CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
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MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Los Angeles Regional Water Quality Control Board

December 15, 2015

Dr. Roberta L. Marinelli, Director
University of Southern California
Wrigley Marine Science Center
P.O Box 5069
Avalon, CA 90704

Dear Dr. Marinelli:

TRANSMITTAL OF ORDER AMENDING WASTE DISCHARGE REQUIREMENTS (WDRs) AND NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT – UNIVERSITY OF SOUTHERN CALIFORNIA, WRIGLEY MARINE SCIENCE CENTER, AVALON, CALIFORNIA (NPDES NO. CA0056651, CI-6068)

On October 23, 2015, we transmitted you the tentative order amending the existing National Pollutant Discharge Elimination System (NPDES) Permit (Order R4-2013-0172) for the Wrigley Marine Science Center.

Pursuant to Division 7 of the California Water Code, this Regional Water Board at a public hearing held on December 10, 2015, reviewed the tentative requirements, considered all factors in the case, and adopted Order R4-2013-0172-A01.

The requirements in the amendment order, Order No. R4-2013-0172-A01, becomes effective on December 10, 2015. Order R4-2013-0172-A01 has the same expiration date of December 26, 2018, as in the original permit (Order R4-2013-0172). Section 13376 of the California Water Code requires that an application/Report of Waste Discharge for a new permit must be filed at least 180 days before the expiration date of the effective permit.

The Regional Water Board is implementing a paperless office system to reduce paper use, increase efficiency and provide a more effective way for our staff, the public and interested parties to view water quality documents. Therefore, please convert all regulatory documents, submissions, data and correspondence that you would normally submit to us as hard copies to a searchable Portable Document Format (PDF). Documents that are less than 10 megabytes (MB) should be emailed to losangeles@waterboards.ca.gov with a copy to JauRenChen@waterboards.ca.gov. Documents that are 10 MB or larger should be transferred to a disk and mailed to the address listed above. If you need additional information regarding electronic submittal of documents please visit the Regional Water Board's website listed above and navigate to Paperless Office.

We are sending the hard copy of the amendment order to the Discharger only. For those on the mailing list or other interested parties who would like access to a copy of the Order, please go to the Regional Water Board's website at:

http://www.waterboards.ca.gov/losangeles/board_decisions/adopted_orders/by_permits_tools.shtml.

If you have any questions, please contact Dr. Jau Ren Chen at (213) 576-6656.

Sincerely,

for Cassandra Owens, Chief
Industrial Permitting Unit

Enclosures

cc: (via email only):
David Smith, Environmental Protection Agency, Region 9, Permits Branch (WTR-5)
NPDES Wastewater Unit, State Water Resources Control Board, Division of Water Quality
Kenneth Wong, U.S Army Corps of Engineers
Bryant Chesney, NOAA, National Marine Fisheries Service
Jeff Phillips, Department of Interior, U.S. Fish and Wildlife Service
William Paznokas, Department of Fish and Game, Region 5
Tim Smith, Los Angeles County, Department of Public Works, Waste Management Division
Teresa Henry, California Coastal Commission, South Coast Region
Angelo Bellomo, Los Angeles County, Department of Health Services
Rita Kampalath, Heal the Bay
Liz Crosson, Los Angeles Waterkeeper
Becky Hayat, Natural Resources Defense Council
Jason Weiner, Ventura Coastkeeper
Jae Kim, Tetra Tech

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

320 West 4th Street, Suite 200, Los Angeles, California 90013
(213) 576-6660 • Fax (213) 576-6640
http://www.waterboards.ca.gov/losangeles/

ORDER R4-2013-0172-A01
NPDES NO. CA0056651

WASTE DISCHARGE REQUIREMENTS FOR THE UNIVERSITY OF SOUTHERN CALIFORNIA, WRIGLEY MARINE SCIENCE CENTER DISCHARGE TO THE PACIFIC OCEAN

The following Discharger is subject to waste discharge requirements (WDR's) set forth in this Order:

Table 1. Discharger Information

Discharger	University of Southern California
Name of Facility	Wrigley Marine Science Center, Avalon
Facility Address	No. 1 Big Fisherman Cove, Catalina Island
	Avalon, CA 90704
	Los Angeles County

Table 2. Discharge Location

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
001	Waste Seawater	33° 26' 42" N	118° 29' 00" W	Pacific Ocean
002	Storm Water Runoff	33° 26' 42" N	118° 29' 00" W	Pacific Ocean

Table 3. Administrative Information

This Order was adopted on:	**November 7, 2013**
This Order shall become effective on:	**December 26, 2013**
This Order was amended on:	**December 10, 2015**
This amended Order shall become effective on:	**December 10, 2015**
This Order shall expire on:	**December 26, 2018**
The Discharger shall file a Report of Waste Discharge as an application for renewal of waste discharge requirements in accordance with title 23, California Code of Regulations, and an application for reissuance of a National Pollutant Discharge Elimination System (NPDES) permit no later than:	**June 30, 2018**
The U.S. Environmental Protection Agency (USEPA) and the Regional Water Quality Control Board have classified this discharge as follows:	**Minor**

I, Samuel Unger, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of the Order adopted by the California Regional Water Quality Control Board, Los Angeles Region, on November 7, 2013, and amended on December 10, 2015.

Samuel Unger

Samuel Unger, P.E.
Executive Officer

Contents

Tables

Attachments

I. FACILITY INFORMATION

Information describing the Wrigley Marine Science Center (Facility) is summarized in Table 1 and in sections I and II of the Fact Sheet (Attachment F). Section I of the Fact Sheet also includes information regarding the Facility's permit application.

II. FINDINGS

The California Regional Water Quality Control Board, Los Angeles Region (hereinafter Regional Water Board), finds:

A. Legal Authorities. This Order serves as Waste Discharge Requirements (WDR's) pursuant to article 4, chapter 4, division 7 of the California Water Code (Water Code) (commencing with section 13260). This Order is also issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the Water Code (commencing with section 13370). It shall serve as an NPDES permit for point source discharges from this facility to surface waters.

B. Background and Rationale for Requirements. The Regional Water Board developed the requirements in this Order based on information submitted as part of the application, through monitoring and reporting programs, and other available information. The Fact Sheet (Attachment F), which contains background information and rationale for the requirements in this Order, is hereby incorporated into and constitutes Findings for this Order. Attachments A through E and G through I are also incorporated into this Order.

C. Notification of Interested Parties. The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe WDR's for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Details of the notification are provided in the Fact Sheet.

D. Consideration of Public Comment. The Regional Water Board, in a public meeting, heard and considered all comments pertaining to the discharge. Details of the Public Hearing are provided in the Fact Sheet of this Order.

THEREFORE, IT IS HEREBY ORDERED that this Order supersedes Order No. R4-2008-0017 except for enforcement purposes, and, in order to meet the provisions contained in division 7 of the Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal CWA and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order. This action in no way prevents the Regional Water Board from taking enforcement action for past violations of the previous Order.

III. DISCHARGE PROHIBITIONS

A. Discharges from Discharge Point No. 001 shall be limited to a maximum of 0.360 million gallons per day (MGD) of waste seawater.

B. Discharges from Discharge Point No. 002 shall be limited to a maximum of 0.61 MGD of storm water runoff.

C. The discharge of wastes from accidental spills or other sources is prohibited.

D. Discharges of non-storm water runoff, except those associated with emergency firefighting are prohibited.

E. Discharges of chemical additives, including antibiotics, in the seawater system effluent are prohibited.

F. Discharges of water, materials, thermal wastes, elevated temperature wastes, toxic wastes, deleterious substances, or wastes other than those authorized by this Order, to a storm drain system, Pacific Ocean, or other waters of the State, are prohibited.

G. Neither the treatment nor the discharge of pollutants shall create pollution, contamination, or a nuisance as defined by section 13050 of the Water Code.

H. Wastes discharged shall not contain any substances in concentrations toxic to human, animal, plant, or aquatic life.

I. The discharge shall not cause a violation of any applicable water quality standards for receiving waters adopted by the Regional Water Board or the California State Water Resources Control Board (State Water Board) as required by the Federal CWA and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated pursuant to section 303 of the Federal CWA, and amendments thereto, the Regional Water Board will revise and modify this Order in accordance with such more stringent standards.

J. The discharge of any radiological, chemical, or biological warfare agent or high level radiological waste into the waters of the state is prohibited under Water Code section 13375.

K. Any discharge of wastes at any point(s) other than specifically described in this Order is prohibited, and constitutes a violation of this Order.

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Final Effluent Limitations

1. Final Effluent Limitations – Discharge Point No. 001 (Waste Seawater Discharge)

a. The Discharger shall maintain compliance with the following effluent limitations at Discharge Point No. 001, with compliance measured at Monitoring Location EFF-001 as described in the Monitoring and Reporting Program, Attachment E:

Table 4. Final Effluent Limitations – Discharge Point No. 001

Parameter	Units	Effluent Limitations				
		6-Month Median[1,2]	Average Monthly[2]	Average Weekly	Maximum Daily	Instantaneous Maximum
Biochemical Oxygen Demand (BOD 5-day@20°C)	mg/L	--	20	--	60	--
	lbs/day[3]	--	60	--	180	--
Oil and Grease	mg/L	--	10	--	15	--
	lbs/day[3]	--	30	--	45	--
pH	standard units	6.0 - 9.0[4]				

Parameter	Units	Effluent Limitations				
		6-Month Median[1,2]	Average Monthly[2]	Average Weekly	Maximum Daily	Instantaneous Maximum
Settleable Solids	mL/L	--	1.0	1.5	--	3.0
Total Suspended Solids (TSS)	mg/L	--	50	--	150	--
	lbs/day[3]	--	150	--	450	--
Temperature	°F	--	--	--	--	86
Turbidity	NTU	--	50	100	150	225
Copper, Total Recoverable	µg/L	3	--	--	12	30
	lbs/day[3]	0.0090	--	--	0.036	--
Chronic Toxicity[5]	Pass or Fail, % Effect	--	Pass[6]	--	Pass or % Effect < 50	--
Total coliform	CFU/100 mL or MPN/100 mL	[7]				
Fecal coliform	CFU/100 mL or MPN/100 mL	[7]				
Enterococcus	CFU/100 mL or MPN/100 mL	[7]				

1. The 6-month median shall apply as a moving median of daily values for any 180-day period in which daily values represent flow weighted average concentrations within a 24-hour period. For intermittent discharges, the daily value shall be considered to equal zero for days on which no discharge occurred.
2. If only one sample is collected during the time period associated with the water quality objective (e.g., monthly average or 6-month median), the single measurement shall be used to determine compliance with the effluent limitation for the entire time period.
3. These mass-based effluent limitations are calculated using the following formula:

   Mass-based effluent limitation (lbs/day) = C * Q * 8.34

   Where: C = concentration-based effluent limitation (mg/L)

   Q = maximum discharge flow rate (MGD) = 0.360 MGD
4. Within limit of 6.0 to 9.0 at all times.
5. "Pass" or "Fail" for Median Monthly Effluent Limitation (MMEL). "Pass" or "Fail" and "% Effect" for Maximum Daily Effluent Limitation (MDEL). The MMEL for chronic toxicity shall only apply when there is a discharge more than one day in a calendar month period. During such calendar months, exactly three independent toxicity tests are required when one toxicity test results in "Fail".
6. This is a Median Monthly Effluent Limitation.
7. 30-day Geometric Mean Limits (based on no less than five samples over a 30-day period):
   a) Total coliform density shall not exceed 1,000/100 mL;
   b) Fecal coliform density shall not exceed 200/100 mL;and
   c) Enterococcus density shall not exceed 35/100 mL.

   Single Sample Limits:
   a) Total coliform density shall not exceed 10,000/100 mL;
   b) Fecal coliform density shall not exceed 400/100 mL;
   c) *Enterococcus* density shall not exceed 104/100 mL; and
   d) Total coliform density shall not exceed 1,000/100 mL, if the ratio of fecal-to-total coliform exceeds 0.1.

2. Final Effluent Limitations – Discharge Point No. 002 (Storm Water Discharge)

a. The Discharger shall maintain compliance with the following effluent limitations at Discharge Point No. 002, with compliance measured at Monitoring Location EFF-002 as described in the attached MRP:

Table 5. Final Effluent Limitations – Discharge Point No. 002

Parameter	Units	Effluent Limitations				
		6-Month Median	Average Monthly[1]	Average Weekly	Maximum Daily	Instantaneous Maximum
BOD (5-day@20°C)	mg/L	--	--	--	60	--
	lbs/day[2]	--	--	--	310	--
Oil and Grease	mg/L	--	--	--	15	--
	lbs/day[2]	--	--	--	76	--
pH	standard units	6.0 - 9.0[3]				
Settleable Solids	mL/L	--	--	--	--	3.0
TSS	mg/L	--	--	--	150	--
	lbs/day[2]	--	--	--	760	--
Temperature	°F	--	--	--	--	86
Turbidity	NTU	--	--	--	150	--
Arsenic, Total Recoverable	µg/L	--	--	--	32	--
	lbs/day[2]	--	--	--	0.16	--
Beryllium, Total Recoverable	µg/L	--	0.033	--	--	--
	lbs/day[2]	--	0.00017	--	--	--
Copper, Total Recoverable	µg/L	--	--	--	12	--
	lbs/day[2]	--	--	--	0.061	--
Lead, Total Recoverable	µg/L	--	--	--	8	--
	lbs/day[2]	--	--	--	0.04	--
Nickel, Total Recoverable	µg/L	--	--	--	20	--
	lbs/day[2]	--	--	--	0.10	--
Zinc, Total Recoverable	µg/L	--	--	--	80	--
	lbs/day[2]	--	--	--	0.41	--
TCDD Equivalents[4]	µg/L	--	3.9E-09	--	--	--
	lbs/day[2]	--	2.0E-11	--	--	--
Chronic Toxicity[5]	Pass or Fail, % Effect	--	--	--	Pass or % Effect < 50	--
Total coliform	CFU/100 mL or MPN/100 mL	[6]				
Fecal coliform	CFU/100 mL or MPN/100 mL	[6]				
Enterococcus	CFU/100 mL or MPN/100 mL	[6]				

1. If only one sample is collected during the time period associated with the monthly average, the single measurement shall be used to determine compliance with the effluent limitation for the entire time period.
2. These mass-based effluent limitations are calculated using the following formula:

Mass-based effluent limitation (lbs/day) = C * Q * 8.34

Where: C = concentration-based effluent limitation (µg/L)

Q = maximum discharge flow rate (MGD) = 0.61 MGD (10-year 24 hours storm event)

3. Within limit of 6.0 to 9.0 at all times.

4. TCDD Equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below. USEPA method 1613 may be used to analyze dioxin and furan congeners.

Dioxin-TEQ (TCDD Equivalents) = Σ (C_x x TEF_x)

Where:

C_x = concentration of dioxin or furan congener x

TEF_x = TEF for congener x

Toxicity Equivalency Factors

Isomer Group	Toxicity Equivalency Factor (TEF)
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
Octa CDD	0.001
2,3,7,8 tetra CDF	0.1
1,2,3,7,8 penta CDF	0.05
2,3,4,7,8 penta CDF	0.5
2,3,7,8 hexa CDFs	0.1
2,3,7,8 hepta CDFs	0.01
Octa CDF	0.001

5. "Pass" or "Fail" and "% Effect" for Maximum Daily Effluent Limitation.

6. 30-day Geometric Mean Limits (based on no less than five samples over a 30-day period):
   a) Total coliform density shall not exceed 1,000/100 mL;
   b) Fecal coliform density shall not exceed 200/100 mL; and
   c) Enterococcus density shall not exceed 35/100 mL.

   Single Sample Limits:
   a) Total coliform density shall not exceed 10,000/100 mL;
   b) Fecal coliform density shall not exceed 400/100 mL;
   c) *Enterococcus* density shall not exceed 104/100 mL; and
   d) Total coliform density shall not exceed 1,000/100 mL, if the ratio of fecal-to-total coliform exceeds 0.1.

V. RECEIVING WATER LIMITATIONS

The Discharger shall not cause a violation of the following water quality objectives. Compliance with these water quality objectives shall be determined by samples collected at stations representative of the area within the waste field where initial dilution is completed.

A. Surface Water Limitations

Receiving water limitations are based on water quality objectives contained in the Ocean Plan and State Water Board Resolution No. 2006-0013 and are a required part of this Order. Compliance with water quality objectives contained in the Ocean Plan and Resolution No. 2006-0013 shall be determined from samples collected at stations representative of the area within the waste field; and for natural / background water quality, for constituents other than indicator bacteria, samples shall be collected at the reference station in the ocean in the vicinity of Goat Harbor or Italian Gardens near Twin Rocks Point on the northern coast of Santa Catalina Island. In situations where water quality objectives from the Ocean Plan and from Resolution No. 2006-0013 may both be applicable, the more stringent water quality objective shall apply. Receiving water conditions not in conformance with the limitation are not necessarily a violation of this Order. The Regional Water Board may require an investigation to determine cause and culpability prior to asserting a violation has occurred.

If monitoring indicates that natural ocean water quality is not maintained, but there is sufficient evidence that this discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff and seawater system effluent data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Discharges from the Facility shall not cause the following in the receiving water:

1. State Water Resources Control Board Resolution No. 2006-0013

Natural water quality conditions in the receiving water must not be altered as a result of the discharge(s), and marine communities must be protected from pollution. Natural ocean water quality will be determined by a comparison to the range of constituent concentrations at REF-001, or in reference areas agreed upon by participants in an approved regional monitoring program.

2. Bacterial Characteristics

a. Water-Contact Standards

Within a zone bounded by the shoreline and a distance of 1,000 feet from the shoreline or the 30-foot depth contour, whichever is further from the shoreline, and in areas outside this zone used for water contact sports, as determined by the Regional Water Board, but including all kelp beds, the following bacterial objectives shall be maintained throughout the water column:

30-day Geometric Mean – The following standards are based on the geometric mean of the five most recent samples from each site:

i. Total coliform density shall not exceed 1,000 per 100 mL;
ii. Fecal coliform density shall not exceed 200 per 100 mL; and
iii. *Enterococcus* density shall not exceed 35 per 100 mL.

Single Sample Maximum:

i. Total coliform density shall not exceed 10,000 per 100 mL;
ii. Fecal coliform density shall not exceed 400 per 100 mL;
iii. Enterococcus density shall not exceed 104 per 100 mL; and

iv. Total coliform density shall not exceed 1,000 per 100 mL when the fecal coliform/total coliform ratio exceeds 0.1.

The Initial Dilution Zone for any wastewater outfall shall be excluded from designation as kelp beds for purposes of bacterial standards. Adventitious assemblages of kelp plants on waste discharge structures (e.g., outfall pipes and diffusers) do not constitute kelp beds for purposes of bacterial standards.

b. Shellfish Harvesting Standards

At all areas where shellfish may be harvested for human consumption, as determined by the Regional Board, the following bacteria objectives shall be maintained throughout the water column:

The median total coliform density (for any 6-month period) shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 mL.

3. Physical Characteristics

The waste discharged shall not:

a. Cause floating particulates and grease and oil to be visible;

b. Cause aesthetically undesirable discoloration of the ocean surface;

c. Significantly reduce the transmittance of natural light at any point outside the initial dilution zone as a result of the discharge of waste; or,

d. Change the rate of deposition of inert solids and the characteristics of inert solids in ocean sediments such that benthic communities are degraded.

4. Chemical Characteristics

The waste discharged shall not:

a. Cause the dissolved oxygen concentration at any time to be depressed more than 10 percent from that which occurs naturally, as a result of the discharge of oxygen demanding waste materials;

b. Change the pH of the receiving waters at any time more than 0.2 units from that which occurs naturally;

c. Cause the dissolved sulfide concentration of waters in and near sediments to be significantly increased above that present under natural conditions;

d. Cause the concentration of substances set forth in Chapter II, Table 1 of the 2012 Ocean Plan, in marine sediments to be increased to levels that would degrade indigenous biota;

e. Cause the concentration of organic materials in marine sediments to be increased to levels that would degrade marine life;

f. Contain nutrients at levels that will cause objectionable aquatic growths or degrade indigenous biota; or,

g. Cause exceedances of Ocean Plan Table 1 water quality objectives. Unless otherwise specified, all metal concentrations are expressed as total recoverable concentrations.

5. Biological Characteristics

The waste discharged shall not:

a. Degrade marine communities, including vertebrate, invertebrate, and plant species;

b. Alter the natural taste, odor, and color of fish, shellfish, or other marine resources used for human consumption; or,

c. Cause the concentration of organic materials in fish, shellfish or other marine resources used for human consumption to bioaccumulate to levels that are harmful to human health.

d. At any time result in physical evidence of wastes discharged on beaches, shore, rocks, or structures.

6. Radioactivity

a. Discharge of radioactive waste shall not degrade marine life.

VI. PROVISIONS

A. Standard Provisions

1. Federal Standard Provisions. The Discharger shall comply with all Standard Provisions included in Attachment D of this Order.

2. Regional Water Board Standard Provisions. The Discharger shall comply with the following provisions:

a. This Order may be modified, revoked, reissued, or terminated in accordance with the provisions of sections 122.44, 122.62, 122.63, 122.64, 125.62 and 125.64. Causes for taking such actions include, but are not limited to: failure to comply with any condition of this Order; endangerment to human health or the environment resulting from the permitted activity; or acquisition of newly-obtained information which would have justified the application of different conditions if known at the time of Order adoption. The filing of a request by the Discharger for an Order modification, revocation, and issuance or termination, or a notification of planned changes or anticipated noncompliance does not stay any condition of this Order.

b. The Discharger must comply with the lawful requirements of municipalities, counties, drainage districts, and other local agencies regarding discharges of storm water to storm drain systems or other water courses under their jurisdiction; including applicable

requirements in the municipal storm water management program developed to comply with NPDES permits issued by the Regional Water Board to local agencies.

c. Discharge of wastes to any point other than specifically described in this Order and permit is prohibited and constitutes a violation thereof.

d. The Discharger shall comply with all applicable effluent limitations, national standards of performance, toxic effluent standards, and all federal regulations established pursuant to sections 301, 302, 303(d), 304, 306, 307, 316, 318, 405, and 423 of the Federal CWA and amendments thereto.

e. These requirements do not exempt the operator of the waste disposal facility from compliance with any other laws, regulations, or ordinances which may be applicable; they do not legalize this waste disposal facility, and they leave unaffected any further restraints on the disposal of wastes at this site which may be contained in other statutes or required by other agencies.

f. Oil or oily material, chemicals, refuse, or other pollutionable materials shall not be stored or deposited in areas where they may be picked up by rainfall and carried off of the property and/or discharged to surface waters. Any such spill of such materials shall be contained and removed immediately.

g. A copy of these waste discharge specifications shall be maintained at the discharge facility so as to be available at all times to operating personnel.

h. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to:

i. Violation of any term or condition contained in this Order;

ii. Obtaining this Order by misrepresentation, or failure to disclose all relevant facts;

iii. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

i. If there is any storage of hazardous or toxic materials or hydrocarbons at this facility and if the facility is not manned at all times, a 24-hour emergency response telephone number shall be prominently posted where it can easily be read from the outside.

j. The Discharger shall notify the Regional Water Board not later than 120 days in advance of implementation of any plans to alter production capacity of the product line of the manufacturing, producing or processing facility by more than ten percent. Such notification shall include estimates of proposed production rate, the type of process, and projected effects on effluent quality. Notification shall include submittal of a new Report of Waste Discharge appropriate filing fee.

k. The Discharger shall file with the Regional Water Board a report of waste discharge at least 120 days before making any material change or proposed change in the character, location or volume of the discharge.

l. All existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Regional Water Board as soon as they know or have reason to believe that they

have begun or expect to begin to use or manufacture intermediate or final product or byproduct of any toxic pollutant that was not reported on their application.

m. In the event of any change in name, ownership, or control of these waste disposal facilities, the discharger shall notify this Regional Water Board of such change and shall notify the succeeding owner or operator of the existence of this Order by letter, copy of which shall be forwarded to the Regional Water Board.

n. The Water Code provides that any person who violates a waste discharge requirement or a provision of the Water Code is subject to civil penalties of up to $5,000 per day, $10,000 per day, or $25,000 per day of violation, or when the violation involves the discharge of pollutants, is subject to civil penalties of up to $10 per gallon per day or $25 per gallon per day of violation; or some combination thereof, depending on the violation, or upon the combination of violations.

o. Violation of any of the provisions of the NPDES program or of any of the provisions of this Order may subject the violator to any of the penalties described herein, or any combination thereof, at the discretion of the prosecuting authority; except that only one kind of penalty may be applied for each kind of violation.

p. The discharge of any product registered under the Federal Insecticide, Fungicide, and Rodenticide Act to any waste stream which may ultimately be released to waters of the United States, is prohibited unless specifically authorized elsewhere in this permit or another NPDES permit. This requirement is not applicable to products used for lawn and agricultural purposes.

q. The discharge of any waste resulting from the combustion of toxic or hazardous wastes to any waste stream that ultimately discharges to waters of the United States is prohibited, unless specifically authorized elsewhere in this permit.

r. The Discharger shall notify the Executive Officer in writing no later than 6 months prior to the planned discharge of any chemical, other than the products previously reported to the Executive Officer, which may be toxic to aquatic life. Such notification shall include:

i. Name and general composition of the chemical,

ii. Frequency of use,

iii. Quantities to be used,

iv. Proposed discharge concentrations, and

v. USEPA registration number, if applicable.

s. Failure to comply with provisions or requirements of this Order, or violation of other applicable laws or regulations governing discharges from this facility, may subject the Discharger to administrative or civil liabilities, criminal penalties, and/or other enforcement remedies to ensure compliance. Additionally, certain violations may subject the Discharger to civil or criminal enforcement from appropriate local, state, or federal law enforcement entities.

t. In the event the Discharger does not comply or will be unable to comply for any reason, with any prohibition, average monthly effluent limitation, maximum daily effluent

limitation, instantaneous minimum effluent limitation, instantaneous maximum effluent limitation, or receiving water limitation of this Order, the Discharger shall notify the Regional Water Board by telephone (213) 576-6600 within 24 hours of having knowledge of such noncompliance, and shall confirm this notification in writing within five days, unless the Regional Water Board waives confirmation. The written notification shall state the nature, time, duration, and cause of noncompliance, and shall describe the measures being taken to remedy the current noncompliance and, prevent recurrence including, where applicable, a schedule of implementation. Other noncompliance requires written notification as above at the time of the normal monitoring report.

u. Prior to making any change in the point of discharge, place of use, or purpose of use of treated wastewater that results in a decrease of flow in any portion of a watercourse, the Discharger must file a petition with the State Water Board, Division of Water Rights, and receive approval for such a change. (Water Code section 1211.)

B. Monitoring and Reporting Program (MRP) Requirements

The Discharger shall comply with the MRP and future revisions thereto, in Attachment E of this Order.

C. Special Provisions

1. Reopener Provisions

a. If more stringent applicable water quality standards are promulgated or approved pursuant to section 303 of the Federal CWA, and amendments thereto, the Regional Water Board will revise and modify this Order in accordance with such more stringent standards.

b. This Order may be reopened to include effluent limitations for toxic constituents determined to be present in significant amounts in the discharge through a more comprehensive monitoring program included as part of this Order and based on the results of the RPA.

c. This Order may be reopened and modified, to incorporate in accordance with the provisions set forth in Parts 122 and 124, to include requirements for the implementation of the watershed management approach or to include new minimum levels (MLs).

d. This Order may be reopened and modified to revise effluent limitations as a result of future Ocean Plan Amendments.

e. This Order may be reopened upon submission by the Discharger of adequate information, as determined by the Regional Water Board, to provide for dilution credits or a mixing zone, as may be appropriate.

f. The Regional Water Board may modify, or revoke and reissue this Order if present or future investigations demonstrate that the discharge(s) governed by this Order will cause, have the potential to cause, or will contribute to adverse impacts on water quality and/or beneficial uses of the receiving waters.

2. Special Studies, Technical Reports and Additional Monitoring Requirements

a. Initial Investigation Toxicity Reduction Evaluation (TRE) Workplan. The Discharger shall submit to the Regional Water Board an Initial Investigation TRE workplan (1-2 pages) within 90 days of the effective date of this permit. This plan shall describe the steps the permittee intends to follow in the event that toxicity is detected. See section V of the Monitoring and Reporting Program (Attachment E) for an overview of Toxicity Reduction Evaluation (TRE) requirements.

b. Benthic Marine Life Survey. Within six months before the end of the permit (permit expiration), the Discharger must submit the results of the quantitative survey of benthic marine life to the Regional Water Board. The Regional Water Board, in consultation with the State Water Board's Division of Water Quality, shall approve the survey design. The survey design is due to the Regional Water Board within **one year** of the effective date of this Order. (State Water Board Resolution No. 2006-0013, condition 2.j)

During the last permit cycle, the Discharger fulfilled this requirement by participation in the Bight '13 Rocky Intertidal Study in lieu of conducting a benthic marine life survey. The consensus of the Bight '13 stakeholder and regulatory work group has identified the Rocky Intertidal Biology as an important indicator of near shore water quality and the benefit of participation in this element of the Bight '13 regional study provides better leverage of information than would be gathered by a site specific Benthic Marine Life Survey.

c. Metals Bioaccumulation Study. The Discharger must conduct a bioaccumulation study using mussels (*Mytilus californianus*) to determine the concentration of metals near field (within Big Fisherman Cove) and far field (at the reference station). The results of the survey must be submitted to the Regional Water Board at least six months prior to the end of the permit (permit expiration, August 10, 2018). The Regional Water Board, in consultation with the State Water Board's Division of Water Quality, shall approve the study design. The study design is due to the Regional Water Board within **one year** of the effective date of this Order. Based on the study results, the Regional Water Board, in consultation with the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits and/or may require additional test organisms. (State Water Board Resolution No. 2006-0013, condition 2.k)

As required in Order No. R4-2008-0017, the Discharger conducted the Metals Bioaccumulation Study in March 2012 and submitted a final report to the Regional Water Board in March 2013. The final report indicates following results:

- Overall metals concentrations are remaining the same or showing significant decreases over time in mussel tissues. Metal concentrations found in this study were consistent with long term metal trends observed in the National Oceanic and Atmospheric Administration (NOAA) Status and Trends (S&T) Mussel Watch program.

- All mussel tissues concentrations for metals collected at the near field Wrigley Marine Science Center station location are below the 85 percent guideline as outlined by the State Board (2009) study.

- With few exception (e.g. cadmium), the western coast of Santa Catalina Island (ASBS No. 25) is showing no elevated levels of bioaccumulation of heavy metals in mussel tissues. There is no indication that storm water runoff is contributing to the observed cadmium based on the water quality data collected under the dischargers permit. The long term average concentration measured for cadmium from the EFF-001 seawater return is approximately 20 parts per trillion. (Ocean Plan 6-month median water quality objective for cadmium is 1 µg/L or 1 part per billion).

d. Regional ASBS Monitoring. Participation in a collaborative regional or statewide ASBS monitoring effort is encouraged. After the first year (2014) of monitoring results are reviewed, the Regional Water Board, in consultation with the State Water Board's Division of Water Quality, may adjust the sediment, receiving water, and bioaccumulation monitoring required under this exception, based on the Facility's participation in an appropriate regional or statewide monitoring program.

During the last permit cycle, in addition to participation in the Bight '13 Rocky Intertidal Study, the Discharger was also a key contributor to the Bight '08 program.

e. Subtidal Sediment Monitoring. Once annually, the Discharger is required to collect samples of the subtidal sediment near the seawater discharge system and storm water outfall in Big Fisherman Cove and analyze the sample for Ocean Plan Table 1 constituents. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* shall be performed. Based on the first year (2014) sample results, the Regional Water Board will determine specific constituents to be tested during the remainder of the permit cycle, except that acute toxicity for sediment shall be tested annually. (State Water Board Resolution No. 2006-0013, condition 2.n.)

The Discharger conducted three monitorings for Ocean Plan Table 1 constituents in 2011 and 2012. Concentrations of constituents in sediment were generally not detected, with the exception of most metals, which were found in relatively low but detectable concentrations. No toxicity were observed in sediments using amphipod *Eohaustorius estuaries.*

f. Receiving Water Monitoring Report. Within 30 days of becoming aware that receiving water monitoring results indicate that storm water discharges are causing or contributing to an alteration of natural water quality in the ASBS, as measured at the reference station (REF-001), the Discharger must submit a report to the Regional Water Board. The report shall include the following:

i. Identify those constituents in storm water that alter natural water quality;

ii. Describe the Best Management Practices (BMPs) that are currently being implemented;

iii. Describe the BMPs that are planned for in the Storm Water Management Plan/Program (SWMP), and additional BMPs that may be added to the SWMP;

iv. Include a new or modified implementation schedule;

The Regional Water Board may require modifications to the report. Within 30 days following approval of the report by the Regional Water Board, the Discharger shall revise its SWMP to incorporate any new or modified BMPs that have been and will be

implemented, the implementation schedule, and any additional monitoring required. If the Discharger has complied with the procedures described above and is implementing the revised SWMP, then the Discharge does not have to repeat the same procedure for continuing or recurring exceedances of the same constituent. (State Water Board Resolution No. 2006-0013, condition 2.p)

The Discharger indicated that no alteration of natural water quality measured based on the results of routine monitoring during the last permit period. Therefore, no receiving water monitoring report was required to be submitted.

3. Best Management Practices and Pollution Prevention

a. Storm Water Management Plan

The Permittee developed and submitted the Draft Storm Water Management Plan in September 2011. The Permittee shall continue to implement the SWMP to comply with the conditions of State Water Board Resolution No. 2006-0013. Specifically, the SWMP must be developed and implemented as follows:

i. The Discharger must specifically address the prohibition of non-storm water runoff and the reduction of pollutants in storm water discharges draining to the ASBS.

ii. The SWMP must include a map of surface drainage of storm water runoff, including areas of sheet runoff, and any structural BMPs employed. The map must also show the storm water conveyances in relation to other facility features such as the laboratory seawater system and discharges, service areas, sewage treatment, and waste and hazardous materials storage areas. The SWMP must also include a procedure for updating the map and plan when other changes are made to the facilities.

iii. The SWMP must describe the measures by which non-storm water discharges have been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

iv. The SWMP must address storm water discharges and how pollutants have been and will be reduced in storm water runoff into the ASBS through the implementation of BMPs. The SWMP must describe the BMPs currently employed and BMPs planned (including those for construction activities) and an implementation schedule. The BMPs and implementation schedule must be designed to ensure natural water quality conditions in the receiving water due to either a reduction in flows from impervious surfaces or reduction in pollutants or some combination thereof.

v. The BMP implementation schedule must be developed to ensure that the BMPs are implemented within one year of the approval date of the SWMP by the Los Angeles Water Board.

Within **90 days** of the effective date of this permit, the Discharger must submit an updated SWMP to the Regional Water Board.

4. Construction, Operation and Maintenance Specifications

a. Construction Activities

The Discharger shall notify the Regional Water Board within 180 days prior to any construction activity that could result in the discharge or habitat modification in the ASBS. Further, the Discharger shall receive approval and appropriate conditions from the Regional Water Board prior to performing any significant modification, rebuilding, or renovation of the waterfront facilities, including the pier and dock, that could result in any discharge or habitat modification in the ASBS, according to the requirements of section III.E.2 of the Ocean Plan. (State Water Board Resolution No. 2006-0013, condition 2.s)

5. Other Special Provisions

a. Nonpoint Source Management Plan

The Discharger developed and submitted a waterfront and marine operations nonpoint source management plan containing appropriate management practices to address nonpoint source pollutant discharges in 2012. Appropriate management measures include those described in the State's Nonpoint Source Program Implementation Plan for marinas and recreational boating, as applicable. An updated waterfront and marine operations nonpoint source management plan must be submitted to the Regional Water Board within 90 days of the effective date of this permit. The Discharger shall implement the plan within six month of its approval. (State Water Board Resolution No. 2006-0013, condition 2.r)

b. Program for Prevention of Biological Pollutants

The Discharger shall implement a Program for Prevention of Biological Pollutants (non-native invasive species) in consultation with the California Department of Fish and Game Marine Resources Division. This program must be submitted to the State and the Regional Water Board within **one year** of the effective date of this permit. Any non-native species found in the Santa Catalina ASBS must be reported to the State and Regional Water Boards and the California Department of Fish and Game. (State Water Board Resolution No. 2006-0013, condition 2.q)

6. Compliance Schedules – Not Applicable

VII. COMPLIANCE DETERMINATION

A. Compliance with Effluent Limitations expressed as Single Constituents

If the concentration of the pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the reported Minimum Level (see Reporting Requirement I.G. of the MRP), then the Discharger is out of compliance.

B. Compliance with Effluent Limitations expressed as Sum of Several Constituents

Dischargers are out of compliance with an effluent limitation which applies to the sum of a group of chemicals (e.g., PCB's) if the sum of the individual pollutant concentrations is greater than the effluent limitation. Individual pollutants of the group will be considered to have a concentration of

zero if the constituent is reported as “Not Detected” (ND) or “Detected, but Not Quantified” (DNQ).

C. Multiple Sample Data Reduction

The concentration of the pollutant in the effluent may be estimated from the result of a single sample analysis or by a measure of central tendency (arithmetic mean, geometric mean, median, etc.) of multiple sample analyses when all sample results are quantifiable (i.e., greater than or equal to the reported Minimum Level). When one or more sample results are reported as ND or DNQ, the central tendency concentration of the pollutant shall be the median (middle) value of the multiple samples, where DNQ is lower than a quantified value and ND is lower than DNQ. If, in an even number of samples, one or both of the middle values is ND or DNQ, the median will be the lower of the two middle values.

D. Average Monthly Effluent Limitation (AMEL)

If the average of daily discharges over a calendar month exceeds the AMEL for a given parameter, an alleged violation will be flagged and the Discharger will be considered out of compliance for each day of that month for that parameter (e.g., resulting in 31 days of non-compliance in a 31-day month). However, an alleged violation of the AMEL will be considered one violation for the purpose of assessing mandatory minimum penalties. The average of daily discharges over a calendar month that exceeds the AMEL for a parameter will be considered out of compliance for that month only. If only a single sample (daily discharge) is taken over a calendar month and the analytical result for that sample exceeds the AMEL, the Discharger will be considered out of compliance for that month. If no sample (daily discharge) is taken over a calendar month, no compliance determination can be made for that month with respect to effluent violation determination, but compliance determination can be made for that month with respect to reporting violation determination.

In determining compliance with the AMEL, the following provisions shall also apply to all constituents:

1. If the analytical result of a single sample, monitored monthly, quarterly, semiannually, or annually, does not exceed the AMEL for that constituent, the Discharger has demonstrated compliance with the AMEL for that month;

2. Additional sampling requirements at Discharge Point No. 001:

If the analytical result of a single sample, monitored monthly, quarterly, semiannually, or annually, exceeds the AMEL for any constituent, the Discharger shall collect four additional samples at approximately equal intervals during the month. All five analytical results shall be reported in the monitoring report for that month, or 45 days after results for the additional samples were received, whichever is later.

When all sample results are greater than or equal to the reported Minimum Level (see Reporting Requirement I.G. of the MRP), the numerical average of the analytical results of these five samples will be used for compliance determination.

When one or more sample results are reported as “Not-Detected (ND)” or “Detected, but Not Quantified (DNQ)” (see Reporting Requirement I.G. of the MRP), the median value of these

four samples shall be used for compliance determination. If one or both of the middle values is ND or DNQ, the median shall be the lower of the two middle values.

In the event of noncompliance with an AMEL, the sampling frequency for that constituent shall be increased to weekly and shall continue at this level until compliance with the AMEL has been demonstrated.

3. If only one sample was obtained for the month or more than a monthly period and the result exceeds the AMEL, then the Discharger is in violation of the AMEL.

E. Average Weekly Effluent Limitation (AWEL)

If the average of daily discharges over a calendar week exceeds the AWEL for a given parameter, an alleged violation will be flagged and the Discharger will be considered out of compliance for each day of that week for that parameter (e.g., resulting in seven days of non-compliance). However, an alleged violation of the AWEL will be considered one violation for the purpose of assessing mandatory minimum penalties. The average of daily discharges over a calendar week that exceeds the AWEL for a parameter will be considered out of compliance for that week only. If only a single sample (daily discharge) is taken over a calendar week and the analytical result for that sample exceeds the AWEL, the Discharger will be considered out of compliance for that week. If no sample (daily discharge) is taken over a calendar week, no compliance determination can be made for that week with respect to effluent violation determination, but compliance determination can be made for that week with respect to reporting violation determination.

A calendar week will begin on Sunday and end on Saturday. Partial calendar weeks at the end of the calendar month will be carried forward to the next month in order to calculate and report a consecutive seven-day average value on Saturday.

F. Maximum Daily Effluent Limitation (MDEL)

If a daily discharge on a calendar day exceeds the MDEL for a given parameter, an alleged violation will be flagged and the Discharger will be considered out of compliance for that day for that parameter. If no sample (daily discharge) is taken over a calendar day, no compliance determination can be made for that day with respect to effluent violation determination, but compliance determination can be made for that day with respect to reporting violation determination.

G. Instantaneous Minimum Effluent Limitation

If the analytical result of a single grab sample exceeds (is lower than) the instantaneous minimum effluent limitation for a given parameter, an alleged violation will be flagged and the Discharger will be considered out of compliance for that single sample for that parameter. Non-compliance for each single grab sample will be considered separately (e.g., the analytical results of two grab samples taken over a calendar day that are lower than the instantaneous minimum effluent limitation would result in two instances of non-compliance with the instantaneous minimum effluent limitation).

H. Instantaneous Maximum Effluent Limitation

If the analytical result of a single grab sample exceeds (is higher than) the instantaneous maximum effluent limitation for a given parameter, an alleged violation will be flagged and the Discharger will be considered out of compliance for that single sample for that parameter. Non-compliance for each single grab sample will be considered separately (e.g., the analytical results of two grab samples taken over a calendar day that both are higher than the instantaneous maximum effluent limitation would result in two instances of non-compliance with the instantaneous maximum effluent limitation).

I. Six-Month Median Effluent Limitation

If the median of daily discharges over any 180-day period exceeds the six-month median effluent limitation for a given parameter, an alleged violation will be flagged and the discharger will be considered out of compliance for each day of that 180-day period for that parameter. The next assessment of compliance will occur after the next sample is taken. If only a single sample is taken during a given 180-day period and the analytical result for that sample exceeds the six-month median, the discharger will be considered out of compliance for the 180-day period. For any 180-period during which no sample is taken, no compliance determination can be made for the six-month median limitation.

The six-month median shall apply as a moving median of daily values for any 180-day period in which daily values represent flow weighted average concentrations within a 24-hour period. For intermittent discharges, the daily value shall be considered to equal zero for days on which no discharge occurred. If only one sample is collected during the time period associated with the 6-month median water quality objective, the single measurement shall be used to determine compliance with the effluent limitation for the entire time period.

J. Median Monthly Effluent Limitation (MMEL)

If the median of daily discharges over a calendar month exceeds the MMEL for a given parameter, an alleged violation will be flagged and the Discharger will be considered out of compliance for each day of that month for that parameter (e.g., resulting in 31 days of non-compliance in a 31-day month). However, an alleged violation of the MMEL will be considered one violation for the purpose of assessing State mandatory minimum penalties. If no sample (daily discharge) is taken over a calendar month, no compliance determination can be made for that month with respect to effluent violation determination, but compliance determination can be made for that month with respect to reporting violation determination.

K. Chronic Toxicity

The discharge is subject to determination of “Pass” or “Fail” and “Percent Effect” from a single-effluent concentration chronic toxicity test at the discharge IWC using the Test of Significant Toxicity (TST) approach described in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (EPA 833-R-10-003, 2010), Appendix A, Figure A-1, and Table A-1. The null hypothesis (H_o) for the TST approach is: Mean discharge IWC response ≤0.75 × Mean control response. A test result that rejects this null hypothesis is reported as “Pass”. A test result that does not reject this null hypothesis is reported as “Fail”. The relative “Percent Effect” at the discharge IWC is defined and reported as: ((Mean control response – Mean discharge IWC response) ÷ Mean control response)) × 100.

The Maximum Daily Effluent Limitation (MDEL) for chronic toxicity is exceeded and a violation will be flagged when a chronic toxicity test, analyzed using the TST approach, results in "Fail" and the "Percent Effect" is ≥0.50.

The Median Monthly Effluent Limitation (MMEL) for chronic toxicity is exceeded and a violation will be flagged when the median of no more than three independent chronic toxicity tests, conducted within the same calendar month and analyzed using the TST approach, results in "Fail". The MMEL for chronic toxicity shall only apply when there is a discharge more than one day in a calendar month period. During such calendar months, exactly three independent toxicity tests are required when one toxicity test results in "Fail".

L. Mass and Concentration Limitations

Compliance with mass effluent limitations and concentration effluent limitations for the same parameter shall be determined separately. When the concentration for a parameter in a sample is reported as ND or DNQ, the corresponding mass emission rate determined using that sample concentration shall also be reported as ND or DNQ.

M. Bacterial Standards and Analyses

The geometric mean used for determining compliance with bacterial standards is calculated using the following equation:

$$\text{Geometric Mean} = (C_1 \times C_2 \times \ldots \times C_n)^{1/n}$$

where n is the number of days samples were collected during the period and C is the concentration of bacteria (MPN/100 mL or CFU/100 mL) found on each day of sampling.

1. For bacterial analyses, sample dilutions should be performed so the expected range of values is bracketed (for example, with multiple tube fermentation method or membrane filtration method, 2 to 16,000 per 100 mL for total and fecal coliform, at a minimum, and 1 to 1000 per 100 mL for *Enterococcus*). The detection method used for each analysis shall be reported with the results of the analysis.

2. Detection methods used for coliforms (total and fecal) and *Enterococcus* shall be those presented in Table 1A of 40 CFR Part 136 (revised May 18, 2012), unless alternate methods have been approved by USEPA pursuant to 40 CFR Part 136, or improved methods have been determined by the Executive Officer and/or USEPA.

ATTACHMENT A – DEFINITIONS

Acute Toxicity:

a Acute Toxicity (TUa)

Expressed in Toxic Units Acute (TUa)

$$TUa = \frac{100}{\text{96-hr LC 50\%}}$$

b Lethal Concentration 50% (LC 50)

LC 50 (percent waste giving 50% survival of test organisms) shall be determined by static or continuous flow bioassay techniques using standard marine test species as specified in Appendix III of the 2012 Ocean Plan. If specific identifiable substances in wastewater can be demonstrated by the discharger as being rapidly rendered harmless upon discharge to the marine environment, but not as a result of dilution, the LC 50 may be determined after the test samples are adjusted to remove the influence of those substances.

When it is not possible to measure the 96-hour LC 50 due to greater than 50 percent survival of the test species in 100 percent waste, the toxicity concentration shall be calculated by the expression:

$$TUa = \frac{\log (100 - S)}{1.7}$$

where:
S = percentage survival in 100% waste. If S > 99, TUa shall be reported as zero.

Areas of Special Biological Significance (ASBS)
Areas of Special Biological Significance are those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that maintenance of natural water quality is assured. All Areas of Special Biological Significance are also classified as a subset of STATE WATER QUALITY PROTECTION AREAS. ASBS are also referred to as State Water Quality Protection Areas – Areas of Special Biological Significance (SWQPA-ASBS).

Average Monthly Effluent Limitation (AMEL)
The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Average Weekly Effluent Limitation (AWEL)
The highest allowable average of daily discharges over a calendar week (Sunday through Saturday), calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Bioaccumulative
Those substances taken up by an organism from its surrounding medium through gill membranes, epithelial tissue, or from food and subsequently concentrated and retained in the body of the organism.

