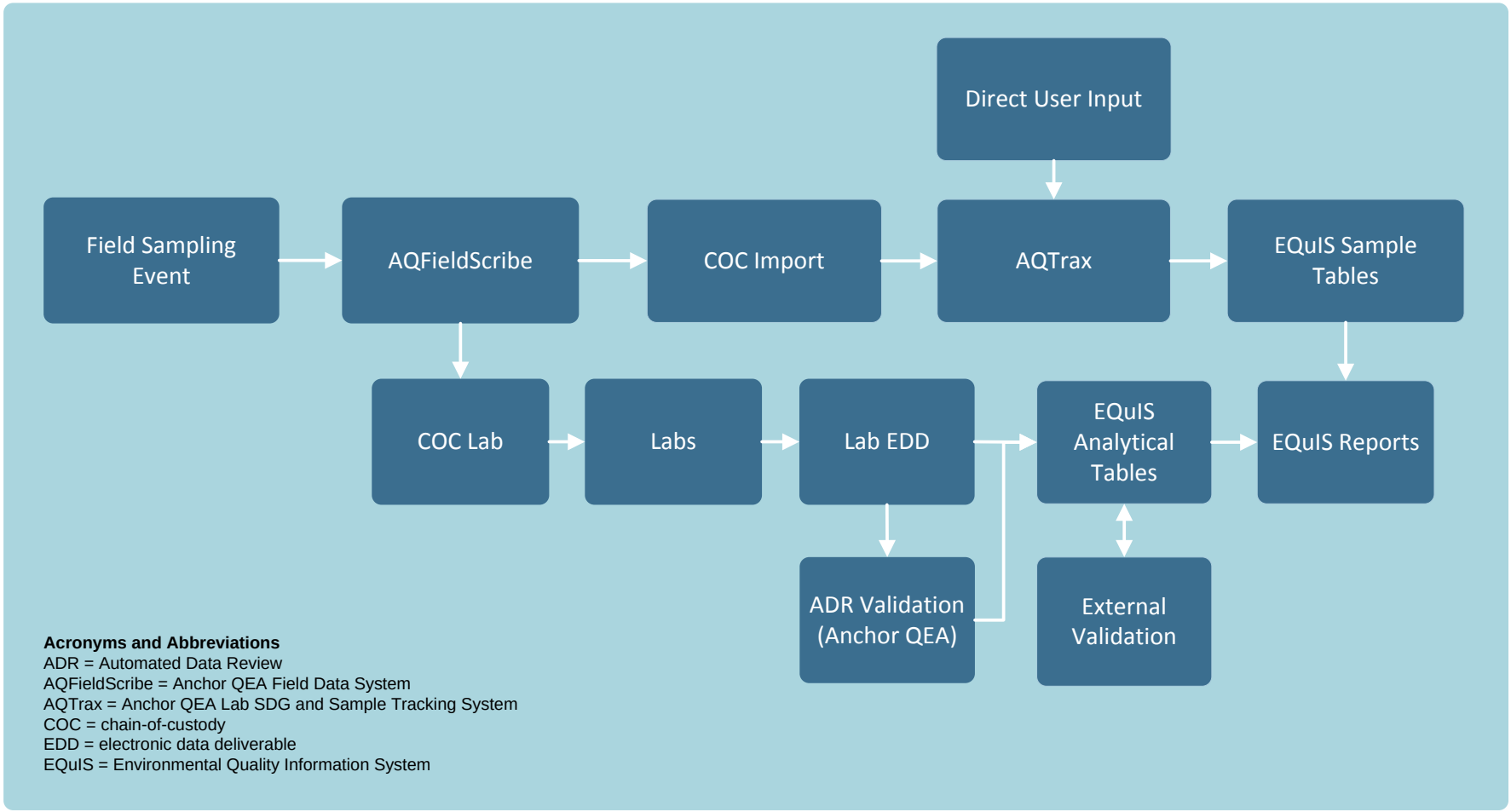


Figure 1
Organizational Chart
Monitoring/Special Studies for Harbor Toxics TMDL



ANCHOR QEA

Figure 2a
Data Flow Using AQFieldScribe
Monitoring/Special Studies for Harbor Toxics TMDL

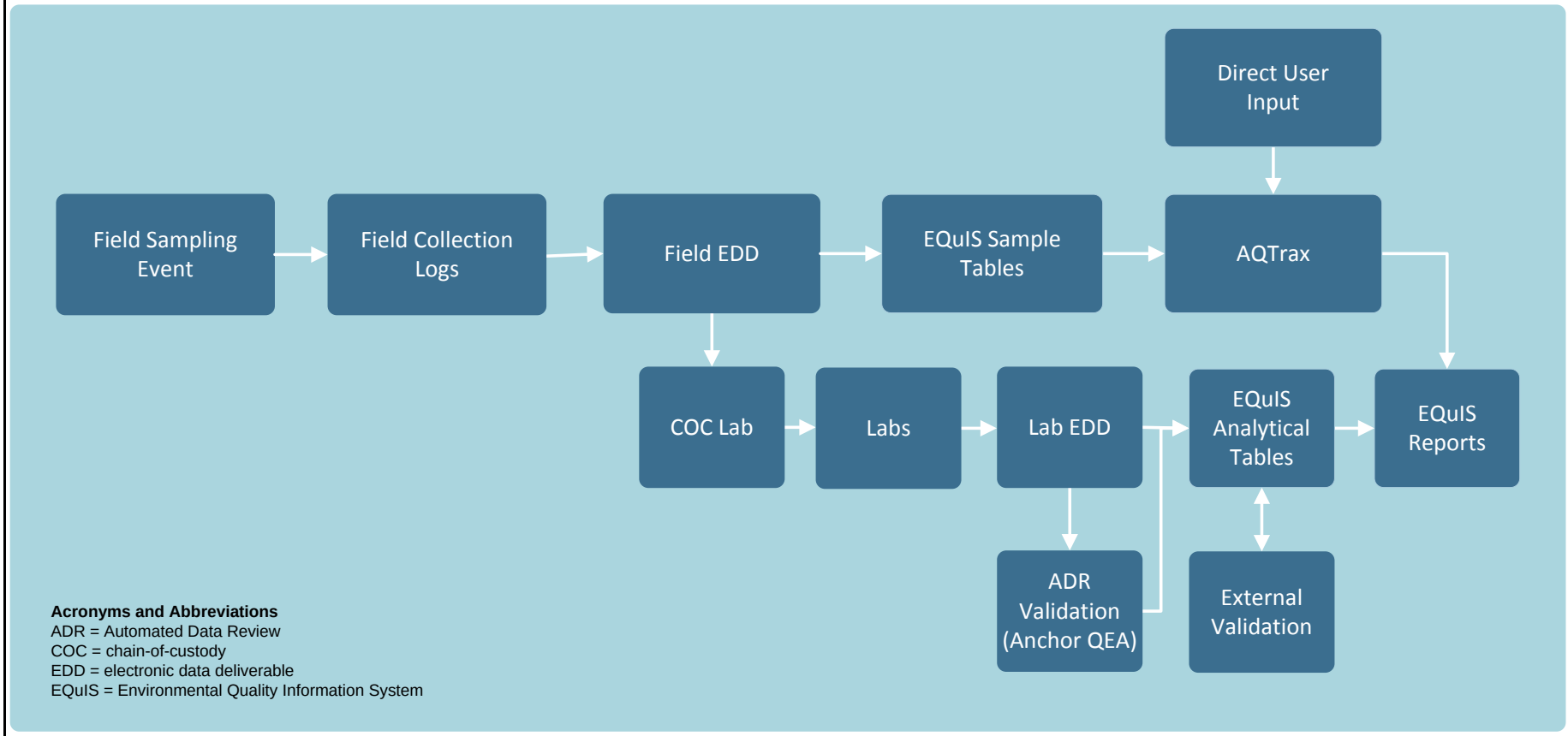


Figure 2b
Data Flow Using Field EDD
Monitoring/Special Studies for Harbor Toxics TMDL

