

# SOUTHERN CALIFORNIA COASTAL WATER RESEARCH PROJECT PROPOSAL FORM

## 2003 REGIONAL SURVEY FIELD SAMPLING AND LABORATORY ANALYSES

### I. INSTRUCTIONS TO BIDDERS

Seven (7) copies of the bidder's complete proposal to provide the services detailed are to be enclosed in a sealed envelope marked "2003 Regional Survey Sampling" and addressed to:

Bryan Nece, Administrative Officer  
Southern California Coastal Water Research Project (SCCWRP)  
7171 Fenwick Lane  
Westminster, CA 92683-5218

All supplemental materials requested within this proposal must be attached to the Proposal. Any unauthorized conditions, limitations, or provisions attached to this proposal may be cause for rejection.

If a bidder wishes to withdraw its Proposal, the Bidder may do so without prejudice by delivery of written notice of withdrawal to the Administrative Officer at any time before the time fixed for the opening of bids.

Sealed bids will be received at SCCWRP's offices, 7171 Fenwick Lane, Westminster, CA, up to the hour of 11:00 AM on March 24, 2003, at which time, the Administrative Officer will open the bids. Bids received by facsimile or email will not be accepted.

All bidders should inform SCCWRP via email ([bryann@sccwrp.org](mailto:bryann@sccwrp.org)), FAX (714.894.9699) or letter mail by February 28, 2003 of their intention to submit a bid. The notification is not mandatory, but is necessary to receive future updates to this bid notification. SCCWRP will hold a non-mandatory bidders meeting at 9:00 AM on February 28, 2003 at SCCWRP's Offices in Westminster. This meeting is intended to provide Bidders the opportunity to ask questions and request clarifications about this document. Bidders who are unable to attend may provide written requests for clarification prior to the meeting. SCCWRP's response to both written and oral questions will be sent to the Bidders by email and posted on the SCCWRP web site ([www.sccwrp.org](http://www.sccwrp.org)).

This solicitation for proposals shall not be construed as obligating SCCWRP to award a contract or to pay any compensation for the information solicited.

### II. SCOPE OF WORK

Southern California Coastal Water Research Project (SCCWRP) will be coordinating a regional monitoring survey of the southern California offshore ocean waters between Point Conception and the Mexican border during the summer of 2003. SCCWRP expects that a portion of the field sampling and laboratory analyses tasks for this survey will be performed by contracted firms. The scope of work for this Proposal Form is as follows:

- Collect the following samples (at stations yet to be identified) at depths of 3-1,000 m in ocean or saline embayment waters between Point Conception and the Mexican border:
  1. Water column sampling
  2. Sediment sampling; and
  3. Trawling (3-500 m depth)
  
- Perform the following laboratory analyses of samples collected (at stations yet to be identified) at depths of 3 – 1,000 m in ocean or saline embayment waters between Point Conception and the Mexican border:
  4. Inorganic sediment chemistry;
  5. Organic sediment chemistry;
  6. Fish tissue;
  7. Benthic infauna; and
  8. Sediment toxicity
  9. Water column toxicity

Section II of this Proposal Form provides a summary of methods to be used for each of the elements of work. Final field and laboratory methods manuals providing greater detail regarding all standards and requirements for each element of work will be issued to all successful bidders prior to the commencement of work. As an example, the field methods manual and quality assurance manual for SCCWRP's last regional survey can be found at SCCWRP's web site ([www.sccwrp.org](http://www.sccwrp.org)).

At present, the amount and locations of sampling stations, as well as the amount of samples for laboratory analyses, have not yet been determined. Bidders are asked to provide pricing for each element within this Scope of Work; at the bidder's discretion, bidders may provide one price or specify price breaks at different possible levels of effort as determined by the bidders, indicating the appropriate price differences for different levels of work (i.e. cost per sampling site or sample analysis for 10-25, 26-50, 51-100, or 100-250 sites/samples). For field activities, if bid prices will differ due to geographic factors (i.e. by region) or depth factors (i.e. 3-200 m, 200-500 m, or 500 – 1000 m), indicate separate pricing for each region or depth. The actual number of sampling sites and samples for analysis will be determined prior to the execution of contracts with the successful bidder(s).

Successful bidders will be required to participate in Quality Assurance/Quality Control (QA/QC) activities to demonstrate comparability in data quality with other participating organizations in the 2003 Regional Survey. QA/QC activities will include pre-survey and in-survey audits of equipment, taxonomic identification exercises, and instrument intercalibration exercises as detailed in the Scope of Work section below. Participation in these activities shall be at the bidders' own expense, and the costs of participation must be included in the bid prices provided in this Proposal Form. NOTE: Failure to

participate, or unsatisfactory performance, in these QA/QC activities will result in the cancellation of SCCWRP's contract with the bidder.

It is anticipated that field sampling will commence in July 2003 and be completed by September 2003. Laboratory analyses will commence in August 2003.

While the initial goal of this RFP is to support the 2003 Regional Survey, SCCWRP may also request the successful bidder to provide the scope of services described in this RFP for up to a period of five years. This work is not guaranteed and the quantity of these additional task orders is currently unknown. If requested to conduct additional work in the future, the successful bidder will be offered the opportunity to revise their price quotes to incorporate a mutually agreeable adjustment for inflation.

#### Technical requirements for each work element

##### 1) Water-column sampling

###### *Product*

The objective of the water-column sampling is to characterize depth-related gradients in water-column properties. Water-column profiling using conductivity-temperature-depth profilers (CTDs) will describe gradients in temperature, salinity, hydrogen ion content (pH), transmissivity, dissolved oxygen and concentration of chlorophyll at each station. The final products will be a file of CTD data in digital format including the agency, station, date, depth (m), temperature (°C), conductivity (Siemens/m), oxygen (mg/L), light transmission (%), salinity (PSU), pH, potential density anomaly as sigma theta (kg/m<sup>3</sup>) and relative *chlorophyll* fluorescence (VDC). In addition, up to 3 discrete water sample depths will be collected at each site for chlorophyll, suspended solids, nutrients, and dissolved oxygen, with a final product consisting of concentrations of chlorophyll, suspended solids, nutrients and dissolved oxygen. The data will be provided on hard-copy data sheets and in computer files using specified formats.