Best Management Practices (BMPs)
BMPs are methods, measures, or practices designed and selected to reduce or eliminate the discharge of pollutants to surface waters from point and nonpoint source discharges including storm water. BMPs include structural and non-structural control, and operation maintenance procedures, which can be applied before, during, and/or after pollution-producing activities.

Carcinogenic
Pollutants are substances that are known to cause cancer in living organisms.

Chlordane
Chlordane shall mean the sum of chlordane-alpha, chlordane-gamma, chlordene-alpha, chlordene-gamma, nonachlor-alpha, nonachlor-gamma and oxychlordane.

Chlorinated Phenolic Compounds
Chlorinated Phenolic Compounds shall mean, at a minimum, the sum of 2-Chlorophenol, 2,4-Dichlorophenol, 4-Chloro-3-methylphenol, 2,4,6-Trichlorophenol, and Pentachlorophenol.

Chronic Toxicity
This parameter shall be used to measure the acceptability of waters for supporting a healthy marine biota until improved methods are developed to evaluate biological response.

a Chronic Toxicity (TUc)

Expressed as Toxic Units Chronic (TUc)

$$TUc = \frac{100}{NOEL}$$

b No Observed Effect Level (NOEL)

The NOEL is expressed as the maximum percent effluent or receiving water that causes no observable effect on a test organism, as determined by the result of a critical life stage toxicity test listed in Appendix III of the Ocean Plan.

Coefficient of Variation (CV)
CV is a measure of the data variability and is calculated as the estimated standard deviation divided by the arithmetic mean of the observed values.

Composite Sample
Composite Sample, for flow rate measurements, means the arithmetic mean of no fewer than eight individual measurements taken at equal intervals for 24 hours or for the duration of discharge, whichever is shorter.

Composite sample, for other than flow rate measurement, means:

a No fewer than eight individual sample portions taken at equal time intervals for 24 hours, or the duration of the discharge, whichever is shorter. The volume of each individual sample portion shall be directly proportional to the discharge flow rate at the time of sampling; or,

b No fewer than eight individual sample portions taken of equal time volume taken over a 24 hour period. The time interval between each individual sample portion shall vary such that the volume of the discharge between each individual sample portion remains constant.

The compositing period shall equal the specified sampling period, or 24 hours, if no period is specified.

For a composite sample, if the duration of the discharge is less than 24 hours but greater than 8 hours, at least eight flow-weighted individual sample portions shall be taken during the duration of the discharge and composited. For a discharge duration of 8 hours or less, eight individual "grab samples" may be substituted and composited.

The composite sample result shall be reported for the calendar day during which composite sampling ends.

Daily Discharge
Daily Discharge is defined as either: (1) the total mass of the constituent discharged over the calendar day (12:00 am through 11:59 pm) or any 24-hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g., concentration).

The daily discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day or other 24-hour period defined as a day) or by the arithmetic mean of analytical results from one or more grab samples taken over the course of the day.

For composite sampling, if 1 day is defined as a 24-hour period other than a calendar day, the analytical result for the 24-hour period will be considered as the result for the calendar day in which the 24-hour period ends.

DDT
DDT shall mean the sum of 4,4'-DDT, 2,4'-DDT, 4,4'-DDE, 2,4'-DDE, 4,4'-DDD and 2,4'-DDD.

Degrade (Degredation)
Degradation shall be determined by comparison of the waste field and reference site(s) for characteristic species diversity, population density, contamination, growth anomalies, debility, or supplanting of normal species by undesirable plant and animal species. Degradation occurs if there are significant differences in any of three major biotic groups, namely, demersal fish, benthic invertebrates, or attached algae. Other groups may be evaluated where benthic species are not affected, or are not the only ones affected.

Detected, but Not Quantified (DNQ)
Sample results that are less than the reported Minimum Level, but greater than or equal to the laboratory's MDL. Sample results reported as DNQ are estimated concentrations.

Dichlorobenzenes
Dichlorobenzenes shall mean the sum of 1,2- and 1,3-dichlorobenzene.

Downstream Ocean Waters
Waters downstream with respect to ocean currents.

Dredged Material
Any material excavated or dredged from the navigable waters of the United States, including material otherwise referred to as “spoil”.

Enclosed Bays
Indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. This definition includes but is not limited to: Humboldt Bay, Bodega Harbor, Tomales Bay, Drakes Estero, San Francisco Bay, Morro Bay, Los Angeles Harbor, Upper and Lower Newport Bay, Mission Bay, and San Diego Bay.

Endosulfan
Endosulfan shall mean the sum of endosulfan-alpha, endosulfan-beta, and endosulfan sulfate.

Grab Sample
Grab Sample means an individual sample collected during a period of time not to exceed 15 minutes. Grab samples shall be collected during normal peak loading conditions for the parameter of interest, which may or may not occur during hydraulic peaks.

Halomethanes
Halomethanes shall mean the sum of bromoform, bromomethane (methyl bromide) and chloromethane (methyl chloride).

HCH
HCH shall mean the sum of alpha, beta, gamma (lindane), and delta isomers of hexachlorocyclohexane.

Initial Dilution
Initial Dilution is the process which results in the rapid and irreversible turbulent mixing of wastewater with ocean water around the point of discharge.

For a submerged buoyant discharge, characteristic of most municipal wastes that are released from the submarine outfalls, the momentum of the discharge and its initial buoyancy act together to produce turbulent mixing. Initial dilution in this case is completed when the diluting wastewater ceases to rise in the water column and first begins to spread horizontally.

For shallow water submerged discharges, surface discharges, and nonbuoyant discharges, characteristic of cooling water wastes and some individual discharges, turbulent mixing results primarily from the momentum of discharge. Initial dilution, in these cases, is considered to be completed when the momentum induced velocity of the discharge ceases to produce significant mixing of the waste, or the diluting plume reaches a fixed distance from the discharge to be specified by the Regional Water Board, whichever results in the lower estimate for initial dilution.

Effluent Concentration Allowance (ECA)
ECA is a value derived from the water quality criterion/objective, dilution credit, and ambient background concentration that is used, in conjunction with the coefficient of variation for the effluent monitoring data, to calculate a long-term average (LTA) discharge concentration. The ECA has the same meaning as waste load allocation (WLA) as used in USEPA guidance (Technical Support Document For Water Quality-based Toxics Control, March 1991, second printing, EPA/505/2-90-001).

Instantaneous Maximum Effluent Limitation
The highest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous maximum limitation).

Instantaneous Minimum Effluent Limitation
The lowest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous minimum limitation).

Kelp Beds
Kelp Beds, for purposes of the bacteriological standards of the Ocean Plan, are significant aggregations of marine algae of the genera Macrocystis and Nereocystis. Kelp beds include the total foliage canopy of Macrocystis and Nereocystis plants throughout the water column. Adventitious assemblages of kelp plants on waste discharge structures (e.g., outfall pipes and diffusers) do not constitute kelp beds for purposes of bacteriological standards.

Mariculture
Mariculture is the culture of plants and animals in marine waters independent of any pollution source.

Material
(a) In common usage: (1) the substance or substances of which a thing is made or composed (2) substantial; (b) For purposes of the Ocean Plan relating to waste disposal, dredging and the disposal of dredged material and fill, MATERIAL means matter of any kind or description which is subject to regulation as waste, or any material dredged from the navigable waters of the United States. See also, DREDGED MATERIAL.

Maximum Daily Effluent Limitation (MDEL)
The maximum allowable discharge of a pollutant during a calendar day. Where MDELs are expressed in units of mass, the daily discharge is the total mass discharged over the course of the day. Where MDELs are expressed in terms of a concentration, the daily discharge is the arithmetic average measurement of the pollutant concentration derived from all measurements taken that day. For pollutant measurements, unless otherwise specified, the results to be compared to the MDEL are usually based on composite samples. However, it may apply to grab samples if the collection of composite samples for those constituents is not appropriate because of instability of the constituents.

Median
The middle measurement in a set of data. The median of a set of data is found by first arranging the measurements in order of magnitude (either increasing or decreasing order). If the number of measurements (n) is odd, then the median = $X_{(n+1)/2}$. If n is even, then the median = $(X_{n/2} + X_{(n/2)+1})/2$ (i.e., the midpoint between the $n/2$ and $n/2+1$).

Method Detection Limit (MDL)
MDL is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, as defined in title 40 of the Code of Federal Regulations, Part 136, Attachment B.

Minimum Level (ML)
ML is the concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed.

Mixing Zone
Mixing Zone is a limited volume of receiving water that is allocated for mixing with a wastewater discharge where water quality criteria can be exceeded without causing adverse effects to the overall water body.

Natural Light
Reduction of natural light may be determined by the Regional Water Board by measurement of light transmissivity or total irradiance, or both, according to the monitoring needs of the Regional Water Board.

Nonchlorinated Phenolic Compounds
Nonchlorinated Phenolic Compounds shall mean, at a minimum, the sum of Phenol, 2, 4-Dimethylphenol, 2-Nitrophenol, and 4-Nitrophenol, 2,4-Dinitrophenol and 4,6-Dinitro-2-Methylphenol.

Not Detected (ND)
Sample results which are less than the laboratory's MDL.

Ocean Waters
The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Water Board's California Ocean Plan.

PAHs (polynuclear aromatic hydrocarbons)
PAHs shall mean the sum of acenaphthylene, anthracene, 1, 2-benzanthracene, 3, 4-benzofluoranthene, benzo[k]-fluoranthene, 1, 12-benzoperylene, benzo[a]pyrene, chrysene, dibenzo[ah]anthracene, fluorene, indeno[1, 2, 3-cd]pyrene, phenanthrene and pyrene.

PCBs (polychlorinated biphenyls)
The sum of chlorinated biphenyls whose analytical characteristics resemble those of Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254 and Aroclor-1260.

Persistent Pollutants
Persistent pollutants are substances for which degradation or decomposition in the environment is nonexistent or very slow.

Pollutant Minimization Program (PMP)
PMP means waste minimization and pollution prevention actions that include, but are not limited to, product substitution, waste stream recycling, alternative waste management methods, and education of the public and businesses. The goal of the PMP shall be to reduce all potential sources of a priority pollutant(s) through pollutant minimization (control) strategies, including pollution prevention measures as appropriate, to maintain the effluent concentration at or below the water quality-based effluent limitation. Pollution prevention measures may be particularly appropriate for persistent bioaccumulative priority pollutants where there is evidence that beneficial uses are being impacted. The Regional Water Board may consider cost effectiveness when establishing the requirements of a PMP. The completion and implementation of a Pollution Prevention Plan, if required pursuant to Water Code section 13263.3(d), shall be considered to fulfill the PMP requirements.

Pollution Prevention
Pollution Prevention means any action that causes a net reduction in the use or generation of a hazardous substance or other pollutant that is discharged into water and includes, but is not limited to, input change, operational improvement, production process change, and product reformulation (as

defined in Water Code section 13263.3). Pollution prevention does not include actions that merely shift a pollutant in wastewater from one environmental medium to another environmental medium, unless clear environmental benefits of such an approach are identified to the satisfaction of the State or Regional Water Board.

Reported Minimum Level
The reported ML (also known as the Reporting Level or RL) is the ML (and its associated analytical method) chosen by the Discharger for reporting and compliance determination from the MLs included in this Order, including an additional factor if applicable as discussed herein. The MLs included in this Order correspond to approved analytical methods for reporting a sample result that are selected by the <Regional Water Board Name> either from Appendix II of the Ocean Plan in accordance with section III.C.5.a. of the Ocean Plan or established in accordance with section III.C.5.b. of the Ocean Plan. The ML is based on the proper application of method-based analytical procedures for sample preparation and the absence of any matrix interferences. Other factors may be applied to the ML depending on the specific sample preparation steps employed. For example, the treatment typically applied in cases where there are matrix-effects is to dilute the sample or sample aliquot by a factor of ten. In such cases, this additional factor must be applied to the ML in the computation of the reported ML.

Shellfish
Shellfish are organisms identified by the California Department of Public Health as shellfish for public health purposes (i.e., mussels, clams, and oysters).

Significant Difference
Defined as a statistically significant difference in the means of two distributions of sampling results at the 95 percent confidence level.

Six-month Median Effluent Limitation:
Six-month Median Effluent Limitation: the highest allowable moving median of all daily discharges for any 180-day period. For intermittent discharges, the daily value shall be considered to equal zero for days on which no discharge occurred.

Standard Deviation (σ)
Standard Deviation is a measure of variability that is calculated as follows:

$$\sigma = (\sum[(x - \mu)^2]/(n - 1))^{0.5}$$

where:

- x is the observed value;
- μ is the arithmetic mean of the observed values; and
- n is the number of samples.

State Water Quality Protection Areas (SWQPAs)
SWQPAs are nonterrestrial marine or estuarine areas designated to protect marine species or biological communities from an undesirable alteration in natural water quality. All AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE (ASBS) that were previously designated by the State Water Board in Resolution Nos. 74-28, 74-32, and 75-61 are now classified as a subset of State Water Quality Protection Areas and require special protections afforded by the California Ocean Plan.

TCDD Equivalents
TCDD Equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below:

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
octa CDD	0.001
2,3,7,8-tetra CDF	0.1
1,2,3,7,8-penta CDF	0.05
2,3,4,7,8-penta CDF	0.5
2,3,7,8-hexa CDFs	0.1
2,3,7,8-hepta CDFs	0.01
octa CDF	0.001

Toxicity Reduction Evaluation (TRE)
TRE is a study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate. (A TIE is a set of procedures to identify the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.)

Waste
As used in the Ocean Plan, waste includes a Discharger's total discharge, of whatever origin, i.e., gross, not net, discharge.

Water Quality-Based Effluent Limit (WQBEL)
A value determined by selecting the most stringent of the effluent limits calculated using all applicable water quality criteria (e.g., aquatic life, human health, and wildlife) for a specific point source to a specific receiving water for a given pollutant.

Water Quality Criteria
Comprised of numeric and narrative criteria. Numeric criteria are scientifically derived ambient concentrations developed by USEPA or States for various pollutants of concern to protect human health and aquatic life. Narrative criteria are statements that describe the desired water quality goal.

Water Quality Standard
A law or regulation that consists of the beneficial use or uses of a waterbody, the numeric and narrative water quality criteria that are necessary to protect the use or uses of that particular waterbody, and an antidegradation statement.

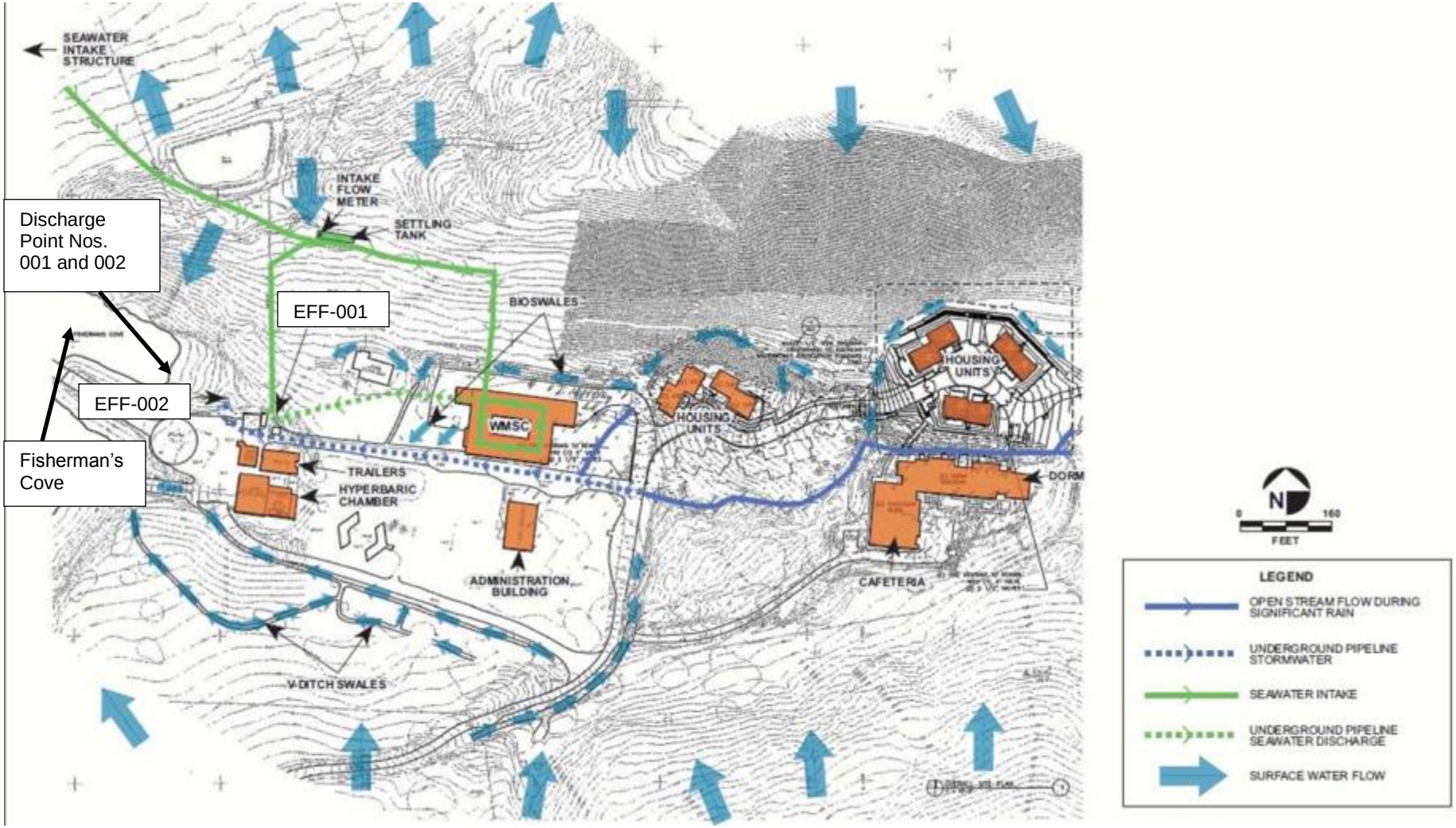
Whole Effluent Toxicity (WET)
The total toxic effect of an effluent measured directly with a toxicity test.

Zone of Initial Dilution (ZID)
Zone of Initial Dilution (ZID) means, for purposes of designating monitoring stations, the region within a horizontal distance equal to a specified water depth (usually depth of outfall or average depth of diffuser) from any point of the diffuser or end of the outfall and the water column above and below that region, including the underlying seabed.

ATTACHMENT B – MAP

Data Source: SCCRWP/SWRCB dishcarge survey 2000
Map Created October 19, 2005 State Water Resources Control Board

ATTACHMENT C – FLOW SCHEMATIC



ATTACHMENT D – STANDARD PROVISIONS

I. STANDARD PROVISIONS – PERMIT COMPLIANCE

A. Duty to Comply

1. The Discharger must comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. (40 CFR section 122.41(a).)

2. The Discharger shall comply with effluent standards or prohibitions established under section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if this Order has not yet been modified to incorporate the requirement. (40 CFR section 122.41(a)(1).)

B. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order. (40 CFR section 122.41(c).)

C. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment. (40 CFR section 122.41(d).)

D. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by a Discharger only when necessary to achieve compliance with the conditions of this Order. (40 CFR section 122.41(e).)

E. Property Rights

1. This Order does not convey any property rights of any sort or any exclusive privileges. (40 CFR section 122.41(g).)

2. The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations. (40 CFR section 122.5(c).)

F. Inspection and Entry

The Discharger shall allow the Regional Water Board, State Water Board, United States Environmental Protection Agency (USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to (40 CFR section 122.41(i); Wat. Code, section 13383):

1. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order (40 CFR section 122.41(i)(1));

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order (40 CFR section 122.41(i)(2));

3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order (40 CFR section 122.41(i)(3)); and

4. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the Water Code, any substances or parameters at any location. (40 CFR section 122.41(i)(4).)

G. Bypass

1. Definitions

a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. (40 CFR section 122.41(m)(1)(i).)

b. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. (40 CFR section 122.41(m)(1)(ii).)

2. Bypass not exceeding limitations. The Discharger may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions listed in Standard Provisions – Permit Compliance I.G.3, I.G.4, and I.G.5 below. (40 CFR section 122.41(m)(2).)

3. Prohibition of bypass. Bypass is prohibited, and the Regional Water Board may take enforcement action against a Discharger for bypass, unless (40 CFR section 122.41(m)(4)(i)):

a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage (40 CFR section 122.41(m)(4)(i)(A));

b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of

equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance (40 CFR section 122.41(m)(4)(i)(B)); and

c. The Discharger submitted notice to the Regional Water Board as required under Standard Provisions – Permit Compliance I.G.5 below. (40 CFR section 122.41(m)(4)(i)(C).)

4. The Regional Water Board may approve an anticipated bypass, after considering its adverse effects, if the Regional Water Board determines that it will meet the three conditions listed in Standard Provisions – Permit Compliance I.G.3 above. (40 CFR section 122.41(m)(4)(ii).)

5. Notice

a. Anticipated bypass. If the Discharger knows in advance of the need for a bypass, it shall submit a notice, if possible at least 10 days before the date of the bypass. (40 CFR section 122.41(m)(3)(i).)

b. Unanticipated bypass. The Discharger shall submit notice of an unanticipated bypass as required in Standard Provisions - Reporting V.E below (24-hour notice). (40 CFR section 122.41(m)(3)(ii).)

H. Upset

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. (40 CFR section 122.41(n)(1).)

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Standard Provisions – Permit Compliance I.H.2 below are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. (40 CFR section 122.41(n)(2).)

2. Conditions necessary for a demonstration of upset. A Discharger who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that (40 CFR section 122.41(n)(3)):

a. An upset occurred and that the Discharger can identify the cause(s) of the upset (40 CFR section 122.41(n)(3)(i));

b. The permitted facility was, at the time, being properly operated (40 CFR section 122.41(n)(3)(ii));

c. The Discharger submitted notice of the upset as required in Standard Provisions – Reporting V.E.2.b below (24-hour notice) (40 CFR section 122.41(n)(3)(iii)); and

d. The Discharger complied with any remedial measures required under Standard Provisions – Permit Compliance I.C above. (40 CFR section 122.41(n)(3)(iv).)

3. Burden of proof. In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof. (40 CFR section 122.41(n)(4).)

II. STANDARD PROVISIONS – PERMIT ACTION

A. General

This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition. (40 CFR section 122.41(f).)

B. Duty to Reapply

If the Discharger wishes to continue an activity regulated by this Order after the expiration date of this Order, the Discharger must apply for and obtain a new permit. (40 CFR section 122.41(b).)

C. Transfers

This Order is not transferable to any person except after notice to the Regional Water Board. The Regional Water Board may require modification or revocation and reissuance of the Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the Water Code. (40 CFR section 122.41(l)(3); section 122.61.)

III. STANDARD PROVISIONS – MONITORING

A. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (40 CFR section 122.41(j)(1).)

B. Monitoring results must be conducted according to test procedures under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503 unless other test procedures have been specified in this Order. (40 CFR section 122.41(j)(4); section 122.44(i)(1)(iv).)

IV. STANDARD PROVISIONS – RECORDS

A. Except for records of monitoring information required by this Order related to the Discharger's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), the Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Regional Water Board Executive Officer at any time. (40 CFR section 122.41(j)(2).)

B. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements (40 CFR section 122.41(j)(3)(i));

2. The individual(s) who performed the sampling or measurements (40 CFR section 122.41(j)(3)(ii));

3. The date(s) analyses were performed (40 CFR section 122.41(j)(3)(iii));

4. The individual(s) who performed the analyses (40 CFR section 122.41(j)(3)(iv));

5. The analytical techniques or methods used (40 CFR section 122.41(j)(3)(v)); and

6. The results of such analyses. (40 CFR section 122.41(j)(3)(vi).)

C. Claims of confidentiality for the following information will be denied (40 CFR section 122.7(b)):

1. The name and address of any permit applicant or Discharger (40 CFR section 122.7(b)(1)); and

2. Permit applications and attachments, permits and effluent data. (40 CFR section 122.7(b)(2).)

V. STANDARD PROVISIONS – REPORTING

A. Duty to Provide Information

The Discharger shall furnish to the Regional Water Board, State Water Board, or USEPA within a reasonable time, any information which the Regional Water Board, State Water Board, or USEPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Discharger shall also furnish to the Regional Water Board, State Water Board, or USEPA copies of records required to be kept by this Order. (40 CFR section 122.41(h); Wat. Code, section 13267.)

B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the Regional Water Board, State Water Board, and/or USEPA shall be signed and certified in accordance with Standard Provisions – Reporting V.B.2, V.B.3, V.B.4, and V.B.5 below. (40 CFR s 122.41(k).)

2. All permit applications shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to

assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures. (40 CFR section 122.22(a)(1).)

3. All reports required by this Order and other information requested by the Regional Water Board, State Water Board, or USEPA shall be signed by a person described in Standard Provisions – Reporting V.B.2 above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described in Standard Provisions – Reporting V.B.2 above (40 CFR section 122.22(b)(1));

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) (40 CFR section 122.22(b)(2)); and

c. The written authorization is submitted to the Regional Water Board and State Water Board. (40 CFR section 122.22(b)(3).)

4. If an authorization under Standard Provisions – Reporting V.B.3 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting V.B.3 above must be submitted to the Regional Water Board and State Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative. (40 CFR section 122.22(c).)

5. Any person signing a document under Standard Provisions – Reporting V.B.2 or V.B.3 above shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." (40 CFR section 122.22(d).)

C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program (Attachment E) in this Order. (40 CFR section 122.22(l)(4).)

2. Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Regional Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. (40 CFR section 122.41(l)(4)(i).)

3. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Regional Water Board. (40 CFR section 122.41(l)(4)(ii).)

4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order. (40 CFR section 122.41(l)(4)(iii).)

D. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order, shall be submitted no later than 14 days following each schedule date. (40 CFR section 122.41(l)(5).)

E. Twenty-Four Hour Reporting

1. The Discharger shall report any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Discharger becomes aware of the circumstances. A written submission shall also be provided within five (5) days of the time the Discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. (40 CFR section 122.41(l)(6)(i).)

2. The following shall be included as information that must be reported within 24 hours under this paragraph (40 CFR section 122.41(l)(6)(ii)):

a. Any unanticipated bypass that exceeds any effluent limitation in this Order. (40 CFR section 122.41(l)(6)(ii)(A).)

b. Any upset that exceeds any effluent limitation in this Order. (40 CFR section 122.41(l)(6)(ii)(B).)

3. The Regional Water Board may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours. (40 CFR section 122.41(l)(6)(iii).)

F. Planned Changes

The Discharger shall give notice to the Regional Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required under this provision only when (40 CFR section 122.41(l)(1)):

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in section 122.29(b) (40 CFR section 122.41(l)(1)(i)); or

2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are subject neither to effluent limitations in this Order nor to notification requirements under section 122.42(a)(1) (see Additional Provisions—Notification Levels VII.A.1). (40 CFR section 122.41(l)(1)(ii).)

3. The alteration or addition results in a significant change in the Discharger's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. (40 CFRsection 122.41(l)(1)(iii).)

G. Anticipated Noncompliance

The Discharger shall give advance notice to the Regional Water Board or State Water Board of any planned changes in the permitted facility or activity that may result in noncompliance with General Order requirements. (40 CFR section 122.41(l)(2).)

H. Other Noncompliance

The Discharger shall report all instances of noncompliance not reported under Standard Provisions – Reporting V.C, V.D, and V.E above at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting V.E above. (40 CFR section 122.41(l)(7).)

I. Other Information

When the Discharger becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Water Board, State Water Board, or USEPA, the Discharger shall promptly submit such facts or information. (40 CFR section 122.41(l)(8).)

VI. STANDARD PROVISIONS – ENFORCEMENT

The Regional Water Board is authorized to enforce the terms of this permit under several provisions of the Water Code, including, but not limited to, sections 13385, 13386, and 13387

VII. ADDITIONAL PROVISIONS – NOTIFICATION LEVELS

A. Non-Municipal Facilities

Existing manufacturing, commercial, mining, and silvicultural Dischargers shall notify the Regional Water Board as soon as they know or have reason to believe (40 CFR section 122.42(a)):

1. That any activity has occurred or will occur that would result in the discharge, on a routine or frequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following "notification levels" (40 CFR section 122.42(a)(1)):

a. 100 micrograms per liter (µg/L) (40 CFR section 122.42(a)(1)(i));

b. 200 µg/L for acrolein and acrylonitrile; 500 µg/L for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol; and 1 milligram per liter (mg/L) for antimony (40 CFR section 122.42(a)(1)(ii));

c. Five (5) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge (40 CFR section 122.42(a)(1)(iii)); or

d. The level established by the Regional Water Board in accordance with section 122.44(f). (40 CFR section 122.42(a)(1)(iv).)

2. That any activity has occurred or will occur that would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following "notification levels" (40 CFR section 122.42(a)(2)):

a. 500 micrograms per liter (µg/L) (40 CFR section 122.42(a)(2)(i));

b. 1 milligram per liter (mg/L) for antimony (40 CFR section 122.42(a)(2)(ii));

c. Ten (10) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge (40 CFR section 122.42(a)(2)(iii)); or

d. The level established by the Regional Water Board in accordance with section 122.44(f). (40 CFR section 122.42(a)(2)(iv).)

B. Publicly-Owned Treatment Works (POTWs)

All POTWs shall provide adequate notice to the Regional Water Board of the following (40 CFR section 122.42(b)):

1. Any new introduction of pollutants into the POTW from an indirect discharger that would be subject to sections 301 or 306 of the CWA if it were directly discharging those pollutants (40 CFR section 122.42(b)(1)); and

2. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of adoption of the Order. (40 CFR section 122.42(b)(2).)

3. Adequate notice shall include information on the quality and quantity of effluent introduced into the POTW as well as any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW. (40 CFR section 122.42(b)(3).)

ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP NO. 6068)

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Tables

ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

The Code of Federal Regulations (40 CFR section 122.48) requires that all NPDES permits specify monitoring and reporting requirements. Water Code sections 13267 and 13383 also authorize the Regional Water Quality Control Board (Regional Water Board) to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements, which implement the federal and California regulations.

I. GENERAL MONITORING PROVISIONS

A. Effluent sampling station shall be established for the points of discharge (Discharge Point Nos. 001 and 002) [Latitude 33° 26' 42" Longitude 118° 29' 0"]) and shall be located where representative samples of that effluent can be obtained.

B. Effluent samples shall be taken downstream of any treatment works and prior to mixing with the receiving waters.

C. This Regional Water Board shall be notified in writing of any change in the sampling stations once established or in the methods for determining the quantities of pollutants in the individual waste streams.

D. Pollutants shall be analyzed using the analytical methods described in 40 CFR sections 136.3, 136.4, and 136.5 (revised May 18, 2012); or, where no methods are specified for a given pollutant, by methods approved by this Regional Water Board or the State Water Resources Control Board (State Water Board). Laboratories analyzing effluent samples and receiving water samples shall be certified by the State Water Board's Division of Drinking Water, Environmental Laboratory Accreditation Program (ELAP) or approved by the Executive Officer and must include quality assurance/quality control (QA/QC) data in their reports. A copy of the laboratory certification shall be provided each time a new certification and/or renewal of the certification is obtained from ELAP.

E. For any analyses performed for which no procedure is specified in the U.S. Environmental Protection Agency (USEPA) guidelines or in the MRP, the constituent or parameter analyzed and the method or procedure used must be specified in the monitoring report.

F. Each monitoring report must affirm in writing that "all analyses were conducted at a laboratory certified for such analyses by the State Water Board or approved by the Executive Officer and in accordance with current USEPA guideline procedures or as specified in this MRP".

G. The monitoring reports shall specify the analytical method used, the Method Detection Limit (MDL), and the Minimum Level (ML) for each pollutant. For the purpose of reporting compliance with numerical limitations, performance goals, and receiving water limitations, analytical data shall be reported by one of the. following methods, as appropriate:

1. actual numerical value for sample results greater than or equal to the ML; or

2. "Detected, but Not Quantified (DNQ)" if results are greater than or equal to the laboratory's MDL but less than the ML; or,

3. "Not-Detected (ND)" for sample results less than the laboratory's MDL with the MDL indicated for the analytical method used.

Analytical data reported as "less than" for the purpose of reporting compliance with permit limitations shall be the same or lower than the permit limit(s) established for the given parameter'.

Current MLs (Attachment G) are those published in Appendix II of the Ocean Plan. In addition, samples for metals analyses, waste seawater discharge, storm water effluent samples, reference station samples, and receiving water samples must be analyzed by the approved analytical method with the lowest MDL (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

H. Where possible, the ML's employed for effluent analyses to determine compliance with effluent limitations shall be lower than the effluent limitations established in this Order for a given parameter as per the sufficiently sensitive regulations at 40 CFR section 122.44(i)(1)(iv). If the ML value is not below the effluent limitation, then the lowest ML value and its associated analytical method shall be selected for compliance purposes. At least once a year, the Discharger shall submit a list of the analytical methods employed for each test and associated laboratory QA/QC procedures.

I. Where possible, the ML's employed for effluent analyses not associated with determining compliance with effluent limitations in this Order shall be lower than the lowest applicable water quality objective, for a given parameter as per the sufficiently sensitive regulations at 40 CFR section 122.21(e)(3). Water quality objectives for parameters may be found in Table 1 of the Ocean Plan. If the ML value is not below the water quality objective, then the lowest ML value and its associated analytical method shall be selected for compliance purposes. At least once a year, the Discharger shall submit a list of the analytical methods employed for each test, the associated laboratory QA/QC procedures, reporting levels (RL's), and method detection limits (MDL's).

The Regional Water Board, in consultation with the State Water Board Quality Assurance Program, shall establish a ML that is not contained in Attachment G to be included in the Discharger's permit in any of the following situations:

1. When the pollutant under consideration is not included in Attachment G;

2. When the Discharger and Regional Water Board agree to include in the permit a test method that is more sensitive than that specified in 40 CFR Part 136 (revised May 18, 2012);

3. When the Discharger agrees to use an ML that is lower than that listed in Attachment G;

4. When the Discharger demonstrates that the calibration standard matrix is sufficiently different from that used to establish the ML in Attachment G, and proposes an appropriate ML for their matrix; or,

5. When the Discharger uses a method whose quantification practices are not consistent with the definition of an ML. Examples of such methods are the USEPA-approved method 1613 for dioxins and furans, method 1624 for volatile organic substances, and method 1625 for semi-volatile organic substances. In such cases, the Discharger, the Regional Water Board, and the State Water Board shall agree on a lowest quantifiable limit and that limit will substitute for the ML for reporting and compliance determination purposes.

J. Water/wastewater samples must be analyzed within allowable holding time limits as specified in section 136.3. All QA/QC items must be run on the same dates the samples were actually analyzed, and the results shall be reported in the Regional Water Board format, when it becomes available, and submitted with the laboratory reports. Proper chain of custody procedures must be followed, and a copy of the chain of custody shall be submitted with the report.

K. Field analyses with short sample holding time such as pH, total residual chlorine, and temperature, may be performed using properly calibrated and maintained portable instruments by trained personnel acting on the Discharger's behalf, using methods in accordance with 40 C.F.R. Part 136. All field instruments must be calibrated per manufacturer's instructions. A manual containing the standard operating procedures for all field analyses, including records of personnel proficiency training, instruments calibration and maintenance, and quality control procedures shall be maintained onsite, and shall be available for inspection by the Regional Water Board and its authorized representatives. Information including instrument calibration, time of sample collection, time of analysis, name of analyst, quality assurance/quality control data, and measurement values shall be clearly documented during each field analysis and submitted to the Regional Water Board as part of the corresponding regular monitoring report.

L. All analyses shall be accompanied by the chain of custody, including but not limited to date and time of sampling, sample identification, and name of person who performed sampling, date of analysis, name of person who performed analysis, QA/QC data, method detection limits, analytical methods, copy of laboratory certification, and a perjury statement executed by the person responsible for the laboratory.

M. The Discharger shall calibrate and perform maintenance procedures on all monitoring instruments and to insure accuracy of measurements, or shall insure that both equipment activities will be conducted.

N. The Discharger shall have, and implement, an acceptable written quality assurance (QA) plan for laboratory analyses. Unless otherwise specified in the analytical method, duplicate samples must be analyzed at a frequency of 5% (1 in 20 samples) with at least one if there are fewer than 20 samples in a batch. A batch is defined as a single analytical run encompassing no more than 24 hours from start to finish. A similar frequency shall be maintained for analyzing spiked samples.

O. When requested by the Regional Water Board or USEPA, the Discharger will participate in the NPDES discharge monitoring report QA performance study. The Discharger must have a success rate equal to or greater than 80%.

P. For parameters that both average monthly and daily maximum limits are specified and the monitoring frequency is less than four times a month, the following shall apply. If an analytical result is greater than the average monthly limit, the Discharger shall collect four additional samples at approximately equal intervals during the month, if possible, until compliance with the average monthly limit has been demonstrated. All five analytical results shall be reported in the monitoring report for that month, or 45 days after results for the additional samples were received, whichever is later. In the event of noncompliance with an average monthly effluent limitation, the sampling frequency for that constituent shall be increased to weekly and shall continue at this level until compliance with the average monthly effluent limitation has been demonstrated. The Discharger shall provide for the approval of the Executive Officer a program to ensure future compliance with the average monthly limit.

Q. In the event wastes are transported to a different disposal site during the report period, the following shall be reported in the monitoring report:

1. Types of wastes and quantity of each type;

2. Name and address for each hauler of wastes (or method of transport if other than by hauling); and

3. Location of the final point(s) of disposal for each type of waste.

If no wastes are transported off-site during the reporting period, a statement to that effect shall be submitted.

R. Each monitoring report shall state whether or not there was any change in the discharge as described in the Order during the reporting period.

II. MONITORING LOCATIONS

The Discharger shall establish the following monitoring locations to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements in this Order:

Table E-1. Monitoring Station Locations

Discharge Point Name	Monitoring Location Name	Monitoring Location Description
--	INF-001	At the seawater intake structure near the bluff below the University of Southern California, Wrigley Marine Science Center sewage treatment plant spray field.
001	EFF-001	Waste seawater effluent prior to discharge to the receiving water.
002	EFF-002	Storm water runoff prior to discharge to the receiving water.
--	REF-001	The reference station in the ocean in the vicinity of Goat Harbor or Italian Gardens near Twin Rocks Point on the northern coast of Santa Catalina Island.
--	RSW-001	Receiving water immediately seaward of the surf zone in Big Fisherman Cove adjacent to the outfall location.
--	SED-001	Subtidal sediment near the seawater discharge system and storm water outfall in Big Fisherman Cove.

III. INFLUENT MONITORING REQUIREMENTS

A. Monitoring Location INF-001

The Discharger shall monitor seawater flows into the Facility (intake) at INF-001 as follows:

Table E-2. Intake Water Monitoring Requirements - INF-001

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Total Coliform	CFU/100 mL or MPN/100mL	Grab	3/Year[1]	[2]

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Fecal Coliform	CFU/100 mL or MPN/100mL	Grab	3/Year[1]	[2]
Enterococcus	CFU/100 mL or MPN/100mL	Grab	3/Year[1]	[2]

1. Samples must be collected at the seawater intake structure during three storm events per year that result in runoff from the spray field hillside and measured for Ocean Plan indicator bacteria. The Regional Water Board may eliminate this requirement if changes are made to the Discharger's sewage plant (regulated under Order No. 94-114) or treated sewage effluent system that would absolutely eliminate the possibility of contaminants entering the Area of Special Biological Significance (ASBS).
2. Detection methods used for coliforms (total and fecal) and *Enterococcus* shall be those presented in Table 1A of Part 136, unless alternate methods have been approved in advance by USEPA pursuant to Part 136. See section VI.J (Compliance Determination, Bacterial Standards and Analyses) of the Order for additional specifications.

IV. EFFLUENT MONITORING REQUIREMENTS

A. Monitoring Location EFF-001

1. The Discharger shall monitor waste seawater discharge effluent at EFF-001 as follows.

Table E-3. Effluent Monitoring at EFF-001

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow[1]	gpd	Recorder	Continuous	--
Biochemical Oxygen Demand (BOD) 5-day @20°C [4]	mg/L	24-Hour Composite	1/Quarter	[3]
Oil and Grease [4]	mg/L	Grab	1/Quarter	[3]
Settleable Solids	mL/L	Grab	1/Quarter	[3]
Total Suspended Solids (TSS) [4]	mg/L	24-Hour Composite	1/Quarter	[3]
Turbidity	NTU	24-Hour Composite	1/Quarter	[3]
pH	Standard units	Grab	1/Month[2, 7]	[3]
Salinity	ppm	24-Hour Composite	2/Year[2, 7]	[3]
Temperature	°F	Grab	1/Month[2, 7]	[3]
Chronic Toxicity	Pass or Fail, % Effect	24-Hour Composite	1/Quarter[2, 7]	[3, 5]
Ammonia (as N)	mg/L	24-Hour Composite	2/Year[2, 7]	[3]
Total Coliform	CFU/100 mL or MPN/100mL	Grab	2/Year[6, 7]	[3, 8]
Fecal Coliform	CFU/100 mL or MPN/100mL	Grab	2/Year[6, 7]	[3, 8]

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Enterococcus	CFU/100 mL or MPN/100mL	Grab	2/Year[6, 7]	[3, 8]
Copper, Total Recoverable[4]	µg/L	24-Hour Composite	1/Month[7]	[3]
Lead, Total Recoverable[4]	µg/L	24-Hour Composite	1/Quarter[7]	[3]
Selenium, Total Recoverable[4]	µg/L	24-Hour Composite	1/Quarter[7]	[3]
Zinc, Total Recoverable[4]	µg/L	24-Hour Composite	1/Quarter[7]	[3]
Remaining Ocean Plan Table 1 Constituents (except acute toxicity)[4,10]	µg/L	Grab or24-Hour Composite[9]	2/Year[2, 7]	[3]

1. Total daily flow and peak daily flows must be reported quarterly to the Regional Water Board.
2. During the first year (2014) of the permit term, two effluent samples must be collected (at the same time as the reference samples at REF-001), once during dry weather and once during wet weather, (i.e., a storm event). Based on the results from the first year, the Regional Water Board will determine the frequency of sampling (at a minimum, annually during wet weather) and the constituents to be tested during the remainder of the permit cycle, except that ammonia (as N), pH, salinity, and temperature must be tested at least annually. Chronic toxicity (for at least one consistent invertebrate species) must be tested at least annually. (State Water Board Resolution No. 2006-0013, condition 2.l.) After one year of monitoring using the TST approach that consistently demonstrates compliance, the Discharger may request a decrease in the monitoring frequency. The Executive Officer will review the request, determine if the requested changes are appropriate and subsequently issue a response. The approved monitoring frequency shall be at least as stringent as the requirements included in Resolution No. 2006-0013.
3. Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136; where no methods are specified for a given pollutant, by methods approved by the Regional Water Board or State Water Board. For any pollutant whose effluent limitation is lower than all the MLs specified in Appendix II of the Ocean Plan (Attachment G), the analytical method with the lowest ML must be selected. For metal analysis, samples must be analyzed by the approved analytical method with the lowest minimum detection limit.
4. The mass emission (lbs/day) for the discharge shall be calculated and reported using the actual concentration and the actual flow rate measured at the time of discharge, using the following formula.

   $M = 8.34 \times C \times Q$

   Where: M = mass discharge for a pollutant, lbs/day
   C = actual concentration for a pollutant, mg/L
   Q = actual discharge flow rate, MGD
5. The Discharger shall conduct whole effluent toxicity monitoring as outlined in section V. The median monthly summary result shall be reported as “Pass” or “Fail”. The Maximum Daily Single Result shall be reported as “Pass or Fail” with a “% Effect”. During calendar months when there is a discharge more than one day, exactly three independent toxicity tests are required when one toxicity test results in “Fail”. The median of three testing results (Fail or Pass) will be used for the determination of compliance with the Median Monthly Effluent Limitation. Please refer to section V.A.8. for the accelerated monitoring schedule.
6. Minimum of five samples, all within any 30-day period, shall be collected once every sampling event. One sampling event shall be conducted in the wet weather and one during the dry weather.
7. At least one sampling event per year must be collected during a wet weather (i.e., a storm event) at the same time as the Reference sampling at REF-001.

8. Detection methods used for coliforms (total and fecal) and *Enterococcus* shall be those presented in Table 1A of 40 CFR Part 136 (revised July 1, 2009), unless alternate methods have been approved by USEPA pursuant to 40 CFR Part 136 or improved methods have been determined by the Executive Officer and/or USEPA. See section VI.J (Compliance Determination, Bacterial Standards and Analyses) of the Order for additional specifications.
9. The Discharger shall collect either "grab' or "24 hour composite" samples based on characteristics of each constituent. 40 CFR Part 136 specifies that grab samples must be collected for pH, temperature, dissolved oxygen, chlorine, purgeable organics, sulfides, oil and grease, coliform bacteria and cyanide.
10. Ocean Plan Table 1 constituents as defined by the Ocean Plan, described in section IV.C.3 of the Fact Sheet of this Order.

B. Monitoring Location EFF-002

1. The Discharger shall monitor storm water runoff at EFF-002 as follows.

Table E-4. Effluent Monitoring at EFF-002

Parameter[5]	Units	Sample Type	Minimum Sampling Frequency[5]	Required Analytical Test Method
Flow[1]	gpd	Estimated	During Each Discharge Event	--
BOD[2]	mg/L	Grab	2/Year[3, 7]	[4]
Dissolved Oxygen	mg/L	Grab	2/Year[3, 7]	[4]
Oil and Grease[2]	mg/L	Grab	2/Year[3, 7]	[4]
Settleable Solids	mL/L	Grab	2/Year[3, 7]	[4]
TSS[2]	mg/L	Grab	2/Year[3 ,7]	[4]
Turbidity	NTU	Grab	2/Year[3 ,7]	[4]
pH	Standard units	Grab	2/Year[3, 7]	[4]
Chronic Toxicity	Pass or Fail, % Effect	Grab	2/Year[3, 7]	[4, 6]
Total Coliform	CFU/100 mL or MPN/100mL	Grab	2/Year[3, 7]	[4, 8]
Fecal Coliform	CFU/100 mL or MPN/100mL	Grab	2/Year[3, 7]	[4, 8]
Enterococcus	CFU/100 mL or MPN/100mL	Grab	2/Year[3, 7]	[4, 8]
Arsenic, Total Recoverable[2]	µg/L	Grab	1/Month[3, 9]	[4]
Beryllium, Total Recoverable[2]	µg/L	Grab	1/Month[3, 9]	[4]
Copper, Total Recoverable[2]	µg/L	Grab	1/Month[3, 9]	[4]
Lead, Total Recoverable[2]	µg/L	Grab	1/Month[3, 9]	[4]
Nickel, Total Recoverable[2]	µg/L	Grab	1/Month[3, 9]	[4]
Zinc, Total Recoverable[2]	µg/L	Grab	1/Month[3, 9]	[4]
TCDD Equivalents [2,10]	µg/L	Grab	2/Year[3, 7]	[4]
Remaining Ocean Plan Table 1 Constituents (except acute toxicity)[2, 11]	µg/L	Grab	1/Year[3]	[4]

1. Total daily flow for each storm event must be reported quarterly to the Regional Water Board.

2. The mass emission (lbs/day) for the discharge shall be calculated and reported using the actual concentration and the actual flow rate estimated at the time of discharge, using the following formula.