APPENDIX A
AUTOMATED DATA REVIEW ELECTRONIC DATA DELIVERABLE SPECIFICATIONS

ADR Electronic Data Deliverable (EDD) File Specifications

The ADR EDD consists of three separate, comma-delimited ASCII text files or Excel CSV files (two, if instrument calibration information is not required by the project). Each file corresponds to a table in the ADR application. These tables are identified as the Analytical Results Table (A1), Laboratory Instrument Table (A2), and Sample Analysis Table (A3). Each file follows the naming convention of using the Laboratory Reporting Batch ID (SDG Number or some other identifier for the EDD) followed by the table identifier (A1, A2, or A3), and then a ".txt" or ".csv" extension. For example, the EDD file names for a laboratory reporting batch identified as SDG001 that includes instrument calibration data would be as follows.

SDG001A1.txt or SDG001A1.csv
SDG001A2.txt or SDG001A2.csv (A2 file is optional)
SDG001A3.txt or SDG001A3.csv

Analytical Results Table (A1 File)

The Analytical Results table contains analytical results and related information on an analyte level for field samples and associated laboratory quality control samples (excluding calibrations and tunes). Field QC blanks and laboratory method blanks must report a result record for each analyte reported within a method. The method target analyte list is matrix dependent and specified in the project library. Laboratory control samples (LCS and LCSD) and matrix spike samples (MS and MSD) must report a result record for every analyte specified as a spiked analyte in the project library. The project library is a reference table ADR uses for both EDD error checking and automated data review. The project library is populated with information from the project QAPP. Refer to the User Manual for detailed information on project libraries. Table 1 in this document lists all field names and their descriptions for the Analytical Results Table (A1).

Laboratory Instrument Table (A2 File)

The Laboratory Instrument table contains results and related information on an analyte level for instrument initial calibration standards, initial calibration verification standards, continuing calibration standards, and GC/MS tunes. A record must exist for each target analyte reported in a method (specified in the project library), for every calibration type (the field named QCType) associated to samples reported in the EDD. Initial calibrations, initial calibration verifications, and associated samples are linked to each other using a unique Run Batch ID for every distinct initial calibration within a method. Continuing calibrations and associated samples are linked to each other using a unique Analysis Batch ID for every distinct continuing calibration within a method. GC/MS tunes are linked to initial and continuing calibrations (and hence samples) using the Run Batch and Analysis Batch IDs respectively. The Laboratory Instrument Table (A2) is optional. Depending on the level of validation required by the data user, the Laboratory Instrument table may not be requested in the deliverable. Table 2 in this document lists field names and descriptions for the Laboratory Instrument Table (A2).

Sample Analysis Table (A3 File)

The Sample Analysis table contains information on a sample level for field samples and laboratory quality control analyses (excluding calibrations and tunes). A sample record exists for each sample/method/matrix/analysis type combination. Table 3 in this document lists field names and descriptions for the Sample Analysis Table (A3).

EDD Field Properties

Tables 1, 2, and 3 in this document specify the EDD field properties for each file. These include the field name and sequence, field name description, data type and length for each field, and whether or not a particular field requires a standard field. Field elements in the EDD must be sequenced according to the order they appear in Tables 1, 2, and 3. For example, in the Analytical Result table (the A1 file), the field "ClientSampleID" will always be the first piece of information to start a new line of data (or database record), followed by the fields "LabAnalysisRefMethodID", "AnalysisType", and so on.

Table 4 in this document lists standard values for those fields that hold standard values. Required field constraints depend on the combination of sample, matrix, method, analyte type, and calibration or QC type information reported in a record. Tables 5 through 9 in this document indicate required fields for each EDD file (table) according to the method category, matrix, analyte type, sample, and QC or calibration type reported in a record.

When creating an EDD as a text file, use the ASCII character set in a file of lines terminated by a carriage return and line feed. No characters are allowed after the carriage return and line feed. Enclose each data set in double quotes (") and separate each field by a comma (comma delimited). Data fields with no information (null) may be represented by two consecutive commas. For example, in the Sample Analysis table, since the "Collected", "ShippingBatchID", and "Temperature" fields do not apply to laboratory generated QA/QC samples, the record for a Laboratory Control Sample by Method 8270C would be entered as follows. Note that the first two fields ("ProjectNumber" and "ProjectName") are omitted in this example.

…"LCSW100598",,"AQ","LCSW100598","LCS",,"8270C",… (and so on)

Do not pad fields with leading or trailing spaces if a field is populated with less than the maximum allowed number of characters. In the above example, although the "MatrixID" field can accommodate up to 10 characters, only 2 characters were entered in this field.

The EDD can be constructed within Excel and saved as .csv file for import into the application. Be sure to format all cells as text beforehand, otherwise Excel will reformat entered values in some cases.

Table 1
Field Descriptions for the Analytical Results Table (A1 file)

Contains laboratory test results and related information for field and QC samples (excluding instrument calibrations) on an analyte level for environmental chemistry including radiochemistry

Field Name	Field Name Description	Field Type	Field Length	Standard Value List
ClientSampleID	Client or contractor's identifier for a field sample as reported on the chain-of-custody If a sample is analyzed as a laboratory duplicate, matrix spike, or matrix spike duplicate, append suffixes DUP, MS and MSD respectively to the Client Sample ID with no intervening spaces or hyphens (i.e. MW01DUP, MW01MS, and MW01MSD). For Method Blanks, LCS, and LCSD enter the unique LaboratorySampleID into this field Do not append suffixes to the ClientSampleID for dilutions, reanalyses, or re-extracts (the AnalysisType field is used for this distinction). For example, MW01DL and MW01RE are not allowed Parent sample records must exist for each MS and MSD. If an MS/MSD is shared between two EDDs, records for the MS/MSD and its parent sample must exist in the Analytical Results table for both EDDs.	Text	25	NO
LabAnalysisRefMethodID	Laboratory reference method ID. The method ID may be an EPA Method number or a Lab Identifier for a method such as a SOP Number, however; method ID is specified by the project. The method ID must be entered into the standard list.	Text	25	YES (specified in project plan)
AnalysisType	Defines the analysis type (i.e., Dilution, Reanalysis, etc.). This field provides distinction for sample result records when multiple analyses are submitted for the same sample, method, and matrix; for example dilutions, re-analyses, and re-extracts.	Text	10	YES (See Table 4)
LabSampleID	Laboratory tracking number for field samples and lab generated QC samples such as method blank, LCS, and LCSD. There are no restrictions for the LabSampleID except for field length and that the LabSampleID must be distinct for a given field sample or lab QC sample and method. Suffixes may be applied to the LabSampleID to designate dilutions, reanalysis, etc.	Text	25	NO
LabID	Identification of the laboratory performing the analyses.	Text	7	NO
ClientAnalyteID	CAS Number or unique client identifier for an analyte or isotope. If a CAS Number is not available, use a unique identifier provided by the client or contractor. The ClientAnalyteID for a particular target analyte or isotope should be specified by the project and must exist in the standard value tables for Analytes. For the LCS, LCSD, MS, and MSD, it is only necessary to report the compounds designated as spikes in the library (and surrogates for organic methods.) For TICs from GC/MS analyses, enter the retention time in decimal minutes as the Client Analyte ID.	Text	12	YES (specified by project)