###### *Equipment*

The following equipment is required: a Seabird 9/11 (model SBE 9 that interfaces with an SBE 11 deck box) or SBE-25 CTD with recent (within 6 months) factory calibration certification data. CTDs must be equipped with sensors that measure temperature, conductivity, pressure, dissolved oxygen, transmissometry (either a Sea Tech or WET Labs 25 cm pathlength with 660 nm wavelength), chlorophyll sensitive fluorometry (preferably SeaTech or WET labs with excitation centered at 440 nm and emission centered as -680 nm), and pH. Other CTDs are acceptable but they must: a) compare well to other participating agencies' CTDs in an intercomparison exercise; b) sensors must be calibrated (specifically temperature and conductivity) at an acceptable national calibration facility; c) all sensors and housing must be capable of profiling to at least 200 m below the ocean surface; and d) CTD must collect data from sensors at a minimum of 8 scans per second.

Discrete water samples can be collected with either a CTD/rosette system, a stand-alone rosette system, or individual bottles hung from a wire. Each bottle should hold more than 5 liters of sample volume. An onboard filtration system is required to immediately process water samples for chlorophyll samples.

## *Methods*

A precruise equipment checkout must be conducted less than or equal to 24 hr prior to the survey cruise. This includes a precruise calibration and visual inspection of the equipment (such as, plugs are secure and waterproof, computer output test for CTD sensors, and checking battery status).

During the survey, routine visual inspection of cast profiles is required to spot potential sensor problems so immediate action can be taken to replace sensor and resample sites with bad data. Before beginning a cast, a 3 minute equilibration upon initial start up and 90 second at each station thereafter will be required to bring the CTD sensors to thermal equilibration with the ambient sea water. The CTD must be lowered to within 2m of bottom when possible with a descent rate not to exceed 1 m/sec; the recommended optimum descent rate is 0.25-0.50 m/sec. The instrument should have a scan rate of no fewer than 8 scans/sec. All raw data will be submitted to SCCWRP. All processed data will be averaged to one second intervals and submitted to SCCWRP.

A post cruise calibration will be required within 24 hr of the last site sampled. The goal is not to recalibrate the instrument, but to record the sensor reading of air saturated water so sensor drift can be calculated.

Some discrete samples will require onboard filtration. Chlorophyll will require immediate filtration on GF/F type filters. Suspended solids samples must be filtered within 24 hr of collection on pre-weighed filters. Preservation and storage protocols shall be as follows: 1) a chlorophyll sample filter shall be placed in a scintillation vial, 10 ml of 90% acetone added, than stored in a freezer for 24 hr before analysis; 2) a nutrient sample shall be frozen for later analysis; 3) a suspended solid sample filter shall frozen for later analysis; and 4) a dissolved oxygen sample shall be immediately fixed and stored upright in a cool location. Samples must be shipped frozen (if required), in the dark, and within 2 days of collection to a designated laboratory for immediate analysis.

Hard copies of all sensor and equipment factory maintenance, pre-and postcruise calibration sheets and CTD field data sheets should be maintained and made available upon request.

## *Quality Assurance/Quality Control*

The contractor will be required to participate in a presurvey intercomparison exercise with all participants in the survey to evaluate the precision, accuracy and comparability of CTDs. The exercise will involve placing all the CTDs in a common temperature-controlled, aerated seawater tank.

## **2) Sediment sampling**

### *Product*

The objective of sediment sampling is to collect sediment for benthic infaunal analysis, sediment chemistry and sediment toxicity. A maximum of four successful benthic grabs will be required: 1 for benthic infauna, 1 for sediment chemistry, and 2 for sediment toxicity. The final product will be properly preserved and labeled samples for benthic infauna, sediment chemistry (metals, organic compounds, sediment grain size, TOC), and sediment toxicity along with

associated chain-of-custody forms. Field observations and sampling positions will be recorded on Cruise logs and Benthic Sampling data forms which will be submitted along with a computer file of this information in specified formats. These computer data files and hard copy forms are to be submitted within 10 working days of completion of field sampling.

### *Equipment*

At least one person on board must have previous experience with collecting, sieving, and preserving samples using a single or tandem 0.1 m<sup>2</sup> Van Veen grab. All surfaces of the grab must be free of rust. Each boat utilized for sampling must have appropriate facilities for 1mm sieving or screening of samples, including a means to filter the vessel's wash water to preclude inclusion of planktonic organisms into the sample.

Samples for sediment chemistry should be collected with a stainless steel, Teflon-coated or plastic scoop. For toxicity samples, a polypropylene or metal scoop may also be used.

### *Methods*

Station occupation is to be guided by use of a differential global positioning system (dGPS). All sampling is to be conducted within 100 M of the nominal site coordinates. The actual position of the vessel at the point at which samples are collected (i.e. the point at which the grab contacts the seafloor) is to be recorded for each benthic grab. Field sampling is to be conducted between sunrise and sunset.

All samples will be collected with a 0.1 m<sup>2</sup> Van Veen grab. The grab should be lowered at 2 m/sec until it is 5 m above the bottom; then it should be lowered at 1 m/sec. Upon retrieval of the grab, the surface of the grab must be inspected for acceptability. To be acceptable, the surface of the grab must be even, with minimal surface disturbance and little or no leakage of overlying water. If the grab is acceptable, the overlying water should be carefully drained. For infaunal samples, the overlying water must be screened; any organisms captured on the screen should be added to the infaunal sample.

The depth of the sediment in the grab will then measured. To be acceptable, penetration depth must be at least 5 cm. If a grab is found not to be acceptable, additional grab samples must be taken. If after 3 successful attempts (with no mechanical problems), no sample with at least 5 cm penetration is collected, the station location should be repositioned within 100 m. If successful grabs cannot be collected from two successive sites within 100 m, the site may be abandoned with no penalty to the contractor.

Samples for benthic infaunal analysis will be screened through a 1.0 mm mesh screen. All vessel wash water must be filtered. The material retained on the screen will be placed in a jar. A solution of relaxant will be added to the jar. After 30 minutes, buffered formalin should be added to obtain approximately 10% formalin solution.