   $M = 8.34 \times C \times Q$

   Where: M = mass discharge for a pollutant, lbs/day

   C = actual concentration for a pollutant, mg/L

   Q = actual discharge flow rate, MGD

3. Sampling shall be performed during wet-weather, during the first hour of discharge, at the same time as the receiving water sampling at RSW-001, the seawater effluent sampling at EFF-001, and the reference sampling at REF-001. If, for safety reasons, a sample cannot be obtained during the first hour of discharge, a sample shall be obtained at the first safe opportunity, and the reason for the delay shall be included in the report. If there is no discharge to surface waters, then no monitoring is required. In the corresponding monitoring report, the Discharger will indicate under the statement of perjury that no effluent was discharged to surface water during the reporting period.

4. Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136; where no methods are specified for a given pollutant, by methods approved by the Regional Water Board or State Water Board. For any pollutant whose effluent limitation is lower than all the MLs specified in Appendix II of the Ocean Plan (Attachment G), the analytical method with the lowest ML must be selected. For metal analysis, samples must be analyzed by the approved analytical method with the lowest minimum detection limit.

5. Based on the results from the first year (2014), the Regional Water Board shall determine the frequency of sampling and the constituents in the storm water runoff and receiving water to be tested during the remainder of the permit term, except that indicator bacteria and chronic toxicity (three species) for receiving water must be tested annually during a storm event. (State Water Board Resolution No. 2006-0013, condition 2.m.)
   After one year of monitoring using the TST approach that consistently demonstrates compliance, the Discharger may request a decrease in the monitoring frequency. The Executive Officer will review the request, determine if the requested changes are appropriate and subsequently issue a response. The approved monitoring frequency shall be at least as stringent as the requirements included in Resolution No. 2006-0013.

6. The Discharger shall conduct whole effluent toxicity monitoring as outlined below in section V. " The Maximum Daily Single Result shall be reported as "Pass or Fail" with a "% Effect". Sufficient storm water shall be collected in case the TIE is required following a failed initial toxicity test. Please refer to section V.A.10. for the toxicity identification evaluation (TIE) procedure.

7. At a minimum, samples must be collected during two separate wet weather discharge events each year.

8. Detection methods used for coliforms (total and fecal) and *Enterococcus* shall be those presented in Table 1A of 40 CFR Part 136, unless alternate methods have been approved in advance by USEPA pursuant to 40 CFR Part 136. See section VI.J (Compliance Determination, Bacterial Standards and Analyses) of the Order for additional specifications.

9. The Discharger must sample the first discharge event of every month during which a discharge occurs.

10. TCDD Equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below. USEPA method 1613 may be used to analyze dioxin and furan congeners.

    Dioxin-TEQ (TCDD Equivalents) = $\Sigma (C_x \times TEF_x)$

    Where:

    C_x = concentration of dioxin or furan congener x

    TEF_x = TEF for congener x

Toxicity Equivalency Factors

Isomer Group	Toxicity Equivalency Factor (TEF)
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5

Isomer Group	Toxicity Equivalency Factor (TEF)
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
Octa CDD	0.001
2,3,7,8 tetra CDF	0.1
1,2,3,7,8 penta CDF	0.05
2,3,4,7,8 penta CDF	0.5
2,3,7,8 hexa CDFs	0.1
2,3,7,8 hepta CDFs	0.01

[11.] Ocean Plan Table 1 Constituents as defined by the Ocean Plan, described in section IV.C.3 of the Fact Sheet of this Order.

V. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

A. Chronic Toxicity Testing

1. Discharge In-stream Waste Concentration (IWC) for Chronic Toxicity

The chronic toxicity IWC for this discharge is **100 percent** effluent.

2. Sample Volume and Holding Time

The total sample volume shall be determined by the specific toxicity test method used. Sufficient sample volume shall be collected to perform the required toxicity test. For the storm water and the receiving water, sufficient sample volume shall also be collected for subsequent TIE studies, if necessary, at each sampling event. All toxicity tests shall be conducted as soon as possible following sample collection. No more than 36 hours shall elapse before the conclusion of sample collection and test initiation**.**

3. Chronic Marine and Estuarine Species and Test Methods

If effluent samples are collected from outfalls discharging to receiving waters with salinity $\geq$1 ppt, the Discharger shall conduct the following chronic toxicity tests on effluent samples—at the in-stream waste concentration for the discharge—in accordance with species and test methods in *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms* (EPA/600/R-95/136, 1995). Artificial sea salts shall be used to increase sample salinity. In no case shall these species be substituted with another test species unless written authorization from the Executive Officer is received.

a. A static renewal toxicity test with the topsmelt, *Atherinops affinis* (Larval Survival and Growth Test Method 1006.01[1]).

b. A static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus*, and the sand dollar, *Dendraster excentricus* (Fertilization Test Method 1008.0), or a static non-renewal toxicity test with the red abalone, *Haliotis rufescens* (Larval Shell Development Test Method).

c. A static non-renewal toxicity test with the giant kelp, *Macrocystis pyrifera* (Germination and Growth Test Method 1009.0).

4. Chronic Freshwater Species and Test Methods

If effluent samples are collected from outfalls discharging to receiving waters with salinity <1 ppt, the Discharger shall conduct the following chronic toxicity tests on effluent samples—at the in-stream waste concentration for the discharge—in accordance with species and test methods in *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (EPA/821/R-02/013, 2002; Table IA, 40 CFR Part 136). In no case shall these species be substituted with another test species unless written authorization from the Executive Officer is received.

a. A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0).

b. A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.01).

c. A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

5. Species Sensitivity Screening

Species sensitivity screening shall be conducted during this permit's first required sample collection. The Discharger shall collect a single effluent sample and concurrently conduct three toxicity tests using the fish, an invertebrate, and the alga species previously referenced. This sample shall also be analyzed for the parameters required for the discharge. The species that exhibits the highest "Percent Effect" at the discharge IWC during species sensitivity screening shall be used for routine monitoring during the permit cycle.

6. Quality Assurance and Additional Requirements

Quality assurance measures, instructions, and other recommendations and requirements are found in the test methods manual previously referenced. Additional requirements are specified below.

a. The discharge is subject to determination of "Pass" or "Fail" and "Percent Effect" from a single-effluent concentration chronic toxicity test at the discharge IWC using the Test of Significant Toxicity (TST) approach described in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (EPA 833-R-10-003, 2010), Appendix A, Figure A-1, and Table A-1. The null hypothesis (H_o) for the TST approach is: Mean discharge IWC response ≤0.75 × Mean control response. A test result that rejects this null hypothesis is reported as "Pass". A test result that does not reject this null hypothesis is reported as "Fail". The relative "Percent Effect" at the discharge IWC is defined and reported as: ((Mean control response – Mean discharge IWC response) ÷ Mean control response)) × 100.

b. The Median Monthly Effluent Limit (MMEL) for chronic toxicity only applies when there is a discharge more than one day in a calendar month period. During such calendar

months, exactly three independent toxicity tests are required when one toxicity test results in "Fail". This requirement is not applicable to the industrial storm water discharge.

c. If the effluent toxicity test does not meet all test acceptability criteria (TAC) specified in the referenced test method, then the Discharger must re-sample and re-test within 14 days. For the industrial storm water discharge, the Discharger must re-sample and re-test as soon as possible.

d. Dilution water and control water, including brine controls, shall be laboratory water prepared and used as specified in the test methods manual. If dilution water and control water is different from test organism culture water, then a second control using culture water shall also be used.

e. Reference toxicant tests and effluent toxicity tests shall be conducted using the same test conditions (e.g., same test duration, etc.). Monthly reference toxicant testing is sufficient.

f. All reference toxicant test results should be reviewed and reported according to EPA guidance on the evaluation of concentration-response relationships found in *Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing* (40 CFR Part 136) (EPA 821-B-00-004, 2000).

g. The Discharger shall perform toxicity tests on final effluent samples. Chlorine and ammonia shall not be removed from the effluent sample prior to toxicity testing, unless explicitly authorized under this section of the Monitoring and Reporting Program and the rational is explained in the Fact Sheet (Attachment F).

7. Preparation of Initial Investigation TRE Work Plan

The Discharger shall prepare and submit a generic Initial Investigation TRE Work Plan within 90 days of the permit effective date, to be ready to respond to toxicity events. The Discharger shall review and update this work plan as necessary so it remains current and applicable to the discharge. At minimum, the work plan shall include:

a. A description of the investigation and evaluation techniques that would be used to identify potential causes and sources of toxicity, effluent variability, and treatment system efficiency.

b. A description of methods for maximizing in-house treatment system efficiency, good housekeeping practices, and a list of all chemicals used in operations at the facility.

c. If a Toxicity Identification Evaluation (TIE) is necessary, an indication of who would conduct the TIEs (i.e., an in-house expert or outside contractor).

Sections 8 and 9 are applicable to non-storm water (waste seawater) discharges:

8. Accelerated Monitoring Schedule for Median Monthly Summary Result: "Fail" (or Maximum Daily Single Result: "Fail and % Effect ≥50"). The summary result shall be used when there is discharge more than one day in a calendar month. The single result shall be used when there is discharge of only one day in a calendar month.

Within 24 hours of the time the Discharger becomes aware of this result, the Discharger shall implement an accelerated monitoring schedule consisting of four, five-concentration toxicity tests (including the discharge IWC), conducted at approximately two week intervals, over an eight week period. If each of the accelerated toxicity tests result in "Pass", the Discharger shall return to routine monitoring for the next monitoring period. If one of the accelerated toxicity tests result in "Fail", the Discharger shall immediately implement the Toxicity Reduction Evaluation (TRE) Process conditions set forth below.

9. Toxicity Reduction Evaluation (TRE) Process

a. Preparation and Implementation of Detailed TRE Work Plan. The Discharger shall immediately initiate a TRE using, according to the type of treatment facility, EPA manual *Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants* (EPA/833/B-99/002, 1999) or EPA manual *Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations* (EPA/600/2-88/070, 1989) and—within 30 days—submit to the Executive Officer a Detailed TRE Work Plan, which shall follow the generic Initial Investigation TRE Work Plan revised as appropriate for this toxicity event. It shall include the following information, and comply with additional conditions set by the Executive Officer:

i. Further actions by the Discharger to investigate, identify, and correct the causes of toxicity.

ii. Actions the Discharger will take to mitigate the effects of the discharge and prevent the recurrence of toxicity.

iii. A schedule for these actions, progress reports, and the final report.

b. TIE Implementation. The Discharger may initiate a TIE as part of a TRE to identify the causes of toxicity using the same species and test method and, as guidance, EPA manuals: *Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures* (EPA/600/6-91/003, 1991); *Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA/600/R-92/080, 1993); *Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA/600/R-92/081, 1993); and *Marine Toxicity Identification Evaluation (TIE): Phase I Guidance Document* (EPA/600/R-96-054, 1996). The TIE should be conducted on the species demonstrating the most sensitive toxicity response.

c. Many recommended TRE elements parallel required or recommended efforts for source control, pollution prevention, and storm water control programs. TRE efforts should be coordinated with such efforts. As toxic substances are identified or characterized, the Discharger shall continue the TRE by determining the sources and evaluating alternative strategies for reducing or eliminating the substances from the discharge. All reasonable steps shall be taken to reduce toxicity to levels consistent with toxicity evaluation parameters.

d. The Discharger shall conduct routine effluent monitoring for the duration of the TRE process. Additional accelerated monitoring and TRE work plans are not required once a TRE is begun.

e. The Regional Water Board recognizes that toxicity may be episodic and identification of causes and reduction of sources of toxicity may not be successful in all cases. The TRE may be ended at any stage if monitoring finds there is no longer toxicity.

The following section (Sections 10) is applicable to industrial storm water discharges:

10. Toxicity Identification Evaluation and Toxicity Reduction Evaluation Process

a. Toxicity Identification Evaluation (TIE). A toxicity test sample is immediately subject to TIE procedures to identify the toxic chemical(s), if a chronic toxicity test shows "Fail and % Effect value ≥50". The Discharger shall initiate a TIE using, as guidance, EPA manuals: *Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures* (EPA/600/6-91/003, 1991); *Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA/600/R-92/080, 1993); *Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA/600/R-92/081, 1993); and *Marine Toxicity Identification Evaluation (TIE): Phase I Guidance Document* (EPA/600/R-96-054, 1996). The TIE should be conducted on the species demonstrating the most sensitive toxicity response.

b. Toxicity Reduction Evaluation (TRE). When a toxicant or class of toxicants is identified, a TRE shall be performed for that toxicant. The TRE shall include all reasonable steps to identify the source(s) of toxicity and discuss appropriate BMPs to eliminate the causes of toxicity. No later than 30 days after the source of toxicity and appropriate BMPs and/or treatment are identified, the Discharger shall submit a TRE Corrective Action Plan to the Executive Officer for approval. At minimum, the plan shall include:

i. The potential sources of pollutant(s) causing toxicity.

ii. Recommended BMPs and/or treatment to reduce the pollutant(s) causing toxicity.

iii. Follow-up monitoring to demonstrate that toxicity has been removed.

iv. Actions the Discharger will take to mitigate the effects of the discharge and prevent the recurrence of toxicity.

v. A schedule for these actions, progress reports, and the final report.

c. Many recommended TRE elements parallel required or recommended efforts for source control, pollution prevention, and storm water control programs. TRE efforts should be coordinated with such efforts. As toxic substances are identified or characterized, the Discharger shall continue the TRE by determining the sources and evaluating alternative strategies for reducing or eliminating the substances from the discharge. All reasonable steps shall be taken to reduce toxicity to levels consistent with toxicity evaluation parameters.

d. The Discharger shall conduct routine effluent monitoring for the duration of the TIE/TRE process.

e. The Regional Water Board recognizes that toxicity may be episodic and identification of causes and reduction of sources of toxicity may not be successful in all cases. The TRE may be ended at any stage if monitoring finds there is no longer toxicity.

11. Reporting

The Self Monitoring Report (SMR) shall include a full laboratory report for each toxicity test. This report shall be prepared using the format and content of the test methods manual chapter called Report Preparation, including:

a. The toxicity test results for the TST approach, reported as "Pass" or "Fail" and "Percent Effect" at the chronic toxicity IWC for the discharge.

b. Water quality measurements for each toxicity test (e.g., pH, dissolved oxygen, temperature, conductivity, hardness, salinity, chlorine, ammonia).

c. TRE/TIE results. The Executive Officer shall be notified no later than 30 days from completion of each aspect of TRE/TIE analyses.

d. Statistical program (e.g., TST calculator, CETIS, etc.) output results for each toxicity test.

VI. LAND DISCHARGE MONITORING REQUIREMENTS – NOT APPLICABLE

VII. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER

A. Monitoring Location REF-001 (Reference Station)

1. The Discharger shall monitor the Natural Water Quality Reference Station REF-001 as follows.

Table E-5. Receiving Water Monitoring Requirements at REF-001 (Reference Station)

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Ammonia (as N)	mg/L	Grab	2/Year[1, 2]	[3]
pH	Standard units	Grab	2/Year[1, 2]	[3]
Salinity	ppm	Grab	2/Year[1, 2]	[3]
Temperature	°F	Grab	2/Year[1, 2]	[3]
Total Coliform	CFU/100 mL or MPN/100mL	Grab	2/Year[1, 2]	[3, 4]
Fecal Coliform	CFU/100 mL or MPN/100mL	Grab	2/Year[1, 2]	[3, 4]
Enterococcus	CFU/100 mL or MPN/100mL	Grab	2/Year[1, 2]	[3, 4]
Ocean Plan Table 1 Constituents (except acute and chronic toxicity)[5]	µg/L	Grab	2/Year[1, 2]	[3]

1. During the first year (2014) of the permit term, two samples must be collected (once during dry weather and once during wet weather, i.e., a storm event), at the same time as seawater at EFF-001, storm

water at EFF-002, and receiving water samples at RSW-001. Based on the results from the first year, the Regional Water Board will determine the frequency of sampling (at a minimum, annually during wet weather) and the constituents to be tested during the remainder of the permit cycle, except that ammonia (as N), pH, salinity, and temperature must be tested at least annually. (State Water Board Resolution 2006-0013, condition 2.l.)
After one year of monitoring using the TST approach that consistently demonstrates compliance, the Discharger may request a decrease in the monitoring frequency. The Executive Officer will review the request, determine if the requested changes are appropriate and subsequently issue a response. The approved monitoring frequency shall be at least as stringent as the requirements included in Resolution No. 2006-0013.

2. Wet weather samples at the reference station may be collected immediately following a storm event, but in no case more than 24 hours after, if sampling conditions are unsafe during the storm.

3. Pollutants shall be analyzed using the analytical methods described in Part 136; for priority pollutants the methods must meet the lowest MLs specified in Appendix II of the Ocean Plan (Attachment G) that is required to demonstrate compliance. Where no methods are specified for a given pollutant, the methods must be approved by this Regional Water Board or the State Water Board. For metals analysis, samples must be analyzed by the approved analytical method with the lowest minimum detection limits.

4. Detection methods used for coliforms (total and fecal) and *Enterococcus* shall be those presented in Table 1A of 40 CFR Part 136, unless alternate methods have been approved in advance by USEPA pursuant to Part 136. See section VI.J (Compliance Determination, Bacterial Standards and Analyses) of the Order for additional specifications.

5. Ocean Plan Table 1 Constituents as defined by the Ocean Plan, described in section IV.C.3 of the Fact Sheet of this Order.

B. Monitoring Location RSW-001 (Receiving Water Station)

1. The Discharger shall monitor receiving water in Big Fisherman Cove at RSW-001 as follows.

Table E-6. Receiving Water Monitoring Requirements at RSW-001 (Receiving Water Station)

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Dissolved Oxygen	mg/L	Grab	1/Year[1, 2]	[2]
Turbidity	NTU	Grab	1/Year[1, 2]	[2]
Chronic Toxicity	TUc	Grab	1/Year[1]	[2, 3]
Total Coliform	CFU/100 mL or MPN/100mL	Grab	1/Year[1]	[2, 4]
Fecal Coliform	CFU/100 mL or MPN/100mL	Grab	1/Year[1]	[2, 4]
Enterococcus	CFU/100 mL or MPN/100mL	Grab	1/Year[1]	[2, 4]
Ocean Plan Table 1 Constituents(except acute toxicity) [5]	µg/L	Grab	1/Year[1, 2]	[2]

1. Sampling shall be performed during wet-weather, at the same time as the seawater effluent at EFF-001, the storm water effluent at EFF-002, and the reference sampling at REF-001. Receiving water samples may be collected immediately following a storm event, but in no case more than 24 hours after, if sampling conditions are unsafe during the storm. Based on the first year sample results, the Regional Water Board will determine specific constituents in the storm water runoff and the receiving water to be tested during the remainder of the permit cycle, except that indicator bacteria and chronic toxicity (three species) for receiving water must be tested annually during a storm event. (State Water Board Resolution 2006-0013, condition 2.m.)
After one year of monitoring using the TST approach that consistently demonstrates compliance, the

Discharger may request a decrease in the monitoring frequency. The Executive Officer will review the request, determine if the requested changes are appropriate and subsequently issue a response. The approved monitoring frequency shall be at least as stringent as the requirements included in Resolution No. 2006-0013.

2. Pollutants shall be analyzed using the analytical methods described in Part 136; for priority pollutants the methods must meet the lowest MLs specified in Appendix II of the Ocean Plan (Attachment G) that is required to demonstrate compliance. Where no methods are specified for a given pollutant, the methods must be approved by this Regional Water Board or the State Water Board. For metals analysis, samples must be analyzed by the approved analytical method with the lowest minimum detection limits.

3. The Discharger shall conduct whole effluent toxicity monitoring as outlined in section V. As previously noted, for industrial storm water effluent samples and receiving water samples the total sample volume shall be determined both by the specific toxicity test method used and the additional volume necessary for TIE studies. Sufficient sample volume shall be collected to perform both the required toxicity tests and TIE studies. If an industrial storm water effluent sample or a receiving water sample chronic toxicity test shows "Fail and % Effect value ≥ 50", the Discharger shall conduct TIE studies (e.g., Phase I) on the additional sample volume collected for the toxicity test.

4. Detection methods used for coliforms (total and fecal) and *Enterococcus* shall be those presented in Table 1A of 40 CFR Part 136, unless alternate methods have been approved in advance by USEPA pursuant to Part 136. See section VI.J (Compliance Determination, Bacterial Standards and Analyses) of the Order for additional specifications.

5. Ocean Plan Table 1 Constituents as defined by the Ocean Plan, described in section IV.C.3 of the Fact Sheet of this Order.

VIII. OTHER MONITORING REQUIREMENTS

A. Subtidal Sediment Monitoring Location SED-001

1. The Discharger shall monitor subtidal sediment in Big Fisherman Cove at SED-001 as follows:

Table E-7. Subtidal Sediment Monitoring Location SED-001

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Acute Toxicity	TUa	Grab[1]	1/Year[2]	[3, 4]
Ocean Plan Table 1 Constituents (except chronic toxicity)[5]	µg/L	Grab[1]	1/Year[2]	[4]

1. Samples collected for testing should be consistent with the sampling procedure outlined in section VIII, *Benthic Sampling of the Southern California Bight 2008 Regional Marine Monitoring Survey (Bight '08) Field Operations Manual.*

2. As required by Special Provision VI.C.2.e. of this Order, once annually, the Discharger is required to collect samples of the subtidal sediment (near the seawater discharge system and storm water outfall in Big Fisherman Cove) and analyze the samples for Ocean Plan Table 1 constituents. Based on the results from the first year, the Regional Water Board shall determine the frequency of sampling and the constituents to be tested during the remainder of the permit term, except that acute toxicity for sediment shall be tested annually. (State Water Board Resolution 2006-0013, condition 2.n.)

3. The presence of sediment toxicity shall be estimated as specified in USEPA's *Methods for Assessing the Toxicity of Sediment-Associated Contaminants with Estuarine and Marine Amphipods* (USEPA Report 600/R-94/025, June 1994), using the amphipod *Eohaustorius estuarius*.

4. All samples will be tested in accordance with USEPA or American Society for Testing and Materials (ASTM) methodologies where such methods exist. Where no USEPA or ASTM methods exist, the State

Water Board or Regional Water Board shall approve the use of other methods. Analytical tests shall be conducted by laboratories certified by the California Department of Health Services in accordance with Water Code section 13176.

5. Ocean Plan Table 1 Constituents as defined by the Ocean Plan, described in section IV.C.3 of the Fact Sheet of this Order.

B. Benthic Marine Life Survey

Within six months before the end of the permit (permit expiration), the Discharge must submit the results of the quantitative survey of benthic marine life to the Regional Water Board. Upon review of study results, the Regional Water Board, in consultation with the State Water Boards Division of Water Quality, may adjust the study design for future permits or add additional test organisms. (State Water Board Resolution No. 2006-0013, condition 2.j)

C. Metals Bioaccumulation Study

The Discharger must conduct a bioaccumulation study using mussels (*Mytilus californianus*) to determine the concentration of metals near field (within Big Fisherman Cove) and far field (at the reference station). The results of the survey must be submitted to the Regional Water Board at least six months prior to the end of the permit (permit expiration). Upon review of study results, the Regional Water Board, in consultation with the State Water Boards Division of Water Quality, may adjust the study design for future permits or add additional test organisms. (State Water Board Resolution No. 2006-0013, condition 2.k)

D. Regional ASBS Monitoring

Participation in a collaborative or statewide ASBS monitoring effort is encouraged. After the first year of monitoring results are reviewed, the Regional Water Board, in consultation with the State Water Board's Division of Water Quality, may adjust the sediment, receiving water, and bioaccumulation monitoring required under this Order based on the Facility's participation in an appropriate regional or statewide monitoring program.

IX. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The Discharger shall comply with all Standard Provisions (Attachment D) related to monitoring, reporting, and recordkeeping.

2. If there is no discharge during any reporting period, the report shall so state.

3. Each monitoring report shall contain a separate section titled “Summary of Non-Compliance” which discusses the compliance record and corrective actions taken or planned that may be needed to bring the discharge into full compliance with waste discharge requirements. This section shall clearly list all non-compliance with waste discharge requirements, as well as all excursions of effluent limitations.

4. The Discharger shall inform the Regional Water Board well in advance of any proposed construction activity that could potentially affect compliance with applicable requirements.

5. The Discharger shall report the results of chronic toxicity testing, TRE and TIE as required in the Attachment E, Monitoring and Reporting, section V.

B. Self Monitoring Reports (SMR's)

1. At any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit Self-Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (http://www.waterboards.ca.gov/ciwqs/index.html). The CIWQS Web site will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.

   Until such notification is given, the Discharger shall submit SMRs that are less than 10 MB by email to losangeles@waterboards.ca.gov. Documents that are 10 MB or larger should be transferred to disk and mailed to:

   California Regional Water Quality Control Board
   Los Angeles Region
   320 West 4th Street, Suite 200
   Los Angeles, CA 90013

2. The Discharger shall report in the SMR the results for all monitoring specified in this MRP under sections III through VIII. The Discharger shall submit quarterly SMRs including the results of all required monitoring using USEPA-approved test methods or other test methods specified in this Order. If the Discharger monitors any pollutant more frequently than required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR.

3. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Table E-8. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period Begins On…	Monitoring Period	SMR Due Date
Continuous	December 26, 2013	All	Submit with quarterly SMR
1/Month	December 26, 2013	1st day of calendar month through last day of calendar month	Submit with quarterly SMR
1/Quarter or 5/Quarter	January 1, 2014	January 1 through March 31 April 1 – June 30 July 1 – September 30 October 1 – December 31	May 1 August 1 November 1 February 1
3/Year During Storm Event	January 1, 2014	January 1 through March 31 April 1 – June 30 July 1 – September 30 October 1 – December 31	May 1 August 1 November 1 February 1
2/Year	January 1, 2014	January 1 through March 31 April 1 – June 30 July 1 – September 30 October 1 – December 31	May 1 August 1 November 1 February 1
1/Year	January 1, 2014	January 1 through December 31	February 1

4. Reporting Protocols. The Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

a. Sample results greater than or equal to the reported ML shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).

b. Sample results less than the reported ML, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported. For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc.").

c. Sample results less than the laboratory's MDL shall be reported as "Not Detected" or ND

Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from extrapolation beyond the lowest point of the calibration curve.

5. Compliance Determination. Compliance with effluent limitations for priority pollutants shall be determined using sample reporting protocols defined above and Attachment A of this Order. For purposes of reporting and administrative enforcement by the Regional and State Water Boards, the Discharger shall be deemed out of compliance with effluent limitations if the concentration of the priority pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the RL.

6. Multiple Sample Data. When determining compliance with an AMEL or MDEL for priority pollutants and more than one sample result is available, the Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of "Detected, but Not Quantified" (DNQ) or "Not Detected" (ND). In those cases, the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

a. The data set shall be ranked from low to high, ranking the reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

b. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

7. The Discharger shall submit SMRs in accordance with the following requirements:

a. The Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the facility is operating in compliance with interim and/or final effluent limitations. The Discharger is not required to duplicate the submittal of data that is entered in a tabular format within CIWQS. When electronic

submittal of data is required and CIWQS does not provide for entry into a tabular format within the system, the Discharger shall electronically submit the data in a tabular format as an attachment.

b. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify violations of the WDRs; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.

C. Other Reports

1. The Discharger shall report the results of any special studies, acute toxicity testing, chronic toxicity testing, TRE/TIE, and SWMP required by Special Provisions – V.C.2 and 3 of this Order. The Discharger shall submit reports with the first quarterly SMR scheduled to be submitted on or immediately following the report due date.

2. Within 90 days of the effective date of this permit, the Discharger is required to submit the following required by Special Provisions of this Order to the Regional Water Board:

a. An Initial Investigation TRE workplan.

b. An updated SWMP

c. An updated waterfront and marine operations nonpoint source management plan

3. Within one year of the effective date of this permit, the Discharger is required to submit the following required by Special Provisions of this Order to the Regional Water Board:

a. A Benthic Marine Life Survey Design

b. A Metals Bioaccumulation Study Design

c. A Program for Prevention of Biological Pollutants

ATTACHMENT F – FACT SHEET

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ATTACHMENT F – FACT SHEET

As described in section I, the Los Angeles Regional Water Quality Control Board (Regional Water Board) incorporates this Fact Sheet as findings of the Regional Water Board supporting the issuance of this Order. This Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order.

This Order has been prepared under a standardized format to accommodate a broad range of discharge requirements for Dischargers in California. Only those sections or subsections of this Order that are specifically identified as "not applicable" have been determined not to apply to this Discharger. Sections or subsections of this Order not specifically identified as "not applicable" are fully applicable to this Discharger.

I. PERMIT INFORMATION

The following table summarizes administrative information related to the Facility

Table F-1. Facility Information

WDID	4B191035002
Discharger	University of Southern California
Name of Facility	Wrigley Marine Science Center, Avalon
Facility Address	No. 1 Big Fisherman Cove, Catalina Island
	Avalon, CA 90704
	Los Angeles County
Facility Contact, Title and Phone	Dr. Roberta L. Marinelli, Director, (213) 740-6720
Authorized Person to Sign and Submit Reports	Dr. Roberta L. Marinelli, Director, (213) 740-6720
Mailing Address	3616 Trousdale Parkway, AHF 410 Los Angeles, CA 90089
Billing Address	SAME
Type of Facility	Marine Research and Education Center
Major or Minor Facility	Minor
Threat to Water Quality	3
Complexity	C
Pretreatment Program	N
Recycling Requirements	N/A
Facility Permitted Flow	Discharge Point No. 001 - 0.360 million gallons per day (MGD) Discharge Point No. 002 – 0.61 MGD (10-year 24 hour storm event)
Facility Design Flow	Discharge Point No. 001 - 0.360 MGD Discharge Point No. 002 – Not Applicable
Watershed	Pacific Ocean
Receiving Water	Pacific Ocean
Receiving Water Type	Ocean Waters

A. The University of Southern California (hereinafter Discharger) is the owner and operator of the Wrigley Marine Science Center (hereinafter Facility), a marine aquarium and education facility.

For the purposes of this Order, references to the "discharger" or "permittee" in applicable federal and state laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

B. The Facility discharges wastewater to the Pacific Ocean, a water of the United States. The Discharger was previously regulated by Order No. R4-2008-0017 and National Pollutant Discharge Elimination System (NPDES) Permit No. CA0056651 adopted on April 3, 2008. The permit expired on March 3, 2013; however, as per 40 CFR section 122 the permit has been administratively extended until the Board takes action on this item. Attachment B provides a map of the area around the Facility. Attachment C provides a flow schematic of the Facility

Prior to making any change in the point of discharge, place of use, or purpose of use of treated wastewater that results in a decrease of flow in any portion of a watercourse, the Discharger must file a petition with the State Water Resources Control Board (State Water Board), Division of Water Rights, and receive approval for such a change. The State Water Board retains the jurisdictional authority to enforce such requirements under Water Code section 1211.

C. The California Ocean Plan prohibits waste discharges to Areas of Special Biological Significance (ASBS). The Discharger applied for an exception to the California Ocean Plan prohibition. An Initial Study and Mitigated Negative Declaration (IS/MND) was circulated for public review, and on February 15, 2006, the State Water Board approved this Exception and the Mitigated Negative Declaration through Resolution No. 2006-0013, provided as Attachment H. The Initial Study and Mitigated Negative Declaration is included as Attachment J. The exception is conditional on several items that must be incorporated into the Discharger's NPDES permit. This Order implements the conditions contained in Resolution 2006-0013.

D. The Discharger filed a Report of Waste Discharge and submitted an application for renewal of its Waste Discharge Requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permit on October 29, 2012. Supplemental information was requested and the application was deemed complete on July 12, 2013.

E. On November 7, 2013, the Regional Water Board adopted Order R4-2013-0172 for the Facility, which became effective on December 26, 2013.

F. The discharge flow limit for Discharge Point No. 001 of 0.180 MGD in Order R4-2013-0172 was the same discharge flow limit established in the prior permit (Order R4-2008-0017). This discharge flow limit was based on the maximum pumping rate of the seawater intake pumps. There was no requirement to measure flow in Order R4-2008-0017, so actual flows were estimated based on the intake pumping rate. Order R4-2013-0172 requires continuous flow monitoring at EFF-001 for Discharge Point No. 001. In response to this requirement, the Discharger installed a Hach/American Sigma 950 bubbler continuous flow meter at the Facility on January 14, 2014. During the initial flow monitoring, the Discharger observed that several readings of the new flow meter were unstable. This instability prompted trouble-shooting of the flow meter and associated plumbing, the addition of a second confirmation flow meter for comparison of accuracy and drift, and corresponding "bucket tests" to compare the measured continuous flow versus manually timed, fixed volume bucket grabs at the end of pipe. Due to the significant number of variables that could influence the measured flow, several months of data were required to evaluate the flow and to tune the flow meter and flow sensor for greater accuracy. Finally, the repairs and recalibration performed in April 2015 appear to have stabilized subsequent readings for the second quarter 2015. The highest daily average continuous flow to date occurred on June 19, 2014, and was measured as 0.357 MGD. Based on data collected

since January 2014, on September 11, 2015, the Discharger submitted a letter along with a revised Report of Waste Discharge (ROWD) to the Regional Water Board requesting an increase of the discharge flow limit at EFF-001 from 0.180 MGD to 0.360 MGD.

G. Order R4-2013-0172 is being amended to increase the discharge flow limit from 0.180 MGD to 0.360 MGD at Discharge Point No. 001 to reflect actual flow conditions at the Facility. Modification to Order R4-2013-0172 is authorized pursuant to 40 CFR section 122.62(a)(2) based on the receipt of new information.

II. FACILITY DESCRIPTION

The University of Southern California (USC) operates the Wrigley Marine Science Center (Facility) for marine research and educational activities at Big Fisherman Cove, on the northern end of Santa Catalina Island, Los Angeles County, California. The Facility is located near Two Harbors on Catalina Island, in a remote area of the Island. The Facility was established in 1965 and the majority of the existing buildings and structures were constructed between 1966 and 1972. The Facility includes laboratories, dormitories, a cafeteria, office trailers, and a set of waterfront buildings. Scientists and educators primarily from the University of Southern California, the University of California, and the California State University system use the Facility for research. In addition, the Facility operates public outreach programs for students.

An intake system delivers seawater to the laboratories and waterfront area. Seawater is pumped from a sub-marine intake into laboratory aquaria. Intake water is used in the laboratory and in the large holding tanks and experimental aquaria which are located on the waterfront. The intake water is passed through a macro-screen, which is used to prevent the intake of kelp. The intake water does not receive additional treatment prior to use. Intake water is pumped to a 15,000-gallon holding tank for storage. Water gravity flows from the holding tank to the laboratory and aquaria.

The Facility's seawater intake structure is located at Blue Cavern Point. It consists of two 6-inch polyvinyl chloride (PVC) pipes submerged 15 feet below the water surface and about 50 feet offshore.

The Discharger operates the wastewater treatment plant for the Facility, which disposes of effluent through spray irrigation on site. The wastewater treatment plant is not regulated by this Order, rather it is regulated by Waste Discharge Requirements contained in Order No. 94-114.

A. Description of Wastewater and Biosolids Treatment or Controls

The waste seawater discharge is composed of once-through seawater that has supplied the laboratory and aquaria for purposes of maintaining marine animals and plants. The seawater is not heated, cooled, filtered, or treated. All of the once-through seawater used in various parts of the Facility are brought together and commingled at the waterfront and discharged at the beach on the north side of Big Fisherman Cove. The total waste seawater flow, as measured at Discharge Point No. 001, is up to 0.360 MGD.

Storm water runoff from approximately 45 acres is discharged at the beach, through a separate pipe adjacent to the waste seawater discharge. While no treatment is provided for storm water, the runoff from smaller precipitation events infiltrates into vegetated swales. Areas of the Facility contributing to storm water runoff include the waterfront area, a small portion of the laboratory building area, the main storm water culvert that drains a watershed area with abandoned silver mines, and an unpaved storage area, where decommissioned laboratory and marine equipment

and construction wastes are stored. The estimated storm water runoff based on a 10-year 24 hour storm event is 0.61 MGD. All other waste waters from the Facility are discharged to the community sewer system.

At the time of issuance of Order No. R4-2008-0017, the Discharger had just segregated storm water and non-storm water sources that were previously commingled. As a result of the modifications, waste seawater and storm water are currently discharged through two separate pipes, located adjacent to each other. The discharges do not commingle until reaching the shore of the receiving water. The discharges are monitored separately in the previous Order as EFF-001 (waste seawater) and EFF-002 (storm water runoff). To reflect the separate sources and distinct discharge points, this Order designates discharge of waste seawater as Discharge Point No. 001 and the storm water runoff as Discharge Point No. 002.

According to the Discharger's Storm Water Management Plan (SWMP), the Discharger implements best management practices (BMPs) to control pollutants in the storm water runoff as follows:

- Structural BMPs consisting of permeable roadways, pavers, use of infiltration bioswales, landscaping with low water and indigenous plantings, segregation and compartmentalization within waste and hazardous materials storage areas.
- Non-structural BMPs including storm drain labeling, community environmental awareness, visual inspections to detect illicit discharges, surveying and mapping of storm water conveyances,
- Construction site BMPs, including requirements for 1) construction site operators to implement appropriate storm water quality control BMPs; 2) construction site operators to prevent construction materials and wastes from causing adverse impacts to storm water quality; 3) procedures for site plan review to incorporate consideration of potential storm water quality impacts, and 4) procedures for site inspection and enforcement of control measures.

B. Discharge Points and Receiving Waters

Within Order No. R4-2008-0017, the waste seawater and storm water runoff discharges are designated as a single discharge point (Discharge Point No. 001) located on the beach of Fisherman's Cove at latitude 33° 26' 42" and longitude 118° 29' 00". After the Facility's modification, the two discharge sources do not commingle until they reach the shoreline of the receiving water and are more appropriately regulated as separate discharge points; therefore, within this Order, the waste seawater discharge is designated as Discharge Point No. 001 and the storm water runoff is designated Discharge Point No. 002.

The receiving water for the ocean discharge was designated by the State Water Board as the Northwest Santa Catalina Island ASBS No. 25 on March 21, 1974 through Resolution No. 74-28.

Within Resolution No. 74-28, the State Water Board defined ASBS No. 25,

> "*From Point 1 determined by the intersection of the mean high tide line and a line extending due west from USGS Triangulation Station "Channel" on Blue Cavern Point: thence due north to the 300-foot isobath or to one nautical mile offshore, whichever distance is greater; thence northerly and westerly, following the 300-foot isobath maintaining a distance of one nautical mile offshore, whichever is the greater distance, around the northwestern tip of the*

island and then southerly and easterly, maintaining the distance offshore described above, to a point due south of USGS Triangulation Station "Cone" on Catalina Head; thence due north to the intersection of the mean high tide line and a line extending due south from USGS Triangulation Station "Cone," thence returning around the northwestern tip of the island following the mean high tide line to Point 1."

C. Summary of Existing Requirements and Self-Monitoring Report (SMR) Data

Effluent limitations contained in the previous Order for discharges from Discharge Point No. 001 (Monitoring Locations EFF-001 and EFF-002) and representative monitoring data from the term of the previous Order are as follows:

Table F-2a. Historic Effluent Limitations and Monitoring Data at EFF-001 (Seawater)

Parameter	Units	Effluent Limitation				Monitoring Data (From May 2008 – To Dec. 2012)		
		Six Month Median	Average Monthly	Maximum Daily	Instantaneous Maximum	Highest Average Monthly Discharge	Highest Average Weekly Discharge	Highest Daily Discharge
Biochemical Oxygen Demand (BOD) (5-day @ 20°C	mg/L	--	20	60	--	1.1[1]	--	1.1[1]
	lbs/day	--	36	108	--	NR	--	NR
Oil and Grease	mg/L	--	10	15	--	< 1.3	--	1.9[1]
	lbs/day	--	18	27	--	NR	--	NR
Total Suspended Solids (TSS)	mg/L	--	50	150	--	22	--	22
	lbs/day	--	90	270	--	NR	--	NR
Settleable Solids	mL/L	--	1.0 1.5 [3]	--	3.0	< 0.1	< 0.1	< 0.1
Turbidity	NTU	--	50	150	--	9	--	18
pH	s.u.	6.0-9.0[2]				--	--	6.21-8.22[2]
Temperature	°F	--	--	--	86	--	--	72.1
Acute Toxicity	TUa	0.3 (only as a trigger for accelerated monitoring)				--	--	0.85[4]
Chronic Toxicity	TUc	1.0 (only as a trigger for accelerated monitoring)				--	--	>4
Antimony, Total Recoverable	µg/L	--	--	--	--	0.16	--	0.16
	lbs/day	--	--	--	--	NR	--	NR
Arsenic, Total Recoverable	µg/L	--	--	--	--	1.1	--	1.1
	lbs/day	--	--	--	--	NR	--	NR
Cadmium, Total Recoverable	µg/L	--	--	--	--	0.023	--	0.023
	lbs/day	--	--	--	--	NR	--	NR
Chromium III, Total Recoverable	µg/L	--	--	--	--	0.3	--	0.3
	lbs/day	--	--	--	--	NR	--	NR
Chromium	µg/L	--	--	--	--	0.39	--	0.39

Parameter	Units	Effluent Limitation				Monitoring Data (From May 2008 – To Dec. 2012)		
		Six Month Median	Average Monthly	Maximum Daily	Instantaneous Maximum	Highest Average Monthly Discharge	Highest Average Weekly Discharge	Highest Daily Discharge
VI, Total Recoverable	lbs/day	--	--	--	--	NR	--	NR
Copper, Total Recoverable	µg/L	--	--	--	--	1.3	--	1.3
	lbs/day	--	--	--	--	NR	--	NR
Lead, Total Recoverable	µg/L	2	--	8	20	139	--	139
	lbs/day	0.0036	--	0.014	0.036	NR	--	NR
Mercury, Total Recoverable	µg/L	--	--	--	--	0.00056	--	0.00056
	lbs/day	--	--	--	--	NR	--	NR
Nickel, Total Recoverable	µg/L	--	--	--	--	0.64	--	0.64
	lbs/day	--	--	--	--	NR	--	NR
Selenium, Total Recoverable	µg/L	15	--	60	150	457	--	457
	lbs/day	0.027	--	0.108	0.27	NR	--	NR
Thallium, Total Recoverable	µg/L	15	--	--	--	0.015	--	0.015
	lbs/day	0.027	--	--	--	NR	--	NR
Zinc, Total Recoverable	µg/L	20	--	80	200	47	--	47
	lbs/day	0.036	--	0.144	0.36	NR	--	NR

1. Estimated concentration. The result was measured at a concentration that was greater than the Method Detection Limit (MDL) and less than the Minimum Level (ML).
2. Range
3. Average weekly limitation.
4. The test result was suspicious because the lab noted a similar die-off in fish upon receipt and during the same 48-hour time-frame where mortality was noted in the test. A re-test confirmed no effect in the sample with 96% survival achieved.

Table F-2b. Historic Effluent Limitations and Monitoring Data at EFF 002 (Storm Water)

Parameter	Units	Effluent Limitation[1]				Monitoring Data (From May 2011 – To Dec. 2012)		
		Six Month Median	Average Monthly	Maximum Daily	Instantaneous Maximum	Highest Average Monthly Discharge	Highest 6-Month Median Discharge	Highest Daily Discharge
Turbidity	NTU	--	--	--	--	220	--	220
Acute Toxicity	TUa	--	--	--	--	--	--	0.53
Chronic Toxicity	TUc	--	--	--	--	--	--	>4
Ammonia	µg/L	--	--	--	--	150	--	150
Arsenic, Total Recoverable	µg/L	--	--	--	--	1.9	--	1.9
	lbs/day	--	--	--	--	NR	--	NR

Parameter	Units	Effluent Limitation[1]				Monitoring Data (From May 2011 – To Dec. 2012)		
		Six Month Median	Average Monthly	Maximum Daily	Instantaneous Maximum	Highest Average Monthly Discharge	Highest 6-Month Median Discharge	Highest Daily Discharge
Beryllium, Total Recoverable	µg/L	--	--	--	--	0.25	--	0.25
	lbs/day	--	--	--	--	NR	--	NR
Cadmium, Total Recoverable	µg/L	--	--	--	--	0.18	--	0.18
	lbs/day	--	--	--	--	NR	--	NR
Chromium III, Total Recoverable	µg/L	--	--	--	--	23	--	23
	lbs/day	--	--	--	--	NR	--	NR
Chromium VI, Total Recoverable	µg/L	--	--	--	--	0.11	--	0.11
	lbs/day	--	--	--	--	NR	--	NR
Copper, Total Recoverable	µg/L	--	--	--	--	15	--	15
	lbs/day	--	--	--	--	NR	--	NR
Lead, Total Recoverable	µg/L	--	--	--	--	4.5	--	4.5
	lbs/day	--	--	--	--	NR	--	NR
Mercury, Total Recoverable	µg/L	--	--	--	--	0.019	--	0.019
	lbs/day	--	--	--	--	NR	--	NR
Nickel, Total Recoverable	µg/L	--	--	--	--	15	--	15
	lbs/day	--	--	--	--	NR	--	NR
Selenium, Total Recoverable	µg/L	--	--	--	--	0.34	--	0.34
	lbs/day	--	--	--	--	NR	--	NR
Silver, Total Recoverable	µg/L	--	--	--	--	0.052	--	0.052
	lbs/day	--	--	--	--	NR	--	NR
Zinc, Total Recoverable	µg/L	--	--	--	--	150	--	150
	lbs/day	--	--	--	--	NR	--	NR

1. Storm water has been discharging through the same Discharge Point 001 but was monitored at Monitoring Location EFF-002 at the Facility. Since the previous Order did not prescribe a separate set of effluent limitations for the storm water discharge measured at Monitoring Location EFF-002, no effluent limitations for storm water were included in the table.

D. Compliance Summary

Based on monitoring data submitted between May 3, 2008 and June 30, 2012, the following violations occurred at the EFF-001 monitoring location.

Table F-3. Summary of Compliance History

Date	Monitoring Period	Violation Type	Pollutant	Reported Value	Permit Limitation	Units
11/05/2008	4th Quarter, 2008	Instantaneous Maximum	Selenium	261	150	µg/L

Date	Monitoring Period	Violation Type	Pollutant	Reported Value	Permit Limitation	Units
11/05/2008	4th Quarter, 2008	Daily Maximum	Selenium	261	60	µg/L
11/05/2008	4th Quarter, 2008	Instantaneous Maximum	Selenium	0.392[1]	0.27	lbs/day
11/05/2008	4th Quarter, 2008	Daily Maximum	Selenium	0.392[1]	0.108	lbs/day
12/01/2008	4th Quarter, 2008	Instantaneous Maximum	Selenium	420	150	µg/L
12/01/2008	4th Quarter, 2008	Daily Maximum	Selenium	420	60	µg/L
12/01/2008	4th Quarter, 2008	Instantaneous Maximum	Selenium	0.63[1]	0.27	lbs/day
12/01/2008	4th Quarter, 2008	Daily Maximum	Selenium	0.63[1]	0.108	lbs/day
01/09/2009	1st Quarter, 2009	Instantaneous Maximum	Selenium	457	150	µg/L
01/09/2009	1st Quarter, 2009	Daily Maximum	Selenium	457	60	µg/L
01/09/2009	1st Quarter, 2009	Instantaneous Maximum	Selenium	0.686[1]	0.27	lbs/day
01/09/2009	1st Quarter, 2009	Daily Maximum	Selenium	0.686[1]	0.108	lbs/day
03/02/2009	1st Quarter, 2009	Daily Maximum	Selenium	107	60	µg/L
03/02/2009	1st Quarter, 2009	Daily Maximum	Selenium	0.161[1]	0.108	lbs/day
05/20/2009	2nd Quarter, 2009	Instantaneous Maximum	Lead	33	20	µg/L
05/20/2009	2nd Quarter, 2009	Daily Maximum	Lead	33	8	µg/L
05/20/2009	2nd Quarter, 2009	Instantaneous Maximum	Lead	0.049[1]	0.036	lbs/day
05/20/2009	2nd Quarter, 2009	Daily Maximum	Lead	0.049[1]	0.014	lbs/day
06/05/2009	2nd Quarter, 2009	Daily Maximum	Selenium	119	60	µg/L
06/05/2009	2nd Quarter, 2009	Daily Maximum	Selenium	0.371[1]	0.108	lbs/day
07/01/2009	3rd Quarter, 2009	Daily Maximum	Selenium	93	60	µg/L
07/01/2009	3rd Quarter, 2009	Daily Maximum	Selenium	0.123[1]	0.108	lbs/day
07/01/2009	3rd Quarter, 2009	Six-Month Median[2]	Selenium	100	15	µg/L
07/01/2009	3rd Quarter, 2009	Six-Month Median[2]	Selenium	0.150[1]	0.027	lbs/day
12/01/2009	4th Quarter, 2009	Instantaneous Maximum	Lead	139	20	µg/L
12/01/2009	4th Quarter, 2009	Daily Maximum	Lead	139	8	µg/L
12/01/2009	4th Quarter, 2009	Instantaneous Maximum	Lead	0.209[1]	0.036	lbs/day

Date	Monitoring Period	Violation Type	Pollutant	Reported Value	Permit Limitation	Units
12/01/2009	4th Quarter, 2009	Daily Maximum	Lead	0.209[1]	0.014	lbs/day

1. Total mass calculated by Regional Water Board staff.
2. Six-month median calculated by Regional Water Board staff.

The Discharger signed an Acceptance of Conditional Resolution and Waiver of Right to Hearing for Revised Settlement Offer R4-2010-0009 on April 14, 2010, accepting the mandatory minimum penalties for violations contained in the Offer. This settlement offer included the violations from November 8, 2008 through December 1, 2009 listed above, as well as violations from earlier dates. Monitoring results reported after December 2009 showed full compliance with effluent limitations.