Table 1
Field Descriptions for the Analytical Results Table (A1 file)

Contains laboratory test results and related information for field and QC samples (excluding instrument calibrations) on an analyte level for environmental chemistry including radiochemistry

Field Name	Field Name Description	Field Type	Field Length	Standard Value List
AnalyteName	Chemical name for the analyte or isotope. The project specifies how an analyte or isotope is named. The analyte name must be associated to a ClientAnalyteID in the standard values table for Analytes (excluding compounds designated as TIC's).	Numeric	60	YES (specified by project)
Result	Result value for the analyte or isotope. Entries must be numeric. For non-detects of target analytes or isotopes and spikes, do not enter "ND" or leave this field blank. If an analyte or spike was not detected, enter the reporting limit value corrected for dilution and percent moisture as applicable. Do not enter "0"	Text	10	NO
ResultUnits	The units defining how the values in the Result, DetectionLimit, and ReportingLimit fields are expressed. For radiochemistry this also includes how the value in the Error field is expressed.	Text	10	YES (specified by project in the library)
LabQualifiers	A string of single letter result qualifiers assigned by the lab based on client-defined rules and values. The "U" Lab Qualifier must be entered for all non-detects. Other pertinent lab qualifiers may be entered with the "U" qualifier. Order is insignificant. Lab qualifiers other than those listed in the standard values table may be used. If so, these must be added to the standard value table in the application.	Text	7	YES (See Table 4)
DetectionLimit	For radiochemistry methods, the minimum detectable activity for the isotope being measured. For all other methods: The minimum detection limit value for the analyte being measured. **For DoD QSM enter the Limit of Detection (LOD)**	Numeric	10	NO
DetectionLimitType	Specifies the type of detection limit (i.e., MDA, MDL, IDL, etc.).	Text	10	YES (See Table 4)
RetentionTime or Error	For radiochemistry methods only, enter the 2 Sigma Counting Error. The units for error are entered in the ResultUnits field. For GC/MS methods only, enter the time expressed in decimal minutes between injection and detection for GC/MS TICs only For target analytes in all other methods, leave this field blank. Note: GC retention times are not evaluated at this time.	Text	5	NO
AnalyteType	Defines the type of result, such as tracer, surrogate, spike, or target compound.	Text	7	YES (See Table 4)

Table 1
Field Descriptions for the Analytical Results Table (A1 file)

Contains laboratory test results and related information for field and QC samples (excluding instrument calibrations) on an analyte level for environmental chemistry including radiochemistry

Field Name	Field Name Description	Field Type	Field Length	Standard Value List
PercentRecovery	For radiochemistry methods: The tracer yield, if applicable. For all other analytical methods: The percent recovery value of a spiked compound or surrogate. If the spike or surrogate was not recovered because of dilution, enter "DIL". If a spike or surrogate was not recovered because of matrix interference, enter "INT". If a spike or surrogate was not recovered because it was not added to the sample, enter "NS".	Numeric	5	NO
RelativePercentDifference	The relative percent difference (RPD) of two QC results, such as MS/MSD, LCS/LCSD, and Laboratory Duplicates. Report RPD in Laboratory Duplicate, LCSD, and MSD records only.	Numeric	5	NO
ReportingLimit	Reporting limit value for the measured analyte or isotope Factor in the dilution factor and percent moisture correction, if applicable. The Reporting Limit for each analyte and matrix in a given method is specified in the project library or QAPP. **For DoD QSM enter the Limit of Quantitation (LOQ)**	Numeric	10	NO
ReportingLimitType	Specifies the type of reporting limit (i.e., CRQL, PQL, SQL, RDL, etc). The Reporting Limit Type for each method and matrix is specified in the project library or QAPP.	Text	10	YES (specified by the project)

Table 1
Field Descriptions for the Analytical Results Table (A1 file)

Contains laboratory test results and related information for field and QC samples (excluding instrument calibrations) on an analyte level for environmental chemistry including radiochemistry

Field Name	Field Name Description	Field Type	Field Length	Standard Value List
ReportableResult	This field indicates whether or not the laboratory chooses an individual analyte or isotope result as reportable. Enter "YES" if the result is reportable. Enter "NO" if the result is not reportable. This field applies to target analytes only. If only one analysis is submitted for a particular sample and method, enter "YES" for all target compounds (where Analyte Type = TRG). For GC/MS methods enter yes for tentatively identified compounds (where Analyte Type = TIC). If two or more analyses are submitted for a particular sample and method (i.e. initial analysis, reanalysis and/or dilutions), enter "YES" from only <u>one</u> of the analyses for each target compound. For example: a sample was run a second time at dilution because benzene exceeded the calibration range in the initial, undiluted analysis. All target analytes are reported in each analysis. For the initial analysis, (Analysis Type = RES), enter "NO" for benzene and enter "YES" for all other compounds. For the diluted analysis (Analysis Type = DL), enter "YES" for benzene and enter "NO" for all other compounds. For TICs (Analyte Type = TIC), if more than one analysis is submitted for a particular sample and method, choose only one of the analyses where Reportable Result = YES for <u>all</u> TICs. For example, a sample was run a second time because one or more target compounds exceeded the calibration range in the undiluted analysis. Choose a particular analysis and enter "YES" for all TICS. In the other analysis enter "NO" for all TICs. Note that it is not necessary to report the full target analyte list for the initial result, dilution, re-analysis, or re-extraction. However, each target analyte must be reported YES once and once only in the case of multiple analyses for a given sample, method, and matrix. In the case of organics, all surrogates must be reported for all analyses submitted for a given sample, method, and, matrix.	Text	3	YES (See Table 4)
MDL_DoD	This field is not part of the standard ADR EDD format. **For DoD QSM enter the MDL, otherwise leave blank. (ADR does not perform error checks on this field)**	Numeric	10	NO

Table 2
Field Descriptions for the Laboratory Instrument Table (A2 file)

Contains related to laboratory instrument calibration on an analyte level and GC/MS Tune information. This table is optional depending on project requirements. Do not report Table A2 for radiochemistry methods.