Samples for sediment chemistry will be collected from the top 2 cm of the grab. Sediment within 1 cm of the sides of the grab should be avoided. Sediment grain size and total organic carbon will each require one 4 oz jar of sample. Trace metals and organics will each require two 8 oz jars of sample. Jars will be provided by SCCWRP. Samples for sediment grain size should be stored at 4°C on ice or in a refrigerator. Other samples may be stored at 4°C, but must be frozen within 24 hr. Samples should be returned to the laboratory within a week.

Samples for toxicity will also be collected from the top 2 cm of the grab. A total of 2 L of sample should be collected in two 1-L jars. Toxicity samples should be maintained in the dark at 4°C on ice or in the refrigerator. Samples must be returned to the lab within 1 week.

#### *Quality Assurance/Quality Control*

No intercalibration is required for this element. However, the contractor must be available for a precruise inspection of equipment and a demonstration of sampling techniques will be required.

### **3) Trawling**

#### *Product*

The purpose of the trawl survey is to (1) collect samples for analysis of demersal fishes and megabenthic invertebrates for assemblage analyses; (2) estimate the prevalence of external anomalies and diseases of fishes and invertebrates; (3) estimate amount of marine debris; (4) collect samples to be used to for analysis of bioaccumulation of contaminants in fish tissues; and (5) assess contaminant exposure and sublethal impacts to fishes using biomarkers. The final product will be data from each station on field observations and sampling positions (positions when the net lands on the bottom and beginning of trawl retrieval); species identification, abundance, biomass, anomalies, and length (fish only) of fish and invertebrates; the relative amount of debris collected in each trawl; and whole fish samples of target species for bioaccumulation analyses. The data, including Cruise logs and Trawl Sampling data forms, will be provided on hard-copy data sheets and in computer files using specified formats. These computer data files and hard copy forms are to be submitted within 20 working days of completion of field sampling.

#### *Equipment*

Station occupation is to be guided by use of a differential global positioning system (dGPS). All sampling is to be conducted between one hour after sunrise and one hour before sunset. The trawl track is to pass within 100 M of the nominal site position.

Trawling will require semiballoon otter trawls with the following dimensions: a) 7.6-m (25 ft) head rope; b) 1.2 cm (0.5 in) cod-end mesh; and 76 cm (30 in.) x 51 cm (20 in) doors, weighing 16 kg (35 lb).

Trawl processing will require the following equipment: 1) a range of hanging spring scales (cylindrical with a hook at bottom) capable of weighing fish in buckets, which in combination are capable of weighing from 0.1 to 6 kg; 2) measuring board with meter stick for measuring centimeter size classes; 3) appropriate species identification aids recommended by field operations manual;

and 4) a camera suitable for producing good quality voucher photographs of large specimens.

Qualified field staff will be required for doing all work in field. A fish taxonomist and megabenthic invertebrate taxonomist knowledgeable of the species encountered on the mainland shelf and slope of southern California must be onboard the sampling vessel during all surveys. The contractor must also be willing to fix voucher and anomalous fish and invertebrates in 10% buffered seawater-formalin solution on board vessel as needed.

### *Methods*

At each station, a 10 minute trawl will be made at a speed of 1.0 m/sec along the isobath. After retrieval, the trawl will be inspected to determine that the net fished as required. If the trawl is deemed acceptable, the fish and invertebrates will be sorted and identified to lowest possible taxon (i.e., species for all fish and most invertebrates). Species that cannot be identified must be returned to the laboratory for identification.

All fish will be measured to centimeter size class on measuring boards. Very large specimens may be measured with a meter stick or tape measure. Maximum (board) standard length will be measured on bony fish and total length will be measured on cartilaginous fishes, with wingspan also being recorded for stingrays. For less abundant species, the size class will be listed on the species data page. All fish will be measured. If there is a huge catch of a single species, a subsample of at least one hundred fish should be measured. Lengths of invertebrate species will not be measured, unless specifically mentioned.

Most invertebrates will be enumerated following identification. However, counts of particularly abundant species may be estimated from the biomass. Fish are enumerated indirectly during the measurement of lengths. However, a complete count is required for all species (whether all individuals are measured or not). Biomass of each species of fish and invertebrate will be measured to the nearest 0.1 kg with a spring scale. The tare of the container will be subtracted from the gross weight. Small species weighing less than 0.1 kg will be combined into a composite weight. There will be one composite weight for fish and one for invertebrates per trawl sample.

During measurement and identification, fish and invertebrates will be examined for external gross pathology, including fin and tail erosion, tumors, lesions, external parasites, and color, skeletal or other anomalies.

Debris in the trawl will be classified by type (e.g., cans, bottles, fishing gear, rocks, terrestrial vegetation, marine vegetation, benthic debris, etc.) and classified into abundance and weight categories (trace, low, moderate, and high).

Whole fish of target species (primarily sanddabs, but some other species) will be collected for bioaccumulation analysis and biomarker studies. Six fish of specified size classes will be collected for each target species taken in a trawl for the bioaccumulation study, and five fish for biomarker studies. If the target species is taken at a station is collected in insufficient numbers in the trawl, up to

two additional 10 minute trawls may be conducted to collect enough specimens to make up a composite.

The contractor will be responsible for assembling a voucher collection of all species identified in the field. A voucher specimen of each specimen collected in the contractor's portion of the survey must be returned to SCCWRP following the survey. In almost all cases, this will consist of a specimen fixed in 10% buffered seawater-formalin solution and preserved in 50% isopropanol. Photographs are not suitable for most specimens. The only exception is the vouchers of very large specimens that may consist of good quality photographs. In addition, incompletely identified specimens and fish with tumors or other anomalies should be preserved by freezing or by fixation in buffered formalin and returned to the laboratory.

#### *Quality Assurance/Quality Control*

The successful bidder will be expected to participate in QA/QC exercises that will include presurvey and in-survey equipment and protocol assessments. For taxonomy, this will include participation in any presurvey training and intercalibration exercises, in-survey audits, and collection of a voucher specimen of each species collected during the contractor's portion of the survey. Presurvey training exercise will consist of one field and one laboratory information exchange session, and participation in an intercalibration exercise requiring identification of species in a bucket of fish and a bucket of invertebrates.