E. Planned Changes

The Discharger does not currently have any planned changes to the Facility.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in this Order are based on the requirements and authorities described in this section.

A. Legal Authorities

This Order serves as WDR's pursuant to article 4, chapter 4, division 7 of the California Water Code (commencing with section 13260). This Order is also issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. EPA and chapter 5.5, division 7 of the Water Code (commencing with section 13370). It shall serve as an NPDES permit for point source discharges from this facility to surface waters.

B. California Environmental Quality Act (CEQA)

Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of CEQA, (commencing with section 21100) of Division 13 of the Public Resources Code.

The Discharger received an exception to the California Ocean Plan to allow discharges to the Northwest Santa Catalina Island ASBS in 2006. The action of granting the exception was subject to CEQA requirements. The State Water Board, as the lead agency for the CEQA analysis, prepared and circulated an Initial Study/Mitigated Negative Declaration for the proposed exception; held a public hearing on February 1, 2006 to hear comments regarding the exception and the Initial Study/Mitigated Negative Declaration; and formally responded to comments. Based on the whole record, including the Initial Study/Mitigated Negative Declaration, comments received, and the response to comments, the State Water Board concluded that there was no substantial evidence that approval of such an exception would have no significant effect on the environment because of the terms and conditions that have been incorporated into the project. These terms and conditions were incorporated into R4-2008-0017 and are included in this Order. The State Water Board thereby satisfied the CEQA

requirements through the adoption of Resolution No. 2006-0013 which granted the exception to the Ocean Plan to allow the Facility to discharge to the ASBS.

C. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plans.** The Regional Water Board adopted a Water Quality Control Plan for the Los Angeles Region (hereinafter Basin Plan) on June 13, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the Pacific Ocean are as follows:

Table F-4a. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
001, 002	Santa Catalina Island (Hydrologic Unit 406.40)	**Nearshore Zone Existing Uses**: Navigation (NAV); contact (REC-1) and non-contact (REC-2) water recreation; commercial and sport fishing (COMM); marine habitat (MAR); wildlife habitat[1] (WILD); preservation of biological habitat (including areas of special biological significance or ecological reserve) (BIOL); rare, threatened or endangered species (RARE); and shellfish harvesting (SHELL). **Nearshore Zone Potential Uses**: Municipal and domestic supply (MUN); spawning, reproduction, and/or early development (SPWN).
	Pacific Ocean Nearshore Zone (The zone bounded by the shoreline and a line 1000 feet from the shoreline or the 30-foot depth contours, whichever is further from the shoreline)	**Existing:** Industrial service supply (IND), navigation (NAV), contact (REC-1) and non-contact (REC-2) water recreation, commercial and sport fishing (COMM), marine habitat (MAR), wildlife habitat (WILD), preservation of biological habitats (BIOL), preservation of rare, threatened, or endangered species[2] (RARE), migration of aquatic organisms[3] (MIGR), spawning, reproduction, and/or early development[3] (SPWN).and shellfish harvesting (SHELL).
	Pacific Ocean Offshore Zone	**Existing:** Industrial service supply (IND), navigation (NAV), contact (REC-1) and non-contact (REC-2) water recreation, commercial and sport fishing (COMM), marine habitat (MAR), wildlife habitat (WILD), preservation of rare, threatened, or endangered species[2] (RARE), migration of aquatic organisms[3] (MIGR), spawning, reproduction, and/or early development[3] (SPWN).and shellfish harvesting (SHELL).

1. Marine Habitats of the Channel islands and Mugu Lagoon serve as pinniped haul-out areas for one or more species (i.e., sea lions)
2. One or more rare species utilizes all ocean, bays, estuaries, and coastal wetlands for foraging and/or nesting.

[3] Aquatic organisms utilize all bays, estuaries, lagoons, and coastal wetlands, to a certain extent, for spawning and early development. This may include migration into areas which are heavily influenced by freshwater inputs

2. **Thermal Plan.** The State Water Board adopted a Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Water and Enclosed Bays and Estuaries of California (Thermal Plan) on January 7, 1971, and amended this plan on September 18, 1975. This plan contains temperature objectives for surface waters. The Thermal Plan cites temperature objectives for coastal waters. Requirements of this Order implement the Thermal Plan.

3. **California Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, 2005, 2009 and 2012. The State Water Board adopted the latest amendment on October 16, 2012, and it became effective on July 1, 2013. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. The Ocean Plan identifies beneficial uses of ocean waters of the state to be protected as summarized below:

Table F-4b. Ocean Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
001, 002	Pacific Ocean	Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance (ASBS); rare and endangered species; marine habitat; fish spawning and shellfish harvesting

In order to protect the beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Requirements of this Order implement the Ocean Plan.

4. **Alaska Rule.** On March 30, 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards (WQS) become effective for CWA purposes (40 C.F.R. section 131.21, 65 Fed. Reg. 24641 (April 27, 2000)). Under the revised regulation (also known as the Alaska rule), new and revised standards submitted to USEPA after May 30, 2000, must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000, may be used for CWA purposes, whether or not approved by USEPA.

5. **Antidegradation Policy.** Federal regulation 40 C.F.R. section 131.12 requires that the state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution 68-16. Resolution 68-16 is deemed to incorporate the federal antidegradation policy where the federal policy applies under federal law. Resolution 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. The permitted discharge must

be consistent with the antidegradation provision of section 131.12 and State Water Board Resolution No. 68-16.

The Ocean Plan, Item III.E., Implementation Provisions For Areas of Special Biological Significance (ASBS), includes a prohibition of the discharge of waste to areas designated as being of special biological significance. The section stipulates that "Discharges shall be located a sufficient distance from such areas to assure maintenance of natural water quality conditions in these areas." Activities in these areas must not permanently degrade water quality or result in water quality lower than that necessary to protect existing uses.

The Wrigley Marine Science center discharges waste seawater from the aquaria operations and storm water runoff to the ASBS located adjacent nearshore zone of the Pacific Ocean, Northwest Santa Catalina Island. The Wrigley Marine Science center was created in 1965 and discharges have emanated from the facility since that time. The State Water Board adopted Resolution No. 2006-0013 approving a conditional exception to the Ocean Plan prohibition after reviewing data submitted by the facility, an analysis of the discharges and flows from the facility, and a proposed Mitigated Negative Declaration for discharges from the facility. The adopted resolution covers all discharges from the Facility into the ASBS, including all seawater point source discharges, storm water discharges, and nonpoint source discharges. The resolution also includes stipulations designated to ensure that the quality of the receiving water is not adversely impacted by the discharges generated at the facility. Exceptions also require USEPA concurrence. On July 19, 2006, USEPA provided concurrence in the exception to the Ocean Plan to discharge into the waters of the Northwest Santa Catalina Island ASBS. The criteria included in that resolution have been implemented in this Order.

The NPDES permit includes effluent limitations to ensure that the listed beneficial uses of the Pacific Ocean in the vicinity of the discharge are not adversely impacted. The inclusion of the effluent limitations, monitoring requirements, prohibitions, and the requirements stipulated in Resolution No. 2006-0013 in the NPDES permit will ensure that the discharge will not result in a lowering of the water quality in ASBS. The issuance of this permit, therefore, is consistent with the state's antidegradation policy.

6. **Anti-Backsliding Requirements.** Sections 402(o) and 303(d)(4) of the CWA and federal regulations at 40 C.F.R. section 122.44(l) restrict backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed.

7. **Endangered Species Act Requirements.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code, section 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. section 1531 to 1544). This Order requires compliance with effluent limits, receiving water limits, and other requirements to protect the beneficial uses of waters of the state, including protecting rare and endangered species. The discharger is responsible for meeting all requirements of the applicable Endangered Species Act.

D. Impaired Water Bodies on CWA 303(d) List

Section 303(d) of the CWA requires states to identify specific water bodies where water quality standards are not expected to be met after implementation of technology-based effluent limitations on point sources. For all 303(d)-listed water bodies and pollutants, the Regional Water Board plans to develop and adopt TMDLs that will specify WLAs for point sources and load allocations (LAs) for non-point sources, as appropriate.

On November 10, 2010, the USEPA approved the State Water Board's 2010 303(d) List of Water Quality Limited Segments (hereinafter 303(d) list). The 303(d) list identifies water bodies where water quality standards are not expected to be met after implementation of technology-based effluent limitations by point sources (water quality limited water bodies). Certain receiving waters in the Los Angeles watershed do not fully support beneficial uses. They have been classified as impaired on the 2010 303(d) list and have been scheduled for TMDL development.

The 2010 State Water Board California 303(d) List does not include the classification of the receiving water in the vicinity of the discharge. The nearest 303(d) listing is for indicator bacteria at Avalon Beach. The Regional Water Board adopted the Avalon Bay Bacteria TMDL as a singular regulatory action, by issuing a Cease and Desist Order (R4-2012-077) to the City of Avalon. The Facility does not discharge to Avalon Bay, and is not subject to the Avalon Bay Bacteria TMDL.

E. Other Plans, Polices and Regulations

Resolution No. 2006-0013: On February 15, 2006, with Resolution No. 2006-0013, the State Water Board approved an exception to the California Ocean Plan's prohibition regarding discharges to an ASBS, thereby allowing continued discharges from the Facility to the Northwest Santa Catalina Island. In its CEQA analysis, the State Water Board concluded that there was no substantial evidence that approval of such an exception would have a significant effect on the environment, so long as specific terms and conditions were incorporated into the facility's NPDES permit. Resolution No. 2006-0013, therefore, included several specific terms and conditions that have been incorporated into this Order.

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

The CWA requires point source dischargers to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations in the Code of Federal Regulations: 40 CFR section 122.44(a) requires that permits include applicable technology-based limitations and standards; and 40 CFR section 122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water.

The list of pollutants of concern is based on constituents that are regulated in the Ocean Plan and are currently detected or regulated in the effluent, as well as pollutants that commonly occur at similar facilities. The Facility discharges once-through marine seawater from aquaria that contain aquatic animals. Waste feed and waste products from marine animals can contribute solids, turbidity, BOD, and ammonia to the discharge. In addition, metabolic wastes from marine animals may potentially alter the pH and dissolved oxygen of the discharge. Effluent monitoring data from the term of the previous permit included detected concentrations of metals, phenolic compounds,

and bacteria. The previous permit contains effluent limits for oil and grease, thus this parameter remains a pollutant of concern in the waste seawater discharge.

The storm water runoff may come in contact with roads, buildings, and service areas. Solids and oil and grease are typical pollutants found in storm water discharges from industrial facilities. Effluent monitoring resulted in detected concentrations of metals, chlorinated phenolics, TCDDs equivalents, and bacteria; therefore, these constituents are pollutants of concern.

The variety of potential pollutants found in the Facility discharges presents a potential for aggregate toxic effects to occur. Chronic toxicity is a more stringent requirement than acute toxicity. Therefore, chronic toxicity is considered pollutant of concern for evaluation of narrative Basin Plan Objectives and Water Quality Objectives in the Ocean Plan.

A. Discharge Prohibitions

The Discharge prohibitions are based on the requirements of the Ocean Plan, State Water Board's plans and policies, Water Code, provisions included in Order No. R4-2008-0017, and the State Water Board Resolution No. 2006-0013; and are consistent with the requirements set for other discharges to the Pacific Ocean that are regulated by an NPDES permit.

B. Technology-Based Effluent Limitations

1. Scope and Authority

Section 301(b) of the CWA and implementing USEPA permit regulations at 40 CFR section 122.44 require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards. The discharge authorized by this Order must meet minimum federal technology-based requirements based on Best Professional Judgment (BPJ) in accordance with 40 CFR section 125.3.

The CWA requires that technology-based effluent limitations be established based on several levels of controls:

a. Best practicable treatment control technology (BPT) represents the average of the best existing performance by well-operated facilities within an industrial category or subcategory. BPT standards apply to toxic, conventional, and non-conventional pollutants.

b. Best available technology economically achievable (BAT) represents the best existing performance of treatment technologies that are economically achievable within an industrial point source category. BAT standards apply to toxic and non-conventional pollutants.

c. Best conventional pollutant control technology (BCT) represents the control from existing industrial point sources of conventional pollutants including BOD, TSS, fecal coliform, pH, and oil and grease. The BCT standard is established after considering a two-part reasonableness test. The first test compares the relationship between the costs of attaining a reduction in effluent discharge and the resulting benefits. The second test examines the cost and level of reduction of pollutants from the discharge from publicly owned treatment works to the cost and level of reduction of such pollutants from a class

or category of industrial sources. Effluent limitations must be reasonable under both tests.

d. New source performance standards (NSPS) represent the best available demonstrated control technology standards. The intent of NSPS guidelines is to set limitations that represent state-of-the-art treatment technology for new sources.

The CWA requires USEPA to develop effluent limitations, guidelines and standards (ELGs) representing application of BPT, BAT, BCT, and NSPS. Section 402(a)(1) of the CWA and 40 C.F.R. section 125.3 authorize the use of best professional judgment (BPJ) to derive technology-based effluent limitations on a case-by-case basis where ELGs are not available for certain industrial categories and/or pollutants of concern. Where BPJ is used, the Regional Water Board must consider specific factors outlined in 40 C.F.R. section 125.3.

2. Applicable Technology-Based Effluent Limitations

The ELG for the Concentrated Aquatic Animal Production (CAAP) Point Source Category, established by USEPA, became effective on September 22, 2004. These regulations, provided in 40 CFR section 451 are applicable to CAAP facilities defined in section 122.24. Based on the type of operation and production, the Facility is not categorized as a CAAP facility. Therefore, the CAAP ELGs provided in 40 CFR section 451 are not applicable to the Facility.

This Order includes technology-based effluent limitations based on BPJ in accordance with 40 CFR section 125.3. Table 2 of the Ocean Plan contains technology-based effluent limitations for oil and grease, total settleable solids, turbidity, and pH. Section 402(o) of the CWA and 40 CFR section 122.44(l) require that effluent limitations or conditions in reissued Orders be at least as stringent as those in the previous Orders. The effluent limitations contained in Table 2 of the Ocean Plan were compared to the effluent limitations contained in Order No. R4-2008-0017. In order to prevent backsliding and apply the Table 2 effluent limitations, the most stringent effluent limitations for each parameter were established in this Order. Table F-5a summarizes the effluent limitations contained in the previous Order and the effluent limitations contained in Table 2 of the Ocean Plan.

Table F-5a. Comparison of Applicable Technology-based Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Contained in Order No. R4-2008-0017						
BOD	mg/L	20	--	60	--	--
Oil and Grease	mg/L	10	--	15	--	--
pH	standard units	--	--	--	6.0	9.0
Total Suspended Solids (TSS)	mg/L	50	--	150	--	--
Settleable Solids	mL/L	1.0	1.5	--	--	3.0
Turbidity	NTU	50	--	150	--	--
Contained in Table 2 of the Ocean Plan						
BOD	mg/L	--	--	--	--	--

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Oil and Grease	mg/L	25	40		--	75
pH	standard units	--	--	--	6.0	9.0
Total Suspended Solids (TSS)	mg/L	--	--	--	--	--
Settleable Solids	mL/L	1.0	1.5	--	--	3.0
Turbidity	NTU	75	100	--	--	225

The technology-based effluent limitations contained in Order No. R4-2008-0017 were applied to discharges of waste seawater measured at Monitoring Location EFF-001. It appears that effluent limitations contained in Order No. R4-2008-0017 are more stringent, therefore, these effluent limitations are carried over and are applicable to Discharge Point 001 for waste seawater discharge as follows:

Table F-5b. Summary of Technology-based Effluent Limitations at Discharge Point No. 001

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
BOD	mg/L	20	--	60	--	--
	lbs/day[1]	60	--	180		
Oil and Grease	mg/L	10	--	15	--	--
	lbs/day[1]	30		45		
pH	standard units	--	--	--	6.0	9.0
Total Suspended Solids (TSS)	mg/L	50	--	150	--	--
	lbs/day[1]	150		450		
Settleable Solids	mL/L	1.0	1.5	--	--	3.0
Turbidity	NTU	50	100	150	--	225

1. These mass-based effluent limitations are calculated using the following formula:

Concentration-based effluent limitation = C * Q * 8.34 * Q)

Where: C = concentration-based effluent limitation (mg/L)

Q = maximum discharge flow rate (MGD) = 0.360 MGD

This Order identifies an additional discharge point (Discharge Point 002) for storm water discharge. Since the discharge of storm water is not continuous, and occurs infrequently, the maximum daily effluent limitations in the above table are applicable to the discharges at Discharge Point 002.

Table F-5c. Summary of Technology-based Effluent Limitations at Discharge Point No. 002

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
BOD	mg/L	--	--	60	--	--
	lbs/day[1]	--	--	310	--	--

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Oil and Grease	mg/L	--	--	15	--	--
	lbs/day[1]	--	--	76	--	--
pH	standard units	--	--	--	6.0	9.0
TSS	mg/L	--	--	150	--	--
	lbs/day[1]	--	--	760	--	--
Settleable Solids	mL/L	--	--	--	--	3.0
Turbidity	NTU	--	--	150	--	--

1. These mass-based effluent limitations are calculated using the following formula:

Concentration-based effluent limitation = C * Q * 8.34 * Q)

Where: C = concentration-based effluent limitation (mg/L)

Q = maximum discharge flow rate (MGD) = 0.61 MGD (a 10-year 24 hour storm event)

C. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

CWA section 301(b) of the CWA and 40 CFR section 122.44(d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards.

40 CFR section 122.44(d)(1)(i) requires that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, water quality-based effluent limitations (WQBELs) must be established using: (1) USEPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided in section 122.44(d)(1)(vi).

The process for determining reasonable potential and calculating WQBELs when necessary is intended to protect the designated beneficial uses of the receiving water as specified in the Basin Plan, and achieve applicable water quality objectives and criteria that are contained in other state plans and policies, or any applicable water quality criteria contained in the Ocean Plan.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

As noted in section III.C of the Fact Sheet, the State Water Board adopted an Ocean Plan that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the Ocean Plan. The beneficial uses applicable to the Pacific Ocean are

summarized in section III.C.3 of this Fact Sheet. The Ocean Plan includes both narrative and numeric water quality objectives applicable to the receiving water.

Table 1 of the Ocean Plan includes the following water quality objectives for toxic pollutants and whole effluent toxicity:

a. 6-month median, daily maximum and instantaneous maximum objectives for 21 chemicals and chemical characteristics, including total residual chlorine and chronic toxicity, for the protection of marine aquatic life;

b. 30-day average objectives for 20 non-carcinogenic chemicals for the protection of human health;

c. 30-day average objectives for 42 carcinogenic chemicals for the protection of human health; and

d. Daily maximum objectives for acute and chronic toxicity.

3. Determining the Need for WQBELs

The need for effluent limitations based on water quality objectives in Table 1 of the Ocean plan was evaluated in accordance with 40 CFR section 122.44(d) and guidance for statistically determining the "reasonable potential" for a discharged pollutant to exceed an objective, as outlined in the California Ocean Plan Reasonable Potential Analysis (RPA) Amendment that was adopted by the State Water Board on April 21, 2005. The statistical approach combines knowledge of effluent variability (as estimated by a coefficient-of variation) with the uncertainty due to a limited amount of effluent data to estimate a maximum effluent value at a high level of confidence. This estimated maximum effluent value is based on a lognormal distribution of daily effluent values. Projected receiving water values (based on the estimated maximum effluent value or the reported maximum effluent value and minimum probable initial dilution); can then be compared to the appropriate objective to determine the potential for an exceedance of that objective and the need for an effluent limitation.

The water quality objectives contained in the Ocean Plan for Table 1 pollutants for which detected effluent data exist or were previously limited in Order No. R4-2008-0017, are summarized in Table F-6 below.

Table F-6. Ocean Plan Water Quality Objectives

Parameter	6-Month Median (µg/L)	Daily Maximum (µg/L)	Instantaneous Maximum (µg/L)	30-Day Average (µg/L)
Arsenic	8	32	80	--
Cadmium	1	4	10	--
Chromium VI	2	8	20	--
Copper	3	12	30	--
Lead	2	8	20	--
Mercury	0.04	0.16	0.4	--
Nickel	5	20	50	--
Selenium	15	60	150	--

Parameter	6-Month Median (µg/L)	Daily Maximum (µg/L)	Instantaneous Maximum (µg/L)	30-Day Average (µg/L)
Silver	0.7	2.8	7	--
Zinc	20	80	200	--
Ammonia (as N)	600	2,400	6,000	--
Chronic Toxicity	--	1	--	--
Chlorinated Phenolics	1	4	10	--
Thallium	--	--	--	2
Beryllium	--	--	--	0.033
TCDD equivalents	--	--	--	0.0000000039

According to the 2012 Ocean Plan amendment, the reasonable potential analysis (RPA) can yield three endpoints:

1) Endpoint 1, an effluent limitation is required and monitoring is required;

2) Endpoint 2, an effluent limitation is not required and the Regional Water Board may require monitoring; and

3) Endpoint 3, the RPA is inconclusive, monitoring is required, and an existing effluent limitation may be retained or a permit reopener clause may be included to allow inclusion of an effluent limitation if future monitoring warrants the inclusion.

Effluent data submitted to the Regional Water Board for the period from March 2008 through December 2012 were considered to evaluate reasonable potential in accordance with the procedures contained in the Ocean Plan (2012). For lead, selenium, and zinc at EFF-001, monitoring data prior to 2010 were not used due to the potential of false positive results caused by the application of inappropriate analytical methods. Based on the possible endpoints, a subset of parameters (i.e., arsenic, cadmium, trivalent chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, silver, zinc, total residual chlorine, phenolic compounds (chlorinated), phenolic compounds (non-chlorinated), endosulfan, antimony, hexachlorocyclohexane, thallium, fluoranthene, beryllium, and TCDD equivalents) required additional evaluation using the RPcalc 2.0 software tool developed by the State Water Board was used for conducting RPAs.

Based on the evaluation using the RPcalc 2.0 software tool to evaluate waste seawater monitoring data from EFF-001, the discharge demonstrates reasonable potential for copper and chronic toxicity. Using the RPcalc 2.0 software tool on monitoring data from EFF-001, it was determined that there was no reasonable potential for arsenic, cadmium, lead, selenium, zinc, and nickel. For the remaining constituents monitored at EFF-001, the RPA was inconclusive and resulted in Endpoint 3. Monitoring is required for all parameters with inconclusive RPA results.

Based on the evaluation using the RPcalc 2.0 software tool and storm water monitoring data collected at EFF-002, the discharge at Discharge Point No. 002 demonstrates reasonable potential for arsenic, beryllium, copper, lead, nickel, TCDD equivalents, zinc, and chronic toxicity. Due to limited data, the RPA did not result in Endpoint 2 for any parameters. For the remaining constituents monitored at EFF-002, the RPA was inconclusive and resulted in Endpoint 3. Monitoring is required for all parameters with inconclusive RPA results.

For many of the Ocean Plan Table 1 parameters, insufficient data were available to determine if the parameters had reasonable potential to exceed water quality objectives, thus monitoring requirements were included in this Order that are consistent with those requirements from the previous permit.

4. WQBEL Calculations

From the Table 1 water quality objectives of the Ocean Plan, effluent limitations are calculated according to Equation 1 of the Ocean Plan for all pollutants, except for acute toxicity (if applicable) and radioactivity:

$$Ce = Co + Dm(Co - Cs)$$

Where:

Ce = the effluent limitation (µg/L)
Co = the water quality objective to be met at the completion of initial dilution (µg/L)
Cs = background seawater concentration (µg/L)
Dm = minimum probable initial dilution expressed as parts seawater per part wastewater.

Initial dilution is the process that results in the rapid and irreversible turbulent mixing of wastewater with ocean water around the point of discharge.

The Dm is based on observed waste flow characteristics, receiving water density structure, and the assumption that no currents of sufficient strength to influence the initial dilution process flow across the discharge structure. No dilution factor has been granted to the Facility; therefore the minimum probable initial dilution is 0.

As stated above, the water quality objective to be met at the completion of initial dilution is contained in Table 1 of the Ocean Plan. The values provided in Table 3 of the Ocean Plan are presented in Table F-7, below. Cs equals zero for all pollutants, except the following:

Table F-7. Background Seawater Concentrations (Cs)

Parameter	Ocean Plan Table C Background Concentration (µg/L)
Arsenic	3
Copper	2
Mercury	0.0005
Silver	0.16
Zinc	8

WQBELs based on the zero dilution provided at Discharge Point No. 001 for copper is developed using Equation 1 of the Ocean Plan and the Ocean Plan background concentration.

WQBELs Calculation Example

The following demonstrates how the WQBELs for copper is established.

Concentration-Based Effluent Limitations

Copper

Ce = 3.0 µg/L + 0 (3.0 µg/L – 2.0 µg/L) = 3.0 µg/L (6-Month Median)
Ce = 12 µg/L + 0 (12.0 µg/L – 2.0 µg/L) = 12 µg/L (Daily Maximum)
Ce = 30 µg/L + 0 (30 µg/L – 2.0 µg/L) = 30 µg/L (Instantaneous Maximum)

5. Temperature

The Regional Water Board staff have developed a white paper entitled *Temperature and Dissolved Oxygen Impacts on Biota in Tidal Estuaries and Enclosed Bays in the Los Angeles Region*. The while paper evaluated the optimum temperatures for steelhead, topsmelt, ghost shrimp, brown rock crab, jackknife clam, and blue mussel. This white paper is used by the Regional Water Board to implement the requirements of the Thermal Plan. As a result of the white paper, a maximum effluent temperature limitation of 86°F was included in Order No. R4-2008-0017 and is included in this Order.

6. Bacteria Compliance

Both the State Water Board and the California Department of Public Health (CDPH) have established standards to protect water contact recreation in coastal waters from bacterial contamination. Bacterial objectives have been adopted by the State Water Board for ocean waters used for water contact recreation. In addition, the Ocean Plan contains bacterial standards for the protection of shellfish harvesting. Monitoring data collected at EFF-001 on February 8, 2012 resulted in an *Enterococcus* bacteria count of 260 MPN/100mL, which is higher than the Ocean Plan single sample maximum standard. Monitoring data collected at EFF-002 on May 17, 2011, February 8, 2012, and March 25, 2012, also resulted in total coliform, fecal coliform and *Enterococcus* bacteria levels higher than the Ocean Plan single sample maximum standards. Because bacteria levels in the effluent are higher than Ocean Plan standards, this Order includes new effluent bacteria limitations at Discharge Point No. 001 and Discharge Point No. 002 as follows:

30-day Geometric Mean Limits (based on no less than five samples over a 30-day period):

a) Total coliform density shall not exceed 1,000/100 mL;
b) Fecal coliform density shall not exceed 200/100 mL; and
c) *Enterococcus* density shall not exceed 35/100 mL.

Single Sample Limits:

a) Total coliform density shall not exceed 10,000/100 mL;
b) Fecal coliform density shall not exceed 400/100 mL;
c) *Enterococcus* density shall not exceed 104/100 mL; and
d) Total coliform density shall not exceed 1,000/100 mL, if the ratio of fecal-to-total coliform exceeds 0.1.

The Ocean Plan Shellfish Harvesting standards include objectives for total coliform as follows:

"*The median total coliform density (for any 6-month period) shall not exceed 70 per 100 mL, and not more than 10 percent of the samples shall exceed 230 per 100 mL.*"

The Ocean Plan also contains implementation provisions for bacterial characteristics, which include monitoring requirements and compliance.

7. Whole Effluent Toxicity (WET)

Whole effluent toxicity (WET) protects the receiving water quality from the aggregate toxic effect of a mixture of pollutants in the effluent. WET tests measure the degree of response of exposed aquatic test organisms to an effluent. The WET approach allows for protection of the narrative "no toxics in toxic amounts" criterion while implementing numeric criteria for toxicity. There are two types of WET tests: acute and chronic. An acute toxicity test is conducted over a short time period and measures mortality. A chronic toxicity test is conducted over a longer period of time and may measure mortality, reproduction, and growth.

a. Discharge Point No. 001

The Discharger monitored acute toxicity in 100 percent effluent on five dates during the term of the previous Order. For the May 18, 2011, sample, the result was 72% survival in 100% effluent. The Discharger noted insufficient acclimation time for organisms and re-tested the sample. Results of the retested sample were 96% survival in effluent with no statistical difference from the control.

The Discharger conducted chronic toxicity tests on effluent for five sample dates. Multiple species were tested on three of the five dates. The February 7, 2012 and March 25, 2012 test results for kelp germination demonstrated reasonable potential with results of >4 TUc and 2 TUc, respectively. The February 7, 2012, test result of 2 TUc for tube length also demonstrated reasonable potential.

Because the effluent demonstrates reasonable potential to exceed chronic toxicity objectives, this Order establishes a chronic toxicity effluent limitation at Discharge Point No. 001 using USEPA's 2010 TST hypothesis testing approach. A dilution factor is not authorized for this discharge. Chronic toxicity limitations are expressed as "Pass" or "Fail" for median monthly summary result and "Pass" or "Fail" and "% Effect" for maximum daily single result. The chronic toxicity effluent limitations in this Order are as stringent as necessary to protect the Ocean Plan Water Quality Objective for chronic toxicity.

b. Discharge Point No. 002

The Discharger conducted acute toxicity tests on effluent for three sampling dates. Monitoring results varied from 92% survival to 96% survival, with no statistical difference from the control.

The Discharger conducted chronic toxicity tests on effluent, using three species, for three sampling dates. Results of the Kelp germination tests on May 18, 2011, and February 7, 2012, resulted in 2 TUc and >4 TUc, demonstrating reasonable potential to exceed the chronic toxicity objective of 1.0 TUc.

Because the effluent demonstrates reasonable potential to exceed chronic toxicity objectives, this Order establishes a daily maximum chronic toxicity effluent limitation at Discharge Point No. 002 using USEPA's 2010 TST hypothesis testing approach. Chronic toxicity limitations are expressed as "Pass" or "Fail" and "% Effect" for the maximum daily single result. The chronic toxicity effluent limitations in this Order are as stringent as necessary to protect the Ocean Plan Water Quality Objective for chronic toxicity.

8. Final WQBELs

This Order establishes new effluent limitations for copper and chronic toxicity at Discharge Point No. 001, based on a demonstration of reasonable potential to exceed Ocean Plan objectives. Effluent limitations for lead, selenium, and zinc have been included for Discharge Point No. 001, since these constituents continue to demonstrate reasonable potential. At Discharge Point No. 002, this Order newly establishes maximum daily effluent limitations for arsenic, copper, lead, nickel, zinc, and chronic toxicity and average monthly effluent limitation for beryllium and TCDD equivalents, based on demonstration of reasonable potential. Because the discharges at Discharge Point No. 002 consist of only storm waters, this Order establishes only maximum daily effluent limitations for parameters having maximum daily water quality objectives in the Ocean Plan. For beryllium and TCDD equivalents, the average monthly limitations instead of the maximum daily limitations were included for Discharge Point 002 in that the only water quality objectives for these two parameters in the Ocean Plan are expressed as a 30-day average.

Monitoring for bacteria at Discharge Point Nos. 001 and 002 resulted in levels greater than the Ocean Plan objectives; therefore this Order includes new effluent limitations for bacteria. The effluent limitation for temperature has been included from the previous permit, applicable to both Discharge Point Nos. 001 and 002.

Table F-8a. Summary of Water Quality-based Effluent Limitations Discharge Point No. 001

Parameter	Units	Effluent Limitations			
		6-Month Median	Average Monthly	Maximum Daily	Instantaneous Maximum
Temperature	°F	--	--	--	86
Copper	µg/L	3	--	12	30
	lbs/day[1]	0.0090	--	0.036	--
Chronic Toxicity[2]	Pass or Fail, % Effect	--	Pass[3]	Pass or % Effect < 50	--
Total coliform	MPN/100 mL	[4]			
Fecal coliform	MPN/100 mL	[4]			
Enterococcus	MPN/100 mL	[4]			

1. These mass-based effluent limitations are calculated using the following formula:
Concentration-based effluent limitation = C * Q * 8.34 * Q)
Where: C = concentration-based effluent limitation (mg/L)
Q = maximum discharge flow rate (MGD) = 0.360 MGD
2. "Pass" or "Fail" for Median Monthly Effluent Limitation (MMEL). "Pass" or "Fail" and "% Effect" for Maximum Daily Effluent Limitation (MDEL). The MMEL for chronic toxicity shall only apply when there is a discharge more than one day in a calendar month period. During such calendar months, exactly three independent toxicity tests are required when one toxicity test results in "Fail".

3. This is a Median Monthly Effluent Limitation.
4. 30-day Geometric Mean Limits (based on no less than five samples over a 30-day period):
   a) Total coliform density shall not exceed 1,000/100 mL;
   b) Fecal coliform density shall not exceed 200/100 mL; and
   c) Enterococcus density shall not exceed 35/100 mL.

   Single Sample Limits:
   a) Total coliform density shall not exceed 10,000/100 mL;
   b) Fecal coliform density shall not exceed 400/100 mL;
   c) *Enterococcus* density shall not exceed 104/100 mL; and
   d) Total coliform density shall not exceed 1,000/100 mL, if the ratio of fecal-to-total coliform exceeds 0.1.

Table F-8b. Summary of Water Quality-based Effluent Limitations Discharge Point No. 002

Parameter	Units	Effluent Limitations			
		6-Month Median	Average Monthly	Maximum Daily	Instantaneous Maximum
Temperature	°F	--	--	--	86
Arsenic	µg/L	--	--	32	--
	lbs/day[1]	--	--	0.16	
Beryllium	µg/L	--	0.033	--	--
	lbs/day[1]	--	0.00017	--	
Copper	µg/L	--	--	12	--
	lbs/day[1]	--	--	0.061	
Lead	µg/L	--	--	8	--
	lbs/day[1]	--	--	0.04	
Nickel	µg/L	--	--	20	--
	lbs/day[1]	--	--	0.10	
Zinc	µg/L	--	--	80	--
	lbs/day[1]	--	--	0.41	
TCDD Equivalents	µg/L	--	3.9E-09	--	--
	lbs/day[1]	--	2.0E-11	--	
Chronic Toxicity[2]	Pass or Fail, % Effect	--	--	Pass or % Effect < 50	--
Total coliform	MPN/100 mL	[3]			
Fecal coliform	MPN/100 mL	[3]			
Enterococcus	MPN/100 mL	[3]			

1. These mass-based effluent limitations are calculated using the following formula:
   Concentration-based effluent limitation = C * Q * 8.34 * Q)
   Where: C = concentration-based effluent limitation (mg/L)
   Q = maximum discharge flow rate (MGD) = 0.61 MGD
2. "Pass" or "Fail" and "% Effect" for Maximum Daily Effluent Limitation (MDEL).
3. 30-day Geometric Mean Limits (based on no less than five samples over a 30-day period):
   a) Total coliform density shall not exceed 1,000/100 mL;
   b) Fecal coliform density shall not exceed 200/100 mL; and
   c) Enterococcus density shall not exceed 35/100 mL.

   Single Sample Limits:
   a) Total coliform density shall not exceed 10,000/100 mL;
   b) Fecal coliform density shall not exceed 400/100 mL;
   c) *Enterococcus* density shall not exceed 104/100 mL; and

d) Total coliform density shall not exceed 1,000/100 mL, if the ratio of fecal-to-total coliform exceeds 0.1.

D. Final Effluent Limitation Considerations

1. Anti-Backsliding Requirements

Section 402(o) and 303(d)(4) of the CWA and federal regulations at 40 C.F.R. section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit with some exceptions where limitations may be relaxed. The effluent limitations in this Order are at least as stringent as the effluent limitations in the previous Order, with the exceptions noted below.

The effluent limitations for lead, selenium, and zinc for Discharge Point No. 001 have been deleted because they did not show reasonable potential to cause or contribute to an excursion above the respective water quality. This relaxation of effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations.

CWA section 402(o)(2)(B)(i) and 40 C.F.R. section 122.44(L)(2)(i)(B)(1) provide an exception to the anti-backsliding provisions where information is available which was not available at the time of permit issuance and which would have justified the application of a less stringent effluent limitation at the time of permit issuance. As previously discussed, there was no requirement to measure flow in Order R4-2008-0017. The requirement to measure flow was first included in Order R4-2013-0172. The increases in mass-based effluent limitations for parameters at Discharge Point No. 001 result from the increase of the maximum permitted flow at Discharge Point No. 001 from 0.180 MGD to 0.360 MGD. The previous maximum permitted flow of 0.180 MGD was an estimated value based on the maximum intake pumping rate. This amended Order increases the maximum discharge flow limitation at Discharge Point No. 001 based on the continuous flow measurements at Discharge Point No. 001 as required in Order R4-2013-0172, without any modifications to the Facility. The increase to the maximum discharge flow limitation reflects actual flow conditions at the Facility. This flow information was not available at the time of permit reissuance in 2013 and would have justified higher mass-based effluent limitations at Discharge Point No. 001 at the time of permit reissuance. The concentration-based effluent limitations at Discharge Point No. 001 remain unchanged. Therefore, the increase to the mass-based effluent limitations at Discharge Point No. 001 is consistent with the anti-backsliding requirements of the CWA and federal regulations based on flow measurement data.

2. Antidegradation Policy

Section 131.12 of title 40 of the Code of Federal Regulations requires that state water quality standards include an anti-degradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge.

Provisions of this Order are consistent with applicable antidegradation policy expressed by State Water Board Resolution No. 68-16 and NPDES regulations at 40 CFR section 131.12, which require that water quality be maintained and protected where high quality waters constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance. The Northwest Santa Catalina Island ASBS, into which the Facility discharges waste seawater and storm water, is identified in the Ocean Plan as an Area of Special Biological Significance. In issuing Resolution No. 2006-0013 approving an exception to the Ocean Plan's prohibition against discharges to ASBSs, the State Water Board stated:

"*The USC/WMSC occupies a prominent role in marine science research and education, providing programs and facilities to USC and non-USC scientists and students and visitors from many other institutions. The USC/WMSC research activities and teaching laboratory aquaria both depend on the use of the flow thorough (open) seawater system. There are no viable alternatives to ocean disposed of waste seawater due to the remote location of the facility. If the exception is not granted, USC/WMSC will be forced to shut down its open seawater system. The State Water Board therefore finds that the public interest will be served by granting this exception.* "

"*The State Water Board finds, based on the whole record, including the IS/MND (Initial Study/Mitigated Negative Declaration) and comments received, that there is no substantial evidence that approval of the exception will have a significant effect on the environment because of the terms and conditions that have been incorporated into the project. The MND reflects the State Water Board's independent judgment and analysis*".

"*The proposed exception will not violate State Water Board Resolution No. 68-16 (Antidegradation Policy) because approval of the exception will not lower water quality; the discharge will not unreasonably affect present and anticipated beneficial uses; the discharge will not result in water quality lower than that prescribed in the Ocean Plan; and, the people of California will benefit from the research and education provided by USC/WMSC while beneficial uses will still be protected*".

The newly designated Discharge Point No. 002 does not represent a new or additional discharge; rather it reflects the Discharger's ability to separate the storm water discharge from the seawater discharge. At the time of issuance of Order No. R4-2008-0017, the Discharger had just segregated storm water and non-storm water sources that were previously commingled. As a result of the modifications, waste seawater and storm water are currently discharged through two separate pipes, located adjacent to each other. The discharges do not commingle until reaching the shore of the receiving water. To reflect the separate sources and distinct discharge points, this Order designates discharge of waste seawater as Discharge Point No. 001 and the storm water runoff as Discharge Point No. 002.

This Order estimates the storm water flow based on a 10-year 24 hour storm event at the Facility. The previous permit did not include an estimated flow for storm water only. All conditions and the environmental setting within the Facility continue to improve due to the implementation of Storm Water Management Plan by the Discharger. The final limitations in this Order hold the Discharger to performance levels that will not cause or contribute to water quality impairment or degradation. Therefore, the permitted discharge is consistent with the antidegradation provision of 40 C.F.R. section 131.12 and State Water Board Resolution No. 68-16.

The increase of the maximum discharge flow at Discharge Point No. 001 from 0.180 MGD to 0.360 MGD in this permit amendment are based on the continuous flow measurements at Discharge Point No. 001 as first required in Order R4-2013-0172. Since the Facility configuration and operations remain the same, the discharge flow rate at Discharge Point No. 001 has not changed but the assessment of the flow rate is more accurate. As a result, the change in the permitted flow in this amended Order will not result in the increase in the actual discharge flow at Discharge Point No. 001. Since the concentration-based effluent limitations and the actual flow have remained the same, the discharge will not cause water quality impairment or degradation. The Regional Board continues to find that if the Discharger complies with the conditions set forth in this Order, discharges from the Facility will not adversely impact biological communities in the ASBS. Therefore, this permit amendment is consistent with State and federal antidegradation policies.

3. Stringency of Requirements for Individual Pollutants

This Order contains both technology-based and water quality-based effluent limitations for individual pollutants. The technology-based effluent limitations consist of restrictions on BOD, oil and grease, TSS, settleable solids, turbidity, and pH. Restrictions on these pollutants are discussed in section IV.B. This Order's technology-based pollutant restrictions implement the minimum, applicable federal technology-based requirements.

Water quality-based effluent limitations have been derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. The procedures for calculating the individual water quality-based effluent limitations are based on the Ocean Plan, which was approved by USEPA on October 8, 2010. All beneficial uses and water quality objectives contained in the Ocean Plan were approved under state law and submitted to and approved by USEPA prior to May 30, 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to May 30, 2000, but not approved by USEPA before that date, are nonetheless "applicable water quality standards for purposes of the CWA" pursuant to 40 C.F.R. section 131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the requirements of the CWA.

Table F-9a. Summary of Final Effluent Limitations-Discharge Point No. 001

Parameter	Units	Effluent Limitations					Basis[3]
		6-Month Median[1,2]	Average Monthly[2]	Average Weekly	Maximum Daily	Instantaneous Maximum	
BOD	mg/L	--	20	--	60	--	E, BPJ
	lbs/day[4]	--	60	--	180	--	
Oil and Grease	mg/L	--	10	--	15	--	E, BPJ
	lbs/day[4]	--	30	--	45	--	
pH	standard units	6.0-9.0[5]					E, OP
Settleable Solids	ml/L	--	1.0	1.5	--	3.0	E, OP
Total Suspended Solids (TSS)	mg/L	--	50	--	150	--	E, BPJ
	lbs/day[4]	--	150	--	450	--	
Turbidity	NTU	--	50	100	150	--	E, BPJ, OP

Parameter	Units	Effluent Limitations					Basis[3]
		6-Month Median[1,2]	Average Monthly[2]	Average Weekly	Maximum Daily	Instantaneous Maximum	
Temperature	°F	--	--	--	--	86	E
Copper, Total Recoverable	µg/L	3	--	--	12	30	OP
	lbs/day[4]	0.0090	--	--	0.036	--	
Chronic Toxicity[6]	Pass or Fail, % Effect	--	Pass[7]	--	Pass or % Effect <50	--	TST
Total coliform	MPN/100 mL	[8]					OP
Fecal coliform	MPN/100 mL	[8]					OP
Enterococcus	MPN/100 mL	[8]					OP

1. The 6-month median shall apply as a moving median of daily values for any 180-day period in which daily values represent flow weighted average concentrations within a 24-hour period. For intermittent discharges, the daily value shall be considered to equal zero for days on which no discharge occurred.
2. If only one sample is collected during the time period associated with the water quality objective (e.g., monthly average or 6-month median), the single measurement shall be used to determine compliance with the effluent limitation for the entire time period.
3. E = Existing Order, OP = Ocean Plan (effective July 1, 2013), BPJ = Best Professional Judgment, TST = EPA Test of Significant Toxicity Approach.
4. These mass-based effluent limitations are calculated using the following formula:

   Concentration-based effluent limitation = C * Q * 8.34 * Q)

   Where: C = concentration-based effluent limitation (mg/L)

   Q = maximum discharge flow rate (MGD) = 0.360 MGD
5. Within limit of 6.0 to 9.0 at all times.
6. "Pass" or "Fail" for Median Monthly Effluent Limitation (MMEL). "Pass" or "Fail" and "% Effect" for Maximum Daily Effluent Limitation (MDEL). The MMEL for chronic toxicity shall only apply when there is a discharge more than one day in a calendar month period. During such calendar months, exactly three independent toxicity tests are required when one toxicity test results in "Fail".
7. This is a Median Monthly Effluent Limitation.
8. 30-day Geometric Mean Limits (based on no less than five samples over a 30-day period):
   a) Total coliform density shall not exceed 1,000/100 mL;
   b) Fecal coliform density shall not exceed 200/100 mL; and
   c) Enterococcus density shall not exceed 35/100 mL.

   Single Sample Limits:
   a) Total coliform density shall not exceed 10,000/100 mL;
   b) Fecal coliform density shall not exceed 400/100 mL;
   c) *Enterococcus* density shall not exceed 104/100 mL; and
   d) Total coliform density shall not exceed 1,000/100 mL, if the ratio of fecal-to-total coliform exceeds 0.1.