Field Name	Field Name Description	Field Type	Field Length	Standard Value List
InstrumentID	Laboratory instrument identification.	Text	15	NO
QCType	Type of instrument QC (i.e., Instrument_Performance_Check or type of calibration standard).	Text	10	YES (See Table 4)
Analyzed	Analysis date/time for BFB, DFTPP, initial calibration verification standards, calibration verification standards, and continuing calibration standards. For the initial calibration, enter date and time of the last standard analyzed. Also, see comments about initial calibrations in the Alternate_Lab_Analysis_ID field name description.	Date/ Time	*	NO
AlternateLab_AnalysisID	Common laboratory identification used for standards (i.e., VOA STD50, CCAL100, BFB50, etc). For initial calibration, enter ICAL. Information from the initial calibration is entered as one record for each analyte that summarizes the results of the initial calibration (i.e. %RSD, correlation coefficient, and avg RF). Records are not entered for each individual standard within the initial calibration.	Text	12	NO
LabAnalysisID	Unique identification of the raw data electronic file associated with the calibration standard or tune (i.e., 9812101MS.DV). Leave this field blank for the initial calibration. See comments about initial calibrations in the Alternate_Lab_Analysis_ID field description. This field is only applicable where an electronic instrument file is created as part of the analysis.	Text	15	NO
LabAnalysisRefMethodID	Laboratory reference method ID (i.e., 8260B, 8270C, 6010B, etc.). The method ID is specified by the project. The LabAnalysisRefMethodID must be in the standard value list for Method IDs.	Text	25	YES (specified by the project)
ClientAnalyteID	CAS number or unique client identifier for an analyte. If a CAS number is not available, use a unique identifier provided by the client. The unique identifier for a particular analyte should be specified by the project and must exist in the standard value list for ClientAnalyteID. Records for each calibration must report the full target analyte list including surrogates as applicable. The target analyte list is specified for each method and matrix in the project	Text	12	YES (specified by the project)
AnalyteName	The chemical name for the analyte. The project specifies how an analyte is named. The AnalyteName must be associated to a ClientAnalyteID in the standard values.	Text	60	YES (specified by the project)

Table 2
Field Descriptions for the Laboratory Instrument Table (A2 file)

Contains related to laboratory instrument calibration on an analyte level and GC/MS Tune information. This table is optional depending on project requirements. Do not report Table A2 for radiochemistry methods.

Field Name	Field Name Description	Field Type	Field Length	Standard Value List
RunBatch	Unique identifier for a batch of analyses performed on one instrument under the control of one initial calibration and initial calibration verification. The Run Batch ID links both the initial calibration and initial calibration verification to subsequently analyzed and associated continuing calibrations, field samples, and QC analyses. For GC/MS methods, the Run_Batch ID also links a BFB or DFTPP tune and the initial calibration and initial calibration verification standards to associated samples and method QC analyses. A new and unique Run Batch ID must be used with every new initial calibration.	Text	12	NO
AnalysisBatch	Unique laboratory identifier for a batch of analyses performed on one instrument and under the control of a continuing calibration or continuing calibration verification. The Analysis Batch ID links the continuing calibration or calibration verification to subsequently analyzed and associated field sample and QC analyses. For GC/MS methods, the Analysis Batch ID also links the BFB or DFTPP tune. A new and unique Analysis Batch ID must be used with every new continuing calibration or continuing calibration verification. For GC methods, only report opening standards, do not include closing standards (unless the closing standard functions as the opening standard for a subsequent set of analyses, in which case a new and unique Analysis Batch ID is assigned). When dual or confirmation columns/detectors are used, enter results from the primary column/detector only (this is similar to CLP Pesticide reporting).	Text	12	NO
LabReportingBatch	Unique laboratory identifier for a batch of samples including associated calibrations and method QC, reported as a group by the lab (i.e., lab work order #, log-in #, or SDG). Links all instrument calibrations, samples, and method QC reported as a group or SDG.	Text	12	NO
PercentRelativeStandard Deviation	The standard deviation relative to the mean used to evaluate initial calibration linearity. Organic methods may use either %RSD or Correlation Coefficient. If applicable, enter the %RSD. Leave this field blank if the Correlation Coefficient is used.	Numeric	5	NO
CorrelationCoefficient	The correlation coefficient resulting from linear regression of the initial calibration. For metals by ICAP, enter '1.0' if a two-point initial calibration was analyzed. Organic methods may use either %RSD or Correlation Coefficient. If applicable, enter the Correlation Coefficient. Leave this field blank if the %RSD is used	Numeric	5	NO
RelativeResponseFactor	This field applies to GC/MS only. For continuing calibration enter the relative response factor. For initial calibration enter the average relative response factor. Refer to comments about initial calibration records in the field description for Alternate_Lab_Analysis_ID.	Numeric	5	NO

Table 2
Field Descriptions for the Laboratory Instrument Table (A2 file)

Contains related to laboratory instrument calibration on an analyte level and GC/MS Tune information. This table is optional depending on project requirements. Do not report Table A2 for radiochemistry methods.

Field Name	Field Name Description	Field Type	Field Length	Standard Value List
Percent_Difference (or Percent Recovery)	For organic methods, this field is the difference between 2 measured values expressed as a percentage. If %RSD is reported, enter the % difference between the average response factor of the initial calibration (IC) and the response factor of the initial calibration verification (ICV) or continuing calibration (CCV). If correlation coefficient is used, enter the % difference between the true value and the measured value. The Percent_Difference is expressed as a negative or positive value. Do not express Percent_Difference as an absolute value. Use a negative value if the CCV or ICV response factor is less than the IC average response factor or, in the case of correlation coefficient, the CCV or ICV measured value is less than the true value. Use a positive value if the CCV or ICV response factor is greater than the IC average response factor, or in the case of correlation coefficient, the CCV or ICV measured value is greater than the true value. For inorganic methods, this field is the recovery of an analyte expressed relative to the true amount (i.e., %R for a metal in the continuing calibration or initial calibration verification by Method 6010B).	Numeric	5	NO
PeakID01	Identifies individual m/z ions for GC/MS tuning compounds. For BFB enter 50, for DFTPP enter 51.	Numeric	10	NO
PercentRatio01	For BFB enter the relative percent abundance of m/z 50 measured relative to the raw abundance of m/z 95. For DFTPP enter the relative percent abundance of m/z 51 measured relative to the raw abundance of m/z 198.	Numeric	10	NO
PeakID02	Identifies individual m/z ions for GC/MS tuning compounds. For BFB enter 75, for DFTPP enter 68.	Numeric	10	NO
PercentRatio02	For BFB enter the relative percent abundance of m/z 75 measured relative to the raw abundance of m/z 95. For DFTPP enter the relative percent abundance of m/z 68 measured relative to the raw abundance of m/z 69.	Numeric	10	NO
PeakID03	Identifies individual m/z ions for GC/MS tuning compounds. For BFB enter 95, for DFTPP enter 69.	Numeric	10	NO
PercentRatio03	For BFB enter the ion abundance of m/z 95 as 100 percent. For DFTPP enter the relative percent abundance of m/z 69 measured relative to the raw abundance of m/z 198.	Numeric	10	NO
PeakID04	Identifies individual m/z ions for GC/MS tuning compounds. For BFB enter 96, for DFTPP enter 70.	Numeric	10	NO

Table 2
Field Descriptions for the Laboratory Instrument Table (A2 file)

Contains related to laboratory instrument calibration on an analyte level and GC/MS Tune information. This table is optional depending on project requirements. Do not report Table A2 for radiochemistry methods.