#### **4) Inorganic sediment chemistry**

##### *Product*

Sediment samples are to be analyzed for 14 trace metals (Table 1) and moisture content. The final product will be a computer file in a prescribed format, including field order and analyte codes. All data are due within 45 days of sample delivery.

##### *Equipment*

Atomic absorption spectrometer (AA), inductively coupled plasma atomic emission spectrometer (ICP-AES), and inductively coupled plasma mass spectrometer (ICP- MS) must be utilized.

##### *Methods*

Sediment samples will be digested using a strong acid method (chloric acid/nitric acid) approved or recommended by EPA. Prior to analysis of any field samples, the laboratory should establish five-point calibration ranges for all the target analytes. The lowest point of each calibration curve must be equal to the maximum acceptable method detection limits (MDLs) for all the trace metals (Table 1). Initial MDLs for target analytes must be obtained and should not be higher than the maximum acceptable MDLs. Data are to be reported as dry weight.

##### *Quality Assurance/Quality Control*

An intercalibration exercise will be conducted in which reference material CRM-10-050 (lot #L516) from Resource Technology Corporation will be analyzed, along with up to two other reference materials to be determined; results should



be that are comparable to those of other participating agencies in the 1998 Regional Survey. Participation in group meetings regarding intercalibration and quality control issues.

## **5) Organic sediment chemistry**

### *Product*

Sediment samples are to be analyzed for 41 PCB congeners (Table 2), 6 DDT components (Table 3), 24 PAH compounds (Table 4) and moisture content. The final product will be a computer file in a prescribed format, including field order and analyte codes. All data are due within 45 days of sample delivery.

### *Equipment*

A gas chromatography/electron-capture detector (GC/ECD) and gas chromatography/mass spectrometer (GC/MS) must be utilized.

### *Methods*

Sediment samples may be extracted using any of the EPA-approved methods or equivalents. Clean-up procedures are essential to remove matrix interference.

Surrogate standards should be spiked into the samples (including quality control samples) prior to extraction. Internal calibration is preferred as the quantitation method and internal standards are added to the samples before injection. PCBs and DDTs will be measured using a GC/ECD and a capillary column. Confirmation of peak identification is required and should be done using a GC/MS and capillary column under the identical chromatographic conditions to those used for the GC/ECD instrument. Selected Ion Monitoring (SIM) mode is preferred in order to achieve comparable detection sensitivity as with GC/ECD. PCBs should be measured on a congener-specific basis, as opposed to the conventional Aroclor pattern-matched approach. To achieve reasonable chromatographic resolution, the total run time for PCB analysis should not be less than 60 minutes.

PAHs will be measured using a GC/MS and a capillary column. Chromatographic conditions should be so chosen that benzo[b]fluoranthene and benzo[k]fluoranthene can partially be resolved. Mass spectrometry full scan should be used in acquiring data to allow confirmation of positive peak identification by matching sample spectra with reference spectra.

Prior to analysis of any field samples, the laboratory should establish five-point calibration ranges for all the target analytes. The lowest point of each calibration curve must be equal to the report level (Tables 2-4). MDL for each target analyte must be obtained and should not be higher than the reporting level. Data are to be reported as dry weight. The PCB and PAH compounds are prepared in custom-made mixtures and can be purchased from AccuStandards, Inc.

### *Quality Assurance/Quality Control*

An intercalibration exercise will be conducted in which two sediments collected from Santa Monica Bay and the Palos Verdes Shelf will be analyzed (in

triplicates) for PCB congeners (Table 2), DDTs (Table 3), and PAHs (Table 4); results should be achieved that are comparable to those of other participating agencies in the 1998 Regional Survey. Participation in group meetings regarding intercalibration.

## **6) Fish tissue analysis**

### *Product*

Fish tissue samples are to be analyzed for 41 PCB congeners (Table 2), 6 DDT components (Table 3), and lipid content. The final product will be a computer file in a prescribed format, including field order and analyte codes. All data are due within 45 days of sample delivery.

### *Equipment*

GC/ECD and GC/MS must be utilized.

### *Methods*

Composites of 6-10 whole fish (one species per composite from several species) will be homogenized prior to extraction. The appropriate blender (0.5 L and 1.0 L with glass or stainless steel containers with silicone or B.U.N.A. rubber gaskets - no neoprene) is necessary for whole fish homogenization. Caution should be taken to avoid cross contamination.

Extraction can be performed using any of the EPA-approved methods or equivalents. Clean-up procedures are essential to remove matrix interference. Surrogate standards should be spiked into the samples (including quality control samples) prior to extraction. Internal calibration is preferred as the quantitation method and internal standards are added to the samples before injection.

PCBs and DDTs will be measured using a GC/ECD and a capillary column. Confirmation of peak identification is required and should be done using a GC/MS and capillary column under the identical chromatographic conditions to those used for the GC/ECD instrument. Selected Ion Monitoring (SIM) mode is preferred in order to achieve comparable detection sensitivity as with GC/ECD. PCBs should be measured on a congener-specific basis, as opposed to the conventional Aroclor pattern-matched approach. To achieve reasonable chromatographic resolution, the total run time for PCB analysis should not be less than 60 minutes. Data are to be reported as wet weight.

### *Quality Assurance/Quality Control*

The selected contractor will be required to demonstrate proficiency through participation in an intercalibration exercise, in which a reference material, CARP-1, from the National Research Council (Canada) will be analyzed in triplicates for chlorinated hydrocarbons and lipid content. The results will be compared to the certified values and results and must be of comparable quality to that of other participating organizations in the 1998 Regional Survey. Participation in group meetings regarding intercalibration and quality control issues and familiarity with all relevant technical approaches will be required.

Table 1. List of metals and maximum acceptable method detection limits for the 2003 regional survey.

Target Analyte	MDL (ug/g) (dry wt based)
Aluminum	a
Antimony	10
Arsenic	1.6
Beryllium	0.2
Cadmium	0.2
Chromium	16
Copper	7.0
Iron	a
Lead	9.3
Mercury	0.03
Nickel	4.2
Selenium	1.0
Silver	0.2
Zinc	30

<sup>a</sup>Must report a value above the detection limit.