Table F-9b. Summary of Final Effluent Limitations-Discharge Point No. 002

Parameter	Units	Effluent Limitations					Basis[3]
		6-Month Median[1]	Average Monthly[2]	Average Weekly	Maximum Daily	Instantaneous Maximum	
BOD	mg/L	--	--	--	60	--	BPJ
	lbs/day[4]	--	--	--	310	--	

Parameter	Units	Effluent Limitations					Basis[3]
		6-Month Median[1]	Average Monthly[2]	Average Weekly	Maximum Daily	Instantaneous Maximum	
Oil and Grease	mg/L	--	--	--	15	--	BPJ
	lbs/day[4]	--	--	--	76	--	
pH	standard units	6.0-9.0[5]					OP
Settleable Solids	mL/L	--	--	--	--	3.0	OP
Total Suspended Solids (TSS)	mg/L	--	--	--	150	--	BPJ
	lbs/day[4]	--	--	--	760		
Turbidity	NTU	--	--	--	150	--	BPJ, OP
Temperature	°F	--	--	--	--	86	BPJ
Arsenic, Total Recoverable	µg/L	-	--	--	32	--	OP
	lbs/day[4]	--	--	--	0.16	--	
Beryllium, Total Recoverable	µg/L	--	0.033	--	--	--	OP
	lbs/day[4]	--	0.00017	--	--	--	
Copper, Total Recoverable	µg/L	--	--	--	12		OP
	lbs/day[4]	--	--	--	0.061		
Lead, Total Recoverable	µg/L	--	--	--	8		OP
	lbs/day[4]	--	--	--	0.04		
Nickel, Total Recoverable	µg/L	--	--	--	20		OP
	lbs/day[4]	--	--	--	0.10		
Zinc, Total Recoverable	µg/L	--	--	--	80		OP
	lbs/day[4]	--	--	--	0.41		
TCDD Equivalents[6]	µg/L	--	3.9E-09	--	--	--	OP
	lbs/day[4]	--	2.0E-11	--	--	--	
Chronic Toxicity[7]	Pass or Fail, % Effect	--	--	--	Pass or % Effect <50	--	TST
Total coliform	MPN/100 mL	[8]					OP
Fecal coliform	MPN/100 mL	[8]					OP
Enterococcus	MPN/100 mL	[8]					OP

1. The 6-month median shall apply as a moving median of daily values for any 180-day period in which daily values represent flow weighted average concentrations within a 24-hour period. For intermittent discharges, the daily value shall be considered to equal zero for days on which no discharge occurred.
2. If only one sample is collected during the time period associated with the water quality objective (e.g., monthly average or 6-month median), the single measurement shall be used to determine compliance with the effluent limitation for the entire time period.
3. E = Existing Order, OP = Ocean Plan (effective March 10, 2010), BPJ = Best Professional Judgment, TST = EPA Test of Significant Toxicity Approach.
4. These mass-based effluent limitations are calculated using the following formula:

   Concentration-based effluent limitation = C * Q * 8.34

   Where: C = concentration-based effluent limitation (mg/L)

Q = maximum discharge flow rate (MGD) = 0.61 MGD

5. Within limit of 6.0 to 9.0 at all times.

6. TCDD Equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below. USEPA method 1613 may be used to analyze dioxin and furan congeners.

Dioxin-TEQ (TCDD Equivalents) = Σ (C_x x TEF_x)

Where:

C_x = concentration of dioxin or furan congener x

TEF_x = TEF for congener x

Toxicity Equivalency Factors

Isomer Group	Toxicity Equivalency Factor (TEF)
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
Octa CDD	0.001
2,3,7,8 tetra CDF	0.1
1,2,3,7,8 penta CDF	0.05
2,3,4,7,8 penta CDF	0.5
2,3,7,8 hexa CDFs	0.1
2,3,7,8 hepta CDFs	0.01
Octa CDF	0.001

7. "Pass" or "Fail" and "% Effect" for Maximum Daily Effluent Limitation (MDEL).

8. 30-day Geometric Mean Limits (based on no less than five samples over a 30-day period):
   a) Total coliform density shall not exceed 1,000/100 mL;
   b) Fecal coliform density shall not exceed 200/100 mL; and
   c) Enterococcus density shall not exceed 35/100 mL.

   Single Sample Limits:
   a) Total coliform density shall not exceed 10,000/100 mL;
   b) Fecal coliform density shall not exceed 400/100 mL;
   c) *Enterococcus* density shall not exceed 104/100 mL; and
   d) Total coliform density shall not exceed 1,000/100 mL, if the ratio of fecal-to-total coliform exceeds 0.1.

E. Interim Effluent Limitations – Not Applicable

F. Land Discharge Specifications – Not Applicable

G. Recycling Specifications – Not Applicable

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

A. Surface Water

The Ocean Plan contains numeric and narrative water quality objectives applicable to the coastal waters of California. Water quality objectives include an objective to maintain the high

quality waters pursuant to federal regulations (section 131.12) and State Water Board Resolution No. 68-16. Receiving water limitations in this Order are included to ensure protection of beneficial uses of the receiving water and are based on the water quality objectives contained in the Ocean Plan.

This Order includes a receiving water limitation prohibiting the discharge from altering natural water quality within the receiving water. This receiving water limitation is based on condition 2.a. of Resolution No. 2006-0013. As stated in the Resolution, Regional Water Board staff in consultation with the State Water Board's Division of Water Quality shall define Natural Water Quality in the receiving water, seaward of the surf zone. For constituents other than indicator bacteria, natural water quality shall be determined using the reference station in the ocean in the vicinity of Goat Harbor or Italian Gardens near Twin Rocks Point on the northern coast of Santa Catalina Island. For indicator bacteria, the Ocean Plan bacteria objectives will be used. Regional Water Board staff shall review monitoring data and determine whether or not natural water quality is being altered in the ASBS because of the discharges from the Facility. (State Water Board Resolution No. 2006-0013, 2.a).

B. Groundwater– Not Applicable

VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

Section 122.48 of 40 CFR requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorize the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program (MRP), Attachment E, establishes monitoring and reporting requirements that implement federal and state requirements. The following provides the rationale for the monitoring and reporting requirements contained in the MRP for this facility.

A. Influent Monitoring

Order No. R4-2008-0017 specified monitoring of the intake for several parameters in order to establish "natural water quality". Resolution No. 2006-0013 specifies the reference station monitoring location as within Goat Harbor near Italian Gardens, which is over 6 shoreline miles from the intake structure. The location at the intake structure has not been determined to be free of anthropogenic sources of pollutants. For this reason and to eliminate redundancy, this Order discontinues monitoring requirements at the intake structure, with the exception of bacteria. Alternatively, as required in Resolution No. 2006-0013, the reference station, designated as REF-001, for determination of "natural water quality", is in the ocean in the vicinity of Goat Harbor or Italian Gardens near Twin Rocks Point on the northern coast of Santa Catalina Island. See section VI.D.1 for further discussion of reference station monitoring requirements.

For indicator bacteria, Resolution No. 2006-0013 specifies monitoring of influent as follows:

> "*In addition to the bacterial monitoring requirements described in conditions 1. and m. above, samples must be collected at the seawater intake structure during a maximum of three storm events per year that result in runoff from the spray field hillside and measured for Ocean Plan indicator bacteria. The station at the seawater intake structure is selected for this requirement because it is near the bluff below the USC/WMSC sewage treatment plant spray field. This requirement along with the bacterial monitoring in conditions 1. and m. is meant to satisfy in total the Ocean Plan bacteria monitoring requirements*."

This Order includes monitoring requirements for indicator bacteria at INF-001 to satisfy the requirements of Resolution No. 2006-0013. Monitoring at the intake location provides a comparative basis of bacteria in source water versus effluent and receiving water and in turn indicates whether the Facility may be contributing bacteria to the discharge.

B. Effluent Monitoring

Monitoring for those pollutants expected to be present in discharges from Discharge Point No. 001 (Monitoring Location EFF-001) and Discharge Point No. 002 (Monitoring Location EFF-002) will be required as shown in the MRP (Attachment E). To determine compliance with effluent limitations, the monitoring plan includes monitoring requirements for the contaminants of concern at least on a quarterly frequency. The monitoring frequency for metals with effluent limitations is monthly. Effluent monitoring requirements pursuant to State Water Board Resolution No. 2006-0013 have also been included in the MRP.

Resolution No. 2006-0013, condition l, requires the Discharger to collect two waste seawater effluent samples (once during dry weather and once during wet weather, i.e., a storm event) during the first year of the permit cycle. Samples are to be analyzed for all Ocean Plan Table 1 constituents, pH, salinity, and temperature. Resolution No. 2006-0013 further stipulates "*Based on the results from the first year, the Los Angeles Water Board will determine the frequency of sampling (at a minimum, annually during wet weather) and the constituents to be tested during the remainder of the permit cycle, except that ammonia nitrogen, pH, salinity, and temperature must be tested at least annually. Chronic toxicity (for at least one consistent invertebrate species) must be tested at least annually for the waste seawater effluent.*"

The required frequency of monitoring for the storm water discharge at EFF-002 has been increased from 1/Year to 2/Year as a few constituents including arsenic, copper, lead, nickel, zinc, chronic toxicity, beryllium and TCDD equivalents has been detected in the storm water at levels exceeding the Ocean Plan Water Quality Objectives. The monitoring frequency for metals with effluent limitations is monthly when a discharge of the storm water occurs during the month.

The Ocean Plan implementation procedures III.C.4.g and h for Table 1 constituents specifies that daily maximum water quality objective shall apply to flow weighted, 24-hour composite samples and that the instantaneous maximum water quality objective shall apply to grab sample determinations. The sample collection types for Table 1 constituents at Discharge Point No. 001 have been based on this requirement to enable compliance determination as directed by the Ocean Plan. For Discharge Point No. 002, 24-hour composites may not be feasible due to the short-term nature of the storm water runoff. For this reason, the required sample type is limited to grab samples.

C. Whole Effluent Toxicity Testing Requirements

Whole effluent toxicity (WET) protects the receiving water quality from the aggregate toxic effect of a mixture of pollutants in the effluent. An acute toxicity test is conducted over a short time period and measures mortality. A chronic toxicity test is conducted over a longer period of time and may measure mortality, reproduction, and growth. Chronic toxicity is a more stringent requirement that acute toxicity. A chemical at a low concentration can have chronic effects but no acute effects until it get to the higher level. For this permit, chronic toxicity in the discharge is limited and evaluated using USEPA's 2010 TST hypothesis testing approach. The chronic

toxicity effluent limitations are as stringent as necessary to protect the Ocean Plan Water Quality Objective for chronic toxicity.

Section III.C.3.c.(4) of the Ocean Plan requires dischargers to conduct chronic toxicity testing if the minimum initial dilution of the effluent is below 100:1. This Order includes monitoring requirements for chronic toxicity in the MRP (Attachment E). The discharges enter an ASBS and the Facility does not have dilution credit. The frequency for chronic toxicity monitoring has been increased from annually as required in Order No. R4-2008-0017 to two times per year at each discharge point due to the demonstration of reasonable potential. These requirements satisfy the minimum toxicity requirements specified in Resolution No. 2006-0013.

D. Receiving Water Monitoring

The discharge shall comply with all applicable provisions, including water quality standards of the Ocean Plan. Natural water conditions in the receiving water, seaward of the surf zone, shall not be altered as a result of the discharge. As specified in Resolution No. 2006-0013, for constituents other than indicator bacteria, natural water quality will be determined using the reference station in the ocean in the vicinity of Goat Harbor or Italian Gardens near Twin Rocks Point on the northern coast of Santa Catalina Island. For indicator bacteria, the Ocean Plan bacteria objectives will be used to establish natural water quality; however, monitoring for bacteria at the reference station is required for informational purposes. This Order designates the reference monitoring site as REF-001.

1. Surface Water

a. Reference Station Monitoring at REF-001

Monitoring at the reference site REF-001 is required to determine whether the discharge is altering "natural water quality". The reference site location was selected as it was determined to be relatively free from anthropogenic sources of pollutants. Condition 2.a. of Resolution No. 2006-0013 requires: "*For constituents other than indicator bacteria, natural water quality will be determined using the reference station in the ocean in the vicinity of Goat Harbor or Italian Gardens near Twin Rocks Point on the northern coast of Santa Catalina Island. For indicator bacteria, the Ocean Plan bacteria objectives will be used*." The MRP of this Order incorporates the reference station monitoring requirements of Resolution No. 2006-0013.

The Ocean Plan contains implementation procedures for bacteria objectives which address minimum receiving water monitoring. Resolution 2006-0013 incorporates into the Ocean Plan mitigating conditions which address bacteria monitoring. The bacteria monitoring requirements in Resolution 2006-0013 therefore supersede the Ocean Plan section III.D Implementation Procedures for Bacterial Characteristics for this Order. As explained in Condition 2.o of Resolution 2006-0013 the bacteria monitoring requirements at the combined locations of the intake structure, effluent, reference station, and receiving water are meant to satisfy in total the Ocean Plan bacteria monitoring requirements.

b. Receiving Water Monitoring at RSW-001

Condition 2.m. of Resolution No. 2006-0013 specifies "*Once annually, during wet weather (storm event), the storm water runoff effluent and the receiving water adjacent*

to the seawater and storm water discharge system must be sampled and analyzed for Ocean Plan Table 1 constituents. The receiving water in Big Fisherman Cove must also be monitored for Ocean Plan indicator bacteria water quality objectives. The sample location for the receiving water will be immediately seaward of the surf zone in Big Fisherman Cove adjacent to the outfall location." This Order includes monitoring requirements at RSW-001 to satisfy the condition 2.m. of Resolution No. 2006-0013.

2. Groundwater– Not Applicable

E. Other Monitoring Requirements

This Order includes additional monitoring requirements per the conditions of Resolution No. 2006-0013, including subtidal sediment monitoring, benthic marine life monitoring, and a metals bioaccumulation study.

VII. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with 40 C.F.R. section 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 C.F.R. section 122.42, are provided in Attachment D to the order.

Sections 122.41(a)(1) and (b) through (n) of 40 C.F.R. establish conditions that apply to all State-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the Order. Section 123.25(a)(12) allows the state to omit or modify conditions to impose more stringent requirements. In accordance with 40 C.F.R. section 123.25, this Order omits federal conditions that address enforcement authority specified in 40 C.F.R. sections 122.41(j)(5) and (k)(2) because the enforcement authority under the Water Code is more stringent. In lieu of these conditions, this Order incorporates by reference Water Code section 13387(e).

B. Special Provisions

1. Reopener Provisions

These provisions are based on section 123 and the previous Order. The Regional Water Board may reopen the permit to modify permit conditions and requirements. Causes for modifications include the promulgation of new federal regulations, modification in toxicity requirements, or adoption of new regulations by the State Water Board or Regional Water Board, including revisions to the Basin Plan and/or Ocean Plan.

2. Special Studies and Additional Monitoring Requirements

a. Initial Investigation Toxicity Reduction Evaluation Workplan

This provision is based on section III.C.10 of the Ocean Plan.

b. Benthic Marine Life Survey

Condition 2.j. of Resolution No. 2006-0013 requires "*that at least once every permit cycle (every five years), a quantitative survey of benthic marine life must be performed near the discharge and at a reference site. The Los Angeles Water Board, in consultation with the State Water Board's Division of Water Quality, must approve the survey design. The results of the survey must be completed and submitted to the Los Angeles Water Board within six months before the end of the permit cycle (permit expiration)*." This Order incorporates the requirements of condition 2.j as special provision V.C.2.b.

During the last permit cycle, the Discharger fulfilled this requirement by participation in the Bight '13 Rocky Intertidal Study in lieu of conducting a benthic marine life survey. The consensus of the Bight '13 stakeholder and regulatory work group has identified the Rocky Intertidal Biology as an important indicator of near shore water quality and the benefit of participation in this element of the Bight '13 regional study provides better leverage of information than would be gathered by a site specific Benthic Marine Life Survey.

c. Metals Bioaccumulation Study

Condition 2.k of Resolution No. 2006-0013 specifies: "*Once during the upcoming permit cycle, a bioaccumulation study using mussels (Mytilus californianus) must be conducted to determine the concentrations of metals near field (within Big Fisherman Cove) and far field (at the reference station). The Los Angeles Water Board, in consultation with the Division of Water Quality, must approve the study design. The results of the survey must be completed and submitted to the Los Angeles Water Board at least six months prior to the end of the permit cycle (permit expiration). Based on the study results, the Los Angeles Water Board, in consultation with the Division of Water Quality, may adjust the study design in subsequent permits, or add additional test organisms*". This Order incorporates the requirements of condition 2.j as special provision V.C.2.c.

As required in Order No. R4-2008-0017, the Discharger conducted the Metals Bioaccumulation Study in March 2012 and submitted a final report to the Regional Water Board in March 2013. The final report indicates following results:

- Overall metals concentrations are remaining the same or showing significant decreases over time in mussel tissues. Metal concentrations found in this study were consistent with long term metal trends observed in the National Oceanic and Atmospheric Administration (NOAA) Status and Trends (S&T) Mussel Watch program.

- All mussel tissues concentrations for metals collected at the near field Wrigley Marine Science Center station location are below the 85 percent guideline as outlined by the State Board (2009) study.

- With few exception (e.g. cadmium), the western coast of Santa Catalina Island (ASBS No. 25) is showing no elevated levels of bioaccumulation of heavy metals in mussel tissues. There is no indication that storm water runoff is contributing to the observed cadmium based on the water quality data collected under the dischargers permit. The long term average concentration measured for cadmium from the EFF-

001 seawater return is approximately 20 parts per trillion. (Ocean Plan 6-month median water quality objective for cadmium is 1 µg/L or 1 part per billion).

d. Regional ASBS Monitoring

This provision allows the Discharger to satisfy monitoring requirements through participation in a Regional Monitoring Program.

During the last permit cycle, in addition to participation in the Bight '13 Rocky Intertidal Study, the Discharger was also a key contributor to the Bight '08 program.

e. Subtidal Sediment Monitoring

Special Provision V.C.2.e is based on condition 2.n of Resolution No. 2006-0013. As required in this Order, the Discharger must conduct annual monitoring of subtidal sediment at SED-001 for Ocean Plan Table 1 constituents. For acute toxicity testing, the species *Eohaustorius estuarius* is required. As stipulated by Resolution No. 2006-0013, after the first year, the Regional Water Board will determine specific constituents to be tested during the remainder of each permit cycle, except that acute toxicity for sediment must be tested annually.

The Discharger conducted three monitorings for Ocean Plan Table 1 constituents in 2011 and 2012. Concentrations of constituents in sediment were generally not detected, with the exception of most metals, which were found in relatively low but detectable concentrations. No toxicity were observed in sediments using amphipod *Eohaustorius estuaries.*

f. Receiving Water Monitoring Report

Special Provision V.C.2.f. is based on condition 2.p. of Resolution No. 2006-0013 and is necessary to provide information to the Regional Water Board of potential impacts to the ASBS and steps taken to prevent alteration of natural water quality.

The Discharger indicated that no alteration of natural water quality measured based on the results of routine monitoring during the last permit period. Therefore, no receiving water monitoring report was required to be submitted.

3. Best Management Practices and Pollution Prevention

a. Storm Water Management Plan (SWMP)

The requirements of special condition VI.C.3.a are based on conditions 2.e, f, g, h, and i of Resolution No. 2006-0013, which collectively require the Discharger to develop and implement a SWMP designed to prevent all discharges of non-storm water facility runoff. Order No. R4-2008-0017 required the Discharger to develop a SWMP. This Order requires the Discharger to update and continue to implement the SWMP.

b. Pollutant Minimization Program

Monitoring data of TCDD congeners at EFF-002 were above the laboratory reported limits on February 7, 2012 and March 25, 2012. Based on RPA results, an effluent

limitation for TCDD equivalents for EFF-002 (storm water discharge) was newly prescribed in the Order. The Discharger is responsible for the implementation of appropriate control measures and/or BMPs in the Storm Water Management Plan in response to the elevated levels of TCDD in the storm water discharged from the Facility. The TCDD monitoring frequency has been increased to twice per year at Discharge Point No. 002 because of the newly prescribed TCDD effluent limitation.

Monitoring data of TCDD congeners at EFF-001 (waste seawater discharge) were consistently below the laboratory reported limits and reported as DNQs. The presence of TCDD in the waste seawater at EFF-001 may be associated with the wild fire on Catalina Island that occurred in May 2011 and the resultant aerial deposition. In view of the very low detected concentrations of the TCDD congeners (all DNQs) in the waste seawater and no known source of TCDD associated with the operation, the development and implementation of a Pollutant Minimization Program (PMP) is not required in the Order.

4. Construction, Operation, and Maintenance Specifications

The provision to notify the Regional Water Board 180 days prior to construction/facility modification is based on condition 2.s. of Resolution No. 2006-0013 and section III.E.2 of the Ocean Plan. This provision is necessary to prevent permanent or long-term water quality degradation within the ASBS.

5. Other Special Provisions

a. Implementing Nonpoint Source Management Plan

Special Provision V.C.5.a requires the Discharger to implement a Nonpoint Source Management Plan. As required in conditions 2.r of Resolution No. 2006-0013, the Discharger prepared a waterfront and marine operations nonpoint source management plan in 2012. Because the Discharger's site is located at the water's edge, potential pollutants at the site are subject to reduced buffering by natural processes. The Nonpoint Source Management Plan includes applicable management measures as described in the State's Nonpoint Source Program Implementation Plan for marinas and recreational boating. This permit requires the implementation of the Management Plan.

b. Program for Prevention of Biological Pollutants

The discharge has the potential to introduce invasive species or pathogenic organisms. Such accidental introductions could alter the marine community in an undesirable way. To prevent such introductions, condition 2.q of Resolution No. 2006-0013 requires the Discharger to pursue and implement a program for prevention of Biological Pollutants (non-native invasive species) in consultation with the California Department of Fish and Game Marine Resources Division. This requirement is incorporated into this Order as Special Provision V.C.5.b.

6. Compliance Schedule – Not Applicable

VIII. PUBLIC PARTICIPATION

The Regional Water Board has considered the issuance of WDR's, as well as an amendment thereto, that will serve as an NPDES permit for the Wrigley Marine Science Center. As a step in the WDR adoption process, the Regional Water Board staff has developed tentative WDR's and has encouraged public participation in the WDR adoption process.

A. Notification of Interested Parties

The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe, and amend, waste discharge requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Notification was provided to all interested parties.

The public had access to the agenda and any changes in dates and locations through the Los Angeles Regional Water Board's website at:
http://www.waterboards.ca.gov/losangeles

B. Written Comments

The staff determinations are tentative. Interested persons were invited to submit written comments concerning tentative WDRs as provided through the notification process electronically at losangeles@waterboards.ca.gov with a copy to JauRen.Chen@waterboards.ca.gov.

To be fully responded to by staff and considered by the Regional Water Board, written comments pertaining to adoption of Order R4-2013-0172 were due at the Regional Water Board offices by 5:00 p.m. on October 14, 2013. Written comments pertaining to amending Order R4-2013-0172-A01 were due at the Regional Water Board offices by 5:00 p.m. on November XX, 2015.

C. Public Hearing

The Regional Water Board held a public hearing to adopt Order R4-2013-0172 during its regular Board meeting on the following date and time and at the following location:

Date: November 7, 2013
Time: 9:00 A.M.
Location: The City of Simi Valley
2929 Tapo Canyon Road
Simi Valley, California

The Regional Water Board held a public hearing to amend Order R4-2013-0172 during its regular Board meeting on the following date and time and at the following location:

Date: December 10, 2015
Time: 9:00 A.M.
Location: Metropolitan Water District of Southern California, Board Room
700 North Alameda Street
Los Angeles, California

Interested persons were invited to attend. At the public hearing, the Regional Water Board heard testimony pertinent to the discharge, WDRs, and permit. For accuracy of the record, important testimony was requested in writing.

Please be aware that dates and venues may change. Our Web address is http://www.waterboards.ca.gov/losangeles where you can access the current agenda for changes in dates and locations.

D. Reconsideration of Waste Discharge Requirements

Any aggrieved person may petition the State Water Board to review the decision of the Regional Water Board regarding the final WDRs. The petition must be received by the State Water Board at the following address within 30 calendar days of the Regional Water Board's action:

State Water Resources Control Board
Office of Chief Counsel
P.O. Box 100, 1001 I Street
Sacramento, CA 95812-0100

For instructions on how to file a petition for review, see
http://www.waterboards.ca.gov/public_notices/petitions/water_quality/wqpetition_instr.shtml

E. Information and Copying

The Report of Waste Discharge, other supporting documents, and comments received are on file and may be inspected at the address above at any time between 8:30 a.m. and 4:45 p.m., Monday through Friday. Copying of documents may be arranged through the Regional Water Board by calling (213) 576-6600.

F. Register of Interested Persons

Any person interested in being placed on the mailing list for information regarding the WDR's and NPDES permit should contact the Regional Water Board, reference this facility, and provide a name, address, and phone number.

G. Additional Information

Requests for additional information or questions regarding this order should be directed to Jau Ren Chen at (213) 576-6656.

ATTACHMENT G – STATE WATER BOARD MINIMUM LEVELS

The Minimum Levels identified in this appendix represent the lowest concentration of a pollutant that can be quantitatively measured in a sample given the current state of performance in analytical chemistry methods in California. These Minimum Levels were derived from data provided by state-certified analytical laboratories in 1997 and 1998 for pollutants regulated by the California Ocean Plan and shall be used until new values are adopted by the State Water Board. There are four major chemical groupings: volatile chemicals, semi-volatile chemicals, inorganics, pesticides & PCB's. "No Data" is indicated by "--".

TABLE II-1
MINIMUM LEVELS – VOLATILE CHEMICALS

Volatile Chemicals	CAS Number	Minimum Level* (µ/L)	
		GC Method[a]	GCMS Method[b]
Acrolein	107028	2.	5
Acrylonitrile	107131	2.	2
Benzene	71432	0.5	2
Bromoform	75252	0.5	2
Carbon Tetrachloride	56235	0.5	2
Chlorobenzene	108907	0.5	2
Chlorodibromomethane	124481	0.5	2
Chloroform	67663	0.5	2
1,2-Dichlorobenzene (volatile)	95501	0.5	2
1,3-Dichlorobenzene (volatile)	541731	0.5	2
1,4-Dichlorobenzene (volatile)	106467	0.5	2
Dichlorobromomethane	75274	0.5	2
1,1-Dichloroethane	75343	0.5	1
1,2-Dichloroethane	107062	0.5	2
1,1-Dichloroethylene	75354	0.5	2
Dichloromethane	75092	0.5	2
1,3-Dichloropropene (volatile)	542756	0.5	2
Ethyl benzene	100414	0.5	2
Methyl Bromide	74839	1.	2
Methyl Chloride	74873	0.5	2
1,1,2,2-Tetrachloroethane	79345	0.5	2
Tetrachloroethylene	127184	0.5	2
Toluene	108883	0.5	2
1,1,1-Trichloroethane	71556	0.5	2
1,1,2-Trichloroethane	79005	0.5	2
Trichloroethylene	79016	0.5	2
Vinyl Chloride	75014	0.5	2

Table II-1 Notes

a) GC Method = Gas Chromatography
b) GCMS Method = Gas Chromatography / Mass Spectrometry

* To determine the lowest standard concentration in an instrument calibration curve for these techniques, use the given ML (see Ocean Plan, Chapter III, "Use of Minimum Levels").

TABLE II-2
MINIMUM LEVELS – SEMI VOLATILE CHEMICALS

Semi-Volatile Chemicals	CAS Number	Minimum* Level (µg/L)			
		GC Method[a]	GCMS Method[b]	HPLC Method[c]	COLOR Method[d]
Acenapthylene	208968	--	10	0.2	--
Anthracene	120127	--	10	2	--
Benzidine	92875	--	5	--	--
Benzo(a)anthracene	56553	--	10	2	--
Benzo(a)pyrene	50328	--	10	2	--
Benzo(b)fluoranthene	205992	--	10	10	--
Benzo(g,h,i)perylene	191242	--	5	0.1	--
Benzo(k)floranthene	207089	--	10	2	--
Bis2-(1-Chloroethoxy) methane	111911	--	5	--	--
Bis(2-Chloroethyl)ether	111444	10	1	--	--
Bis(2-Chloroisopropyl)ether	39638329	10	2	--	--
Bis(2-Ethylhexyl) phthalate	117817	10	5	--	--
2-Chlorophenol	95578	2	5	--	--
Chrysene	218019	--	10	5	--
Di-n-butyl phthalate	84742	--	10	--	--
Dibenzo(a,h)anthracene	53703	--	10	0.1	--
1,2-Dichlorobenzene (semivolatile)	95504	2	2	--	--
1,3-Dichlorobenzene (semivolatile)	541731	2	1	--	--
1,4-Dichlorobenzene (semivolatile)	106467	2	1	--	--
3,3-Dichlorobenzidine	91941	--	5	--	--
2,4-Dichlorophenol	120832	1	5	--	--
1,3-Dichloropropene	542756	--	5	--	
Diethyl phthalate	84662	10	2	--	--
Dimethyl phthalate	131113	10	2	--	--
2,4-Dimethylphenol	105679	1	2	--	--
2,4-Dinitrophenol	51285	5	5	--	--
2,4-Dinitrotoluene	121142	10	5	--	--
1,2-Diphenylhydrazine	122667	--	1	--	--
Fluoranthene	206440	10	1	0.05	--
Fluorene	86737	--	10	0.1	--
Hexachlorobenzene	118741	5	1	--	--
Hexachlorobutadiene	87683	5	1	--	--
Hexachlorocyclopentadiene	77474	5	5	--	--
Hexachloroethane	67721	5	1	--	--
Indeno(1,2,3-cd)pyrene	193395	--	10	0.05	--
Isophorone	78591	10	1	--	--
2-methyl-4,6-dinitrophenol	534521	10	5	--	--
3-methyl-4-chlorophenol	59507	5	1	--	--
N-nitrosodi-n-propylamine	621647	10	5	--	--
N-nitrosodimethylamine	62759	10	5	--	--
N-nitrosodiphenylamine	86306	10	1	--	--
Nitrobenzene	98953	10	1	--	--

Semi-Volatile Chemicals	CAS Number	Minimum* Level (µg/L)			
		GC Method[a]	GCMS Method[b]	HPLC Method[c]	COLOR Method[d]
2-Nitrophenol	88755	--	10	--	--
4-Nitrophenol	100027	5	10	--	--
Pentachlorophenol	87865	1	5	--	--
Phenanthrene	85018	--	5	0.05	--
Phenol	108952	1	1	--	50
Pyrene	129000	--	10	0.05	--
2,4,6-Trichlorophenol	88062	10	10	--	--

Table II-2 Notes:

a) GC Method = Gas Chromatography
b) GCMS Method = Gas Chromatography / Mass Spectrometry
c) HPLC Method = High Pressure Liquid Chromatography
d) COLOR Method = Colorimetric

* To determine the lowest standard concentration in an instrument calibration curve for this technique, multiply the given ML by 1000 (see Ocean Plan, Chapter III, “Use of Minimum Levels”).

TABLE II-3
MINIMUM* LEVELS – INORGANICS

Inorganic Substances	CAS Number	Minimum* Level (µg/L)								
		COLOR Method[a]	DCP Method[b]	FAA Method[c]	GFAA Method[d]	HYBRIDE Method[e]	ICP Method[f]	ICPMS Method[g]	SPGFAA Method[h]	CVAA Method[i]
Antimony	7440360	--	1000.	10.	5.	0.5	50.	0.5	5.	--
Arsenic	7440382	20.	1000.	--	2.	1.	10.	2.	2.	--
Beryllium	7440417	--	1000.	20.	0.5	--	2.	0.5	1.	--
Cadmium	7440439	--	1000.	10.	0.5	--	10.	0.2	0.5	--
Chromium (total)	--	--	1000.	50.	2.	--	10.	0.5	1.	--
Chromium (VI)	18540299	10.	--	5.	--	--	--	--	--	--
Copper	7440508	--	1000.	20.	5.	--	10.	0.5	2.	--
Cyanide	57125	5.	--	--	--	--	--	--	--	--
Lead	7439921	--	10000.	20.	5.	--	5.	0.5	2.	--
Mercury	7439976	--	--	--	--	--	--	0.5	--	0.2
Nickel	7440020	--	1000.	50.	5.	--	20.	1.	5.	--
Selenium	7782492	--	1000.	--	5.	1.	10.	2.	5.	--
Silver	7440224	--	1000.	10.	1.	--	10.	0.2	2.	--
Thallium	7440280	--	1000.	10.	2.	--	10.	1.	5.	--
Zinc	7440666	--	1000.	20.	--	--	20.	1.	10.	--

Table II-3 Notes

a) COLOR Method = Colorimetric
b) DCP Method = Direct Current Plasma
c) FAA Method = Flame Atomic Absorption
d) GFAA Method = Graphite Furnace Atomic Absorption
e) HYDRIDE Method = Gaseous Hydride Atomic Absorption
f) ICP Method = Inductively Coupled Plasma
g) ICPMS Method = Inductively Coupled Plasma / Mass Spectrometry
h) SPGFAA Method = Stabilized Platform Graphite Furnace Atomic Absorption (i.e., US EPA 200.9)
i) CVAA Method = Cold Vapor Atomic Absorption

* To determine the lowest standard concentration in an instrument calibration curve for these techniques, use the given ML (see Ocean Plan, Chapter III, “Use of Minimum* Levels”).

TABLE II-4
MINIMUM* LEVELS – PESTICIDES AND PCBs*

Pesticides – PCB's	CAS Number	Minimum* Level (µg/L) GC Method[a]
Aldrin	309002	0.005
Chlordane	57749	0.1
4,4'-DDD	72548	0.05
4,4'-DDE	72559	0.05
4,4'-DDT	50293	0.01
Dieldrin	60571	0.01
a-Endosulfan	959988	0.02
b-Endosulfan	33213659	0.01
Endosulfan Sulfate	1031078	0.05
Endrin	72208	0.01
Heptachlor	76448	0.01
Heptachlor Epoxide	1024573	0.01
a-Hexachlorocyclohexane	319846	0.01
b-Hexachlorocyclohexane	319857	0.005
d-Hexachlorocyclohexane	319868	0.005
g-Hexachlorocyclohexane (Lindane)	58899	0.02
PCB1016	--	0.5
PCB1221	--	0.5
PCB1232	--	0.5
PCB1242	--	0.5
PCB1248	--	0.5
PCB1254	--	0.5
PCB1260	--	0.5
Toxaphene	8001352	0.5

Table II-4 Notes

a) GC Method = Gas Chromatography

* To determine the lowest standard concentration in an instrument calibration curve for this technique, multiply the given ML by 100 (see Ocean Plan, Chapter III, “Use of Minimum Levels”)

ATTACHMENT H – STATE WATER BOARD RESOLUTION NO. 2006-0013

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2006 – 0013

APPROVING AN EXCEPTION TO THE CALIFORNIA OCEAN PLAN FOR THE UNIVERSITY OF SOUTHERN CALIFORNIA WRIGLEY MARINE SCIENCE CENTER DISCHARGE INTO THE NORTHWEST SANTA CATALINA ISLAND AREA OF SPECIAL BIOLOGICAL SIGNIFICANCE, INCLUDING SPECIAL PROTECTIONS TO PROTECT BENEFICIAL USES

WHEREAS:

1. The State Water Resources Control Board (State Water Board) adopted the California Ocean Plan (Ocean Plan) on July 6, 1972 and revised the plan in 1978, 1983, 1988, 1990, 1997, 2000, and 2005.
2. The Ocean Plan states that waste shall not be discharged to areas designated as being of special biological significance.
3. The waters of the Northwest Santa Catalina Island have been designated as an Area of Special Biological Significance (ASBS).
4. Public Resources Code (PRC) section 36750 provides that, as of January 1, 2003, all ASBS are now included in the Marine Managed Area category State Water Quality Protection Areas (SWQPAs).
5. PRC section 36700(f) defines an SWQPA as "a nonterrestrial marine or estuarine area designated to protect marine species or biological communities from an undesirable alteration in natural water quality, including, but not limited to, areas of special biological significance that have been designated by the State Water Board through its water quality control planning process."
6. The University of Southern California (USC) Wrigley Marine Science Center (WMSC) discharges waste seawater and storm water runoff into the Northwest Santa Catalina Island ASBS. This action covers all discharges from USC/WMSC into the ASBS, including all seawater point source discharges, storm water discharges, and nonpoint source discharges.
7. The State Water Board may grant exceptions to the Ocean Plan provided that (a) the exception will not compromise protection of ocean waters for beneficial uses, and (b) the public interest will be served.
8. The USC/WMSC has requested an exception to the Ocean Plan's prohibition against discharges to ASBS for waste discharges from its facilities.
9. The staff of the Los Angeles Regional Water Quality Control Board (Los Angeles Water Board) has reviewed this exception request and has recommended that the exception be granted.

10. The Los Angeles Water Board is proposing to issue a National Pollutant Discharge Elimination System (NPDES) permit for the discharges, which is contingent upon this exception being granted by the State Water Board.

11. The Los Angeles Water Board has concluded, and the State Water Board concurs, that if USC/WMSC complies with the conditions to be set forth in the NPDES permit, the discharges will not adversely impact biological communities in the ASBS nor will the discharges compromise protection of ocean waters for beneficial uses.

12. The USC/WMSC occupies a prominent role in marine science research and education, providing programs and facilities to USC and non-USC scientists and students and visitors from many other institutions. The USC/WMSC research activities and teaching laboratory aquaria both depend on the use of the flow thorough (open) seawater system. There are no viable alternatives to ocean disposed of waste seawater due to the remote location of the facility. If the exception is not granted, USC/WMSC will be forced to shut down its open seawater system. The State Water Board therefore finds that the public interest will be served by granting this exception.

13. The State Water Board prepared and circulated an Initial Study/**Mitigated Negative Declaration** (IS/MND) for the proposed exception in accordance with the California Environmental Quality Act (CEQA) and the California Code of Regulations, Title 14, Section 15070. The State Water Board finds, based on the whole record, including the IS/MND and comments received, that there is no substantial evidence that approval of the exception will have a significant effect on the environment because of the terms and conditions that have been incorporated into the project. The MND reflects the State Water Board's independent judgment and analysis.

14. The proposed exception will not violate State Water Board Resolution No. 68-16 (Antidegradation Policy) because approval of the exception will not lower water quality; the discharge will not unreasonably affect present and anticipated beneficial uses; the discharge will not result in water quality lower than that prescribed in the Ocean Plan; and, the people of California will benefit from the research and education provided by USC/WMSC while beneficial uses will still be protected.

15. The State Water Board held a public hearing on February 1, 2006 to consider comments on and minor revisions to the proposed exception and the IS/MND.

16. The exception will be reviewed during the Triennial Review of the Ocean Plan. If the State Water Board finds cause to revoke or re-open this exception, it may do so during the Triennial Review or at any other time that it so desires.

17. The State Water Board's record of proceedings in this matter is located at 1001 I Street, Sacramento, California, and the custodian is the Division of Water Quality.

THEREFORE BE IT RESOLVED:

The State Water Board:

1. Adopts the Mitigated Negative Declaration, with revisions proposed by staff on February 1, 2006, for the proposed exception.

2. Approves an exception to the Ocean Plan prohibition against discharges to the Northwest Santa Catalina Island ASBS to the USC/WMSC for discharges of waste seawater and storm water discharges. The exception is conditioned on compliance by USC/WMSC with its NPDES permit(s). The following conditions must be implemented through a NPDES permit(s) issued by the Los Angeles Water Board:

   a. The discharge must comply with all other applicable provisions, including water quality standards, of the Ocean Plan. Natural water quality conditions in the receiving water, seaward of the surf zone, must not be altered as a result of the discharge. The surf zone is defined as the area between the breaking waves and the shoreline at any one time. Natural water quality will be defined, based on a review of the monitoring data, by Los Angeles Water Board staff in consultation with the Division of Water Quality of the State Water Board. For constituents other than indicator bacteria, natural water quality will be determined using the reference station in the ocean in the vicinity of Goat Harbor or Italian Gardens near Twin Rocks Point on the northern coast of Santa Catalina Island. For indicator bacteria, the Ocean Plan bacteria objectives will be used.

   b. USC/WMSC will not discharge chemical additives, including antibiotics, in the seawater system effluent. In addition and at a minimum, USC/WMSC, for its waste seawater effluent, must comply with effluent limits implementing Table B water quality objectives as required in Section III.C. of the Ocean Plan.

   c. For metals analysis, waste seawater effluent, storm water effluent, reference samples, and receiving water samples must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

   d. Flows for the seawater discharge system and storm water runoff (by storm event) must be reported quarterly to the Los Angeles Water Board.

   e. USC/WMSC must continue to prevent all discharges of non-storm water facility runoff (i.e., any discharge of facility runoff that reaches the ocean that is not composed entirely of storm water), except those associated with emergency fire fighting.

   f. USC/WMSC must specifically address the prohibition of non-storm water runoff and the reduction of pollutants in storm water discharges draining to the ASBS in a Storm Water Management Plan/Program (SWMP). USC/WMSC is required to submit its final SWMP to the Los Angeles Water Board.

g. The SWMP must include a map of surface drainage of storm water runoff, including areas of sheet runoff, and any structural Best Management Practices (BMPs) employed. The map must also show the storm water conveyances in relation to other facility features such as the laboratory seawater system and discharges, service areas, sewage treatment, and waste and hazardous materials storage areas. The SWMP must also include a procedure for updating the map and plan when other changes are made to the facilities.

h. The SWMP must describe the measures by which non-storm water discharges have been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

i. The SWMP must also address storm water discharges and how pollutants have been and will be reduced in storm water runoff into the ASBS through the implementation of BMPs. The SWMP must describe the BMPs currently employed and BMPs planned (including those for construction activities) and an implementation schedule. The BMPs and implementation schedule must be designed to ensure natural water quality conditions in the receiving water due to either a reduction in flows from impervious surfaces or reduction in pollutants or some combination thereof. The implementation schedule must be developed to ensure that the BMPs are implemented within one year of the approval date of the SWMP by the Los Angeles Water Board.

j. At least once every permit cycle (every five years), a quantitative survey of benthic marine life must be performed near the discharge and at a reference site. The Los Angeles Water Board, in consultation with the State Water Board's Division of Water Quality, must approve the survey design. The results of the survey must be completed and submitted to the Los Angeles Water Board within six months before the end of the permit cycle (permit expiration).

k. Once during the upcoming permit cycle, a bioaccumulation study using mussels (*Mytilus californianus*) must be conducted to determine the concentrations of metals near field (within Big Fisherman Cove) and far field (at the reference station). The Los Angeles Water Board, in consultation with the Division of Water Quality, must approve the study design. The results of the survey must be completed and submitted to the Los Angeles Water Board at least six months prior to the end of the permit cycle (permit expiration). Based on the study results, the Los Angeles Water Board, in consultation with the Division of Water Quality, may adjust the study design in subsequent permits, or add additional test organisms.

l. During the first year of each permit cycle, two effluent samples must be collected from the waste seawater discharge (once during dry weather and once during wet weather, i.e., a storm event). In addition, samples must also be collected at the reference station, described in condition a, along with the effluent samples. Samples collected at the reference station will represent natural water quality for all Ocean Plan constituents

except indicator bacteria and total chlorine residual. Samples at the reference station may be collected immediately following a storm event, but in no case more than 24 hours after, if sampling conditions are unsafe during the storm. All of these samples must be analyzed for all Ocean Plan Table B constituents, pH, salinity, and temperature, except that samples collected at the reference station do not require toxicity testing; instead, samples collected at the reference station must be analyzed for Ocean Plan indicator bacteria. Based on the results from the first year, the Los Angeles Water Board will determine the frequency of sampling (at a minimum, annually during wet weather) and the constituents to be tested during the remainder of the permit cycle, except that ammonia nitrogen, pH, salinity, and temperature must be tested at least annually. Chronic toxicity (for at least one consistent invertebrate species) must be tested at least annually for the waste seawater effluent. In addition, samples collected at the reference station must be analyzed for indicator bacteria according to the requirements of condition p.

m. Once annually, during wet weather (storm event), the storm water runoff effluent and the receiving water adjacent to the seawater and storm water discharge system must be sampled and analyzed for Ocean Plan Table B constituents. The receiving water in Big Fisherman Cove must also be monitored for Ocean Plan indicator bacteria water quality objectives. The sample location for the receiving water will be immediately seaward of the surf zone in Big Fisherman Cove adjacent to the outfall location. Storm water runoff and receiving water must be sampled at the same time as the seawater effluent and reference sampling described in condition 1 above. Based on the first year sample results, the Los Angeles Water Board will determine specific constituents in the storm water runoff and receiving water to be tested during the remainder of the permit cycle, except that indicator bacteria and chronic toxicity (three species) for receiving water must be tested annually during a storm event.

n. Once annually, the subtidal sediment near the seawater discharge system and storm water outfall in Big Fisherman Cove must be sampled and analyzed for Ocean Plan Table B constituents. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. Based on the first year sample results, the Los Angeles Water Board will determine specific constituents to be tested during the remainder of each permit cycle, except that acute toxicity for sediment must be tested annually.

o. In addition to the bacterial monitoring requirements described in conditions 1. and m. above, samples must be collected at the seawater intake structure during a maximum of three storm events per year that result in runoff from the spray field hillside and measured for Ocean Plan indicator bacteria. The station at the seawater intake structure is selected for this requirement because it is near the bluff below the USC/WMSC sewage treatment plant spray field. This requirement along with the bacterial monitoring in conditions 1. and m. is meant to satisfy in total the Ocean Plan bacteria monitoring requirements. This additional bacteria monitoring may be eliminated by the Los Angeles Water Board if changes are made to USC/WMSC's sewage plant or treated sewage effluent system that would absolutely eliminate the possibility of contaminants entering the ASBS.

p. If the results of receiving water monitoring indicate that the storm water runoff is causing or contributing to an alteration of natural water quality in the ASBS, as measured at the reference station, USC/WMSC is required to submit a report to the Los Angeles Water Board within 30 days of receiving the results. Those constituents in storm water that alter natural water quality or receiving water objectives must be identified in that report. The report must describe BMPs that are currently being implemented, BMPs that are planned for in the SWMP, and additional BMPs that may be added to the SWMP. The report shall include a new or modified implementation schedule. The Los Angeles Water Board may require modifications to the report. Within 30 days following approval of the report by the Los Angeles Water Board, USC/WMSC must revise its SWMP to incorporate any new or modified BMPs that have been and will be implemented, the implementation schedule, and any additional monitoring required. As long as USC/WMSC has complied with the procedures described above and is implementing the revised SWMP, then USC/WMSC does not have to repeat the same procedure for continuing or recurring exceedances of the same constituent.

q. USC/WMSC must pursue and implement a program for prevention of Biological Pollutants (non-native invasive species) in consultation with the California Department of Fish and Game Marine Resources Division.

r. USC/WMSC must prepare a waterfront and marine operations nonpoint source management plan containing appropriate management practices to address nonpoint source pollutant discharges. Appropriate management measures will include those described in the State's Nonpoint Source Program Implementation Plan for marinas and recreational boating, as applicable. The Los Angeles Water Board, in consultation with the State Water Board's Division of Water Quality, will review the plan. The Los Angeles Water Board shall appropriately regulate nonpoint source discharges in accordance with the State Water Board's Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program. The plan must be implemented within six months of its approval.

s. USC/WMSC will notify the Los Angeles Water Board within 180 days prior to any construction activity that could result in any discharge or habitat modification in the ASBS. Furthermore USC/WMSC must receive approval and appropriate conditions from the Los Angeles Water Board prior to performing any significant modification, re-building, or renovation of the water front facilities, including the pier and dock, that could result in any discharge or habitat modification in the ASBS, according to the requirements of Section III.E.2 of the Ocean Plan.

t. The Los Angeles Water Board will include these mitigating conditions in the NPDES permit for the seawater effluent. Alternatively, the Los Angeles Water Board may regulate the storm water discharge in a storm water NPDES permit and, in that case, would include those conditions relative to storm water in that storm water NPDES permit. In the latter case, all conditions would be included, in some combination, in the waste seawater effluent permit and the storm water permit.

3 Authorizes the Executive Director to transmit the exception to the U.S. Environmental Protection Agency for approval.

4 Authorizes the Executive Director to file the Notice of Determination with the Governor's Office of Planning and Research.

CERTIFICATION

The undersigned, Acting Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on February 15, 2006.