Field Name	Field Name Description	Field Type	Field Length	Standard Value List
PercentRatio04	For BFB enter the relative percent abundance of m/z 96 measured relative to the raw abundance of m/z 95. For DFTPP enter the relative percent abundance of m/z 70 measured relative to the raw abundance of m/z 69	Numeric	10	NO
PeakID05	Identifies individual m/z ions for GC/MS tuning compounds. For BFB enter 173, for DFTPP enter 127.	Numeric	10	NO
PercentRatio05	For BFB enter the relative percent abundance of m/z 173 measured relative to the raw abundance of m/z 174. For DFTPP enter the relative percent abundance of m/z 127 measured relative to the raw abundance of m/z 198	Numeric	10	NO
PeakID06	Identifies individual m/z ions for GC/MS tuning compounds. For BFB enter 174, for DFTPP enter 197.	Numeric	10	NO
PercentRatio06	For BFB enter the relative percent abundance of m/z 174 measured relative to the raw abundance of m/z 95. For DFTPP enter the relative percent abundance of m/z 197 measured relative to the raw abundance of m/z 198.	Numeric	10	NO
PeakID07	Identifies individual m/z ions for GC/MS tuning compounds. For BFB enter 175, for DFTPP enter 198.	Numeric	10	NO
PercentRatio07	For BFB enter the relative percent abundance of m/z 175 measured relative to the raw abundance of m/z 174. For DFTPP enter the ion abundance of m/z 198 as 100 percent.	Numeric	10	NO
PeakID08	Identifies individual m/z ions for GC/MS tuning compounds. For BFB enter 176, for DFTPP enter 199.	Numeric	10	NO
PercentRatio08	For BFB enter the relative percent abundance of m/z 176 measured relative to the raw abundance of m/z 174. For DFTPP enter the relative percent abundance of m/z 199 measured relative to the raw abundance of m/z 198.	Numeric	10	NO
PeakID09	Identifies individual m/z ions for GC/MS tuning compounds. For BFB enter 177, for DFTPP enter 275.	Numeric	10	NO
PercentRatio09	For BFB enter the relative percent abundance of m/z 177 measured relative to the raw abundance of m/z 176. For DFTPP enter the relative percent abundance of m/z 275 measured relative to the raw abundance of m/z 198.	Numeric	10	NO
PeakID10	Identifies individual m/z ions for GC/MS tuning compounds. For BFB leave blank, for DFTPP enter 365.	Numeric	10	NO

Table 2
Field Descriptions for the Laboratory Instrument Table (A2 file)

Contains related to laboratory instrument calibration on an analyte level and GC/MS Tune information. This table is optional depending on project requirements. Do not report Table A2 for radiochemistry methods.

Field Name	Field Name Description	Field Type	Field Length	Standard Value List
PercentRatio10	For BFB leave blank. For DFTPP enter the relative percent abundance of m/z 365 measured relative to the raw abundance of m/z 198.	Numeric	10	NO
PeakID11	Identifies individual m/z ions for GC/MS tuning compounds. For BFB leave blank, for DFTPP enter 441.	Numeric	10	NO
PercentRatio11	For BFB leave blank. For DFTPP the percent abundance of m/z 441 measured relative to the raw abundance of m/z 443	Numeric	10	NO
PeakID12	Identifies individual m/z ions for GC/MS tuning compounds. For BFB leave blank, for DFTPP enter 442.	Numeric	10	NO
PercentRatio12	For BFB leave blank. For DFTPP enter the relative percent abundance of m/z 442 measured relative to the raw abundance of m/z 198.	Numeric	10	NO
PeakID13	Identifies individual m/z ions for GC/MS tuning compounds. For BFB leave blank, for DFTPP enter 443.	Numeric	10	NO
PercentRatio13	For BFB leave blank. For DFTPP enter the relative percent abundance of m/z 443 measured relative to the raw abundance of m/z 442.	Numeric	10	NO

* Date/time format is: MM/DD/YYYY hh:mm where MM = month, DD = day, YYYY = four digits of the year, hh = hour in 24 hour format, and mm = minutes.

Table 3
Field Description for the Sample Analysis (A3 file)

This table contains information related to analyses of field samples and laboratory QC samples (excluding calibrations and tunes) on a sample level for environmental chemical analyses including radiochemistry

Field Name	Field Name Description	Field Type	Field Length	Standard Value List
ProjectNumber	Project number assigned by the client.	Text	30	YES (specified by project)
ProjectName	Project name assigned by the client.	Text	90	YES (specified by project)
ClientSampleID	Client or contractor's identifier for a field sample If a sample is analyzed as a laboratory duplicate, matrix spike, or matrix spike duplicate, append suffixes DUP, MS and MSD respectively to the Client Sample ID with no intervening spaces or hyphens (i.e. MW01DUP, MW01MS, and MW01MSD). For Method Blanks, LCS, and LCSD enter the unique LaboratorySampleID into this field Do not append suffixes to the ClientSampleID for dilutions, reanalyses, or re-extracts (the Analysis_Type field is used for this distinction). For example, MW01DL and MW01RE are not allowed Parent sample records must exist for each MS and MSD. If an MS/MSD is shared between two EDDs, records for the MS/MSD and its parent sample must exist in the Sample Analysis table for both EDDs.	Text	25	NO
Collected	For radiochemistry methods the Date of sample collection. Refer to the date format for radiochemistry methods at the end of this table. For all other methods the Date and Time of sample collection. Refer to the date/time format at the end of this table. Leave this field blank for Method Blank, LCS, and LCSD	Date/ Time	16*	NO
MatrixID	Sample matrix (i.e., AQ, SO, etc.)	Text	10	YES (See Table 4)
LabSampleID	Laboratory tracking number for field samples and lab generated QC samples such as method blank, LCS, and LCSD. There are no restrictions for the LabSampleID except field length and that the LabSampleID must be unique for a given field sample or lab QC sample and method.	Text	25	NO
QCType	This record identifies the type of quality control sample QC (i.e., Duplicate, LCS, Method Blank, MS, or MSD). For regular samples, leave this field blank.	Text	10	YES (See Table 4)
ShippingBatchID	Unique identifier assigned to a cooler or shipping container used to transport client or field samples. Links all samples to a cooler or shipping container. No entry for method blanks, LCS, and LCSD. This field is optional.	Text	25	NO
Temperature	Temperature (in centigrade degrees) of the sample as received. This field is not required for radiochemistry methods.	Numeric	10	NO

Table 3
Field Description for the Sample Analysis (A3 file)

This table contains information related to analyses of field samples and laboratory QC samples (excluding calibrations and tunes) on a sample level for environmental chemical analyses including radiochemistry

