APPENDIX A

MANAGEMENT AND FACILITIES

The management structure, shown in the accompanying organizational diagram, has worked well for a dozen years. Control of the Project is in the hands of a Commission of distinguished members of the public under President Janet Garber. The Commission meets four times a year to hear the reports of the Project's Director and Administrative Officer, approve the Research Plan, and review financial and personnel matters.

Twice a year the staff meets with the Consulting Board, under the chairmanship of Professor Perry McCarty, to report on the progress of the scientific studies and to obtain advice and guidance on current and future investigations.

Day-to-day decisions relating to the conduct of the scientific work are made by the director and senior staff members who meet frequently to discuss Project activities. Most of our research projects are the combined efforts of chemists, biologists, and marine technicians, who are in daily contact. The spirit of friendly cooperation among these scientists, who are striving to be leaders in marine environmental studies, is one of our strong points.

An official accounting of our funds is kept by the County Sanitation Districts of Los Angeles County. In addition, the Project Administrative Officer keeps data that can be used to determine our financial status on an accrual basis and to control the costs of individual research tasks. This permits financial planning and cost allocation based on the research plan. A summary of our Revenues and Expenditures for 1981 and 1982 is attached.

As a means of keeping the local sponsors of this program informed about our research, meetings with a group of their technical representatives are held on the first Thursday of every even-numbered month.

Our cycle begins with the preparation of a Research Plan. This is a collection of proposals for research to be done in the following two years. Each proposal is developed by one or more of the scientists who plan to carry out the work. First, it describes some environmental problem which is of general interest. Then it gives the specific objective of the research to be done that will answer part of that problem; this is followed by an estimate of the probable answer or outcome. Next comes the description of what will be done, where, how often, and by whom. All the above can usually be covered in two pages; this gives enough information so that when the collection of 30 or so proposals is considered as a group, priorities can be set.

After considerable discussion and consultation with the Consulting Board the better proposals are chosen. This selection necessarily takes into account work in progress, contractual obligations with Federal Agencies, the special competence of staff members, availability of laboratory facilities, and such matters. Even after the research plan is adopted, we try to retain some flexibility so that it is possible to take advantage of better ideas and/or unexpected findings that arise in mid-cycle. Sometimes after the work starts it becomes evident that the results will be unsatisfactory; we simply scratch that project and transfer the effort to a new one or one that is going well.

As the research proceeds, we constantly exchange ideas with other scientists doing similar work by means of meetings, scientific papers, and personal contacts. The result is a continual exchange of ideas that helps all involved keep up with technological creep.

Finally, we put together the best of the results of two years research in reports such as this one. These reports are widely distributed to laboratories throughout the U. S. and the world. We are always pleased to have comments and criticisms on the papers contained herein, especially because many of them will later be published elsewhere.

Our scientific work is supported by several laboratories in which we can do the necessary experiments and make precise measurements. Our spacious and convenient headquarters building in Long Beach contains the following equipment and capabilities:

A **taxonomy laboratory** identifies and preserves reference specimens of the marine animals of southern California. In addition to a reference collection of bottled animals, this laboratory has a reference collection of taxonomic literature and microscopes (Aus Jena and Nikon stereoscopes, 4x to 100x) for examining animals.

The **toxicity laboratory** is an insulated aquarium room in which ocean water is used for many kinds of experiments. Four 340-liter (90 gallon) glass tanks and four 150 liter (40 gallon) tanks are kept at 12°C by the flow of surrounding cold water. Each aquarium has its own individual pump and filter so that the natural seawater in the tank is recirculated through the filter several times a day. One flow-through system of five 76-liter (20 gallon) tanks is used for toxicity tests; seventy jars, fourteen 19-liter (5 gallon) tanks, and 150 one-liter beakers are used for experiments with invertebrates.

The **wet chemistry laboratory** is used to monitor the chemical climate in the tanks in the toxicity laboratory and to determine some of the physical/chemical properties of samples of water, suspended solids, and sediments taken at sea. A Bausch and Lomb Spectronic 710 is used to measure echinochrome, ammonia, glutathione, enzyme activity, and protein content of cytosols. A Leitz SM-LUX microscope with phase contrast capabilities is used for the examination of invertebrate gametes, larvae, and adults.

In the **trace metals laboratory**, an atomic absorption spectrophotometer (Varian Techtron AA-6) with a carbon rod atomizer and BC-6 background corrector is used to measure metals in seawater, sediments, animal tissues, and effluents. With this device, and very careful preparation techniques, repeatable results are obtained for cadmium, chromium, copper, nickel, manganese, silver, and zinc in seawater at the tenth of parts-per-billion level. Chromium valence levels of three and six are measured independently. In another type of atomic absorption instrument, organic and inorganic mercury are measured independently, also to parts per billion. We also are able to take advantage of the 250 kw Triga reactor owned by the University of California at Irvine for nuclear activation analysis of arsenic, selenium, and antimony.