AYE: Tam M. Doduc
Richard Katz
Gerald D. Secundy

OPPOSED: None

ABSENT: Arthur G. Baggett, Jr.

ABSTAIN: None

Selica Potter
Acting Clerk to the Board

ATTACHMENT I – SUMMARY OF REASONABLE POTENTIAL ANALYSIS

Discharge Point No. 001

Pollutant	Unit	No. of Results	No. ND/DNQ	MEC	Co	B	Endpoint*
Arsenic	µg/l	5	0	1.1	8	3	2
Cadmium	µg/l	5	0	0.023	1	0	2
Chromium (Hexavalent)	µg/l	4	2	0.39	2	0	3
Copper	µg/l	5	0	1.3	3	2	1
Lead	µg/l	41	3	0.644	2	0	2
Mercury	µg/l	5	3	0.00056	0.04	0.0005	3
Nickel	µg/l	5	0	0.64	5	0	2
Selenium	µg/l	41	40	0.03	15	0	2
Silver	µg/l	5	5	<0.018	0.7	0.16	3
Zinc	µg/l	42	4	20	20	8	2
Cyanide	µg/l	5	5	<2.7	1	0	3
Total Chlorine Residual	µg/l	5	4/1 DNQ	<1.5	2	0	3
Ammonia (expresed as Nitrogen)	µg/l	5	4	72	600	0	3
Acute Toxicity	TUa	5	NA	0.85	0.3	0	3
Chronic Toxicity-Giant Kelp Germination	Tuc	3	NA	>4	1	0	1
Chronic Toxicity-Giant Kelp Growth	Tuc	3	NA	2	1	0	1
Chronic Toxicity-Sea Urchin Fertilization	Tuc	3	NA	1	1	0	3
Chronic Toxicity-Topsmelt 7-day Survival	Tuc	3	NA	1	1	0	3
Chronic Toxicity- Topsmelt 7-day Growth	Tuc	3	NA	1	1	0	3
Phenolic Compounds (non-chlorinated)	µg/l	5	5	<0.16	30	0	3
Chlorinated Phenolics	µg/l	5	4	1.2	1	0	3
Endosulfan	µg/l	5	5	<0.0017	0.009	0	3
Endrin	µg/l	5	5	<0.0028	0.002	0	3
HCH	µg/l	5	5	<0.0018	0.004	0	3
Acrolein	µg/l	5	5	<2.2	220	0	3
Antimony	µg/l	5	2/3 DNQs	0.16	1200	0	3
Bis(2-chloroethoxy)methane	µg/l	5	5	<0.25	4.4	0	3
Bis(2-chloroisopropyl)ether	µg/l	5	5	<0.38	1200	0	3
Chlorobenzene	µg/l	5	5	<0.21	570	0	3
Chromium (III)	µg/l	4	3	0	190000	0	3
Di-n-butyl phthalate	µg/l	5	5	<0.24	3500	0	3
Dichlorobenzenes	µg/l	5	5	<0.53	5100	0	3
Diethyl Phthalate	µg/l	5	5	<0.15	33000	0	3
Dimethyl Phthalate	µg/l	5	5	<0.18	820000	0	3

Pollutant	Unit	No. of Results	No. ND/DNQ	MEC	Co	B	Endpoint*
4,6-Dinitro-2-methylphenol	µg/l	5	5	<1.7	220	0	3
2,4-dinitrophenol	µg/l	5	5	<1.6	4	0	3
Ethylbenzene	µg/l	5	5	<0.17	4100	0	3
Fluoranthene	µg/l	5	5	<0.02	15	0	3
Hexachlorocyclopentadiene	µg/l	5	5	<1.5	58	0	3
Nitrobenzene	µg/l	5	5	<0.36	4.9	0	3
Thallium	µg/l	5	2	0.015	2	0	2
Toluene	µg/l	5	5	<0.22	85000	0	3
Tributyltin	µg/l	5	5	<0.03	0.0014	0	3
1,1,1-Trichloroethane	µg/l	5	5	<0.38	540000	0	3
Acrylonitrile	µg/l	5	5	<1.8	0.1	0	3
Aldrin	µg/l	5	5	<0.001	0.000022	0	3
Benzene	µg/l	5	5	<0.23	5.9	0	3
Benzidine	µg/l	5	5	<3.7	0.000069	0	3
Beryllium	µg/l	5	5	<0.039	0.033	0	3
Bis(2-chloroethyl)ether	µg/l	5	5	<0.27	0.045	0	3
Bis(2-ethylhexyl)Phthalate	µg/l	5	5	<2.3	3.5	0	3
Carbon Tetrachloride	µg/l	5	5	<0.33	0.9	0	3
Chlordane	µg/l	5	5	<0.005	0.000023	0	3
Chlorodibromomethane	µg/l	5	5	<0.38	8.6	0	3
Chloroform	µg/l	5	5	<0.25	130	0	3
DDT	µg/l	5	5	<0.0025	0.00017	0	3
1,4-Dichlorobenzene	µg/l	5	5	<0.55	18	0	3
3,3'-Dichlorobenzidine	µg/l	5	5	<1.2	0.0081	0	3
1,2-Dichloroethane	µg/l	5	5	<0.24	28	0	3
1,1-Dichloroethylene	µg/l	5	5	<0.39	0.9	0	3
Dichlorobromomethane	µg/l	5	5	<0.28	6.2	0	3
Dichloromethane	µg/l	5	5	<0.25	450	0	3
1,3-Dichloropropene	µg/l	5	5	<0.22	8.9	0	3
Dieldrin	µg/l	5	5	<0.0021	0.00004	0	3
2,4-Dinitrotoluene	µg/l	5	5	<0.18	2.6	0	3
1,2-Diphenylhydrazine	µg/l	5	5	<0.25	0.16	0	3
Halomethanes	µg/l	5	5	<0.26	130	0	3
Heptachlor	µg/l	5	5	<0.0017	0.00005	0	3
Heptachlor epoxide	µg/l	5	5	<0.0017	0.00002	0	3
Hexachlorobenzene	µg/l	5	5	<0.49	0.00021	0	3
Hexachlorobutadiene	µg/l	5	5	<0.47	14	0	3
Hexachloroethane	µg/l	5	5	<0.52	2.5	0	3
Isophorone	µg/l	5	5	<0.21	730	0	3
N-Nitrosodimethylamine	µg/l	5	5	<0.0012	7.3	0	3
N-Nitrosodi-N-Propylamine	µg/l	5	5	<0.0012	0.38	0	3
N-Nitrosodiphenylamine	µg/l	5	5	<0.19	2.5	0	3
PAHs	µg/l	5	5	<0.02	0.0088	0	3

Pollutant	Unit	No. of Results	No. ND/DNQ	MEC	Co	B	Endpoint*
PCB-sum	µg/l	5	5	<0.04	0.000019	0	3
TCDD-TEQ	µg/l	5	5	<0.481	3.90E-09	0	3
1,1,2,2-Tetrachloroethane	µg/l	5	5	<0.18	2.3	0	3
Tetrachloroethylene	µg/l	5	5	<0.27	2	0	3
Toxaphene	µg/l	5	5	<0.12	0.00021	0	3
Trichloroethylene	µg/l	5	5	<0.37	27	0	3
1,1,2-Trichloroethane	µg/l	5	5	<0.25	9.4	0	3
2,4,6-Trichlorophenol	µg/l	5	5	<0.22	0.29	0	3
Vinyl Chloride	µg/l	5	5	<0.33	36	0	3

Discharge Point No. 002

Pollutant	Unit	No. of Result	No. ND	MEC	Co	B	Endpoint*
Arsenic	µg/l	3	0	1.9	8	3	1
Cadmium	µg/l	3	0	0.18	1	0	3
Chromium (Hexavalent)	µg/l	2	1	0.11	2	0	3
Copper	µg/l	3	0	15	3	2	1
Lead	µg/l	3	0	4.5	2	0	1
Mercury	µg/l	3	1	0.019	0.04	0.0005	3
Nickel	µg/l	3	0	15	5	0	1
Selenium	µg/l	3	0	0.34	15	0	3
Silver	µg/l	3	2	0.052	0.7	0.16	3
Zinc	µg/l	3	0	150	20	8	1
Cyanide	µg/l	3	3	<2.7	1	0	3
Total Chlorine Residual	µg/l	3	0/3 DNQs	<50	2	0	3
Ammonia (expresed as Nitrogen)	µg/l	3	1	150	600	0	3
Acute Toxicity	% survival	3	NA	0.53	0.3	0	3
Chronic Toxicity-Giant Kelp Germination	Tuc	3	NA	>4	1	0	1
Chronic Toxicity-Giant Kelp Growth	Tuc	3	NA	1	1	0	3
Chronic Toxicity-Sea Urchin Fertilization	Tuc	3	NA	1	1	0	3
Chronic Toxicity-Pacifici Topsmelt 7-day Survival	Tuc	3	NA	1	1	0	3
Chronic Toxicity-Pacifici Topsmelt Growth	Tuc	3	NA	1	1	0	3
Phenolic Compounds(non-chlorinated)	µg/l	3	3	<0.16	30	0	3
Chlorinated phenolics	µg/l	3	3/1 DNQ	<0.19	1	0	3
Endosulfan	µg/l	3	3	<0.0017	0.009	0	3
Endrin	µg/l	3	3	<0.0028	0.002	0	3

Pollutant	Unit	No. of Result	No. ND	MEC	Co	B	Endpoint*
HCH	µg/l	3	3	<0.0018	0.004	0	3
Acrolein	µg/l	3	3	<2.2	220	0	3
Antimony	µg/l	3	2/1 DNQ	<0.09	1200	0	3
Bis(2-chloroethoxy)methane	µg/l	3	3	<0.25	4.4	0	3
Bis(2-chloroisopropyl)ether	µg/l	3	3	<0.38	1200	0	3
Chlorobenzene	µg/l	3	3	<0.21	570	0	3
Chromium (III)	µg/l	3	1	23	190000	0	3
Di-n-butyl phthalate	µg/l	3	3	<0.24	3500	0	3
Dichlorobenzenes	µg/l	3	3	<0.53	5100	0	3
Diethyl Phthalate	µg/l	3	3	<0.15	33000	0	3
Dimethyl Phthalate	µg/l	3	3	<0.18	820000	0	3
4,6-Dinitro-2-methylphenol	µg/l	3	3	<1.7	220	0	3
2,4-dinitrophenol	µg/l	3	3	<1.6	4	0	3
Ethylbenzene	µg/l	3	3	<0.17	4100	0	3
Fluoranthene	µg/l	3	2/1 DNQ	<0.02	15	0	3
Hexachlorocyclopentadiene	µg/l	3	3	<1.5	58	0	3
Nitrobenzene	µg/l	3	3	<0.36	4.9	0	3
Thallium	µg/l	3	1/1DNQ	0.065	2	0	3
Toluene	µg/l	3	3	<0.22	85000	0	3
Tributyltin	µg/l	3	3	<0.03	0.0014	0	3
1,1,1-Trichloroethane	µg/l	3	3	<0.38	540000	0	3
Acrylonitrile	µg/l	3	3	<1.8	0.1	0	3
Aldrin	µg/l	3	3	<0.0015	0.000022	0	3
Benzene	µg/l	3	3	<0.23	5.9	0	3
Benzidine	µg/l	3	3	<3.7	0.000069	0	3
Beryllium	µg/l	3	0	0.25	0.033	0	1
Bis(2-chloroethyl)ether	µg/l	3	3	<0.27	0.045	0	3
Bis(2-ethylhexyl)Phthalate	µg/l	3	3	<2.3	3.5	0	3
Carbon Tetrachloride	µg/l	3	3	<0.33	0.9	0	3
Chlordane	µg/l	3	3	<0.005	0.000023	0	3
Chlorodibromomethane	µg/l	3	3	<0.38	8.6	0	3
Chloroform	µg/l	3	3	<0.25	130	0	3
DDT	µg/l	3	3	<0.0025	0.00017	0	3
1,4-Dichlorobenzene	µg/l	3	3	<0.37	18	0	3
3,3'-Dichlorobenzidine	µg/l	3	3	<1.2	0.0081	0	3
1,2-Dichloroethane	µg/l	3	3	<0.24	28	0	3
1,1-Dichloroethylene	µg/l	3	3	<0.39	0.9	0	3
Dichlorobromomethane	µg/l	3	3	<0.28	6.2	0	3
Dichloromethane	µg/l	3	3	<0.25	450	0	3
1,3-Dichloropropene	µg/l	3	3	<0.22	8.9	0	3
Dieldrin	µg/l	3	3	<0.0021	0.00004	0	3
2,4-Dinitrotoluene	µg/l	3	3	<0.18	2.6	0	3
1,2-Diphenylhydrazine	µg/l	3	3	<0.25	0.16	0	3

Pollutant	Unit	No. of Result	No. ND	MEC	Co	B	Endpoint*
Halomethanes	µg/l	3	3	<0.26	130	0	3
Heptachlor	µg/l	3	3	<0.0017	0.00005	0	3
Heptachlor epoxide	µg/l	3	3	<0.0019	0.00002	0	3
Hexachlorobenzene	µg/l	3	3	<0.49	0.00021	0	3
Hexachlorobutadiene	µg/l	3	3	<0.47	14	0	3
Hexachloroethane	µg/l	3	3	<0.52	2.5	0	3
Isophorone	µg/l	3	3	<0.21	730	0	3
N-Nitrosodimethylamine	µg/l	3	3	<0.0012	7.3	0	3
N-Nitrosodi-N-Propylamine	µg/l	3	3	<0.0012	0.38	0	3
N-Nitrosodiphenylamine	µg/l	3	3	<0.19	2.5	0	3
PAHs	µg/l	3	3	<0.02	0.0088	0	3
PCB-sum	µg/l	3	3	<0.04	0.000019	0	3
TCDD-TEQ	µg/l	3	1/1 DNQ	0.000000755	3.90E-09	0	1
1,1,2,2-Tetrachloroethane	µg/l	3	3	<0.18	2.3	0	3
Tetrachloroethylene	µg/l	3	3	<0.27	2	0	3
Toxaphene	µg/l	3	3	<0.12	0.00021	0	3
Trichloroethylene	µg/l	3	3	<0.37	27	0	3
1,1,2-Trichloroethane	µg/l	3	3	<0.25	9.4	0	3
2,4,6-Trichlorophenol	µg/l	3	3	<0.22	0.29	0	3
Vinyl Chloride	µg/l	3	3	<0.33	36	0	3

DNQ = Detected, but Not Quantified.

* According to the 2012 Ocean Plan amendment, the reasonable potential analysis (RPA) can yield three endpoints:

1) Endpoint 1, an effluent limitation is required and monitoring is required;
2) Endpoint 2, an effluent limitation is not required for the pollutant. Appendix III effluent monitoring is not required for the pollutant, the Regional Water Board, however, may require monitoring for the pollutant or for whole effluent toxicity as appropriate; and
3) Endpoint 3, the RPA is inconclusive, monitoring is required, and an existing effluent limitation may be retained or a permit reopener clause may be included to allow inclusion of an effluent limitation if future monitoring warrants the inclusion.

ATTACHMENT J – INITIAL STUDY AND MITIGATED NEGATIVE DECLARATION

Alan C. Lloyd, Ph.D.
Agency Secretary

State Water Resources Control Board

Division of Water Quality

1001 I Street • Sacramento, California 95814 • (916) 341-5455
Mailing Address: P.O. Box 100 • Sacramento, California • 95812-0100
Fax (916) 341-5584 • http://www.waterboards.ca.gov

Arnold Schwarzenegger
Governor

MITIGATED
NEGATIVE DECLARATION
Pursuant to Section 21080(c)
Public Resources Code

To:	Office of Planning & Research State Clearinghouse 1400 Tenth Street Sacramento, CA 95814	From:	State Water Resources Control Board Division of Water Quality 1001 I Street Sacramento, CA 95814

Project Title: Exception to the California Ocean Plan for the University of Southern California Wrigley Marine Science Center Discharge into the Northwest Santa Catalina Island Area of Special Biological Significance (No. 25)

Applicant: University of Southern California
Wrigley Institute for Environmental Studies
AHF 232
Los Angeles, CA 90089-0371

Project Description: University of Southern California (USC) Wrigley Marine Science Center (WMSC) seeks an exception from the California Ocean Plan prohibition on discharges into Areas of Special Biological Significance (ASBS). The exception with conditions, if approved, would allow continued waste seawater and storm water discharges into the Northwest Santa Catalina Island ASBS.

Determination: The State Water Board has determined that the above-proposed project will have a less-than-significant effect on the environment for the reasons specified in the attached Initial Study.

Terms and Conditions:

1. The discharge must comply with all other applicable provisions, including water quality standards, of the Ocean Plan. Natural water quality conditions in the receiving water, seaward of the surf zone, must not be altered as a result of the discharge. The surf zone is defined as the area between the breaking waves and the shoreline at any one time. Natural water quality will be defined, based on a review of the monitoring data, by Regional Water Board staff in consultation with the Division of Water Quality of the State Water Board. For constituents other than indicator bacteria, natural water quality will be determined using the reference station in the ocean in the vicinity of Goat Harbor or Italian Gardens near Twin Rocks Point on the northern coast of Santa Catalina Island. For indicator bacteria, the Ocean Plan bacteria objectives will be used.

2. WMSC will not discharge chemical additives, including antibiotics, in the seawater system effluent. In addition and at a minimum, WMSC, for its waste seawater effluent, must comply with effluent limits implementing Table B water quality objectives as required in Section III.C. of the Ocean Plan.

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3. For metals analysis, waste seawater effluent, storm water effluent, reference samples, and receiving water samples must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

4. Flows for the seawater discharge system and storm water runoff (by storm event) must be reported quarterly to the Regional Water Board.

5. WMSC must continue to prevent all discharges of non-storm water facility runoff (i.e., any discharge of facility runoff that reaches the ocean that is not composed entirely of storm water), except those associated with emergency fire fighting.

6. WMSC must specifically address the prohibition of non-storm water runoff and the reduction of pollutants in storm water discharges draining to the ASBS in a Storm Water Management Plan/Program (SWMP). WMSC is required to submit its final SWMP to the Regional Water Board.

7. The SWMP must include a map of surface drainage of storm water runoff, including areas of sheet runoff, and any structural Best Management Practices (BMPs) employed. The map must also show the storm water conveyances in relation to other facility features such as the laboratory seawater system and discharges, service areas, sewage treatment, and waste and hazardous materials storage areas. The SWMP must also include a procedure for updating the map and plan when other changes are made to the facilities.

8. The SWMP must describe the measures by which non-storm water discharges have been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

9. The SWMP must also address storm water discharges, and how pollutants have been and will be reduced in storm water runoff into the ASBS through the implementation of BMPs. The SWMP must describe the BMPs currently employed and BMPs planned (including those for construction activities), and an implementation schedule. The BMPs and implementation schedule must be designed to ensure natural water quality conditions in the receiving water due to either a reduction in flows from impervious surfaces or reduction in pollutants, or some combination thereof. The implementation schedule must be developed to ensure that the BMPs are implemented within one year of the approval date of the SWMP by the Regional Water Board.

10. At least once every permit cycle (every five years), a quantitative survey of benthic marine life must be performed near the discharge and at a reference site. The Regional Water Board, in consultation with the State Water Board's Division of Water Quality, must approve the survey design. The results of the survey must be completed and submitted to the Regional Water Board within six months before the end of the permit cycle.

11. Once during the upcoming permit cycle, a bioaccumulation study using mussels (*Mytilus californianus*) must be conducted to determine the concentrations of metals near field (within Big Fisherman Cove) and far field (at the reference station). The Regional Water Board, in consultation with the Division of Water Quality, must approve the study design. The results of the survey must be completed and submitted to the Regional Water Board at least six months prior to the end of the permit cycle (permit expiration). Based on the study results, the Regional Water Board, in consultation with the Division of Water Quality, may adjust the study design in subsequent permits, or add additional test organisms.

12. During the first year of each permit cycle, two effluent samples must be collected from the waste seawater discharge (once during dry weather and once during wet weather, i.e. a storm event). In addition, samples must also be collected at the reference station, described in condition 1, along with the effluent samples. Samples

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collected at the reference station will represent natural water quality for all Ocean Plan constituents except indicator bacteria and total chlorine residual. Samples at the reference station may be collected immediately following a storm event, but in no case more than 24 hours after, if sampling conditions are unsafe during the storm. All of these samples must be analyzed for all Ocean Plan Table B constituents, pH, salinity, and temperature, except that samples collected at the reference station do not require toxicity testing; instead, samples collected at the reference station must be analyzed for Ocean Plan indicator bacteria. Based on the results from the first year, the Regional Water Board will determine the frequency of sampling (at a minimum, annually during wet weather) and the constituents to be tested during the remainder of the permit cycle, except that ammonia nitrogen, pH, salinity, and temperature must be tested at least annually. Chronic toxicity (for at least one consistent invertebrate species) must be tested at least annually for the waste seawater effluent. In addition, samples collected at the reference station must be analyzed for indicator bacteria according to the requirements of condition 16.

13. Once annually, during wet weather (storm event), the storm water runoff effluent and the receiving water adjacent to the seawater and storm water discharge system must be sampled and analyzed for Ocean Plan Table B constituents. The receiving water in Big Fisherman Cove must also be monitored for Ocean Plan indicator bacteria water quality objectives. The sample location for the receiving water will be immediately seaward of the surf zone in Big Fisherman Cove adjacent to the outfall location. Storm water runoff and receiving water must be sampled at the same time as the seawater effluent and reference sampling described in condition 12 above. Based on the first year sample results, the Regional Water Board will determine specific constituents in the storm water runoff and receiving water to be tested during the remainder of the permit cycle, except that indicator bacteria and chronic toxicity (three species) for receiving water must be tested annually during a storm event.

14. Once annually, the subtidal sediment near the seawater discharge system and storm water outfall in Big Fisherman Cove must be sampled and analyzed for Ocean Plan Table B constituents. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. Based on the first year sample results, the Regional Water Board will determine specific constituents to be tested during the remainder of each permit cycle, except that acute toxicity for sediment must be tested annually.

15. In addition to the bacterial monitoring requirements described in conditions 12 and 13 above, samples must be collected at the seawater intake structure during a maximum of three storm events per year that result in runoff from the spray field hillside, and measured for Ocean Plan indicator bacteria. The station at the seawater intake structure is selected for this requirement because it is near the bluff below the WMSC sewage treatment plant spray field. This requirement along with the bacterial monitoring in conditions 12 and 13 is meant to satisfy in total the Ocean Plan bacteria monitoring requirements. This additional bacteria monitoring may be eliminated by the Regional Water Board if changes are made to WMSC's sewage plant or treated sewage effluent system that would absolutely eliminate the possibility of contaminants entering the ASBS.

16. If the results of receiving water monitoring indicate that the storm water runoff is causing or contributing to an alteration of natural water quality in the ASBS, as measured at the reference station, WMSC is required to submit a report to the Regional Water Board within 30 days of receiving the results. Those constituents in storm water that alter natural water quality or receiving water objectives must be identified in that report. The report must describe BMPs that are currently being implemented, BMPs that are planned for in the SWMP, and additional BMPs that may be added to the SWMP. The report shall include a new or modified implementation schedule. The Regional Water Board may require modifications to the report. Within 30 days following approval of the report by the Regional Water Board, WMSC must revise its SWMP to incorporate any new or modified BMPs that have been and will be implemented, the implementation schedule, and any additional

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monitoring required. As long as WMSC has complied with the procedures described above and is implementing the revised SWMP, then WMSC does not have to repeat the same procedure for continuing or recurring exceedances of the same constituent.

17. WMSC must pursue and implement a program for prevention of Biological Pollutants (non-native invasive species) in consultation with the California Department of Fish and Game Marine Resources Division.

18. WMSC must prepare a waterfront and marine operations non-point source management plan containing appropriate management practices to address non-point source pollutant discharges. Appropriate management measures will include those described in the State's Non-point Source Program Implementation Plan for marinas and recreational boating, as applicable. The Regional Water Board, in consultation with the State Water Board's Division of Water Quality, will review the plan. The Regional Water Board shall appropriately regulate non-point source discharges in accordance with the State Water Board's Policy for Implementation and Enforcement of the Non-point Source Pollution Control Program. The plan must be implemented within six months of its approval.

19. WMSC will notify the Regional Water Board within 180 days prior to any construction activity that could result in any discharge or habitat modification in the ASBS. Furthermore, WMSC must receive approval and appropriate conditions from the Regional Water Board prior to performing any significant modification, re-building, or renovation of the water front facilities, including the pier and dock, that could result in any discharge or habitat modification in the ASBS, according to the requirements of Section III.E.2 of the Ocean Plan.

20. The Regional Water Board will include these mitigating conditions in the National Pollutant Discharge Elimination System (NPDES) permit for the seawater effluent. Alternatively, the Regional Water Board may regulate the storm water discharge in a storm water NPDES permit and, in that case, would include those conditions relative to storm water in that storm water NPDES permit. In the latter case, all conditions would be included, in some combination, in the waste seawater effluent permit and the storm water permit.

Contact Person: Constance S. Anderson	Telephone: (916) 341-5280 email: csanderson@waterboards.ca.gov

Adopted by the State Water Resources Control Board on February 15, 2006.

Selica Potter
Acting Clerk to the Board

February 15, 2006
Date

STATE WATER RESOURCES CONTROL BOARD
DIVISION OF WATER QUALITY
P.O. BOX 100
SACRAMENTO, CA 95812-0100

INITIAL STUDY

I. Background

Project Title: Exception to the California Ocean Plan for the University of Southern California Wrigley Marine Science Center Discharge into the Northwest Santa Catalina Island Area of Special Biological Significance (No. 25)

Applicant: University of Southern California
Wrigley Institute for Environmental Studies
AHF 232
Los Angeles, CA 90089-0371

Applicant's Contact Person: Dr. Anthony Michaels, (213) 740-6780

Introduction

The State Water Resources Control Board (State Water Board), under its Resolution No. 74-28, designated certain Areas of Special Biological Significance (ASBS) in the adoption of water quality control plans for the control of wastes discharged to ocean waters. To date, thirty-four coastal and offshore island sites have been designated ASBS. Among the ASBS designated was the Santa Catalina Island Subarea One ASBS. The name of this ASBS was changed by the State Water Board in April 2005 to the Northwest Santa Catalina Island ASBS (Resolution 2005-0035).

Since 1983, the California Ocean Plan (Ocean Plan) has prohibited waste discharges to ASBS (SWRCB 1983). Similar to previous versions of the Ocean Plan, the 2001 Ocean Plan (SWRCB 2001) states: "Waste shall not be discharged to areas designated as being of special biological significance. Discharges shall be located a sufficient distance from such designated areas to assure maintenance of natural water quality conditions in these areas."

The Northwest Santa Catalina Island ASBS, (from Isthmus Cove to Catalina Head), was included in this designation for the following reasons: 1. it has a diversity of habitat and biological assemblages; 2. it is possibly a transitional zone between subtidal areas containing predominantly northern and southern species; and 3. due to the proximity of the University of Southern California's Wrigley Marine Science Center, many scientific studies have yielded valuable information about the area.

Assembly Bill 2800 (Chapter 385, Statutes of 2000), the Marine Managed Areas Improvement Act, was approved by the Governor on September 8, 2000. This law added sections to the Public Resources Code (PRC) that are relevant to ASBS. Section 36700 (f) of the PRC defines a State Water Quality Protection Area (SWQPA) as "a nonterrestrial marine or estuarine area designated to protect marine species or biological communities from an undesirable alteration in natural water quality, including, but not limited to, areas of special biological significance that have been designated by the State Water Board through its water quality control planning process." Section 36710 (f) of the PRC stated: "In a state water quality protection area, point source waste and thermal discharges shall be prohibited or limited by special conditions. Nonpoint source pollution shall be controlled to the extent practicable. No other use is restricted." The classification of ASBS as SWQPAs went into effect on January 1, 2003 (without Board action) pursuant to Section 36750 of the PRC.

Senate Bill 512 (Chapter 854, Statutes of 2004) amended the marine managed areas portion of the PRC, effective January 1, 2005, to clarify that ASBS are a subset of SWQPAs and require special protection as determined by the State Water Board pursuant to the California Ocean Plan and the California Thermal Plan. Specifically, SB 512 amended the PRC section 36700 (f) definition of state water quality protection area to add the following: "'Areas of special biological significance' are a subset of state water quality protection areas, and require special protection as determined by the State Water Board pursuant to the California Ocean Plan adopted and reviewed pursuant to

Article 4 (commencing with Section 13160) of Chapter 3 of Division 7 of the Water Code and pursuant to the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (California Thermal Plan) adopted by the State Board."

Section 36710(f) of the PRC was also amended as follows: "In a State Water Quality Protection Area, waste discharges shall be prohibited or limited by the imposition of special conditions in accordance with the Porter-Cologne Water Quality Control Act (Division 7 (commencing with Section 13000) of the Water Code) and implementing regulations, including, but not limited to, the California Ocean Plan adopted and reviewed pursuant to Article 4 (commencing with Section 13160) of Chapter 3 of Division 7 of the Water Code and the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (California Thermal Plan) adopted by the state board. No other use is restricted." This language replaced the prior wording stating that point sources into ASBS must be prohibited or limited by special conditions, and that nonpoint sources must be controlled to the extent practicable. In other words, the absolute discharge prohibition in the Ocean Plan stands, unless of course an exception is granted. The classification of ASBS as a subset of SWQPAs does not change the ASBS designated use for these areas. Practically speaking, this means that waste discharges to ASBS are prohibited under the Ocean Plan and Thermal Plan unless an exception is granted. The terms and conditions in the mitigated negative declaration and in this initial study are special protections recommended by staff for the Northwest Santa Catalina Island ASBS, and constitute the special conditions referred to in Section 36710(f) of the PRC.

The University of Southern California (USC) Wrigley Marine Science Center (WMSC) is located on the coast adjacent to the Northwest Santa Catalina Island ASBS at Big Fisherman Cove. Wrigley Marine Science Center currently discharges waste seawater without the benefit of an exception from the California Ocean Plan. The Wrigley Marine Science Center was founded in 1965 through a deed of property from the Santa Catalina Island Company. WMSC discharges waste seawater into the ASBS/SWQPA under National Pollutant Discharge Elimination System (NPDES) Permit CA 0056661. The Regional Water Board issued USC its first Waste Discharge Requirements and NPDES permit in Order No. 79-59, on April 23, 1979 (RWQCB 1979). The Ocean Plan in effect at that time prohibited discharges into an ASBS that could alter natural water quality. The permit was re-issued in May 21, 1984, and again on October 12, 2000, expiring November 10, 2005. This discharge has never been issued an exception by the State Water Board and thus does not comply with the California Ocean Plan.

Section III (I)(1) of the 2001 Ocean Plan states: "The State Board may, in compliance with the California Environmental Quality Act, subsequent to a public hearing, and with the concurrence of the U.S. Environmental Protection Agency, grant exceptions where the Board determines: a. The exception will not compromise protection of ocean waters for beneficial uses, and, b. The public interest will be served."

Project Description

USC seeks an exception from the Ocean Plan's prohibition on discharges into ASBS. The exception with conditions, if approved, would allow their continued waste seawater and co-mingled storm water discharge into the Northwest Santa Catalina Island ASBS. This would provide additional protections for beneficial uses that are not currently provided.

Environmental Setting

Physical Description

Location and Size

Santa Catalina Island is located at 33° 22′ N Latitude, 118° 25′ W longitude and lies 20 miles offshore of the Palos Verdes Peninsula. The Island is 22 miles (35.4 km) long, 8 miles (12.9 km) across at its widest point and is oriented in a general NW-SE direction. The Northwest Santa Catalina Island ASBS is located at the western end of the Island. The shoreline bordering the ASBS is 20.9 miles (33.6 km) in length. The seaward boundary of the ASBS is one mile offshore, and the enclosed water surface is about 13,235 acres (20.68 square miles.) (State Water Board GIS data, at a scale of 1:24,000).

Santa Catalina Island is part of Los Angeles County. Avalon, the only city on the island, is approximately 13 miles (20.9 km) straight-line distance from the University of Southern California Wrigley Marine Science Center (26 miles by road). There is a community located between Catalina Harbor and Isthmus Cove, known as Two Harbors,

operated by the Santa Catalina Island Company. Approximately 100 permanent residents of Two Harbors maintain the local recreational facility utilized by vacationers, the area's primary industry.

The State Water Board has legally defined ASBS No. 25, Northwest Santa Catalina Island Area of Special Biological Significance: "From Point 1 determined by the intersection of the mean high tide line and a line extending due west from USGS Triangulation Station "Channel" on Blue Cavern Point: thence due north to the 300-foot isobath or to one nautical mile offshore, whichever distance is greater; thence northerly and westerly, following the 300-foot isobath maintaining a distance of one nautical mile offshore, whichever is the greater distance, around the northwestern tip of the island and then southerly and easterly, maintaining the distance offshore described above, to a point due south of USGS Triangulation Station "Cone" on Catalina Head; thence due north to the intersection of the mean high tide line and a line extending due south from USGS Triangulation Station "Cone," thence returning around the northwestern tip of the island following the mean high tide line to Point 1."

Climate

Santa Catalina Island has a Mediterranean climate characterized by warm, sunny, and dry summer months and relatively little rainfall during the cooler months. Skies are generally clear; however, fog does occur during the cooler months. The mountainous land mass often limits the fog to the windward side of the island. The Isthmus is a break in this terrain and permits fog and wind to reach the leeward side (SWRCB 1979).

The average daily temperature ranges from the high 70's (°F) in late summer and the low 50's (°F) in the winter. Rainfall occurs primarily between October and April; the average annual precipitation is 11.4 inches, based on data from 1945 through 1967 (SWRCB 1979). More recent precipitation data from the Catalina Island Conservancy for Two Harbors, immediately southwest of WMSC is summarized in Appendix A. On average it rains 27 days per year in Two Harbors and the average rainfall per rain day is 0.40 inches (Mertes, et al. 2005). The northeast side of Catalina experiences greater rainfall than the southwest side. The northeast facing slopes (toward the mainland) are protected from the drying effects of the prevailing westerly winds and hot afternoon sun. Prevailing winds are from the west-northwest. However, during the summer and early fall, warm drying Santa Ana winds occasionally blow from the mainland (SWRCB 1979). These Santa Ana winds may extend into the early winter (Michaels 2005).

Geological Setting

Submarine Topography

Santa Catalina Island borders the San Pedro Basin on the north and Catalina Basin on the south. The Island is rimmed by a shelf extending to a water depth of 450 feet (140 m) approximately one mile offshore on the southern side and two miles on the northern side. The shelf is narrowest off Arrow Point. It has no prominent features and gradually rises to a near shore physiography of steep boulder slopes and cliffs that usually begin at a subtidal depth of approximately 100 feet (30m) (SWRCB 1979).

Above Shoreline Land Mass

The major exposed rock on Santa Catalina Island is generally Catalina schist, a low-grade layered metamorphic rock. Landslides commonly occur where it forms steep slopes (SWRCB 1979). The Isthmus is geologically very active, as indicated by frequent landslides.

The land adjacent to the ASBS is extremely rugged, consisting primarily of mountains with steep drop-offs to the ocean. The area is frequently intersected by narrow ravines (Catalina Head to West End) and by relatively wide stream valleys (West End to Blue Cavern Point). The highest peak adjacent to the ASBS is Silver Peak, reaching an elevation of 1,805 feet. The Isthmus is the land area with the lowest elevation (less than 20 feet) and also has the narrowest width of any portion of the Island (0.25 miles).

Above shoreline landmass adjacent to the ASBS in Big Fisherman is comprised of a gray, friable to unconsolidated, silty matrix of lithic and calcareous sediments. The basement outcropping is composed of andesite, as are numerous boulders (SWRCB 1979).

Oceanographic Conditions and Marine Water Quality

Currents

Northwest Santa Catalina Island ASBS is located in the Southern California Bight (SCB). The Bight is the 300 km of recessed coastline between Point Conception in Santa Barbara County and Cabo Colnett, south of Ensenada, Mexico. The dramatic change in the angle of the coastline creates a large backwater eddy in which equatorial waters flow north near shore and subartic waters flow south offshore. This unique oceanographic circulation pattern creates a biological transition zone between warm and cold waters that contains approximately 500 marine fish species and more than 5,000 invertebrate species (SWRCB 1979).

The principal geostrophic current in this area of Northwest Santa Catalina Island ASBS is the California Current, which flows southward along the coast, and a north-flowing gyre is created east of the California Current and is known as the Southern California Countercurrent. Santa Catalina Island is surrounded by the Southern California Countercurrent. On average, ocean water moves northwest along the WMSC portion of the ASBS (Michaels 2005).

The prevailing direction of swell in the California Bight is from the west. Consequently, intertidal areas on the southwest (windward) side of this ASBS are exposed to the most wave action. The swell bends around the west end and strikes north-facing beaches on the leeward side at an angle, reducing wave energy. Northeast-facing habitats on the leeward shore are the most protected. Only during northeast wind conditions (Santa Ana's) are these areas exposed to wave action. (SWRCB 1979).

Water Quality and Temperature, vicinity of WMSC

Water clarity data measurements were taken approximately daily from 1970-1978 at Bird Rock (surface and twenty meter depths). Though this station is located close to shore, the clarity is not indicative of those areas on the Island coastline subjected to extensive landslide runoff. For example, during the winter of 1977-78 heavy rains and subsequent runoff resulted in poor clarity in the nearshore waters. Clarity is usually greatest (about 25 m) between October and January and poorest (8 m) between April and July when plankton blooms occur (SWRCB 1979).

Surface water temperature measurements were taken approximately daily from 1970-1978 at Bird Rock. Ocean water temperatures for this period at Bird Rock ranged from 11°C in the winter to 20°C in September and October (SWRCB 1979).

Water quality in the ASBS was previously assessed in studies involving analyses of biological material for the presence of pollutants. Drs. Rudolf K. Zahn and Gertud Zahn-Daimler for the Physiologisch-Chemisches Institut der Johannes Gutenberg, Universtat Mainz, found no significant levels of pollutants in the sponge (*Tethya aurantia)* collected on the leeward side of the ASBS (SWRCB 1979).

In a study by Alexander and Young for the Southern California Coastal Water Research Project (1976), in which mussel tissue (*Mytilus californianus*) from the mainland and from Bird Rock was analyzed in 1971 for trace metals, the Bird Rock samples were lower in lead, copper, silver, and nickel, but higher in chromium and zinc, at 27 and 100 mg/kg dry weight respectively. Chen and Lu for the Bureau of Land Management (1974) tested the sediments at Blue Cavern Point and at the mainland shelf of Palos Verdes for synthetic chlorinated hydrocarbons (e.g., DDT), oil and grease, nutrients, total volatile substances, trace metals, and other constituents. They found that the sample from Blue Cavern Point was lower in all constituents except for oil and grease (2,480 ppm), total volatile substances (4.34%), organic and Kjeldahl nitrogen (both 448 ppm), and nickel (41.6 mg/kg dry weight). (SWRCB 1979).

State Mussel Watch results for metals organics from 1977 - 1994 for the west end of Santa Catalina Island are presented in Appendix E.

Subtidal Substrate

Sand and mud comprise the majority of the subtidal substrate from the outer boundary of the ASBS to within approximately 500 yards (457 m) offshore. Nearshore, the main subtidal substrates in the ASBS are boulder slopes

and sandy slopes with a few rocky reefs. There are submerged reefs located off Emerald Bay, Starlight Beach, Howland's Landing and Isthmus Cove. Offshore rock formations, which break the surface, include Whale Rock, Eagle Rock, Indian Rock, Ship Rock and Bird Rock.

In general, the nearshore subtidal area of the ASBS is rimmed with boulder slopes to a depth of 50 to 100 feet (30 m). Boulder size varies with depth. Shallow sloped areas often have a narrow band of medium-sized boulders (1 m diameter) interspersed with course sand closer to shore. Sandy substrate is rare in water shallower than 40 feet (12 m). Isthmus Cove however has sandy subtidal substrate, enclosed by rock outcropping and boulders extending to a depth of approximately 40 feet (12 m). Sediments found in some of the coves from Emerald Bay to Big Fisherman Cove contain a large percentage of calcareous debris (SWRCB 1979).

Intertidal Substrate

The intertidal area of the ASBS is not extensive. The shoreline is extremely rugged, with the main landmass rising steeply out of the ocean. Consequently, intertidal habitats are quite restricted in vertical range. The windward side of the island is exposed to wave action and, in certain places, slightly well developed intertidal areas exist (for example, at Catalina Head). However, the leeward side does not benefit from significant wave activity, and the combination of steep slopes and low wave action result in generally poor intertidal habitats.

Approximately 40 percent of the ASBS intertidal area consists of solid rock walls, and about 45 percent consists of various sized boulders. The majority of the habitats are extremely steep in profile. The remaining 15 percent of the intertidal area consists of sandy or cobbly beaches. Virtually no beaches exist from Catalina Head to the West End, with the exception of Sandy Beach. Between Catalina Head and Arrow Point, most of the intertidal habitat is occupied by boulders. Many small coves and sandy beaches occur along the northeast (leeward) coast from Arrow Point to Blue Cavern Point adjacent to WMSC, although cliffs and boulder areas predominate in this region. The only relatively good intertidal habitat near WMSC, characterized by gently sloping solid substrate, may be found only at Ship Rock, Bird Rock, and Big Fisherman Cove Point.

Marine Biological Resources of the ASBS

Generalized Marine Ecosystem Considerations

Each marine biological community is a group of plant and animal populations that live together, interact with and influence each other. Communities tend to be associated with certain habitat depth ranges which can be described as: 1) Intertidal 2) Intertidal to 30m, 3) 30 to 100 m, 4) 100 to 200 m and 5) 200 m and deeper (NCCOS 2003). Marine habitats include ocean circulation features, because habitat is not simply defined by the substrate. Seawater characteristics are analogous to the climate of terrestrial habitats and include temperature, salinity, nutrients, current speed and direction. Organisms will also be affected by the circulation induced by tidal currents. For those living in shallow water habitats very close to shore, a dominant influence is also the circulation generated by breaking waves.

Rocky reefs, rocky intertidal zones and kelp forests are habitats that support distinct biological communities. In rocky reefs and intertidal zones, the type of rock that forms the reef greatly influences the species using the habitat. For example, granitic versus sedimentary rock reefs each may support different species assemblages.

Phytoplankton, which consists of single-celled algae suspended in the water column, comprises the base of most food chains in the Southern California Bight (Dailey, et al. 1993). The next pelagic trophic levels are composed of zooplankton, consisting of small holoplankton consumers, such as copepods, and meroplankton such as the larval stages of benthic macroinvertebrates and fish. Larger invertebrates and fish consume zooplankton and each other.

Benthic macro algae and vascular plants, including kelp and surf grass respectively, are also important primary producers along the coast of the Southern California Bight, including the ASBS. Benthic invertebrates and demersal fish, which live on the seafloor, graze on benthic algae, filter plankton from the water, and prey on other invertebrates and fishes. Many benthic organisms feed entirely on dead material that accumulates on the seafloor or is suspended in the water.

Marine mammals, birds, and turtles feed on algae, invertebrates, and fishes. Over 5,000 species of benthic invertebrates, 481 fish species, 200 bird species, and 40 species of marine mammals inhabit the SCB (Dailey, et al.

1993). The high diversity is due to a mixture of northern and southern fauna and flora that occurs in the SCB, and the wide range of habitats.

ASBS Intertidal Biota

Well-developed intertidal habitats are sparse at Catalina Island. Big Fisherman Cove Point, Bird Rock and Ship Rock have the only relatively extensive rocky intertidal communities found in the general vicinity of the WMSC within the ASBS. Bird Rock and Ship Rock are offshore rocks that have broad bases and rise from below sea level up to 50 or more feet (15m) above sea level with approaching angles of approximately 45° from the vertical.

A reconnaissance survey to identify marine life forms in the ASBS was performed in 1977 and 1978 (SWRCB 1979). According to this survey the highest rocky intertidal zone is inhabited by the periwinkle (*Littorina planaxis).* In the ASBS, these individuals are usually of small size, never attaining the 10-15mm size of northern California specimens. The congeneric (*Littorina scutulata)* is much rarer than periwinkle. The rock louse (*Ligia occidentalis)* is also found here.

The limpets (*Collisella scabra* and *C. digitalis)* share high intertidal areas with the giant owl limpet (*Lottia gigantean).* The giant owl limpet is not equally distributed over all rock types on Bird Rock but is usually restricted to basalt or other smooth surfaces. The barnacles *Balanus glandula, Chthamalus fissus,* and *Tetraclita squamosa* occur within a broad vertical band in the upper intertidal zone. Below this, California mussel *(Mytilus californianus)* can be found in scattered clumps, attaining the densest populations on the exposed western end of Bird Rock. Interspersed with California mussels is the gooseneck barnacle (*Pollicipes polymerus)*, again being most abundant in exposed areas of the substrate. A host of invertebrates is associated with the mussel beds, one of the more important being the predatory sea star (*Pisaster ochraceus).*

Small numbers of the aggregate anemone (*Anthopleura elegantissima)* can be found on Bird Rock. The black turban (*Tegula funebralis)* can occasionally be found, although populations are not large. The lined shore crab (*Pachygrapsus crassipes)* is also encountered. The black abalone (*Haliotis cracherodii)* was locally abundant in crevices washed by wave surge; however withering foot syndrome has had a decimating impact on the black abalone since the Reconnaissance Survey was completed.

The California mussel zone grades into a zone dominated by the southern sea palm (*Eisenia arborea)* and the surf grass (*Phyllospadix torreyi)* on the south side of Bird Rock. Elsewhere, California mussels continue into subtidal areas to approximately –5 feet (e.g. Bird Rock, north wall). *Chama pellucida,* occasionally seen in intertidal areas, is most abundant just below the California mussel zone.

A band of the feather boa kelp (*Egregia laevigata)* is commonly found fringing the intertidal zone. Other algae common to this zone include the erect coralline (*Corallina officinalis)* the red alga (*Geldium purpurascens),* and the brown algae (*Pelvetia fastigiata* and *Hesperophycus harveyanus)* (SWRCB 1979).

ASBS Subtidal Biota

Within the ASBS, substrate type and topographical features are largely responsible for the creation of distinct subtidal habitats. Habitat types include sand, sand interspersed with small boulders, vertical walls, and large and medium boulder slopes. Algae form an additional habitat type that can be utilized by fauna and epiphytic algae. For example, the giant kelp (*Macrocystis pyrifera*) growing on boulders at 20- to 60-foot (18 m) depths, creates an aquatic forest habitat for many fishes and invertebrates.

Sand Substrate Biota

Sand is the major substrate within the boundaries of the ASBS. However, most sand bottom areas occur at depths beyond the reach of scuba divers. In a submarine survey completed in 1977 at Big Fisherman's Cove, the large anomuran crab (*Paralithoides tanneri)* was found to be relatively abundant along with some scattered holothurians and rockfish.

Four categories of organisms live in the nearshore sandy substrate habitats: 1) anchored; 2) mobile; 3) infaunal; and 4) epiphytic. The large bulb or elk kelp (*Pelagphycus* sp.) is an example of the first type of inhabitant (anchored)

and is found attached to the substrate at 50- to 100-foot (30m) depths. Within the ASBS, it is known to occur at the mouth of Big Fisherman Cove, in Isthmus Cove, and at Black Point.

Mobile organisms found within the ASBS and at WMSC in sandy subtidal habitat include the extremely common detritus feeding sea cucumber (*Parastichopus parvimensis)*, the predatory sea star (*Astropecten brasiliensis)*, and the bat ray (*Myliobatis californica)*.