Field Name	Field Name Description	Field Type	Field Length	Standard Value List
LabAnalysisRefMethodID	Laboratory reference method ID. The method ID may be an EPA Method number or laboratory identifier for a method such as a SOP number, however; values used for Laboratory Method IDs are specified by the project and must in the in standard value list for method IDs.	Text	25	YES (Specified by the project)
PreparationType	Preparation Method Number (i.e., 3010A, 3510C, 3550C, 5030B, etc.) For analytical procedures that do not have a specific preparation method number, use "Gen Prep".	Text	25	YES (See Table 4)
AnalysisType	Defines the type of analysis such as initial analysis, dilution, re-analysis, etc. This field provides distinction for sample records when multiple analyses are submitted for the same sample, method, and matrix, for example: dilutions, re-analyses, and re-extracts.	Text	10	YES (See Table 4)
Prepared	For radiochemistry leave this field blank. For all other methods enter the date and time of sample preparation or extraction. Refer to the date/time format at the end of this table.	Date/ Time	16*	NO
Analyzed	For radiochemistry methods the date of sample analysis. Refer to the date format for radiochemistry methods at the end of this table. For all other methods the date and time of sample analysis. Refer to the date and time format at the end of this table.	Date/ Time	*	NO
LabID	Identification of the laboratory performing the analysis.	Text	7	NO
QCLevel	The level of laboratory QC associated with the analysis reported in the EDD. If only the Analytical Results Table (A1) and the Sample Analysis Table (A3) information are submitted for the sample, enter "COA". If the Laboratory Instrument Table (A2) information is also submitted for the sample, enter "COCAL"	Text	6	YES (See Table 4)
ResultBasis	Indicates whether results associated with this sample records are reported as wet or percent moisture corrected. This field is only required for soils and sediments. Enter "WET" if results are not corrected for percent moisture. Enter "DRY" if percent moisture correction is applied to results.	Text	3	YES (See Table 4)
TotalOrDissolved	This field indicates if the results related to this sample record are reported as a total or dissolved fraction. This field is only required for metal methods. For all other methods leave this field blank.	Text	3	YES (See Table 4)
Dilution	Dilution of the sample aliquot. Enter "1" for method blanks, LCS, and LCSD, or if the field samples was analyzed without dilution.	Numeric	10	NO
HandlingType	Indicates the type of leaching procedure, if applicable (i.e., SPLP, TCLP, WET). Leave this field blank if the sample analysis was not performed on a leachate.	Text	10	YES (See Table 4)

Table 3
Field Description for the Sample Analysis (A3 file)

This table contains information related to analyses of field samples and laboratory QC samples (excluding calibrations and tunes) on a sample level for environmental chemical analyses including radiochemistry

Field Name	Field Name Description	Field Type	Field Length	Standard Value List
HandlingBatch	Unique laboratory identifier for a batch of samples prepared together in a leaching procedure (i.e., SPLP, TCLP, or WET preparation). The HandlingBatch links samples with leaching blanks. Leave this field blank if the sample analysis was not performed on a leachate	Text	12	NO
LeachateDate	Date and time of leaching procedure (i.e., date for SPLP, TCLP, or WET preparation). Refer to the date and time format at the end of this table. Leave this field blank if the sample analysis was not performed on a leachate	Date /Time	16*	NO
Percent_Moisture	Percent of sample composed of water. Enter for soil and sediment samples only.	Numeric	10	NO
MethodBatch	Unique laboratory identifier for a batch of samples of similar matrices analyzed by one method and treated as a group for matrix spike, matrix spike duplicate, or laboratory duplicate association The method batch links the matrix spike and/or matrix spike duplicate or laboratory duplicates to associated samples. Note, the MethodBatch association may coincide with the PreparationBatch association. The MethodBatch is specifically used to link the MS/MSD and/or DUP to associated samples.	Text	12	NO
PreparationBatch	Unique laboratory identifier for a batch of samples prepared together for analysis by one method and treated as a group for method blank, LCS and LCSD association. The PreparationBatch links method blanks and laboratory control samples (blank spikes) to associated samples. Note, the PreparationBatch association may coincide with the MethodBatch association but the PreparationBatch specifically links the Method Blank and LCS to associated samples.	Text	12	NO
RunBatch	For radiochemistry methods leave this field blank. For all other methods the RunBatch is the unique identifier for a batch of analyses performed on one instrument under the control of one initial calibration and initial calibration verification. The RunBatch links both the initial calibration and initial calibration verification to subsequently analyzed and associated continuing calibrations, field samples, and QC analyses. For GC/MS methods, the RunBatch also links a BFB or DFTPP tune. A distinct RunBatch must used with every new initial calibration within a method The value entered in this field links a particular sample/method/analysis type record to a set of associated initial calibration and initial calibration verification records from Table A2. This field is only required if the A2 table is included with the EDD.	Text	12	NO

Table 3
Field Description for the Sample Analysis (A3 file)

This table contains information related to analyses of field samples and laboratory QC samples (excluding calibrations and tunes) on a sample level for environmental chemical analyses including radiochemistry

Field Name	Field Name Description	Field Type	Field Length	Standard Value List
AnalysisBatch	For radiochemistry methods leave this field blank. For all other methods the AnalysisBatch is the unique identifier for a batch of analyses performed on one instrument and under the control of a continuing calibration or continuing calibration verification. The AnalysisBatch links the continuing calibration or calibration verification to subsequently analyzed and associated field sample and QC analyses. For GC/MS methods, the AnalysisBatch also links the BFB or DFTPP tune. A distinct AnalysisBatch must be used with every new continuing calibration or continuing calibration verification within a method The value entered in this field links a particular sample/method/analysis type record to a set of associated continuing calibration records in the Laboratory Instrument table. This field is only required if the A2 table is included with the EDD.	Text	12	NO
LabReportingBatch	Unique laboratory identifier for the EDD. This is equivalent to the sample delivery group, lab work number, login ID, etc. The LabReportingBatch links all records in the EDD reported as one group. The value entered in this field must be the same in all records.	Text	12	NO
LabReceipt	Date and time the sample was received in the lab. A time value of 00:00 may be entered. Refer to the date/time format at the end of this table.	Date/ Time	16*	
LabReported	Date and time hard copy reported delivered by the lab. A time value of 00:00 may be entered. Refer to the date/time format at the end of this table.	Date/ Time	16*	

* For radiochemistry methods format Date as MM/DD/YYYY (where MM = two digit month, DD = two digit day, and YYYY = four digit year)

For all other methods format Date and Time as MM/DD/YYYY hh:mm YYYY (where MM = two digit month, DD = two digit day, and YYYY = four digit year, hh = hour in 24 hour format, and mm = minutes)

Table 4
Standard Value List

Field Name	Standard Value	Standard Value Description
Analysis_Type	DL	Dilution of the original sample
	DL2	Second dilution of the original sample
	DL3	Third dilution of the original sample
	DL4	Fourth dilution of the original sample
	RE	Reanalysis/re-extraction of sample
	RE2	Second reanalysis/re-extraction of sample
	RE3	Third reanalysis/re-extraction of sample
	RE4	Fourth reanalysis/re-extraction of the original sample
	RES	The initial or original sample.
Analyte_Name	Refer to QAPP and Project Library	Analyte names are specified by the project and entered into the library for each method and matrix. Analyte Names used in project libraries must first exist in the standard value table. The same holds true for the ClientAnalyteID
Analyte_Type	IS	Internal standard as defined per CLP usage
	SPK	Spiked analyte
	SURR	Surrogate as defined as per CLP usage
	TIC	Tentatively identified compound for GC/MS analysis
	TRG	Target compound
Detection_Limit_Type [1]	CRDL	Contract required detection limit
	IDL	Instrument detection limit
	MDA	Minimum detectable activity
	MDL	Method detection limit
Handling_Type [2]	WET	Wet leaching procedure
	SPLP	Synthetic Precipitation Leaching Procedure
	TCLP	Toxicity Characteristic Leaching Procedure
Lab_Analysis_Ref_Method_ID	Refer to QAPP and Project Library	Method IDs are specified by the project and entered into the library. Methods used in project libraries must first exist in the standard value table
Lab_Qualifiers [3]	*	INORG: Duplicate analysis was not within control limits
	*	ORG: Surrogate values outside of contract required QC limits
	+	INORG: Correlation coefficient for the method of standard additions (MSA) was less than 0.995
	A	ORG: Tentatively identified compound (TIC) was a suspected aldol-condensation product
	B	INORG: Value less than contract required detection limit, but greater than or equal to instrument detection limit
	B	ORG: Compound is found in the associated blank as well as in the sample
	C	ORG: Analyte presence confirmed by GC/MS
	D	Result from an analysis at a secondary dilution factor
	E	INORG: Reported value was estimated because of the presence of interference
	E	ORG: Concentrations exceed the calibration range of the instrument
	H	Analysis performed outside method or client-specified holding time requirement
	J	Estimated value
	M	INORG: Duplicate injection precision was not met
	N	INORG: Spiked sample recovery was not within control limits
	N	ORG: Presumptive evidence of a compound
	P	ORG: Difference between results from two GC columns unacceptable (>25% Difference)
	S	Reported value was determined by the method of standard additions (MSA)
	U	Compound was analyzed for, but not detected. Analyte result was below the Reporting Limit.
	W	INORG: Post digestion spike was out of control limits
	X	Reserved for a lab-defined data qualifier
	Y	Reserved for a lab-defined data qualifier
	Z	Reserved for a lab-defined data qualifier
Matrix_ID	AIR	Air
	AQ	Water
	ASH	Ash