Table 2. List of PCB congeners and reporting levels for the 2003 regional survey.

Congener	Reporting Limit (ng/g) <sup>a</sup>	
	Sediment (dry wt)	Fish (wet wt)
18	1	10
28	1	10
37	1	10
44	1	10
49	1	10
52	1	10
66	1	10
70	1	10
74	1	10
77	1	10
81	1	10
87	1	10
99	1	10
101	1	10
105	1	10
110	1	10
114	1	10
118	1	10
119	1	10
123	1	10
126	1	10
128	1	10
138	1	10
149	1	10
151	1	10
153	1	10
156	1	10
157	1	10
158	1	10
167	1	10
168	1	10
169	1	10
170	1	10
177	1	10
180	1	10
183	1	10
187	1	10
189	1	10
194	1	10
201	1	10
206	1	10

TABLE 3. List of DDT components and reporting levels for the 2003 regional survey.

Congener	Reporting Limit (ng/g) <sup>3</sup>	
	Sediment (dry wt)	Fish (wet wt)
o,p'-DDT	1	10
p,p'-DDT	1	10
o,p'-DDD	1	10
p,p'-DDD	1	10
o,p'-DDE	1	10
p,p'-DDE	1	10

TABLE 4. List of PAH compounds and reporting levels for the 2003 regional survey.

Target Analyte	Reporting Limit (ng/g drywt)
Naphthalene	50
2-Methylnaphthalene	50
1-Methylnaphthalene	50
Biphenyl	50
2,6-Dimethylnaphthalene	50
Acenaphthylene	50
Acenaphthene	50
1,6,7-Trimethylnaphthalene	50
Fluorene	50
Phenanthrene	50
Anthracene	50
1-Methylphenanthrene	50
Fluoranthene	50
Pyrene	50
Benzo[a]anthracene	50
Chrysene	50
Benzo[b]fluoranthene	50
Benzo[k]fluoranthene	50
Benzo[e]pyrene	50
Benzo[a]pyrene	50
Perylene	50
Indeno[1,2,3-cd]pyrene	100
Dibenzo[a,h]anthracene	100
Benzo[g,h,i]perylene	100

## 7) Benthic infaunal samples

### *Product*

Sample analysis for benthic infaunal samples includes the following tasks: (1) transfer of the sample from formalin to alcohol; (2) sorting the sample to remove all organisms from the debris; and (3) identification and enumeration of all organisms in the sample. In addition, prequalification of the laboratory in a taxonomic intercalibration exercise and participation in a series of workshops on taxonomy, culminating in a synoptic review of the project data by all participants, is required.

The final product will be data sheets showing the number of individuals in each taxon at each station as well as supporting documentation and data for QA/QC.

The data will also be provided in computer files in specified formats. All data are due within 160 days of sample delivery.

### *Methods*

Benthic samples must be washed and transferred to a 70% solution of ethanol after a minimum of 72 hours or a maximum of two weeks after collection. It is recommended that the alcohol be buffered with marble chips. Formalin from the sample should be decanted through a 0.5 mm or finer mesh.

Sorting will include completion of a Sorting Record form provided to the contractor. Samples must be sorted under a stereo microscope. All individual organisms except foraminiferans and planktonic organisms should be removed from the sample and sorted into taxa lots (e.g., Annelida, Mollusca). Fragments of organisms should also be removed. Each taxon lot should be internally labeled with the sample number. Labels should be written in pencil or indelible ink on 100% rag-paper, poly-paper or other paper suitable for wet labels.

The laboratory may use its own bench sheets for identification. However, in addition to columns for the taxon name and the number of individuals, two additional columns must be included: (1) Voucher and (2) Exclude. The voucher column will be used to note the removal of specimens for the voucher collection (See below). The exclude column is used to note when a taxon should be excluded from the data for counts of number of species. Instructions will be provided for filling out these columns.

Taxonomic identifications, including nomenclature and orthography, will be based on Edition 4 of the Southern California Association of Marine Invertebrate Taxonomists as well as keys and other materials produced for the survey. The objective will be to accurately identify all organisms to the lowest possible taxonomic category, most often species, and to provide an accurate count of the organisms in each taxon.

Following identification and enumeration, all specimens are to be retained in taxa lots within the sample. Minimally, the material must be segregated and internally labeled into the following 17 lots:

### *Annelid lots:*

Oligocheata  
Spionidae  
Cirratulidae  
Other Polychaetes (by order)

*Echinoderm lots:*

Ophiuroidea  
Misc. Echinodermata

*Arthropod lots:*

Ostracoda  
Amphipoda  
Decapoda  
Misc Arthropoda

*Misc. Phyla lots:*

Cnidaria  
Nematoda  
Nemertea  
Other Phyla (a collective lot)

*Molluscan lots:*

Bivalvia  
Gastropoda  
Misc. Mollusca

The laboratory will be responsible for maintaining thorough and complete records through all stages of sample analysis and QC procedures.

*Quality Assurance/Quality Control*

Since taxonomic consistency is of particular importance in a cooperative survey, the taxonomists will be required to participate in meetings to discuss taxonomic issues. It is expected that the meetings will be held approximately once a month during the project. In addition, after the data from all laboratories is compiled, the taxonomists will have 2-3 meetings organized by major taxa to review the final data for taxonomic consistency.

Before benthic organisms are identified, the contractor must show that the taxonomists who will process samples can meet the Measurement Quality Objectives for sample identification and enumeration by participating in a pre-qualification exercise. The contractor will submit a list of taxonomists who will be processing samples along with the taxonomic groups for which each person will be responsible. Any taxonomist who did not participate in the quality control exercise for sample identification in the Southern California Bight Pilot Project or Bight '98 will be required to identify and enumerate two taxa lots in the taxonomic group for which they are responsible. The data sheets for the samples and the samples sorted into taxa lots as reported in the results will be returned to SCCWRP. The results of the identifications will be scored by the Chairperson of the Benthic Working Group and selected members of SCAMIT as described in Montagne and Bergen (1977). If the taxonomist meets the



Measurement Quality Objectives (MQO) of 10% for the number of taxa reported, total organism count, and accuracy of identification, the taxonomist will be considered qualified to process samples. If the taxonomist does not meet the MQOs, the committee will evaluate the reasons for the failure and make a recommendation to the Steering Committee as to whether the taxonomist is qualified to process samples. If the Steering Committee finds that the taxonomist is not qualified, that person will not be allowed to process samples.