Some highly visible infaunal macroinvertebrates include the large tube dwelling polychaetes parchment worm (*Chaetopterus variopedatus)* and the ornate tube worm (*Diopatra ornate)*. The ornate tube worm was found near the outer edges of kelp beds and in other areas of organic debris accumulation, at depths of 60 to 90 feet (20 to 30 m). In some areas of the ASBS, the density of these worms can be as high as 500 individuals per square meter.

The tubes of these large polychaetes, which sometimes extend up to 5 cm above the sea floor, often provide substrate for small red algae and for the larger brown algae such as *Zonaria farlowii, Distopteris undulata* and *Pachydictyon coriaceum.*

The phoronoid worm (*Phoronopsis californica)*, the sea pens (*Stylatula elongate)* and *Acanthoptilum* spp., and several species of cerianthid anemones are other sessile invertebrates visible in sandy subtidal portions of the ASBS. Brachiopods, in the genus *Glottidia*, were found in sand substrate at depths of 80 feet.

There is considerable species diversity in the sandy subtidal macrofaunal community. One hundred species of polychaete worms were identified from cores taken during survey dives (SWRCB 1979). *Spiochaetopterus costarum, Lumbrineris latreilli, Owenia collaris* and *Allia* sp. were the species found in greatest abundance. Numerous polychaetes *Schistomeringos longicornis* and *Lumbrineris zonata* were found in the sands of north facing coves. The remainder of the macrofaunal organisms is primarily small bivalve mollusks and crustaceans. The clam *Phacoides approximatus* and the gammarid amphipods *Ampelisca cristata* and *Photis sp.* were most abundant (SWRCB 1979).

Vertical Rock Walls Biota

The algal community found on vertical rock walls is subjected to heavy surge and surf action at the shallower depths. Red algae such as *Laurencia spetabilis, Gelidium robustum,* and *Sciadophycus stellatus* are usually found in this habitat along with the brown sea palm, *Eisenia arborea.* The giant kelp, *Macrocystis pyrifera*, may occur on horizontal reefs but is sparse in heavy surge regions. Large, broad bladed brown algae such as *Agarum fimbriatum* and *Laminaria farlowii* predominate at deeper depths (50 to 80 feet).

Subtidal faunal assemblages can be grouped into two general associations according to depth. The *Chama pellucida – Pisaster giganteus* assemblage occurs between 15 and 50 feet (15m) depths, the lower boundary being indistinct as *Chama* abundance gradually becomes less with increasing depth. The sea star *Pisaster giganteus* is the bivalve *Chama's* primary predator and reaches its maximum density within this zone (approximately $0.1/m^2$). A host of invertebrates is found associated with *Chama* beds, including the strawberry anemone *Corynactis californica*, the corals *Coenocyathus bowersi* and *Paracyathus stearnsi*, the tubed polychaete *Spirobranchus spinosus*, the rock scallop *Hinnites multirugosus*, the gastropods *Megathura crenulata* and *Serpulorbis squamigerus*, the sea urchins *Centrostephanus coronatus* and *Strongylocentrotus franciscanus*, the sea cucumbers *Parastichopus parvimensis* and *Cucumaria salma*, and the tunicate *Tridid*emnum *opacum.*

The second major grouping found between 50 and 80 feet (24m) depths includes the two common gorgonians *Muricea fruiticosa* and *M. californica.* The gorgonian *Lophogorgia chilensis* is common at Bird Rock. Many sessile tunicate and sponge species grow on or near the base of these gorgonians, perhaps gaining some protection thereby. These include the sponges *Haliclona permollis* and *Vergongia aurea*, and the tunicate *Tridid*emnum *opacum.* The corals *Coenocyathus bowersi, Paracyathus stearnsi*, and *Astrangia lajollaensis* can be found in the region also. Much rock surface is covered by encrusting bryozoans such as *Rhynchozoon rostratum* and *Parasmittina californica* (SWRCB 1979).

Subtidal Boulder Habitat Biota

Boulder habitats are much more three-dimensional than either soft substrates or solid rock walls. In addition to surface substrate, there is much under-rock area utilized by a whole community of organisms. Boulders in the ASBS range between 3 and 33feet (1-10 m) in diameter, with sand often interspersed between the smaller ones. In fact, the majority of subtidal reefs are of this type (SWRCB 1979).

Shallow boulder reefs (10 to 15 foot depths) support several species of common, large algae including *Eisenia arborea, Plocamium sp., Pterocladia capillacea*, and *Cystoseira neglecta.* The marine flowering plant surfgrass, *Phyllospadix torreyi*, is found on reefs exposed to heavy wave action. In slightly deeper water (20- to 40-foot depths), *M. pyrifera* becomes abundant. Extensive kelp forests have a reduced understory algal community. Otherwise, *Cystoseira neglecta*, *Dictyota flabellate*, and *Pachydictyon coriaceum* are locally common. The red algae *Gelidium nudifrons, G. purpurascens,* and *G. robustum* are also locally abundant. *Plocamium coccineum* and *Sargassum muticum* occur extensively in some boulder areas seasonally. Deeper boulder reefs (greater than 50-foot depths) support primarily *Laminaria farlowii, Agarum fimbriatum,* and occasionally *Cystoseira neglecta* and *Eisenia arborea* (SWRCB 1979).

The fauna of the boulder reefs can be conveniently grouped into three categories: 1) those sessile on rock surfaces; 2) those mobile over the rock surface; and 3) those dwelling under rocks. One major difference between boulder reefs and solid rock wall habitats is the reduced abundance of the attached bivalve *Chama pellucida* on the boulder reefs. Concomitant with this reduction is a lower density of the predator *Pisaster giganteus,* although it is still common here. Other large mobile predators are a common component of the subtidal boulder community and include the octopus *Octopus bimaculatus*; the lobster *Panulirus interruptus*; and the whelk *Kelletia kelletii.* The large keyhole limpet, *Megathura crenulata*, is a grazer commonly found on boulder reefs. Boulder areas often have large populations of the sea urchin *Strongylocentrotus franciscanus* and *Centrostephanus coronatus* (the latter being restricted to holes during daylight hours). In addition to urchin and limpet grazers, pink and green abalone *Haliotis corrugata* and *H. fulgens* are other common herbivores (although their populations may also have suffered from withering foot syndrome since the reconnaissance survey was conducted).

Attached fauna include the gorgonians *Muricea californica* and *M. fruiticosa* in deeper water. The sponges *Tethya aurantia* and *Vergonia aurea* are locally common. Abundant bryozoans include *Bugula neritina, Diaperoecia californica, Hippodiplosia inscuplta* and *Phidolopora pacifica.* The tunicates *Eutherdmania claviformis, Pyura haustor,* and *Tridid*emnum opacum* are locally abundant.

The encrusting coralline algae, *Lithothamnium giganteum* is common throughout the ASBS from 0 to 100-feet (30m) depths. Shallow-water rock substrate is often covered primarily by low-growing algae, especially in gently sloping boulder reef areas.

Under-rock habitats support a diverse fauna. Attached to the undersurfaces of rocks are several sponges, including *Hymanamphiastra cyanocrypta.* The polychaete *Chaetopterus variopedatus* is often found there, as is the terebellid polychaete *Neoamphitrite robusta.* Several brittle stars, including *Ophioderma panamensis* and *Ophiothrix spiculata,* utilize this habitat. *Strongylocentrotus purpuratus* is also found there, as the juveniles of both other urchin species. The predatory sea star, *Astrometis sertulifera*, is most often found under boulders (SWRCB 1979).

Fish Communities

Many diverse habitats are utilized by fishes in the shallow waters off Santa Catalina Island. Surfgrass beds, sandy/shelly debris bottoms, low algae/rocky rubble, and giant kelp beds are the major inshore habitats present, each with a distinct fish species composition.

The surfgrass beds off Bird Rock, 0.2 NM northerly of Big Fisherman Cove, are a haven for small benthic fishes. Within these beds, spotted kelpfish (*Gibbonsia elegans)*, pipefish (*Syngnathus* spp.), and juvenile California scorpionfish (*Scorpaena guttata),* are the dominant species. Reef finspot (*Paraclinus integripinnis)*, mussel blenny (*Hypsoblennius jenkinsi)*, cabezon (*Scorpaenichthys marmoratus),* and coralline sculpin (*Artedius corallinus)* are also present but in fewer numbers. Just outside the deeper margins of these beds, opaleye (*Girella nigricans),* rock wrasse *(Halichoeres semicinctus)*, kelp bass (*Paralabrax clathratus)*, sheephead (*Pimelometopon pulchrum),* and señorita (*Oxyjulis californica)* are common, while kelp perch (*Barchyistius frenatus),* shiner (*Cymatogaster aggregate),* halfmoon (*Medialuna californiensis),* and black surfperch (*Embiotoca jacksoni)* occasionally frequent

the area. Topsmelt (*Atherinops affinis)* and occasionally blacksmith (*Chromis punctipinnis)* are abundant in the upper water column.

In shallow sandy/shelly debris bottom habitats with seasonal fluctuations of small benthic algae, rock wrasse and sheephead are the most abundant fish, followed by small to medium-sized kelp bass. Present in fewer numbers are the C-O turbot (*Pleuronichthys coenosus)*, the lavender sculpin (*Leicottus hirundo)*, and the bat ray (*Myliobatis californica).* Blackeye gobies (*Coryphopterus nicholsii)* occur in areas with small rocks or other structures for shelter. The upper water column is often dominated by large schools of blacksmith and topsmelt.

The low algae/rocky rubble habitat lying inshore of the giant kelp beds is dominated by large schools of opaleye. Schools of juvenile opaleye are more common in the intertidal or shallow subtidal zones, whereas adults are found in deeper waters and often range into other habitats. Rock wrasse, kelp bass, sheephead and spotted kelpfish are present in fewer numbers, while black surfperch, señorita, kelp perch, California scorpionfish, the giant kelpfish (*Heterostichus rostratus),* and juvenile garibaldi (*Hypsypops rubicundus)* are observed here frequently. The wooly sculpin (*Clinocottus analis)* is only observed in the intertidal and very shallow subtidal regions. During certain times of the day, large schools of blacksmith and topsmelt are in the upper water column. Schools of reproductively active shiner perch are common during the fall.

The kelp beds are the most structurally complex of the ASBS subtidal habitats, and the diversity of fishes there is proportionately greater. These beds are divided vertically into a benthic zone and a middle-to-canopy zone. The most abundant benthic fishes are sheephead, rock wrasse, kelp bass, señorita, garibaldi, black perch, California scorpionfish, opaleye, kelp perch and pile perch (*Damalichtys vaca).* Among the smaller benthic fishes, blue-banded goby (*Lythrypnus dalli)*, Blackeye goby, island kelpfish (*Alloclinus holderi),* and spotted kelpfish are the most abundant, with zebra goby (*Lythrypnus zebra)* common in some areas. Benthic fish seen infrequently here include giant kelpfish, kelp rockfish (*Sebastes atrovirens),* treefish (*Sebastes serriceps),* California moray (*Gymnothorax mordax),* horn shark (*Heterodontus francisci),* and swell shark (*Cephaloscyllium ventriosum).*

In the middle-to-canopy zone, señorita, kelp perch and blacksmith are dominant. Kelp bass and halfmoons occur in fewer numbers, followed by giant kelp fish, kelp rockfish, and in some areas, juvenile olive rockfish (*Sebastes serranoides).* First-year juvenile kelp bass, señorita, giant kelp fish, kelp rockfish, and treefish are most prevalent in the middle-to-canopy zone.

At Bird Rock and Ship Rock, convict fish (*Oxylebius pictus)* are found along with other kelp bed fishes. Angel sharks (*Squatina californica)* are found in the deep sandy bottom areas near these rocks. Pelagic fish, such as yellowtail (*Seriola dorsalis),* jack mackerel (*Trachurus symmetricus),* California barracuda (*Sphyraena argentea),* and common mola (*Mola mola)*, are occasionally abundant in the upper water column surrounding Bird Rock.

The scythe-marked butterfly fish (*Chaetodon falcifer)*, a southern species, is known to inhabit the ASBS.

There are diurnal differences in fish distribution in the ASBS. For example, at night sheephead, garibaldi, blacksmith, opaleye and kelp bass take shelter. At night kelp rockfish are active in the kelp forest, California morays forage in rocky areas, and sargo (*Anisotremus Davidsoni)* are active over shell debris or sand bottoms. (SWRCB 1979).

A complete listing of marine species known to occur in the ASBS may be found in the appendices of the SWRCB April 1979 Reconnaissance Survey Report.

Market Squid

Market squid (*Loligo opalescens)* are an important seasonal member of the community in the ASBS from December through March. Market squid aggregate in nearshore waters to spawn during the winter season.

White Abalone

White abalone (*Haliotus sorenseni*, Federally Endangered) was once common in the ASBS at depths of 60-100 feet (SWRCB 1979). White abalone may still occur within the Marine Reserve and ASBS.

Biota of Big Fisherman Cove

The above description of marine life in the ASBS is not specific to Big Fisherman Cove but is instead a description of the biota generally found in the ASBS by habitat type. Specific species recorded during surveys in Big Fisherman Cove are presented in Appendices B, C and D. These species records are limited to only certain survey dates and times, and do not represent exhaustive lists of all species inhabiting Big Fisherman Cove. Appendix B includes only algal species, and does not include marine vascular plants. It must be noted that the vascular plant surf grass (*Phyllospadix sp.*), an important community member, was identified in the summer of 1999 at Big Fisherman Cove by the author. An important fish species found in Big Fisherman Cove, and specifically the receiving water near the outfall, are leopard sharks (*Triakis semifasciata).* Leopard sharks are not listed in the survey data presented in Appendix D but are abundant in Big Fisherman Cove during the summer. As another example flyingfish (*Cypselurus californicus)* have been observed by the author at night in Big Fisherman Cove, but this species is not found in the survey data in Appendix D.

Threatened, Endangered and Other Wildlife

Many of the following marine reptile, bird and mammal species are federally and/or state-listed as endangered (FE, SE), threatened (FT, ST), or species of special concern (SSC).

Marine Reptiles

Marine sea turtles occur in California waters, and have been observed in Santa Catalina Island waters. Four species of federally protected sea turtles may be found in Santa Catalina Island waters: green (*Chelonia mydas,* FE), leatherback (*Dermochelys coriacea* FE), loggerhead (*Caretta caretta* FE), and olive ridley sea turtles (*Lepidochelys olivacea* FE). These marine turtles are circum-global in distribution but breeding colonies have not been observed in California (Coastal Conservancy 2005).

Marine Birds

Seabirds found at Santa Catalina Island include Xantu's murrelet (*Synthliboramphus hypoleucus,* ST), California gull (*Larus californicus,* SSC), Heermann's gull *(Larus heermanni)*, western gull *(Larus occidentalis*), Royal tern (*Sterna maxima*), California brown pelican (*Pelecanus occidentalis*, FE, SE), ashy storm-petrel (*Oceanodroma homochroa,* SSC), Brandt's cormorant (*Phalacrocorax penicillatus*), and double-crested cormorant (*Phalacrocorax auritus,* SSC). (SWRCB 1979, PRBO 2005.) The California least tern (*Sterna antillarum*, FE, SE) and elegant tern (*Thalasseus elegans*, SSC) forage and nest along the California coast and may possibly frequent the project area.

Only western gulls were documented as nesting on the island in 1979. However, Brandt's cormorant historically bred on Ship and Bird Rocks (SWRCB 1979). In their 2005 California Current Marine Bird Conservation Plan, the Point Reyes Bird Observatory stated that breeding individuals of ashy storm-petrels, western gulls, and possibly Xantu's murrelets were observed on Santa Catalina Island (PRBO 2005).

The bald eagle *(Haliaeetus leucocephalus*, FT, SE*)* is also present on Santa Catalina Island. They were listed as an endangered species in 1967 when their population drastically diminished from exposure to the chemical pesticide DDT. Recovery efforts were made to repopulate this species and, after successful attempts, they were downgraded to threatened in 1995. As of July 6, 1999, they were recommended for delisting by the United States Fish and Wildlife Services due to the increase in numbers found to exist. (DFG 2001)

Marine Mammals

All marine mammals are protected under federal law (Marine Mammal Protection Act). Six species of threatened or endangered marine mammals occur within the Southern California Bight. Three are cetaceans: blue whales (*Balaenoptera musculus,* FE), sperm whales (*Physeter catodon,* FE), and humpback whales (*Megaptera novaeangliae,* FE). The blue whale feeds and migrates off the coast and may transiently venture into shallow (<100 ft) water. Sperm whales occur year-round offshore and may transiently venture into shallower waters. Humpback whales occur year-round and migrate off of the coast, and may venture into shallower water. (DFG 2001).

Two of the threatened listed species are pinnipeds: Steller sea lions (*Eumatopias jubatus,* FT) and Guadalupe fur seals (*Arctocephalus townsendi*, FT, ST), which migrate along the coast and offshore. The most common pinnipeds

found in the ASBS are the California sea lion (*Zalophus californianus*) and the harbor seal (*Phoca vitulina*). (SWRCB 1979).

The southern sea otter (*Enhydra lutris neresis*, FT) was historically abundant in southern California waters but is no longer common there. While most of the sea otters are now found along the central California coast, a population was trans-located to San Nicolas Island, west of Santa Catalina Island.

The gray whale (*Eschrichtius robustus)* also appears in southern California. This species was formerly on the endangered species list, but was deemed recovered and delisted in 1994. They migrate yearly to the entire west coast of the United States, including the Santa Catalina Island area. Also present in this region are the bottlenose dolphin *(Tursiops truncates)*, common dolphin *(Delphinus delphis)*, and Pacific white-sided dolphin *(Lagenorhynchus obliquidens)*. These dolphin species are not on the Endangered Species List, yet they are protected through the Marine Mammal Protection Act. These dolphin species occur year-round in shallow waters among the Channel Islands and surrounding areas at shallow depths (less than approximately 180 m). (DFG 2001).

Fisheries, Marine Protected Areas and Prohibitions on the Take of Marine Life

The Northwest Santa Catalina Island ASBS encompasses, the western portion of the Catalina Marine Science Center State Marine Reserve, including Big Fisherman Cove. Fishing is not allowed in the Catalina Marine Science Center State Marine Reserve. All commercial and recreational take of marine life is prohibited in the Reserve (California Department of Fish and Game, Marine Region 2005).

Commercial and sport fishing occur in the waters off Catalina Island, including the ASBS outside of the Marine Reserve. Both activities are regulated and managed by either the California Department of Fish and Game, or the National Marine Fisheries. Important commercial fisheries include market squid, Pacific mackerel (*Scomber japonicus)*, jack mackerel *(Trachurus symmetricus)*, Pacific bonito *(Sarda chiliensis)*, northern anchovy *(Engraulis mordax)* and Pacific sardine *(Sardinops Sagax)*. The commercial catch of spiny lobster *(Panulirus interruptus)* is prohibited in the vicinity of Big Fisherman and Isthmus Coves (SWRCB 1979). Sport catch is via hook and line as well as scuba diving. Important sport fisheries include finfish such as halfmoon, California halibut *(Paralichthys californicus)*, scorpionfish, rockfish, California barracuda *(Sphyraena argentea)*, bonito, kelp bass, sheephead, and spiny lobster (SWRCB 1979). Abalone, once an important fishery, is now closed entirely in southern California.

Land Use

Between 1965 and 1970, the Santa Catalina Island Company deeded a total of 13.5 acres (5.5 ha) of land in Big Fisherman Cove to the University of Southern California, to support the building and later expansion of the Catalina Marine Science Center (now WMSC). Another 40 acres in the Big Fisherman Cove area is under long-term lease to USC by the Santa Catalina Island Company.

Except for the WMSC, which maintains a more-or-less seasonal enrollment of 50-100 people (Michaels 2005), the population of Catalina varies drastically with the tourist seasons. The "summer" runs roughly from Memorial Day in May through Labor Day in September. During that time, the City of Avalon, as well as other recreation areas and summer camps on the island are generally filled to capacity. During the remaining "winter" months, the population drops to a fairly constant level of permanent residents while other areas retain a minimum number of more-or-less permanent, maintenance-type personnel (Los Angeles County, Department of Regional Planning. 1983. Local Coastal Plan, Santa Catalina Island).

Scientific Study Uses

Infrastructure

In October 1995, the University of Southern California expanded the scope of WMSC at Big Fisherman Cove to include environmental sciences. The lab was renovated in 1996 and the dorms in 1997.

WMSC consists of a 30,000 square-foot laboratory building, a dormitory housing and cafeteria complex, a cluster of cottages, a hyperbaric chamber, an administration building, and a large waterfront staging area complete with dock, pier, helipad, and diving lockers. The facilities are used by USC students and scientists and for full-semester course programs in the Biology Department and Environmental Studies Program of the USC College of Letters, Arts and

Sciences. USC faculty, staff and students also conduct a wide range of research, education and outreach programs for broader audiences, form k-12 to adult learners. These facilities are also used by non-USC scientists, students and other education and outreach visitors from many other institutions. Programs range from day trips to full semester classes run by the California State University and other universities. Currently about half of the use of the facility is by non-USC participants. This facility also provides critical emergency care facilities for a remote region (Michaels 2005).

Dormitory housing and cafeteria facilities are located near the main laboratory building. Adjoining the dormitory-apartment complex is the cafeteria, which provides food service for up to 150 people. There are also outdoor barbecue and picnic facilities. New housing was added in 2002 and the facility has Los Angeles County Planning Commission approval for additional housing, a new educational building, and rebuilding of the waterfront facilities (Michaels 2005).

Laboratory Facilities

In October, 1995 USC expanded the scope of their Marine Science Center to include environmental sciences. Now Named the Philip K. Wrigley Marine Science Center (WMSC), it is the centerpiece of the USC Wrigley Institute for Environmental Studies. WMSC is a facility for marine, terrestrial and environmental science and education. The University of Southern California maintains a 30,000 square-foot marine laboratory that was renovated in the summer of 1996 and is used by faculty and students from USC and other regional universities. The laboratory is available for a broad range of research and educational activities (Michaels, 2005). The lab includes two teaching laboratories and six research laboratories, each with freshwater sinks and seawater aquaria. The facility also contains a library, a stockroom equipped with basic glassware, chemicals, small lab equipment, and a freezer storage space. An onsite machine shop stocked with tools and large equipment provides for repairs or fabrication.

Seawater System

Seawater flows into laboratory aquaria after being pumped from the sub-marine intake. The intake structure is located at Blue Cavern Point, immediately outside the ASBS. It consists of two 6-inch poly-vinyl chloride pipes submerged 15 feet below the water surface. This is a continuous-flow system, designed with a current pump rate of 180,000 GPD (Michaels 2004) available to the laboratory and to large holding tanks and experimental aquaria on the waterfront. The water is untreated except for a macro-screen located on the intake pipes designed to prevent the intake of kelp. This is a once-through system (no recirculation). Seawater is pumped into a 15,000-gallon holding tank on the hill above the facility and is then gravity fed to the laboratory and waterfront facilities. The waterfront holding tank(s) may be used to store fish, shellfish, or algae prior to removal to the laboratory for experimentation. Any sediment picked up at the intakes settles out in the 15,000-gallon storage tank on the hill (Michaels 2005). The sediment may eventually be discharged to Big Fisherman Cove during cleanout operations.

Waterfront Facilities

The waterfront facilities consist of a dock and pier, helipad, dive locker and diver staging area, and the USC Catalina Hyperbaric Chamber. Water depth beneath the two 20-by-60-foot floating dock is 24-40 feet at MLLW. The dock is attached to a 70- by 20-foot standing pier supplied with 110V electrical outlets, a freshwater spigot, and a 5-ton capacity jib crane.

The Center's fleet of small boats is available to students and researchers. The Center maintains 25 moorings for its fleet and private transient boats up to 70 feet in length. Subtidal scientific experiments are frequently staged in the same area as the moorings, often taking advantage of the mooring weights or simply using sand anchors (Michaels 2005).

As mentioned above WMSC has Los Angeles County Planning Commission approval for rebuilding of the waterfront facilities. Per the requirements of Section III.E.2 of the Ocean Plan WMSC must notify the Regional Water Board within 180 days prior to any construction activity that could result in any discharge or habitat modification in the ASBS. Furthermore, WMSC must receive approval and appropriate conditions from the Regional Water Board prior to performing any significant modification, re-building or renovation of the water front facilities, including the pier and dock.

In the vicinity of the waterfront is a helipad licensed by the State of California for day or night helicopter landings. It serves the Catalina Hyperbaric Chamber and is used during evacuation for other medical emergencies. It may also

be used for routine transportation to the mainland by special arrangement with independent helicopter services. Medical and work trailers supporting the lab, chamber, and habitat programs surround the hangar. Two dive lockers provide locked storage for gear, showers and dressing rooms for up to 80 divers, and an air compressor fills standard steel tanks to 2300 psi. A diver staging area is located outside the diving lockers, and includes freshwater tubs for rinsing gear and equipment (Michaels 2005).

Existing Discharges

The Southern California Coastal Water Research Project (SCCWRP), under contract to the State Water Board, conducted a survey of all discharges into State Water Quality Protection Areas. SCCWRP's (2003) final report identified 58 drainages into the Northwest Santa Catalina Island ASBS, consisting of 38 discharges, 17 outlets (natural ephemeral streams), 1 intake line, and 2 potential sources that were not completely identified.

SCCWRP identified two discharges at Wrigley Marine Science Center and one seawater intake pipe for the laboratory aquaria. (It should be noted that the SCCWRP survey of the area of WMSC was conducted from a vessel and not from shore, and therefore had limitations.) Waste seawater drained from the laboratory and the holding tanks at the waterfront. The landscape's main natural drainage feature passes through a 60-inch metal outfall pipe (circa 1965) passing under the road and outfalls, and draining storm water runoff directly into the ASBS waters. Storm water runoff also drained from the laboratory and dormitory areas, co-mingling with return seawater effluent. At the time of the survey a portion of the seawater return from the holding tanks at the waterfront area, and the freshwater rinsing of dive equipment, flowed from a small bluff into Big Fisherman Cove adjacent to the facility's dock. Occasionally flows from tank cleaning operations and dive equipment rinsing eroded the bluff.

SCCWRP also identified discharges in the Two Harbors area, west of the WMSC. These drainages consisted mainly of small earthen channels and pipes that appeared to be used for storm water runoff (SCCWRP 2003). Storm water discharges from Two Harbors are not regulated under a Storm Water NPDES Permit. In addition, Two Harbors has marina facilities (mooring field and pier facilities) that were included in the survey as a nonpoint source. Two Harbors is served by a sewage treatment plant, the effluent from which is disposed of via spraying on a hillside (SWRCB 1979). See Figure 1 for the locations of discharges and other features in the general vicinity of Isthmus Cove (Two Harbors) and Big Fisherman Cove. See Figure 2 for the locations of discharges and other features at Big Fisherman Cove.

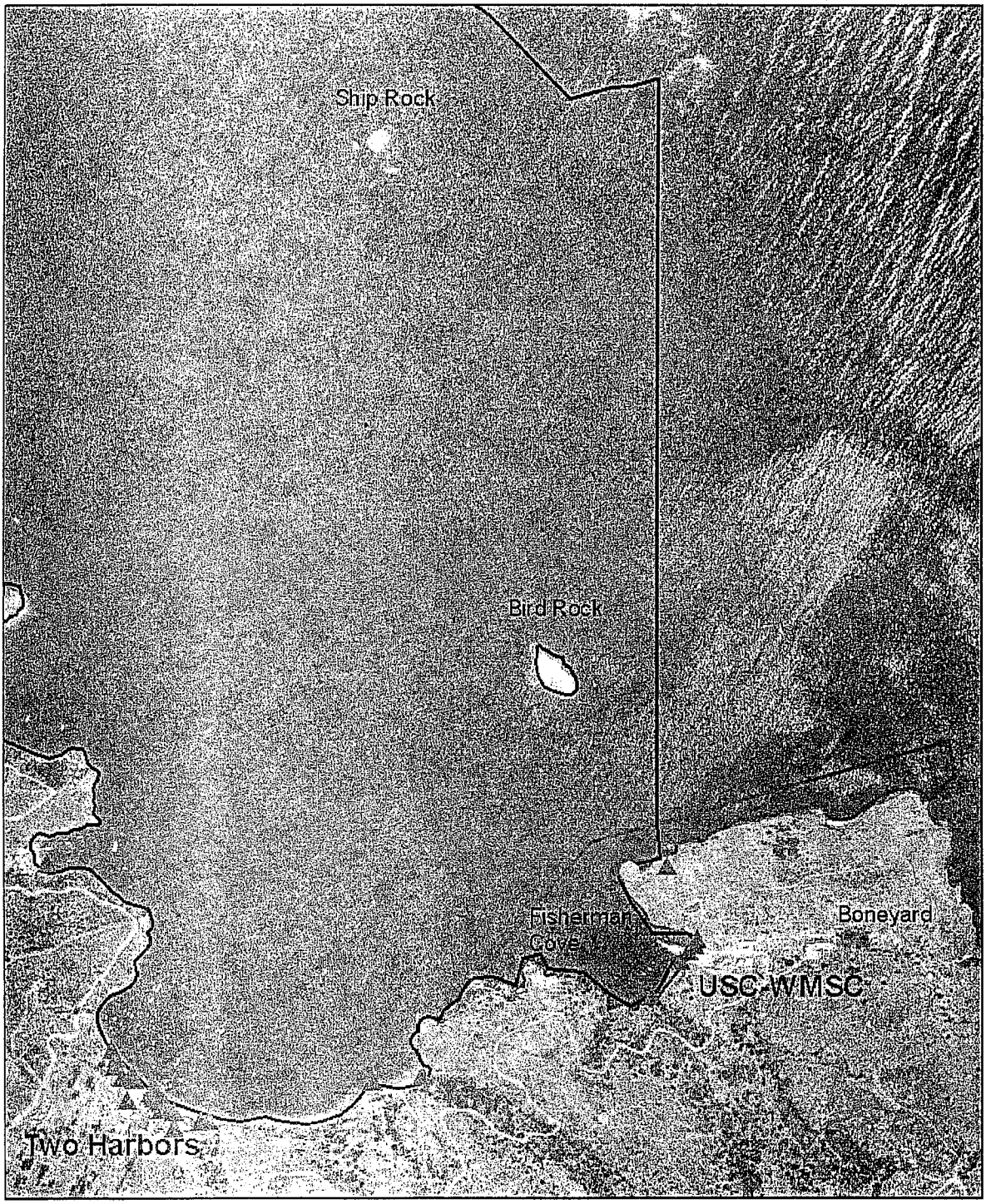
WMSC Waste Seawater Discharge

As mentioned above in the discussion regarding laboratory infrastructure WMSC operates a flow-through seawater system designed to supply the laboratory and waterfront with seawater for purposes of keeping marine animals and plants alive. The seawater is not heated, cooled, or filtered, being used strictly for maintenance of living organisms. All of the once-through seawater used in various parts of the facility are brought together and co-mingled at the waterfront and discharged to the north side of Big Fisherman Cove. The total flow during normal operations is about 180,000 GPD. In addition, as mentioned above, the discharge is covered under NPDES Permit (CA 0056661) issued by the Los Angeles Regional Water Board, re-issued most recently on October 12, 2000, and expiring on November 10, 2005. This discharge has never been issued an exception by the State Water Board and thus does not currently comply with the California Ocean Plan. However, the WMSC has committed to not discharging any chemicals, including chlorine bleach. Furthermore, since the system has no filtration, there will be no need to discharge filter backwash. Monitoring results for the seawater discharge are detailed in the Water Quality Section.

WMSC Sewage Treatment Plant

The wastewater treatment plant for Wrigley Marine Science Center (WMSC) went into operation in late 1967. Sewage treatment consists of an activated sludge digestion process, with extended aeration and provisions for chlorination. The holding pond has a ten-day capacity (per 1979 flows) and the effluent is ultimately sprayed onto a hillside in a fenced area. Capacity of the system is 15,000 GPD. The plant is owned by USC, operated and monitored by WMSC staff.

Isthmus Cove Area Figure 1



Seawater Intake

Discharges and outlets

ASBS

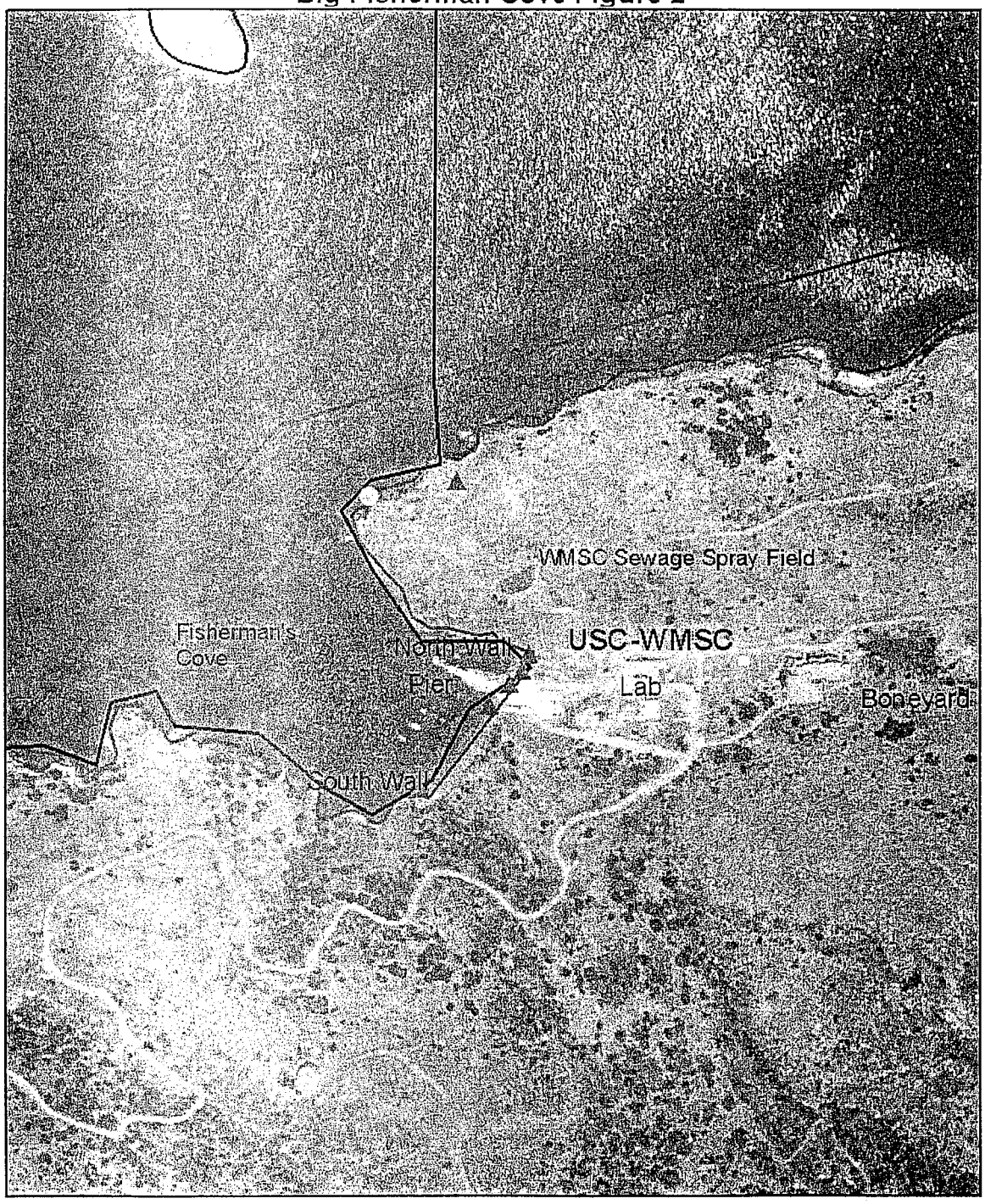
Catalina Marine Science Center Marine Life Refuge

0 0.125 0.25 0.5 Miles

Data Source: SCCRWP/SWRCB dishcarge survey 2000
Map Created October 19, 2005 State Water Resources Control Board

Water Boards

Big Fisherman Cove Figure 2



Seawater Intake

Discharges and outlets

ASBS

Catalina Marine Science Center Marine Life Refuge

0 45 90 180 Meters

Water Boards

Data Source: SCCRWP/SWRCB dishcarge survey 2000
Map Created October 19, 2005 State Water Resources Control Board

Storm runoff from this land disposal spray field may possibly enter the ASBS via ocean currents during large precipitation events.

In June 1966, the County of Los Angeles Health Department set criteria for the WMSC wastewater treatment plant, including requirements that only well-stabilized and disinfected effluent will be used for spray irrigation, that the effluent shall at all times be confined to property under the control of the discharger, that the plant, pond and spray area be fenced to exclude unauthorized persons, and that suitable warning signs will be provided on the fence.

Waste Discharge Requirements (WDR) were originally issued by the Los Angeles Regional Water Quality Control Board in 1966. The plant and discharge currently operate under WDR File No. 66-069, Order No. 94-114, CI No. 5215, most recently reissued in October 1994. The plant is allowed to discharge treated and disinfected (chlorinated) wastewater to land via a spray field. According to the WDR, the wastewater treatment plant effluent is limited to treated domestic and commercial wastewater, prohibiting all other discharge such as water softener regeneration brines, raw sewage, partially dried waste sludge or radioactivity. Wastewater effluent must also meet specific water quality criteria such as pH, total dissolved solids, sulfate, chloride, boron, oil & grease, suspended solids, biochemical oxygen demand and coliform bacteria prior to discharge by irrigation upon the spray field. Total dissolved solids and chloride levels are set above the Basin Plan water quality objectives, reflecting the high concentrations of the constituents in the supply water and the very limited groundwater resources underlying the area. Irrigated effluent must be controlled for both the rate and volume at which it is applied to prevent excess soil moisture conditions and the potential for runoff, and at a distance of 150 feet from any water well or mineral spring.

The Regional Board WDR Monitoring and Reporting Program requires sampling and analyzing the treated wastewater for a variety of constituents. All analyses shall be conducted at a State Department of Health Services approved facility. The quarterly monitoring reports shall contain an average and maximum daily waste flow for each month of the quarter; the estimated average population served during each month of the reporting period and the approximate acreage irrigated by the treated wastewater; a statement relative to compliance with discharge specifications during the reporting period; and results of at least weekly observations in the disposal area for any overflow or surfacing of waste.

II. Environmental Impacts

The environmental factors checked below could be potentially affected by this project. See the checklist on the following pages for more details.

☐	Land Use and Planning	☐	Transportation/Circulation	☐	Public Services
☐	Population and Housing	☑	Biological Resources	☐	Utilities and Service Systems
☐	Geological Problems /Soils	☐	Energy and Mineral Resources	☐	Aesthetics
☑	Hydrology/Water Quality	☐	Hazards	☐	Cultural Resources
☐	Air Quality	☐	Noise	☐	Recreation
☐	Agriculture Resources	☐	Mandatory Findings of Significance		

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
1. GEOLOGY and SOILS. Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☑
i) Rupture of a known earthquake fault, as delineated in the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines & Geology Special Publication 42.	☐	☐	☐	☑
ii) Strong seismic ground shaking?	☐	☐	☐	☑
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☑
iv) Landslides?	☐	☐	☐	☑
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☑
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☐	☑
d) Be located on expansive soils, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☑
e) Have soils incapable of adequately supporting the use of septic tanks or alternate wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☑
2. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☑
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☑
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☑
d) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☑
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☑

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
3. HYDROLOGY and WATER QUALITY. Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☑	☐	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (*e.g.*, the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☑
c) Substantially alter the existing drainage pattern of the site, including through alteration of the course of a stream or river, or substantially increase the rate or volume of surface runoff in a manner that would:				
i) result in flooding on- or off-site	☐	☐	☐	☑
ii) create or contribute runoff water that would exceed the capacity of existing or planned stormwater discharge	☐	☐	☐	☑
iii) provide substantial additional sources of polluted runoff	☐	☐	☐	☑
iv) result in substantial erosion or siltation on-or off-site?	☐	☐	☐	☑
d) Otherwise substantially degrade water quality?	☐	☑	☐	☐
e) Place housing or other structures which would impede or re-direct flood flows within a 100-yr. flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☑
f) Expose people or structures to a significant risk of loss, injury, or death involving flooding:				
i) as a result of the failure of a dam or levee?	☐	☐	☐	☑
ii) from inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☑
g) Would the change in the water volume and/or the pattern of seasonal flows in the affected watercourse result in:				
i) a significant cumulative reduction in the water supply downstream of the diversion?	☐	☐	☐	☑
ii) a significant reduction in water supply, either on an annual or seasonal basis, to senior water right holders downstream of the diversion?	☐	☐	☐	☑
iii) a significant reduction in the available aquatic habitat or riparian habitat for native species of plants and animals?	☐	☐	☐	☑

iv) a significant change in seasonal water temperatures due to changes in the patterns of water flow in the stream?	☐	☐	☐	☑
v) a substantial increase or threat from invasive, non-native plants and wildlife	☐	☑	☐	☐
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☑

HYDROLOGY and WATER QUALITY

Storm Water and Non-Storm Water Runoff

At the time of the SCCWRP survey and initial review by State and Regional Water Board staff concerning the ASBS, storm water runoff (and in some cases non-storm water runoff) was co-mingled with the waste seawater prior to discharge. Major improvements have been made in terms of segregating waste streams, replacement of road materials (to reduce storm water pollutants) and in routing runoff into vegetated swales. The WMSC staff is commended for the work performed in advance of an exception.

The public touch tank area on the east side of the main lab building had originally been designed with seawater drains, which discharged into a concrete swale on the north side of the building. This swale continued down the hill parallel to the road and the surface flow discharged into the ocean near the seawater tanks and other effluent discharges on the waterfront. When it rained, this swale also collected storm water runoff and the two fluids co-mingled. The touch tank drains have since been re-routed and now connect through a four-inch PVC pipe to the existing seawater drainage system. Storm water runoff through the concrete swale is no longer co-mingled with the waste seawater.

In the loading dock area of the main lab building, (on the west side), there is a vent for the seawater drainage system from the lab building. The laboratory's outdoor aquaculture tanks are also located in this area and drain to that same portion of the waste seawater system. Originally this vent also collected runoff from parts of the loading dock, where among other things vehicle maintenance is performed, and the two waste streams co-mingled during storm events. USC WMSC has now segregated (as of February 2005) the storm water runoff from the loading dock and the waste seawater effluent into separate waste streams (Michaels 2005).

The majority of dry weather flows and wet weather flows during small precipitation events will likely be infiltrated in vegetated swales. Storm water runoff will still occur from the water front (dive locker area included), from a small portion of the laboratory building area, and from the main storm water culvert that drains a watershed area with abandoned silver mines, and a non-paved storage area, where old lab and marine equipment and construction wastes have been stored. Although a great deal of progress has already been made, storm water runoff may still contain constituents that are toxic to marine life as shown in Table 1.

The possibility exists that contamination of the ASBS may result due to storm water runoff from the sewage treatment spray field. Additional testing will be required to ensure that runoff from the spray field does not result in any contamination in the ASBS.

WMSC has not prepared and submitted a Storm Water Management Plan (SWMP) to the Regional Water Board that covers those drainage facilities that drain to the ASBS. A SWMP should be developed to identify pollutant sources, develop Best Management Practices (BMPs), and provide measurable goals to reduce the discharge of identified pollutants into the ASBS. The SWMP should include an implementation schedule for specific BMPs (e.g., maintenance area cleanup, spill prevention and control, elimination of non-storm flows, storm drain inspection/maintenance and for addressing storm water pollutant sources).

Metals

Table 1 includes the analytical results for Table B metals (marine aquatic life) for storm water and reference (intake) samples collected in 2004.

Table 1. Analysis of Intake, Seawater and Storm Water Effluents, and Receiving Water, November 2004.

Analyte µg/L	Ocean Plan 6 month median	Intake seawater	Big Fisherman Cove	Runoff from Lab	Main Storm Drain	Dive Locker Runoff	Detection limit
Arsenic	8	0.998	0.949	4.53	1.31	15.1	**0.015**
Cadmium	1	0.039	0.038	0.23	0.216	0.382	**0.01**
Copper	3	0.267	1.13	34.6	11.3	64.9	**0.01**
Lead	2	0.05	0.044	3.34	4.24	14.9	**0.01**
Nickel	5	0.019	0.275	11.4	11.8	41.8	**0.01**
Selenium	15	ND	ND	0.073	ND	ND	**0.015**
Silver	0.7	ND	ND	ND	0.287	0.18	**0.01**
Zinc	20	1.32	2.5	46.8	166.0	387.0	**0.01**

Non-detected constituents are listed as ND. (CRG Laboratories 2004).

Results for the dive locker storm runoff exceed California Ocean Plan six month median water quality objectives for arsenic, copper, lead, nickel and zinc.

The main storm drain exceeds the California Ocean Plan six month median water quality objectives for copper, lead, nickel, and zinc. The drainage area for this discharge includes a combination of natural watershed, abandoned silver mines from the nineteenth century, a storage area where old lab and marine equipment and construction wastes have been stored, and a long stretch of 60" pipe (possibly in poor repair) that carries runoff below the laboratory and other facilities.

Lab storm water drainage exceeds California Ocean Plan six month median water quality objectives for copper, lead, nickel, and zinc. In the loading dock area of the main lab building, (on the west side), there is a vent for the seawater drainage system from the lab building. At the time of the sampling in November 2004 this vent also collected runoff from parts of the loading dock, and the two waste streams co-mingled during storm events. USC WMSC has now segregated the two streams (Michaels, 2005).

The results of the intake seawater (reference) and the receiving water in Big Fisherman Cove were below Ocean Plan Table C background concentrations for arsenic, copper, silver, and zinc. The receiving water was noticeably elevated above the reference sample for copper, nickel, and zinc.

It must be noted that earlier samples were analyzed for metals but State and Regional Water Board staff determined that the procedures and quality assurance for that analysis were inadequate, providing faulty results. Those results are not presented here.

In December 2004, additional testing to screen for PAH's (by HPLC) was performed at the same three runoff sampling locations. Water samples were collected from the main storm water drainage, the lab storm water drainage and the dive locker storm water drainage sites. PAH's were not detected in any of these this samples at that time.