Table 4
Standard Value List

Field Name	Standard Value	Standard Value Description
Matrix_ID (continued)	BIOTA	Biological matter
	FILTER	Filter
	LIQUID	Non-aqueous liquid
	OIL	Oil
	SED	Sediment
	SLUDGE	Sludge
	SO	Soil
	SOLID	Non-soil/sediment solid
	TISSUE	Tissue
	WASTE	Waste
	WIPE	Wipe
Preparation_Type [4]	3005A	Acid Digestion of Waters for Total Recoverable or Dissolved Metals by FLAA or ICP
	3010A	Acid of Aqueous Samples and Extracts for Total Metals by FLAA or ICP
	3015	Microwave Assisted Acid Digestion of Aqueous Samples and Extracts
	3020A	Acid Digestion of Aqueous Samples and Extracts for Total Metals by GFAA
	3031	Acid Digestion of Oils for Metals Analysis by AA or ICP
	3050B	Acid Digestion of Sediments, Sludges, and Soils
	3051	Microwave Assisted Acid Digestion of Sediments, Sludges, Soils and Oils
	3052	Microwave Assisted Acid Digestion of Siliceous and Organically Based Matrices
	3060A	Alkaline Digestion for Hexavalent Chromium
	3510C	Separatory Funnel Liquid-Liquid Extraction
	3520C	Continuous Liquid-Liquid Extraction
	3535	Solid Phase Extraction
	3540C	Soxhlet Extraction
	3541	Automated Soxhlet Extraction
	3545	Pressurized Fluid Extraction
	3550B	Ultrasonic Extraction
	3560	Supercritical Fluid Extraction of Total Recoverable Petroleum Hydrocarbons
	5030B	Purge and Trap for Aqueous Samples
	5035	Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples
	7470A	Acid digestion of waters for Mercury analysis
	7471A	Acid digestion of soils and solids for Mercury analysis
	Gen Prep	Generic preparation type when a preparation method ID does not exist (used mostly for general chemistry methods)
QC_Level	COA	Certificate of Analysis (accuracy and precision, no calibration)
	COACAL	Certificate of Analysis (accuracy and precision including calibration)
QC_Type	MB	Analytical control consisting of all reagents and standards that is carried through the entire procedure (Method Blank)
	CV	(Calibration Verification) Analytical standard run at a specified frequency to verify the calibration of the analytical system
	CCV	(Continuing Calibration Verification) Analytical standard run every 12 hours to verify the calibration of the GC/MS system
	DUP	A second aliquot of a sample that is treated the same as the original aliquot to determine the precision of the method
	IC	(Initial Calibration) Analysis of analytical standards for a series of different specified concentrations
	ICV	(Initial Calibration Verification) Analytical standard run at a specified frequency to verify the accuracy of the initial calibration of the analytical system
	IPC	(Instrument Performance Check) Analysis of DFTPP or BFB to evaluate the performance of the GC/MS system
	LCS	(Laboratory Control Sample) A control sample of known composition
	LCSD	(Laboratory Control Sample Duplicate) A duplicate control sample of known composition
	MS	(Matrix Spike) Aliquot of a matrix spiked with known quantities and subjected to the entire analytical procedure to measure recovery
	MSD	(Matrix Spike Duplicate) A second aliquot of the same matrix as the matrix spike that is spiked in order to determine the precision of the method
Reporting_Limit_Type [1]	CRDL	Contract–required detection limit
	CRQL	Contract–required quantitation limit

Table 4
Standard Value List

Field Name	Standard Value	Standard Value Description
Reporting_Limit_Type (continued)	PQL	Practical quantitation limit
	SQL	Sample quantitation limit
	RDL	Reportable detection limit
Result_Basis	DRY	Result was calculated on a dry weight basis
	WET	Result was calculated on a wet weight basis
Result_Units [5]	ug/L	Micrograms per liter
	mg/L	Milligrams per liter
	ug/Kg	Micrograms per kilogram
	mg/Kg	Milligrams per kilogram
	pg/L	Picograms per liter
	ng/Kg	Nanograms per kilogram
Total_Or_Dissolved	DIS	Dissolved
	TOT	Total

1 **Additional Detection Limit Types and Reporting Limit Types may be used. These must be added to the application standard values.**
2 **Additional Handling Types (leachate procedures) may be used. These must be added to the application standard values**
3 **Additional Lab Qualifiers may be used, or listed Lab Qualifiers may be used in a different manner than described in this table. New lab qualifiers must be added to the application standard value tables. NOTE: The "U" Lab Qualifier must be used for all non-detects.**
4 **Additional Preparation Types may be used. These must be added to the application standard value tables.**
5 **Additional Result Units may be used. The project library specifies the reporting limit used for each method and matrix**

Note: If new standard values are used then these standard values must be entered in the software standard values for both the lab and contractor. The application will automatically update the standard values tables if an importing library contains standard values (method, client analyte ID, and analyte name) that do not exist in the software importing the new library.