The contractor must create a voucher collection of all taxa identified to species in the survey. Only glass containers are to be used for the storage of voucher material unless specimens are inappropriate for wet storage.

Quality control for sorting will require resorting a minimum of 10% of each sample must be resorted by an experienced sorter other than the original sorter. If the MQO of 95% removal efficiency is not met, the entire sample must be resorted.

Quality control for taxonomic identification and enumeration will involve reidentification of 10% of samples processed by each laboratory according to the procedures described in Montagne and Bergen (1997). The contract lab will reidentify a number of samples equal to 10% of the number of samples processed. After the results of the reidentification have been submitted, the taxonomists will meet to resolve discrepancies between the laboratories.

## **8) Sediment Toxicity**

### *Product*

Bulk sediment samples will be tested for survival of *Eohaustorius estuarius* after 10 days exposure. The final product will be a computer file of amphipod survival and associated test water quality in a prescribed format, including field order and analyte codes. In addition, a hardcopy report must be delivered that provides test endpoint summary statistics and a statement of quality assurance including descriptions of QA/QC deviations, if any. All data are due within 45 days of sample delivery.

### *Methods*

The amphipod survival test will be conducted according to US EPA (1994) guidelines. This test consists of a 10-day exposure of *Eohaustorius estuarius* to sediment under static conditions. Amphipods are placed in glass chambers containing seawater and a 2 cm layer of test sediment. The number of surviving amphipods is measured at the end of the test and used to calculate the percentage survival.

All test organisms must be obtained from a common source during the Bight '03 survey. Species identification should be verified through consultation with a taxonomist, if necessary. Individuals selected for testing should be visually inspected to confirm that they are the proper size and in good condition (i.e., no external damage). Holding time prior to testing should be 10 days or less.

A reference toxicant test must be run with every batch of test samples in order to document amphipod relative sensitivity and test precision. This test will consist of a 96-hour exposure to five different concentrations of cadmium dissolved in seawater. Cadmium concentrations will be selected to provide an estimate of the LC50 and will be verified by chemical analysis of a midrange concentration. Reference toxicant test results that fall outside of control chart limits (2 std dev of mean) will trigger a review of test procedures and a possible retest of the corresponding sediment samples.

Water quality of the overlying water and pore water will be measured for each sample type at the beginning of the exposure. Overlying water quality will also be measured at the end of exposure. Temperature will be measured continuously in the exposure room. Instruments will be calibrated daily. Deviations in water quality will be noted on the data files and a synopsis given in the hardcopy summary report.

This toxicity test procedure is considered unacceptable if amphipod survival in "home sediment" is less than 90%, or if survival in any control replicate is less than 80%. Reference toxicant results must also be within two standard deviations of the mean response specific to the laboratory. Water quality parameters (salinity, temperature, pH, and ammonia) should also be within the tolerance range of the test organism, as specified in EPA (1994) guidance.

#### *Quality Assurance/Quality Control*

The selected contractor must be able to demonstrate proficiency of toxicity testing with this species. Prior to participating in the Bight '03 survey, the test laboratory must document at least three prior tests in which test acceptability was attained. In addition, the laboratory should have conducted at least three prior reference toxicant tests so that a control chart can be constructed. A written description of the test method used must also be provided to the Toxicology Committee prior to the analysis of samples.

The selected contractor must participate in one pre survey coordination meeting, one post survey data exchange meeting, and successfully complete an amphipod survival test interlaboratory comparison exercise, which will be conducted prior to sample testing. This exercise will include the analysis of field collected sediments and a reference toxicant test. Successful completion of this exercise by a laboratory will be evaluated using two criteria: 1) attainment of test acceptability criteria, and 2) agreement of results between laboratories. The criteria for establishing agreement of results will be determined by the Toxicology Committee.

## **9) Water Column Toxicity**

### *Product*

Seawater and stormwater plume samples will be tested for toxicity using one of the following methods: purple sea urchin fertilization test or 96 hr mysid survival test. The final product will be a computer file of the test results and associated test water quality in a prescribed format, including field order and analyte codes. In addition, a hardcopy report must be delivered that provides

test endpoint summary statistics and a statement of quality assurance including descriptions of QA/QC deviations, if any. All data are due within 45 days of sample delivery.

### Methods

The sea urchin fertilization test will be conducted according to USEPA (1995) guidelines. This test consists of a 20-minute exposure of *Strongylocentrotus purpuratus* sperm to the sample under static conditions. The sperm are placed in glass chambers containing 10 mL of sample. Unfertilized eggs are added to the sample chamber after the sperm exposure period and the percentage of fertilized eggs is determined by examination using a microscope.

The mysid survival test will be conducted according to USEPA (1993) guidelines. This test consists of a 96-hour exposure of *Americamysis bahia* juveniles (3-days old) to the sample under static-renewal conditions. The mysids are exposed in glass chambers containing 200 mL of solution, with a 75% renewal of the solution at 48 h. The number of surviving mysids at the end of the exposure is determined and used to calculate the percentage survival.

All test organisms must be obtained from a common source during the Bight '03 survey. Species identification should be verified through consultation with a taxonomist, if necessary. Individuals selected for testing should be visually inspected to confirm that they are the proper size and in good condition (i.e., no external damage). The salinity of all samples must be adjusted to the range specified by the test protocol prior to testing. The tests will be conducted on the 100% sample concentration only. Dilutions of the samples will not be tested.

A reference toxicant test must be run with every batch of test samples in order to document relative test sensitivity and test precision. This test will consist of a concurrent exposure to five different concentrations of copper dissolved in seawater. Copper concentrations will be selected to provide an estimate of the median effect concentration and will be verified by chemical analysis of a midrange test concentration. Reference toxicant test results that fall outside of control chart limits (2 sd of mean) will trigger a review of test procedures and a possible retest of the corresponding samples.