REVENUES	July 1980-June 1981		July 1981-June 1982	
Interest	$ 33,300		$ 43,500	
Joint Powers Agreement Parties	500,000		500,000	
U.S. Department of Commerce, NOAA	95,000		161,000	
National Science Foundation	85,000		30,100	
Orange County Sanitation Districts	-0-		81,700	
University of Southern California	9,500		45,300	
Marine Biological Consultants	38,700		-0-	
CH2M Hill, Inc.	19,500		-0-	
Other	10,600		3,100	
		$791,600		$864,700
EXPENDITURES				
Salaries and Benefits				
Salaries and Wages				
Scientists and Technicians	387,100		446,500	
Management and Administration	100,500		119,400	
Pension and Insurance	37,300	524,900	56,300	622,200
Fixed Assets				51,700
Equipment		27,400		
Services and Supplied				
Contracts and Grants	7,900		2,300	
Materials and Supplies	28,500		41,400	
Shiptime	7,200		9,800	
Independent Contractors	18,900		19,400	
Consulting Board	8,200		4,990	
Computer Services	300		1,200	
Publications	34,900		600	
Transportation and Travel	11,400		8,500	
Office Rental	33,600		36,200	
Office Expense	8,000		9,600	
Maintenance	12,600		15,600	
Telephone	10,900		9,900	
Utilities	11,100		13,400	
Equipment Rental	4,000		5,100	
Legal and Accounting Services	14,200		13,700	
Insurance	9,700		8,900	
Miscellaneous	1,500	222,900	4,400	204,900
		$775,200		$878,800

The **trace organics laboratory** makes precise measurements of chlorinated pesticides, benzenes, and polychlorinated biphenyls (to parts per trillion in seawater). Concentrations of these compounds have been measured extensively in the body parts of fish and invertebrates and in bottom sediments, river runoff, sewage effluent, aerial fallout, and harbor water.

The principal instruments are (1) A gas chromatograph (Tracor MT 220) utilizing dual packed columns and Ni electron-capture detectors; (2) a Varian Vista 44 gas chromatograph equipped with a glass capillary column, a Ni-electron-capture detector, and a computerized data handling system. This instrument allows us to automatically quantitate a large number of trace organics including base-neutral and acid extractable compounds; (3) A Varian 5000 Liquid chromatograph (an HPLC) with a variable wavelength detector that makes it possible to measure the metabolites of trace organic contaminants in the tissues of sea animals.

Other laboratory equipment includes a rotary evaporator, cell-disrupting homogenizer, analytical balance, freeze dryer, Coulson detector, and a kiln for cleaning glassware.

We also have access to a Finnegan 4021 GCMS (Gas Chromatograph/Mass Spectrometer) equipped with an Inco data system. This instrument is located at the Hyperion Treatment Plant; it allows us to determine the identity of unknown organic compounds.

The **histopathology laboratory** is equipped with a complete Tissue Tek II system for making slides. This system includes an automatic tissue processor, embedding center, microtome, drying ovens, and staining supplies. Slides are examined using a Leitz model SM-LUX microscope equipped with a camera for photographing slides.

The **phycology laboratory** was set up for the identification of marine algae and the preparation of museum quality herbarium specimens. There is an extensive library devoted to taxonomy and southern California algal ecology. Laboratory equipment includes a Nikon Labophot microscope and dissecting scope, plant presses, and a drying cabinet.

Project personnel spend a great deal of time at sea (438 man-days last year) taking samples of water and bottom sediments, trawling and fishing, towing television cameras, and placing current meters and collection devices. Our marine coordinator has been very successful at obtaining the services of various small ships at modest cost. We wish to thank the City of Los Angeles for the use of the MARINE SURVEYOR, the Los Angeles County Sanitation Districts for the use of SEA-S-DEE, the Orange County Sanitation Districts for the use of the ENCHANTER, and City of San Diego for the use of the MONITOR. A list of cruises is given in Appendix C.

The project has its own equipment for making measurements at sea, including current meters, drogues, corers, and Van Veen grabs. Special instrumentation includes underwater color television (120 m depth), a 35 mm still camera (1000 m depth) peristaltic and deep-well pumps for seawater sampling, and a Turner fluorometer.

The data processing facilities of the University of Southern California at Los Angeles (IBM 370-168) and at San Diego (CDC 3600 and B 6700) are used to process data on the distribution of fish and benthic invertebrates, as well as to analyze water motion and the distribution of fallout particles.