Table 5
Required Fields in the Analytical Results Table for GC/MS, GC, and HPLC Methods

	GC/MS Methods			GC and HPLC Methods		
Field	Regular Sample*	MS/MSD	Method Blank, LCS/LCSD	Regular Sample*	MS/MSD	Method Blank, LCS/LCSD
Client_Sample_ID	X	X	X	X	X	X
Lab_Analysis_Ref_Method_ID	X	X	X	X	X	X
Analysis_Type	X	X	X	X	X	X
Lab_Sample_ID	X	X	X	X	X	X
Lab_ID	X	X	X	X	X	X
Client_Analyte_ID	X	X	X	X	X	X
Analyte_Name	X	X	X	X	X	X
Result	X	X	X	X	X	X
Result_Units	X	X	X	X	X	X
Lab_Qualifiers	Q	Q	Q	Q	Q	Q
Detection Limit	X	X	X	X	X	X
Detection_Limit_Type	X	X	X	X	X	X
Retention_Time	T		T			
Analyte_Type	X	X	X	X	X	X
Percent_Recovery	S	R	R	S	R	R
Relative_Percent_Difference		D	D		D	D
Reporting_Limit	X	X	X	X	X	X
Reporting_Limit_Type	X	X	X	X	X	X
Reportable_Result	X	X	X	X	X	X

Key

- X Required Field
- D Required field for spiked compounds in the LCSD and MSD only
- Q Required field if laboratory has qualified result. The “U” qualifier MUST be entered if the result is non-detect.
- R Required field if Analyte_Type = “SPK” or “SURR”
- S Required field for surrogate compounds only
- T Required field for tentatively identified compounds by GC/MS only
- * Also includes Equipment Blanks, Field Blanks, and Trip Blanks

Table 6
Required Fields in the Analytical Results Table for ICAP, AA, and IC Methods

Field	ICAP and AA Methods			IC and Wet Chemistry Methods		
	Regular Sample*	Sample Duplicate, MS/MSD	Method Blank, LCS/LCSD	Regular Sample*	Sample Duplicate MS/MSD	Method Blank, LCS/LCSD
Client_Sample_ID	X	X	X	X	X	X
Lab_Analysis_Ref_Method_ID	X	X	X	X	X	X
Analysis_Type	X	X	X	X	X	X
Lab_Sample_ID	X	X	X	X	X	X
Lab_ID	X	X	X	X	X	X
Client_Analyte_ID	X	X	X	X	X	X
Analyte_Name	X	X	X	X	X	X
Result	X	X	X	X	X	X
Result_Units	X	X	X	X	X	X
Lab_Qualifiers	Q	Q	Q	Q	Q	Q
Detection Limit	X	X	X	X	X	X
Detection_Limit_Type	X	X	X	X	X	X
Retention_Time						
Analyte_Type	X	X	X	X	X	X
Percent_Recovery		S	S		S	S
Relative_Percent_Difference		R	R		R	R
Reporting_Limit	X	X	X	X	X	X
Reporting_Limit_Type	X	X	X	X	X	X
Reportable_Result	X	X	X	X	X	X

Key

X Required field
Q Required field if laboratory has qualified result. The “U” qualifier MUST be entered if the result is non-detect
R Required field for spiked compounds in LCSD or MSD, or target compounds in the Sample Duplicate only
S Required field if Analyte_Type = “SPK”
* Also includes Trip Blanks, Equipment Blanks, and Field Blanks

Table 7
Required Fields in the Laboratory Instrument Table

	GC/MS Tunes		Initial Calibration				Initial Calibration Verification				Calibration Verification, Continuing Calibration
Field	VOA	SVOA	GC/MS	GC HPLC	ICP/AA	IC*	GC/MS	GC HPLC	ICP/AA	IC*	ALL METHODS
Instrument_ID	X	X	X	X	X	X	X	X	X	X	X
QC_Type	X	X	X	X	X	X	X	X	X	X	X
Analyzed	X	X	X	X	X	X	X	X	X	X	X
Alternate_Lab_Analysis_ID	X	X	X	X	X	X	X	X	X	X	X
Lab_Analysis_ID	X	X					X	X	X	X	X
Lab_Analysis_Ref_Method_ID	X	X	X	X	X	X	X	X	X	X	X
Client_Analyte_ID	X	X	X	X	X	X	X	X	X	X	X
Analyte_Name	X	X	X	X	X	X	X	X	X	X	X
Run_Batch	X	X	X	X	X	X	X	X	X	X	X
Analysis_Batch	C	C									X
Lab_Reporting_Batch	X	X	X	X	X	X	X	X	X	X	X
Percent_Relative_Standard_Deviation			X	X							
Correlation_Coefficient			B	B	X	X					
Relative_Response_Factor			X				X				M
Percent_Difference							X	X	X	X	X
Peak_ID_01	X	X									
Percent_Ratio_01	X	X									
Peak_ID_02	X	X									
Percent_Ratio_02	X	X									
Peak_ID_03	X	X									
Percent_Ratio_03	X	X									
Peak_ID_04	X	X									
Percent_Ratio_04	X	X									
Peak_ID_05	X	X									
Percent_Ratio_05	X	X									
Peak_ID_06	X	X									
Percent_Ratio_06	X	X									
Peak_ID_07	X	X									
Percent_Ratio_07	X	X									
Peak_ID_08	X	X									
Percent_Ratio_08	X	X									
Peak_ID_09	X	X									
Percent_Ratio_09	X	X									
Peak_ID_10		X									
Percent_Ratio_10		X									
Peak_ID_11		X									
Percent_Ratio_11		X									
Peak_ID_12		X									
Percent_Ratio_12		X									
Peak_ID_13		X									
Percent_Ratio_13		X									

Key

X Required field (some fields are not applicable to some General (Wet) Chemistry tests)

B Required field if reporting best fit

C Required field if BFB or DFTPP associated with a continuing calibration only

M Required field for GC/MS continuing calibration only

*IC Includes Ion Chromatography and Classical or Wet Chemistry methods. Methods such as pH, Conductivity, and others do not use traditional calibration procedures~~,~~ ; therefore, some fields marked as a required field under the "IC" column do not apply for these methods.

Table 8
Required Fields in the Sample Analysis Table

Field	GC, GC/MS, HPLC Methods		ICAP and AA Methods		IC and Wet Chemistry Methods	
	Method Blanks, LCS/LCSD	Regular Samples*, Sample Duplicate, MS/MSD	Method Blanks, LCS/LCSD	Regular Samples*, Sample Duplicate, MS/MSD	Method Blanks, LCS/LCSD	Regular Samples*, Sample Duplicate, MS/MSD
Client_Sample_ID	X	X	X	X	X	X
Collected		X		X		X
Matrix_ID	X	X	X	X	X	X
Lab_Sample_ID	X	X	X	X	X	X
QC_Type	X	Q	X	Q	X	X
Shipping_Batch_ID		X		X		X
Temperature		X				X
Lab_Analysis_Ref_Method_ID	X	X	X	X	X	X
Preparation_Type	X	X	X	X	X	X
Analysis_Type	X	X	X	X	X	X
Prepared	A	A	X	X	N	N
Analyzed	X	X	X	X	X	X
Lab_ID	X	X	X	X	X	X
QC_Level	X	X	X	X	X	X
Results_Basis		S		S		S
Total_Or_Dissolved			W	W		
Dilution	X	X	X	X	X	X
Handling_Type	L	L	L	L	L	L
Handling_Batch	L	L	L	L	L	L
Leachate_Date	L	L	L	L	L	L
Percent Moisture		S		S		S
Method_Batch	X	X	X	X	X	X
Preparation_Batch	X	X	X	X	X	X
Run_Batch	C	C	C	C	C	C
Analysis_Batch	C	C	C	C	C	C
Lab_Reporting_Batch	X	X	X	X	X	X
Lab_Receipt		X		X		X
Lab_Reported	X	X	X	X	X	X

Key

X Required field
A Required field for samples prepared by methanol extraction
C Required field if Instrument Calibration Table (A2) is included in EDD
L Required field if analysis performed on SPLP, TCLP, or WET extracts
N Required field only for samples that require preparation before analysis
Q Required field for Sample Duplicate, MS, and MSD only
S Required field if “Matrix_ID” = “SO” or “SED”
W Required field for aqueous samples only
* Includes Trip Blanks, Equipment Blanks, and Field Blanks