Water quality of each sample type will be measured at the beginning of the exposure. Water quality during the mysid test will also be measured at the water change and end of exposure. Temperature will be measured continuously in the exposure room. Instruments will be calibrated daily. Deviations in water quality will be noted on the data files and a synopsis given in the hardcopy summary report.

This toxicity test procedure is considered unacceptable if test acceptability criteria described in the method reference are not met. Reference toxicant results should also be within two standard deviations of the mean response specific to the laboratory. Water quality parameters (salinity, temperature, pH, and ammonia) should also be within the tolerance range of the test organism, as specified in the method reference.

### *Quality Assurance/Quality Control*

The selected contractor must be able to demonstrate proficiency of toxicity testing with the species. Prior to participating in the Bight '03 survey, the test laboratory must document at least three prior tests in which test acceptability was attained. In addition, the laboratory should have conducted at least three prior reference toxicant tests so that a control chart can be constructed. A written description of the test method used must also be provided to the Toxicology Committee prior to the analysis of samples.

The selected contractor must participate in one pre survey coordination meeting, one post survey data exchange meeting, and successfully complete an interlaboratory comparison exercise using the selected test method. The interlaboratory comparison exercise will be conducted prior to sample testing. This exercise will include the analysis of field-collected samples and a reference toxicant test. Successful completion of this exercise by a laboratory will be evaluated using two criteria: 1) attainment of test acceptability criteria, and 2) agreement of results between laboratories. The criteria for establishing agreement of results will be determined by the Toxicology Committee.

### **Literature Cited**

Montagne, D., and M. Bergen. 1997. Quality control and assessment of infaunal identification and enumeration: the SCBPP experience, pp. 147-154 in: S. Weisberg, C. Francisco and D. Hallock (eds.), Southern California Coastal Water Research Project Annual Report 1996. Westminster, CA.

USEPA (United States Environmental Protection Agency). 1993. Methods for measuring the acute toxicity of effluents and receiving waters to freshwater and marine organisms. Fourth Edition. USEPA Environmental Monitoring and Support Laboratory, Cincinnati, OH. EPA/600/4-90/027F.

USEPA (United States Environmental Protection Agency). 1994. Methods for assessing the toxicity of sediment-associated contaminants with estuarine and marine amphipods. EPA/600/R-94/025. USEPA Office of Research and Development, Washington, DC. 140 p.

USEPA (United States Environmental Protection Agency). 1995. Short-term methods for estimating the chronic toxicity of effluents and receiving waters to west coast marine and estuarine organisms. First Edition. USEPA National Exposure Research Laboratory, Cincinnati, OH. EPA/600/R-95/136.

### **III. SPECIAL REQUIREMENTS AND INSTRUCTIONS**

Bidders will be required to comply with the following special requirements and instructions during the performance of services rendered under this project:

#### *General*

- Insurance

Bidders shall, at their sole expense, maintain in effect at all times during the performance of services awarded under this Proposal Form, general liability insurance providing for bodily injury liability and property damage liability. The combined single limits of liability for bodily injury or property damage shall be One Million Dollars (\$1,000,000) for each occurrence and One Million Dollars (\$1,000,000) aggregate, with the policy naming Southern California Coastal Water Research Project Authority as Additional Insured. Further, workers compensation insurance shall be held and maintained as required by applicable laws of the State of California with a minimum amount and limit of One Million Dollars (\$1,000,000) for each accident. Bidders shall also hold automobile liability insurance (bodily injury and property damage liability), including coverage for all owned, hired, and non-owned automobiles, with the combined single limit of liability of Two Hundred Fifty Thousand Dollars (\$250,000) for any one accident or loss. Bidders shall provide SCCWRP with evidence that policies providing such coverage and limits are in full force and effect within ten (10) days of the award of any contracts by SCCWRP. Such certificates shall provide that not less than thirty (30) calendar days advance notice will be given to SCCWRP prior to cancellation, termination, or material alteration of said policies of insurance.

- Field Sampling Elements of Work

1. Possession of a valid Coast Guard license by the Captain of each boat utilized for field sampling is mandatory.
2. Possession of a valid scientific collecting permit by the cruise chief of each boat utilized for field sampling is mandatory.
3. All bidders for field sampling activities will be responsible for verifying the locations and depths of all sampling stations, and all stations must be plotted on North American (NAD) 1983 Datum charts.
4. All boats must have the ability to store collected samples using a refrigerator, freezer, or dry ice.
5. All samples collected must be delivered to SCCWRP or a designated laboratory within one week of collection, dependent on analysis requirements.
6. All containers, labels, and fixatives for field collections will be provided by SCCWRP.

### **IV. BID EVALUATION PROCESS AND CRITERIA**

Following the opening of bids, SCCWRP will evaluate and score the bids received. Each work element of each bid submitted will be evaluated using the following criteria and scoring system, with a maximum possible score of 100.

1. Price (40 points): The lowest bid price will receive the maximum score of 40 points, with higher bids receiving scores proportional to the lowest bid price. If

separate prices are provided for different quantities, SCCWRP will evaluate the bid based on the quantity of service that is most likely to be awarded.

2. Qualifications and experience (40 points): Each bid will be rated on a scale of 0 to 40 points, based upon the bidder's demonstrated experience using the methodologies and equipment required for the work, relevant experience of the bidder's staff members, and contingency planning for equipment and personnel due to weather, equipment failure, or other emergencies.
3. Survey/intercalibration experience (20 points): The regional survey data will be compiled from multiple sources. Consistency in procedures and measurements among data providers is important to the survey's success. Each bid will be rated on a scale of 0 to 20 points on the bidder's demonstrated experience in achieving similarity to others in cooperative surveys and intercalibrations. Points will be awarded for any intercalibration exercise or integrated multi-organization cooperative program. Preference will be given to those bidders with demonstrated comparability to other organizations participating in the southern California regional survey.

The bidder receiving the highest total score for each work element will be awarded a contract to perform the work. SCCWRP retains the right to award separate contracts for each of the work elements specified within the Proposal Form. SCCWRP also reserves the right to offer multiple contracts for the field surveys if there is sufficient geographical cost differentiation in the bids.

**V. PROPOSAL SUBMISSION**

*Bids*

Bidders may submit bids for any or all of the work elements as detailed in this Proposal Form. The amount and locations of sampling stations, as well as the amount of samples for laboratory analyses, have not yet been determined. Bidders are asked to provide pricing for each element within the Scope of Work; at the bidder's discretion, bidders may provide one price or specify price breaks at different possible levels of effort as determined by the bidders, indicating the appropriate price differences for possible levels of work (i.e. cost per sampling site or sample analysis for 10-25, 26-50, 51-100, or 100-250 sites/samples). For field activities, if bid prices will differ due to geographic factors (i.e. by region) or depth factors (i.e. 3-200 m, 200-500 m, or 500–1000 m), indicate separate pricing for each region or depth. The actual number of sampling sites and samples to be analyzed will be determined prior to the execution of contracts with the successful bidder(s). For work elements not being bid, please indicate NO BID on the first line of those sections.

1. Collect water column samples in ocean or saline embayment waters between Point Conception and the Mexican border.

	Pt Conception to Point Dume	Point Dume to Dana Point	Dana Point to the US/Mexico International Border	Channel Islands
Coastal Lagoons	\$ _____	\$ _____	\$ _____	\$ _____
3-200 m depth	\$ _____	\$ _____	\$ _____	\$ _____
200-500 m depth	\$ _____	\$ _____	\$ _____	\$ _____
500-1,000m depth	\$ _____	\$ _____	\$ _____	\$ _____

2. Collect sediment samples in ocean or saline embayment waters between Point Conception and the Mexican border.

	Pt Conception to Point Dume	Point Dume to Dana Point	Dana Point to the US/Mexico International Border	Channel Islands
Isolated Coastal Lagoons	\$ _____	\$ _____	\$ _____	\$ _____
3-200 m depth	\$ _____	\$ _____	\$ _____	\$ _____
200-500 m	\$ _____	\$ _____	\$ _____	\$ _____

depth				
500-1,000m depth	\$ _____	\$ _____	\$ _____	\$ _____

3. Conduct trawls in ocean waters between Point Conception and the Mexican border.

	Pt Conception to Point Dume	Point Dume to Dana Point	Dana Point to the US/Mexico International Border	Channel Islands
3-200 m depth	\$ _____	\$ _____	\$ _____	\$ _____
200-500 m depth	\$ _____	\$ _____	\$ _____	\$ _____
500-1,000m depth	\$ _____	\$ _____	\$ _____	\$ _____

4. Analyze inorganic sediment chemistry samples collected in ocean or saline embayment waters between Point Conception and the Mexican border.

No. of samples	Price per sample
_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____

5. Analyze organic sediment chemistry samples collected in ocean or saline embayment waters between Point Conception and the Mexican border.

No. of samples	Price per sample
_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____

6. Analyze fish tissue samples collected in ocean or saline embayment waters between Point Conception and the Mexican border.

No. of samples	Price per sample
_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____

7. Analyze benthic infauna samples collected in



A) Ocean waters (3-500 m depth) between Point Conception and Mexican border, including the Channel Islands.

No. of samples	Price per sample
_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____

B) Saline embayment or lagoon waters between Point Conception and Mexican border.

No. of samples	Price per sample
_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____

C) Deep ocean waters (500-1,000m) between Point Conception and Mexican border.

No. of samples	Price per sample
_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____

8. Analyze sediment toxicity samples collected in ocean or saline embayment waters between Point Conception and the Mexican border.

No. of samples	Price per sample
_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____

9. Analyze water column toxicity samples collected in ocean or saline embayment waters between Point Conception and the Mexican border using

A) Purple Sea Urchin fertilization test.

No. of samples	Price per sample
_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____

B) Mysid survival test.

No. of samples	Price per sample
_____	\$ _____
_____	\$ _____

\_\_\_\_\_  
\_\_\_\_\_

\$ \_\_\_\_\_  
\$ \_\_\_\_\_

Additional Information to Accompany Proposal Form

The following additional information must accompany this Proposal Form as detailed below. This additional information should not exceed fifteen (15) single-sided pages, 12 point times roman font, exclusive of resumes.

• **Statement of Qualifications**

Bidders are required to submit a Statement of Qualifications detailing the following information pertinent to the elements of work being bid. The document should include the following:

- a) a description of the firm;
- b) a listing of marine research and monitoring activities performed within the last three years;
- c) a listing of equipment to be utilized to perform the work;
- d) a listing of personnel that will perform the work (include resumes as an appendix);
- e) a description of the bidder's participation in previous integrated multi-agency cooperative projects, including SCCWRP's 1994 Southern California Bight Pilot Project and/or 1998 Regional Survey; and
- f) a description of the bidder's participation in previous intercalibration exercises such as those sponsored by SCCWRP and/or NOAA.
- g) a description of the bidders contingency plan detailing methods to complete the work being bid under the time frames indicated in the event of vessel, personnel and/or equipment failure.

• **Certifications and Permits**

Bidders are required to list all relevant certifications and permits necessary and/or desirable to perform the work being bid.

**VI. CERTIFICATION OF BIDDER**

Name of corporation, partnership, or individual in whose behalf the bid is submitted:

Address: \_\_\_\_\_

City/State/Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ FAX: \_\_\_\_\_ E-mail: \_\_\_\_\_

Tax Identification No.: \_\_\_\_\_

The full names and addresses of all persons and parties interested in the foregoing proposal as principals are as follows: (If bidder is a corporation or organization, give names of President, Secretary, and Treasurer; if bidder is a partnership, give the names of all partners.)

Name	Title
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I certify under penalty of perjury under the laws of the State of California that the foregoing representations are true and correct. Further, I certify that I have carefully examined the proposed work and the specifications as contained herein, and hereby propose to perform and complete all the work for this project as specified, in accordance with these specifications, and to furnish all materials and equipment necessary therefore to the satisfaction of SCCWRP, at the price(s) indicated within this document. In the event that this proposal is accepted by SCCWRP and the said work is awarded to the undersigned bidder, the said bidder agrees to sign and date, within seven (7) calendar days after it has been delivered or mailed to the bidder or its authorized agent, the Agreement for the performance of the work.

Signature of Bidder: \_\_\_\_\_

Title: \_\_\_\_\_ Date: \_\_\_\_\_