The following mitigating conditions will be required for the exception in relation to non-storm runoff and storm water management plans:

- *For metals analysis, waste seawater effluent, storm water effluent, reference samples, and receiving water samples must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/ Mass Spectrometry) described in the Ocean Plan.*

- *Flows for the seawater discharge system and storm water runoff (by storm event) must be reported quarterly to the Regional Water Board.*

- *WMSC must continue to prevent all discharges of non-storm water facility runoff (i.e., any discharge of facility runoff that reaches the ocean that is not composed entirely of storm water), except those associated with emergency fire fighting.*

- *WMSC must specifically address the prohibition of non-storm water runoff and the reduction of pollutants in storm water discharges draining to the ASBS in a Storm Water Management Plan/Program (SWMP). WMSC is required to submit its final SWMP to the Regional Water Board.*

- *The SWMP must include a map of surface drainage of storm water runoff, including areas of sheet runoff, and any structural Best Management Practices (BMPs) employed. The map must also show the storm water conveyances in relation to other facility features such as the laboratory seawater system and discharges, service areas, sewage treatment, and waste and hazardous materials storage areas. The SWMP must also include a procedure for updating the map and plan when other changes are made to the facilities.*

- *The SWMP must describe the measures by which non-storm water discharges have been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.*

- *The SWMP must also address storm water discharges, and how pollutants have been and will be reduced in storm water runoff into the ASBS through the implementation of BMPs. The SWMP must describe the BMPs currently employed and BMPs planned (including those for construction activities), and an implementation schedule. The BMPs and implementation schedule must be designed to ensure natural water quality conditions in the receiving water due to either a reduction in flows from impervious surfaces or reduction in pollutants, or some combination thereof. The implementation schedule must be developed to ensure that the BMPs are implemented within one year of the approval date of the SWMP by the Regional Water Board.*

- *Once annually, during wet weather (storm event), the storm water runoff effluent and the receiving water adjacent to the seawater and storm water discharge system must be sampled and analyzed for Ocean Plan Table B constituents. The receiving water in Big Fisherman Cove must also be monitored for Ocean Plan indicator bacteria water quality objectives. The sample location for the receiving water will be immediately seaward of the surf zone in Big Fisherman Cove adjacent to the outfall location. Storm water runoff and receiving water must be sampled at the same time as the seawater effluent and reference sampling described in condition 12 above. Based on the first year sample results, the Regional Water Board will determine specific constituents in the storm water runoff and receiving water to be tested during the remainder of the permit cycle, except that indicator bacteria and chronic toxicity (three species) for receiving water must be tested annually during a storm event.*

- *Once annually, the subtidal sediment near the seawater discharge system and storm water outfall in Big Fisherman Cove must be sampled and analyzed for Ocean Plan Table B constituents. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. Based on the first year sample results, the Regional Water Board will determine specific constituents to be tested during the remainder of each permit cycle, except that acute toxicity for sediment must be tested annually.*

- *In addition to the bacterial monitoring requirements described in conditions 12 and 13 above, samples must be collected at the seawater intake structure during a maximum of three storm events per year that result in runoff from the spray field hillside, and measured for Ocean Plan indicator bacteria. The station at the seawater intake structure is not considered a reference station for indicator bacteria but instead is selected for this requirement because it is near the bluff below the WMSC sewage treatment plant spray field. This requirement along with the bacterial monitoring in conditions 12 and 13 is meant to satisfy in total the Ocean Plan bacteria monitoring requirements. This additional bacteria monitoring may be eliminated by the Regional Water Board if changes are made to WMSC's sewage plant or treated sewage effluent system that would absolutely eliminate the possibility of contaminants entering the ASBS.*

- *If the results of receiving water monitoring indicate that the storm water runoff is causing or contributing to an alteration of natural water quality in the ASBS, as measured at the reference station at the seawater intake, WMSC is required to submit a report to the Regional Water Board within 30 days of receiving the results. Those constituents in storm water that alter natural water quality or receiving water objectives must be identified in that report. The report must describe BMPs that are currently being implemented, BMPs that are*

planned for in the SWMP, and additional BMPs that may be added to the SWMP. The report shall include a new or modified implementation schedule. The Regional Water Board may require modifications to the report. Within 30 days following approval of the report by the Regional Water Board, WMSC must revise its SWMP to incorporate any new or modified BMPs that have been and will be implemented, the implementation schedule, and any additional monitoring required. As long as WMSC has complied with the procedures described above and is implementing the revised SWMP, then WMSC does not have to repeat the same procedure for continuing or recurring exceedances of the same constituent.

Waterfront and Marine Nonpoint Source Pollution

The waterfront facilities include a dock and pier. The dock is attached to a 70 by 20 foot standing pier supplied with 110V electrical outlets, a freshwater spigot, and a 5-ton capacity jib crane. The pier and dock are planned for renovation and the construction activity has the potential to cause pollution in the ASBS.

WMSC maintains several small vessels and 25 moorings for this fleet and transient boats up to 70 feet in length. Some of the vessels are operated by WMSC staff and the transient vessels are operated either by research institutions or private parties. The potential exists for pollutants to enter the ASBS from these vessels and associated operations and facilities.

The following mitigating conditions will be required for the exception in relation to nonpoint source pollution from the waterfront and marine operations:

- *WMSC must prepare a waterfront and marine operations non-point source management plan containing appropriate management practices to address non-point source pollutant discharges. Appropriate management measures will include those described in the State's Non-point Source Program Implementation Plan for marinas and recreational boating, as applicable. The Regional Water Board, in consultation with the State Water Board's Division of Water Quality, will review the plan. The Regional Water Board shall appropriately regulate non-point source discharges in accordance with the State Water Board's Policy for Implementation and Enforcement of the Non-point Source Pollution Control Program. The plan must be implemented within six months of its approval.*

- *WMSC will notify the Regional Water Board within 180 days prior to any construction activity that could result in any discharge or habitat modification in the ASBS. Furthermore, WMSC must receive approval and appropriate conditions from the Regional Water Board prior to performing any significant modification, re-building or renovation of the water front facilities, including the pier and dock, according to the requirements of Section III.E.2 of the Ocean Plan.*

Waste Seawater Discharge

As mentioned above, there have been significant improvements in segregating storm water from waste seawater. All waste seawater is now routed through a dedicated drainage system to the outfall at the waterfront. Another improvement involves rinse water disposal at the dive locker/waterfront area. WMSC had originally located a pair of 40-gallon sinks near the seawater tables at the waterfront for the rinsing of dive gear. These sinks were filled with freshwater, but drained onto an earthen bluff and then into the drainage area that catches the discharge from the seawater tanks and tables. Thus, when divers rinsed their gear, they would discharge some amount between 20-60 gallons of waste freshwater onto the bluff and thence into the waste seawater that was running into the ocean. The divers shared these tanks, so they rarely were drained more that 6-10- times per day and most days, probably less than 1-2 times per day. This situation has since been corrected, The rinse tanks were recently relocated to a new location where the freshwater now drains into the sewer and is treated in their secondary treatment plant. Therefore the dive sink wastewater no longer co-mingles with the seawater discharge (Michaels 2004).

Chronic Toxicity Testing

The following are results of the chronic toxicity tests performed on the WMSC waste seawater effluent, and reference and receiving waters, for three samples in February 2004 and one sample in October 2004. Test procedures for the chronic toxicity testing followed the *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms,* EPA/600/R-95/136. *Atherinops affinis* (topsmelt) are a member of the fish community at Big Fisherman Cove and were utilized as the standard marine test organism for the chronic toxicity testing as shown in Table 2.

Table 2. Chronic Toxicity Testing Survival/Growth Results for *Atherinops affinis*

Sample date	Sampling Station		
	Intake Pipes	Big Fisherman Cove	Seawater System Effluent
February 2004	NOEC = 100%	NOEC = 100%	NOEC = 100%
October 2004	---	---	NOEC = 100%

Chronic toxicity tests evaluate the biological response of an organism to the effluent and measure the acceptability of waters for supporting a healthy marine biota. The No-Observed-Effect-Concentration (NOEC) is the highest concentration of toxicant to which organisms are exposed in a full life cycle or partial life-cycle (short-term) test that causes no observable adverse effects on the test organism. Test results from February and October 2004 seawater effluent and receiving water samples show a NOEC of 100%, in other words zero toxicity.

Chemical and Physical Characteristics

Monitoring data for conventional constituents, as required under the NPDES permit for the waste seawater effluent is presented in Table 3. Reported results from February 2004 to January 2005 were in compliance with the permitted effluent limits.

Table 3. Analysis of Waste Seawater Effluent Sampling Station 2004/2005

	Analyte					
Sample date	pH	Total Suspended Solids (mg/L)	Settleable Solids (mg/L)	Oil & Grease (mg/L)	Turbidity (NTU)	Biochemical Oxygen Demand (mg/L)
June 2005	7.94	---	---	---	---	---
May 2005	7.94	20	ND	ND	0.25	3
April 2005	7.96	---	---	---	---	---
March 2005	7.79	ND	ND	ND	0.31	ND
February 2005	7.72	---	---	---	---	---
January 2005	7.80	---	---	---	---	---
October 2004	8.05	ND	ND	ND	0.17	ND
February 2004	7.87	ND	ND	ND	0.25	ND

Results were reported in either mg/L or ug/L. Constituents that were not tested are indicated by dashed symbol in the column (---). Non-detected constituents are listed as ND.

Waste Seawater Effluent Thermal Impacts

WMSC regularly monitors the temperature of the ambient seawater and water entering the aquaria. Temperatures are taken with standard laboratory thermometers calibrated in degrees Celsius and are reported in those units to maintain accuracy. At the location of the seawater system intake pipe, continuously recording thermisters for recording ocean temperature are installed at the 15, 30, 60 and 100-foot depths. The intake pipe is at the 15-foot depth. Shallower temperatures are warmer than deeper waters with a difference of 2-6 degrees C between 15 ft (5m) and 100 ft (33m). (Michaels 2004).

The discharge temperatures during the period 1991 – 2004 varied from 12-23 degrees C with the same seasonality found in natural waters in this region. The average temperature of the discharge water tends to be only slightly warmer, about 0.2-0.3 degrees C, than the background seawater at the intake (15 ft.). Maximum differences of as much as 2 degrees C were observed.

WMSC also measured ambient surface water temperatures at the end of the pier feet in Big Fisherman Cove and the temperature of the seawater discharge, and reported this to the Regional Board in their quarterly monitoring reports. The mean monthly temperatures for the year 2004 differed by only 0.1° F between the discharge (64.3° F) and the Cove (64.4° F), with the Cove being only slightly warmer. This temperature data from January 2004 to June 2005 is given in Table 4.

On October 25, 2004 WMSC performed field temperature measurements within Big Fisherman Cove. The results of those measurements indicate that the receiving water near the discharge is slightly warmer than in the larger portion of the Cove further away from the discharge. However, the receiving water immediately near the discharge is much more shallow in depth than the majority of the Cove, which might account for some of this difference.

Table 4. Monthly Monitoring of Seawater Temperatures for WMSC 2004/2005.

Month	Big Fisherman Cove Ambient Seawater	Seawater System Discharge
January 2004	59.3° F (15.1° C)	59.3° F (16.1° C)
February 2004	58.4° F (14.6° C)	58.4° F (14.6° C)
March 2004	61.3° F (16.2° C)	61.3° F (16.2° C)
April 2004	62.4° F (16.8 °C)	62.4° F (16.8° C)
May 2004	68.4° F (20.2° C)	68.4° F (20.2° C)
June 2004	64.3° F (17.9° C)	64.3° F (17.9° C)
July 2004	71.2° F (21.7° C)	71.5° F (21.9° C)
August 2004	69.1° F (20.6° C)	69.8° F (21.0° C)
September 2004	69.1° F (20.6° C)	68.2° F (20.1° C)
October 2004	66.1° F (18.9° C)	66.4° F (19.1° C)
November 2004	61.3° F (16.27° C)	60.7° F (15.9° C)
December 2004	61.4° F (16.3° C)	61.4° F (16.3° C)
January 2005	61.3 °F (16.2° C)	62.7° F (15.9° C)
February 2005	60.3° F (15.7° C)	59.2° F (15.1° C)
March 2005	60.7° F (15.9° C)	60.8° F (16.0° C)
April 2005	58.2° F (15.1° C)	58.5° F (14.72° C)
May 2005	66.3° F (16.2° C)	66.5° F (19.1° C)
June 2005	68.4° F (20.2° C)	69.3° F (20.7° C)
Mean	63.8° F (17.6° C)	63.8° F (17.6° C)

Metals

The current permit is not consistent with the 2001 Ocean Plan requirements with regard to Table B constituents, including metals. However, in preparation for this environmental review, samples were collected during dry weather (October 2004) and wet weather (November 2004). Table 5 includes the analytical results of reference samples collected at the seawater intake, waste seawater effluent, and the ASBS receiving waters in Big Fisherman Cove, for Table B metals (marine aquatic life). The waste seawater and ASBS receiving waters were below California Ocean Plan's lowest water quality objectives (six month medians) for metals.

Table 5. Analysis of Waste Seawater, Reference and Receiving Water. October and November 2004.

		October (dry weather)			November (wet weather)			
Analyte µg/L	Ocean Plan 6 month median	Intake Seawater	Waste Seawater	Big Fisherman Cove	Intake Seawater	Waste Seawater	Big Fisherman Cove	Detection limit
Arsenic	8	ND	1.02	1.04	0.998	0.859	0.949	**0.015**
Cadmium	1	0.035	0.033	0.042	0.039	0.044	0.038	**0.01**
Copper	3	0.161	0.174	0.515	0.267	0.106	1.13	**0.01**
Lead	2	0.024	0.02	---	0.05	0.015	0.044	**0.01**
Nickel	5	0.21	0.249	0.304	0.019	0.278	0.275	**0.01**
Selenium	15	ND	ND	ND	ND	ND	ND	**0.015**
Silver	0.7	0.024	ND	ND	ND	ND	ND	**0.01**
Zinc	20	8.36	1.74	2.18	1.32	1.65	2.5	**0.01**

Constituents that were not tested are indicated by dashed symbol in the column (---). Non-detected constituents below the DLR are listed as ND. (CRG Laboratories 2004).

During dry weather the results of the intake seawater (reference) sample and the receiving water in Big Fisherman Cove were below Ocean Plan Table C background concentrations for arsenic (3 µg/L), copper (2 µg/L), and silver (0.16 µg/L). The receiving water was below Table C zinc levels as well. Zinc levels in the reference sample were virtually the same (within typical lab error) as the Table C level of 8.0 µg/L. The receiving water was slightly elevated above the reference sample for copper, but was much lower than the reference sample for zinc.

During wet weather the results of the intake seawater (reference) and the receiving water in Big Fisherman Cove were also below Ocean Plan Table C background concentrations for arsenic, copper, silver, and zinc. The receiving water was noticeably elevated above the reference sample for copper, nickel, and zinc, but this is likely related to storm water runoff (see storm water metals analyses in Table1).

It must be noted that earlier samples were analyzed for metals but State and Regional Water Board staff determined that the procedures and quality assurance for that analysis were inadequate, providing faulty results. Those results are not presented here.

The following mitigating conditions will be required for the exception in relation to the waste seawater effluent:

- *The discharge must comply with all other applicable provisions, including water quality standards, of the Ocean Plan. Natural water quality conditions in the receiving water, seaward of the surf zone, must not be altered as a result of the discharge. The surf zone is defined as the area between the breaking waves and the shoreline at any one time. Natural water quality will be defined, based on a review of the monitoring data, by Regional Water Board staff in consultation with the Division of Water Quality of the State Water Board. For constituents other than indicator bacteria, natural water quality will be determined using the reference station in the ocean near the seawater intake structure. For indicator bacteria, the Ocean Plan bacteria objectives will be used.*

- *WMSC will not discharge chemical additives, including antibiotics, in the seawater system effluent. In addition and at a minimum, WMSC, for its waste seawater effluent, must comply with effluent limits implementing Table B water quality objectives as required in Section III.C. of the Ocean Plan (2001).*

- *For metals analysis, waste seawater effluent, storm water effluent, reference samples, and receiving water samples must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.*

- *Flows for the seawater discharge system and storm water runoff (by storm event) must be reported quarterly to the Regional Water Board.*

- *Once during the upcoming permit cycle, a bioaccumulation study using mussels (Mytilus californianus) must be conducted to determine the concentrations of metals near field (within Big Fisherman Cove) and far field (near the seawater intake structure). The Regional Water Board, in consultation with the Division of Water Quality, must approve the study design. The results of the survey must be completed and submitted to the Regional Water Board at least six months prior to the end of the permit cycle (permit expiration). Based on the study results, the Regional Water Board, in consultation with the Division of Water Quality, may adjust the study design in subsequent permits, or add additional test organisms.*

- *During the first year of each permit cycle two effluent samples must be collected from the waste seawater discharge (once during dry weather and once during wet weather, i.e. a storm event). In addition, reference samples must also be collected along with the effluent samples. Reference samples will be collected in the ocean at a station at the seawater intake structure (prior to entering the intake). Samples collected at the seawater intake structure will represent natural water quality for all Ocean Plan constituents except indicator bacteria and total chlorine residual. Samples at the reference station may be collected immediately following a storm event, but in no case more than 24 hours after, if sampling conditions are unsafe during the storm. All of these samples must be analyzed for all Ocean Plan Table B constituents, pH, salinity, and temperature, except that samples collected at the seawater intake do not require toxicity testing; instead, samples collected at the seawater intake structure must be analyzed for Ocean Plan indicator bacteria. Based on the results from the first year, the Regional Water Board will determine the frequency of sampling (at a minimum, annually during wet weather) and the constituents to be tested during the remainder of the permit cycle, except that ammonia nitrogen, pH, salinity, and temperature must be tested at least annually. Chronic toxicity (for at least one consistent invertebrate species) must be tested at least annually for the waste seawater effluent. In addition, samples collected at the seawater intake must be analyzed for indicator bacteria according to the requirements of condition 16.*

- *Once annually, the subtidal sediment near the seawater discharge system and storm water outfall in Big Fisherman Cove must be sampled and analyzed for Ocean Plan Table B constituents. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. Based on the first year sample results the Regional Water Board will determine specific constituents to be tested during the remainder of each permit cycle, except that acute toxicity for sediment must be tested annually.*

- *The Regional Water Board will include these mitigating conditions in the National Pollutant Discharge Elimination System (NPDES) permit for the seawater effluent. Alternatively, the Regional Water Board may regulate the storm water discharge in a storm water NPDES permit, and, in that case, would include those conditions relative to storm water in that storm water NPDES permit. In the latter case, all conditions would be included, in some combination, in the waste seawater effluent permit and the storm water permit.*

Biological Pollutants (Invasive Species)

Any marine organism not indigenous to the Southern California Bight that may possibly be introduced through the laboratory or aquarium discharges is considered a biological pollutant. Currently available information (California Department of Fish and Game (DFG) 2005) indicates that there are no invasive species that would be associated with a possible introduction from the WMSC discharges. Still, the potential for such introductions of potentially invasive species or pathogenic organisms does exist, and such accidental introductions could alter the marine community in an undesirable way.

Examples of marine invasive species potentially found in the Southern California Bight include, but may not be limited to: *Caulerpa taxifolia*, a Mediterranean Sea green algae; *Terebrasabella heterouncinata,* a South African parasitic polychaete worm which parasitizes marine mollusks such as abalone; *Potamocorbula amurenis*, an Asian clam that is a highly efficient filter feeder; and *Carcinus maenas*, the European Green crab, a voracious predator on native invertebrates (CDFG 2005). There is no evidence that these invasive species are in Big Fisherman Cove at the time of preparing this document. *Sargassum muticans*, an invasive brown algae, is found in Big Fisherman Cove, but

it is ubiquitous throughout the Southern California Bight. Another exotic brown algae (*Undaria pinnatifida*) have been found on Santa Catalina Island (Silva, et al. 2002).

Invasive species in the marine environment generally 'arrive' to a location by one of these methods: 1) they are discharged as part of the ballast water from a docked or passing ship; 2) they are inadvertently released; 3) they come in as a 'stowaway' on another species; or 4) they are deliberately released (CDFG 2001). The pathways that are most applicable to WMSC are inadvertent releases or "stowaways" on another species.

Before being introduced into the research laboratory tanks at WMSC, specimens are currently inspected for incidental invasive species. If a specimen is suspected of carrying or containing an invasive species, then it is quarantined. If this occurs, the waste seawater from the quarantine tank is discharged to the sewer, thereby attempting to protect against biological contamination of the ASBS from the research laboratories.

If during the biological surveys required as required by the exception, any of the above species or any other invasives that are not listed above are detected, WMSC must notify the State Water Board and the California Department of Fish and Game (Marine Division) immediately.

The following mitigating condition will be required for the exception as they relate to biological pollutants:

- *WMSC must pursue and implement a program for prevention of Biological Pollutants (non-native invasive species) in consultation with the California Department of Fish and Game Marine Resources Division.*

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
4. BIOLOGICAL RESOURCES. Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the DFG or USFWS?	☐	☑	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the DFG or USFWS?	☐	☑	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the federal Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, *etc.*) through direct removal, filling, hydrological interruption or other means?	☐	☐	☐	☑
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☑
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☑

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☑

Impacts to Marine Biota

Four qualitative surveys were considered in this Initial Study. These surveys were performed by 1) Bob Givens, et al. 1965 prior to the construction of the lab and seawater system, 2) Bob Givens in 1977 prior to construction of the mole and new pier, 3) Bob Given and Jan Dykzeul for the SWRCB Reconnaissance Survey (1979), and 4) WMSC in 2004. It should be noted that the fieldwork for the SWRCB 1979 document was probably conducted during the period 1977-1978, but no record of exact field survey events is available; therefore we will refer to this data by the 1979 date of publication. In addition, the WMSC 2004 data included some quantitative data (population densities) for only certain species. Finally, a fifth source of information is quantitative measures (population densities) of selected species performed by the Catalina Conservancy Divers and provided by WMSC in its November 2004 letter to the Regional Board.

Benthic Macrophytes

The results of four surveys performed at Big Fisherman Cove are presented in Appendix B. Assemblage analysis in each survey was reported as binary data (presence/absence) that weighs all species the same, and is the only form of data collected. The number of algae species reported increased from four in 1965, to 11 in 1977, 15 in 1979, and 25 in 2004. In the authors' opinion, it is highly unlikely that this is a result of an actual increase in algal species present. Instead this may be a result of survey design, specifically more focus toward algae species in later surveys, algal identification expertise, etc. for the 1965, 1977, and 1979 surveys.

No data is available regarding density of the surf grass *Phyllospadix* in Big Fisherman Cove. This is an important habitat forming species and should be included in future quantitative surveys.

Benthic Invertebrates

The results of four surveys performed at Big Fisherman Cove are presented in Appendix C. Assemblage analysis in each survey was reported as binary data (presence/absence) that weighs all species the same, and is the only form of data collected. In 1965, seven species were reported and eight species were reported for 1977. In 1979, 30 species were observed. In 2004, WMSC identified 29 invertebrate species on the north wall of Big Fisherman Cove and 35 on the south wall; a total of 42 invertebrate species were identified in Big Fisherman Cove.

It is interesting that of the eight species reported in 1977, only one species overlapped with the 1965 listing. In 1979 the bulk of the species (24) inhabited the soft bottom substrate and only seven species were reported solely on rock substrate. In 2004, the opposite is true. Of the 42 species reported, 41 species were rock dwellers and only one species, a tube-dwelling anemone, dwells solely on the soft bottom substrate.

Just as in the algal survey data there is an apparent increase in invertebrate species over time. Again, in the authors' opinion this is highly unlikely. Furthermore, it is unlikely that there were huge shifts in habitat during the intervening years. Instead it is likely that the differences between the survey results are due to survey design/emphasis. For example, it appears that in 1979 the surveyors concentrated on the soft bottom substrate and in 2004 the surveyors concentrated on the rock substrate.

Comparison of Species Densities

Species densities have been consistently monitored by Catalina Conservancy Divers (CCD) in conjunction with the WMSC at established sampling sites since 1992. CCD collected data since 1992 at the seawater system intake pipe(s) for sea urchins and giant kelp. CCD also collected data since 1997 at their Pumpernickel Cove site, located 3000 feet from the seawater system discharge, for sea urchins, warty sea cucumber, southern sea palm and giant kelp. For the Initial Study we will consider the both Pumpernickel and the Intake sites as reference locations. For these reference sites the most recent data provided by WMSC was apparently for spring (May and June) 2003. This quantitative information was supplied by WMSC in their letter to the Regional Board of November 4, 2004 in the

form of hard copy graphs. Raw data was not supplied by WMSC. Therefore it should be noted that the numbers presented in this report are interpretations/approximations from those graphs.

Giant kelp density data was collected at three stations at the Intake, at five, ten and twenty meters depth. The five and ten meter depths show similar patterns of kelp density during different years (i.e., oceanographic conditions). Kelp densities were lowest in the periods winter 1993 through spring 1994, winter 1997 through spring 1998, and the summer of 2000. At the Intake sites the highest density of juvenile giant kelp was recorded at five meters, at about 2.7/m^2 in the fall of 1995. The five-meter site also had the highest density recorded for adult giant kelp plants at the Intake, about 1.2/m^2 in the winter of 2000. The twenty-meter depth station did not exactly track kelp bed fluctuations at the other two Intake stations, but a similar dieback was apparent during the fall 97 – spring 98 period.

At Pumpernickel Cove the highest density of juvenile giant kelp was about 5.25/m^2 in the fall of 1999 and for adult giant kelp plants was about 4.75/m^2 in the winter of 2000. Giant kelp density for both Pumpernickel and the Intake, at five and ten meters, fluctuated similarly during different years (i.e., oceanographic conditions) during the period 1997-2003.

Sea urchin density data was collected for three species (purple, red and blacks) at three stations at the Intake, at five, ten and twenty meters depth. The density data was for the period 1992-2003. Purple urchins were most abundant at the five meter Intake station, which is expected since purple urchins are common in the intertidal zone and shallow waters. Purple urchins were nearly non-existent at ten and twenty meters, and black urchins clearly outnumbered red urchins at those depths. Total urchins (all three species combined) displayed the greatest density for the period 1992-2003 in 2001, with approximately 5/m^2 at five meters, 3/m^2 at ten meters, ands almost 6/m^2 at twenty meters. Total urchins were least dense in 2002, with no urchins reported, but their numbers rebounded to levels of 2-5/m^2 in 2003. Urchin densities were consistently lower at Pumpernickel Cove than at the Intake sites. The highest total urchin density there was just over 2.5/m^2, but there was no apparent population crash in 2002 as shown for the Intake sites.

Density data for southern sea palms and warty sea cucumbers were collected during the period 1997-2003 at Pumpernickel Cove. The highest density of sea palms, about 0.35/m^2 was recorded in the summer of 1997. No sea palms were found in 1999 and in the fall of 2001. The highest density of sea cucumbers, slightly over 0.8/m^2 was recorded in the summer of 1997. No sea cucumbers were found in the fall of 1998.

WMSC conducted another quantitative survey of marine life in 2004 at the north wall of Big Fisherman Cove relatively closer to the discharge, at 510 feet away. Of the target invertebrates bat stars, purple urchins, and keyhole limpets were absent. Giant spined sea stars, spiny lobster, and yellow gorgonians were present but in very low densities. (Note, with regard to yellow gorgonians, the authors are unsure as to whether this is the same as the California golden gorgonian listed in Appendix C, since no scientific names were included in the quantitative data provided by WMSC). Southern sea palms were more abundant than adult giant kelp, and warty sea cucumbers were more abundant than black sea urchins (the most abundant sea urchin). Table 6 presents a comparison of the most recent density data for the Intake, Pumpernickel and the north wall of Big Fisherman Cove.

Table 6. Data from 2003 and 2004 surveys, density/m2

Sampling Site	Black sea urchin	Red sea urchin	Warty sea cucumber	Southern sea palm	Giant kelp juvenile	Giant kelp adult
Seawater Intake – 1350' @ 5m (2003)	0.90	0.90	*	*	0.30	0.65
Seawater Intake – 1350' @ 10m (2003)	2.80	0.20	*	*	<0.01	0.35
Seawater Intake – 1350' @ 20m (2003)	4.75	0.30	*	*	<0.01	0.02
Pumpernickel – 3000' (2003)	0.25	0.01	0.83	0.05	<0.01	3.10
North wall – 510' (2004)	0.10	0.01	0.21	0.83	2.70	5.80

*Note: * indicates no data provided*

Black sea urchins near the discharge were at relatively low densities when compared to Pumpernickel and the Intake Sites. Similarly, warty sea cucumbers were also at comparatively low densities. Conversely, sea palms and giant kelp were at high densities near the discharge than at the reference sites. Ultimately this data is severely limited because we are unable to compare to what the reference site densities were in 2004. Therefore, since the data from the reference sites is from a different year than the data from the site nearer the discharge, no direct comparison is legitimate.

Fish Community

Fish are motile and can swim in and out of an area in pursuit of prey, or even if water quality conditions temporarily degrade. Fishing pressures may also reduce their numbers locally. Therefore, fish community composition data may not reflect environmental perturbations as well as less motile species (such as benthic invertebrates or primary producers). However, since the WMSC waste seawater is relatively constant, and storm water discharges are all draining seasonally to the same location, it is still worth considering possible impacts to fish species assemblages.

The results of four surveys performed at Big Fisherman Cove are presented in Appendix D. Assemblage analysis in the 1965, 1977 and 1979 surveys was reported as binary data (presence/absence) that weighs all species the same, and was the only form of data collected. It is unknown (and unlikely) that the surveyors followed the exact same transects or strictly followed the same survey protocols. Three species were identified in 1965, nine species in 1977, and 13 species in 1979. Interestingly, all of the species recorded in the 1965 and 1977 surveys were also recorded in the 1979 survey, with additional species as well.

In the 2004 survey there were larger numbers of fish species present: 15 on the north wall nearer the discharge, 17 at the south wall away from the discharge, and a total of 21 for Big Fisherman Cove. For the 2004 survey most of the fish data is qualitative (presence/absence), but some fish species, black surfperch, blacksmith, garibaldi, kelp bass, rock wrasse, senorita, and sheephead, were quantitatively reported at the north wall of Big Fisherman Cove. Of these, the most abundant were kelp bass at about $0.85/m^2$, adult blacksmith at about $0.64/m^2$, juvenile blacksmith at about $0.32/m^2$, adult senorita at about $0.57/m^2$, and juvenile senorita $0.29/m^2$.

Just as with the algal and invertebrate data there is an apparent increase in fish species over time. Once again, in the authors' opinion this is highly unlikely. Instead, it is likely that the differences between the survey results are due to survey design/emphasis.

Comparison of the North and South Walls of Big Fisherman Cove

In 2004 WMSC conducted a survey (presence/absence) of marine biota near the discharge (north wall) and a reference location away from the discharge (south wall). Twenty species of algae, 29 species of benthic invertebrates, and 15 fish species were recorded along the north wall. Sixteen species of algae, 35 species of benthic invertebrates, and 17 fish species were recorded along the south wall. More species of algae were found nearer the discharge, including the filamentous green algae *Chaetomorpha* sp. While slightly more fish species were recorded away from the discharge, the difference was consistent with natural temporal patchiness. The largest difference was with benthic invertebrate species, with six fewer species found nearer the discharge. However there does not appear to be a conclusive pattern consistent with a discharge impact. This qualitative data is limited in utility and is possibly not sensitive enough to detect impacts if they occur.

Limitations of existing data and recommendations for further work

While no gross impacts are obvious, it is very difficult to make absolute statements based on the data available. Data sets used here have several limitations. The surveys obviously varied in collection methods, effort, and spatio-temporal coverage, factors that can influence the number of taxa observed. Cryptic or very small species may be under-sampled. The life histories and movement potential of species should also be considered. Within species differences in movement characteristics during their juvenile and adult stages must be taken into account; different life stages may be affected differently by the discharges. Different species can have different patterns of movement, whether random dispersal or directed migration. For example, many fish species that occur in this type of habitat have high emigration and immigration rates, which contributes to the large amount of temporal and spatial patchiness.

Given the apparent inconsistencies in survey designs, and resulting limitations in the utility of the data, it is not possible to ascertain impacts from the discharge. Future study design should take into account the limitations described here, and a more robust quantitative study must be conducted near field (at the discharge in Big Fisherman Cove) and at some adequate reference location. Quantitative, consistent, and sensitive techniques must be utilized in order to better detect impacts if they occur. Future sampling should be conducted at all locations with the same amount of effort for species diversity and other measures to be comparable across the study area. Monitoring should be performed, on a more frequent basis, at least once every permit cycle. Surveys should be completed during the same season(s) and at approximately the same tidal height.

Quadrants should be established for algae, invertebrates and smaller or less motile fish species, at locations near the discharge and at a far-field reference location, and possessing the same habitat conditions. Density measurements, very near-the discharge and far-field over a larger habitat scale, for certain large macrophytes (e.g., *Macrocystis or Phyllospadix*) and large invertebrates. Finally, surveys for large, motile fish species, if performed, should employ established transects within the same season(s), time of day, and tidal height.

The following mitigating condition will be required to monitor the ongoing status and protection of marine aquatic life:

- *At least once every permit cycle (every five years), a quantitative survey of benthic marine life must be performed near the discharge and at a reference site. The Regional Water Board, in consultation with the State Water Board's Division of Water Quality, must approve the survey design. The results of the survey must be completed and submitted to the Regional Water Board within six months before the end of the permit cycle.*

- *Once during the upcoming permit cycle, a bioaccumulation study using mussels (Mytilus californianus) must be conducted to determine the concentrations of metals near field (within Big Fisherman Cove) and far field (near the seawater intake structure). The Regional Water Board, in consultation with the Division of Water Quality, must approve the study design. The results of the survey must be completed and submitted to the Regional Water Board at least six months prior to the end of the permit cycle (permit expiration). Based on the study results, the Regional Water Board, in consultation with the Division of Water Quality, may adjust the study design in subsequent permits, or add additional test organisms.*

5. AGRICULTURAL RESOURCES. In determining whether impacts to agricultural resources are significant environmental impacts, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping & Monitoring Program of the California Resources Agency, to non-agricultural uses?	☐	☐	☐	☑
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☑
c) Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use?	☐	☐	☐	☑

6. NOISE. Would the project result in:

a) Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☑

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☑
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☑
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☑
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing in or working in the project area to excessive noise levels?	☐	☐	☐	☑
f) For a project within the vicinity of a private airstrip, would the project expose people residing in or working in the project area to excessive noise levels?	☐	☐	☐	☑
7. LAND USE AND PLANNING. Would the project:				
a) Physically divide an established community?	☐	☐	☐	☑
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☑
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☑
8. MINERAL RESOURCES. Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of future value to the region and the residents of the State?	☐	☐	☐	☑
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☑
9. HAZARDS and HAZARDOUS MATERIALS. Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☑

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☑

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼ mile of an existing or proposed school?	☐	☐	☐	☑
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or to the environment?	☐	☐	☐	☑
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or a public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☑
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☑
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☑
h) Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wild lands are adjacent to urbanized areas or where residences are intermixed with wild lands?	☐	☐	☐	☑
10. POPULATION AND HOUSING. Would the project:				
a) Induce substantial population growth in an area either directly (*e.g.*, by proposing new homes and businesses) or indirectly (*e.g.*, through extension of roads or other infrastructure)?	☐	☐	☐	☑
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑

11. TRANSPORTATION / CIRCULATION. Would the project:

a) Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (*i.e.*, result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?	☐	☐	☐	☑
b) Substantially increase hazards due to a design feature (*e.g.*, sharp curves or dangerous intersections) or incompatible uses (*e.g.*, farm equipment)?	☐	☐	☐	☑
c) Result in inadequate emergency access?	☐	☐	☐	☑

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Result in inadequate parking capacity?	☐	☐	☐	☑
e) Exceed, either individually or cumulatively, a level-of-service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☑
f) Conflict with adopted policies supporting alternative transportation (*e.g.*, bus turnouts, bicycle racks)?	☐	☐	☐	☑
g) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☑

12. PUBLIC SERVICES. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service rations, response times or other performance objectives for any of the public services:

a) Fire protection?	☐	☐	☐	☑
b) Police protection?	☐	☐	☐	☑
c) Schools?	☐	☐	☐	☑
d) Parks?	☐	☐	☐	☑
e) Other public facilities?	☐	☐	☐	☑

13. UTILITIES AND SERVICE SYSTEMS. Would the project:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☑
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental impacts?	☐	☐	☐	☑
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental impacts?	☐	☐	☐	☑

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☑
e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☑
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☑

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☑
14. AESTHETICS. Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☑
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☑
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☑
d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	☐	☐	☐	☑
15. CULTURAL RESOURCES. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☑
b) Cause a substantial adverse change in the significance of an archaeological resource as defined in §15064.5?	☐	☐	☐	☑
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☑
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☑
16. RECREATION. Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☑
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☐	☑

17. MANDATORY FINDINGS OF SIGNIFICANCE.

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☑	☐	☐

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)	☐	☑	☐	☐
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☑

Under the less stringent and somewhat inadequate controls currently in force, WMSC discharges waste into the ASBS and is in violation of the ASBS prohibition. The project, granting an exception with special mitigating conditions (i.e. special protections), will allow the continued discharge of waste seawater and storm water runoff, and therefore has the potential to degrade water quality. However, under these special protections, the quality of the discharge will improve from current conditions, with an important reduction in the potential to degrade water quality. If all of the special protections designed to limit the discharge are met, as described in this Initial Study, the WMSC discharge will not compromise the protection of ocean waters of the ASBS for beneficial uses, and the public interest will be served.

Granting the conditional exception, likewise, will not violate federal antidegradation requirements because water quality will not be lowered, but rather will be improved. Further, allowance of the exception will not violate the State Water Board's antidegradation policy (SWRCB 1968) since water quality conditions will improve; the discharge will not unreasonably affect present and anticipated beneficial uses; the discharge will not result in water quality lower than that prescribed in the Ocean Plan; and, the people of California benefit from the research and education provided by WMSC while beneficial uses will still be protected.

DETERMINATION

Based on this initial evaluation, we find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because mitigation measures have been incorporated into the project. A MITIGATED NEGATIVE DECLARATION will be prepared.

Prepared By:

Dominic Gregorio — Date
Senior Environmental Scientist
Ocean Unit

Constance S. Anderson — Date
Environmental Scientist
Ocean Unit

Reviewed by:

Frank Roddy — Date
Staff Environmental Scientist
Environmental Policy Support

References

Associated Laboratories. 2005. Stormwater Analyses, WMSC.

Bailey, Harry P. 1966. Weather of Southern California. University of California Press.

Caldeira, Miguel. 1998. UCLA PhD Thesis; Multidisciplinary Studies of the Island Mass Effect Phenomena Around Santa Catalina Island, Southern California Bight.

California Department of Fish and Game (DFG). 2001. California's Living Marine Resources: A Status Report.

California Department of Fish and Game (DFG). 2005. California Natural Diversity Data Base, Santa Catalina North Quad, April 2005.

California Department of Fish and Game (DFG). 2005. State and Federally Listed Endangered and Threatened Animals of California, July 2005.

California State Coastal Conservancy. May 3, 2005. Derelict Fishing Gear Removal Pilot Program. SeaDoc Society. Davis, California.

California State University, Long Beach. 2005. Biology of the Southern California Bight. http://seis.natsci.csulb.edu/bperry/scbweb/BIOLOGY.HTM.

Catalina Island Conservancy. 2005. Rainfall Data for Two Harbors, Santa Catalina Island: October 1957 – June 2005. http://www.catalinaconservancy.org/ecology/weather/rainfall.cfm

Code of Federal Regulation, 50CFR 1601-04.

Curtis, M., MBC Applied Environmental Sciences. 2003. Raw data on kelp bed canopy.

Dailey, M.D., D.J. Reish, and J.W. Anderson. 1993. Ecology of the Southern California Bight: A Synthesis and Interpretation. University of California Press, Berkeley, California. xvi+926 pp.

Dawson, E.Y. 1956. How to Know the Seaweeds. Berkeley- Los Angeles, California: University of California Press. Dawson, E. Y. 1966. Seashore Plants of Southern California. Berkeley- Los Angeles, California: University of California Press.

Fager, E.W. 1968. A sand-bottom epifaunal community of invertebrates in shallow water. Limnology and Oceanography 13(3): 448-464.

Gotshall, Daniel. 1994. Guide to Marine Invertebrates, Alaska to Baja California. Third Printing. Sea Challengers, Monterey, California.

Hinton, Sam. 1969. Seashore Life of Southern California. University of California Press.

Kummel, Marc. 2001. Rainfall Data for Downtown Santa Barbara. *http://www.rain.org/~mkummel/stumpers/sb-rain.xls*

Los Angeles County, Department of Regional Planning. 1983. Local Coastal Plan, Santa Catalina Island.

MBC Applied Environmental Sciences. 2004. Chronic Toxicity Testing, WMSC.

McArdle, D. 1997. California Marine Protected Areas. California Sea Grant College System, University of California, La Jolla, California. xiii+268 pp. http://www.csgc.ucsd.edu.

Mertes, Leal A. K., Martella, Kristine D., Ruocco, Marco, and Bushing, William W. 2005. Watershed Analysis for Runoff and Erosion Potential on Santa Catalina, Santa Cruz, and Santa Rosa Islands. Department of Geography, University of California, Santa Barbara, California and Catalina Island Conservancy, Avalon, California. www.starthrower.org/research/conservation/cis99mertes.pdf. 461-468 pp.

Michaels, Anthony. November 5, 2004. Letter from USC Wrigley Institute to David Hung, Regional Water Quality Control Board. University of Southern California, Los Angeles, California.

Michaels, Anthony. 2005. Various personal/verbal/email communications with State Water Board staff Connie Anderson and Dominic Gregorio. University of Southern California, Los Angeles, California.

Miller, DJ & Lea RN, 1972, Fish Bulletin 157, Guide to the Coastal Marine Fishes of California, Department of Fish and Game, 235 pp.

NCCOS, National Centers for Coastal Ocean Science, December 2003. A Biogeographic Assessment off North/Central California: To Support the Joint Management Plan Review for Cordell Bank, Gulf of the Farallones, and Monterey Bay National Marine Sanctuaries: Phase I – Marine Fishes, Birds and Mammals. http://ccma.nos.noaa.gov/ecosystems/sanctuaries/nwhi.html.

NOAA National Marine Fisheries Service Office of Protected Resources 2005.

Point Reyes Bird Observatory (PRBO), April 2005. The California Current Marine Bird Conservation Plan. PRBO Conservation Science Publication. www.prbo.org.

Rand GM & Petrocelli SR, 1985. Fundamentals of Aquatic Toxicology, Taylor and Francis, 666pp.

Reish, Donald J, 1972, Marine Life of Southern California, 164 pp.

RWQCB. 1969. Order No. 00-140: NPDES No. CA0056661, waste discharge requirements for University of California Wrigley Marine Science Center, Los Angeles County.

Silva, Paul C, Woodfield, Rachel A, Cohen, Andrew N, Harris, Leslie H & Goddard, Jeffrey H.R. 2002. First Report of the Asian Kelp *Undaria pinnaitfida* in the Northeastern Pacific Ocean. Biological Invasions 4: Kluwer Academic Publishers, Netherlands. 334-337 pp.

Southern California Coastal Water Research Project (SCCWRP). 2003. Final Report: Discharges into State Water Quality Protection Areas. Final report to the State Water Resources Control Board, Contract 01-187-250. 26pp.

Southern California Coastal Water Research Project (SCCWRP). 1998. Southern California Bight 1994 Pilot Project.

Sumich, J.L. 1999. An Introduction to the Biology of Marine Life, Seventh Ed. WCB/McGraw Hill, Boston, Massachusetts. xii+484 pp.

SWRCB. 1968. Resolution 68-16: statement of policy with respect to maintaining high quality of waters in California. 2 pp.

SWRCB. 1972. Resolution 72-45: water quality control plan for ocean waters of California. 13 pp.

SWRCB. 1974. Resolution 74-28: designating Areas of Special Biological Significance and authorizing notification of the Regional Water Quality Control Boards and the Environmental Protection Agency. 2 pp.

SWRCB. 1979. California Marine Waters Areas of Special Biological Significance Reconnaissance Survey Report: Santa Catalina Island Subareas One-Four, Los Angeles County Water Quality Monitoring Report No. 79-6. 192 pp.

SWRCB. 1983. Resolution 83-87: Water Quality Control Plan for Ocean Waters of California. 14 pp.

SWRCB. 2000. State Mussel Watch Program. www.waterboards.ca.gov/programs/smw.

SWRCB. 2001. Resolution 2000-18: water quality control plan for ocean waters of California – California ocean plan. 40 pp.

SWRCB. 2003. Resolution 2003-0009: approval of the 2002 federal Clean Water Act section 303(d) list of water quality limited segments. 197 pp.

SWRCB. April 2005. Resolution 2005-0035: amendments to the California Ocean Plan, Reasonable Potential and Areas of Special Biological Significance.

Terraserver. 2005. Various aerial photographic resources Catalina Island. http://www.Terraserver.com.

U.S. Department of Commerce National Oceanic and Atmospheric Administration National Ocean Service Office of Ocean and Coastal Resource Management Marine Sanctuaries Division. 2004. A Review of the Ecological Effectiveness of Subtidal Marine Reserves in California Part I Synopsis of Scientific Investigations.

United States Geological Survey. 2005. Catalina Island. Various aerial photographic and topographic mapping resources. http://www.USGS.gov.

Wrigley Marine Science Center. 2004. WMSC Monitoring Reports to the Los Angeles Regional Water Quality Control Board.

Wrigley Marine Science Center. 2005. WMSC Monitoring Reports to the Los Angeles Regional Water Quality Control Board.

Appendix A

Santa Catalina Island Rainfall, Two Harbors Collection Site

Total Rain Days	1201
Total Rainfall	482.97"
Average rain days per year	27
Average rainfall per rain day	0.40"
Minimum rain days	4 (1967)
Maximum rain days	64 (1997)
Maximum rainfall in 24 hours	5.25" (11/21/1967)

From: Catalina Island Conservancy. 2005. Rainfall Data for Two Harbors, Santa Catalina Island: October 1957 – June 2005. http://www.catalinaconservancy.org/ecology/weather/rainfall.cfm

Appendix B. Algal Species found at Big Fisherman Cove. Presence listed by survey.

Algal Group	Species Name	Common Name	Substrate	Givens et. al. 1965	Givens et. al. 1977	SWRCB 1979	WMSC 2004 (South Wall)	WMSC 2004 (North Wall)
Phaeophyta								
	Acinetospora nicholsoniae		Rock			X		
	Colpomenia sp.		Rock				X	X
	Cystoseira osmundacea		Rock				X	X
	Dictyopteris undulata		Rock			X		
	Dictyota sp.		Rock		X	X		
	Dictyota binghamiae		Rock				X	X
	Dictyota undulata		Rock		X			
	Egregia menziesii		Rock	X			X	X
	Eisenia arborea	Southern sea palm	Rock			X	X	X
	Hesperophycus harveyanus		Rock			X		
	Laminaria farlowii	"Kelp"	Rock					X
	Macrocystis pyrifera	Giant Kelp	Rock	X	X	X	X	X
	Pelvetia fastigiata	Brown rock weed	Rock			X		
	Sargassum muticans		Rock			X	X	X
	Zonaria farlowii		Rock			X	X	X
Chlorophyta								
	Chaetomorpha sp.		Rock					X
	Codium fragile	Sea staghorn	Rock		X	X	X	X
	Codium setchellii		Rock				X	X
	Ulva sp.	Sea lettuce	Rock		X	X		X
	Urospora penicilliformis		Rock		X	X		
Rhodophyta								
	Asparagopsis svensonii		Rock					X
	Callithamnion pikeanum		Rock					X
	Corallina sp.		Rock				X	X
	Corallina officinalis		Rock		X	X		
	Fauchea lacinata		Rock					X
	Gastroclonium subarticulatum		Rock				X	X
	Gellidium sp.		Rock				X	X
	Laurencia sp.		Rock		X			
	Lithophyllum spp.	encrusting coralline	Rock	X			X	X
	Lithothamnium sp.	encrusting coralline	Rock			X		
	Lithothamnium giganteum	encrusting coralline	Rock		X			
	Lithothris asperrgillum		Rock		X			
	Mazzaella affinis		Rock					X
	Microcladia coulteri		Rock					X
	Plocamium cartilagineum		Rock				X	X
	Pterocladia sp.		Rock		X			X
	Pterocladia capillacea		Rock			X		
	Rhodymenia californica		Rock	X			X	X

Appendix C. Invertebrate Species found at Big Fisherman Cove. Presence listed by survey.

Invertebrate Group	Species Name	Common Name	Substrate	Givens et. al. 1965	Givens et. al. 1977	SWRCB 1979	WMSC 2004 (South Wall)	WMSC 2004 (North Wall)
Poriferans								
	Lucetta losangelensis	Sponge	Rock					X
	Acarnus erithacus	Red volcano sponge	Rock				X	X
	Cliona sp.	Yellow sponge	Rock					X
	Hymenemphisastra cyanocrypta	Cobalt sponge	Rock				X	
	Ophilitaspongia pennata	Red sponge	Rock				X	X
	Unknown	Sponge	Rock	X				
Cnidarians								
Hydrozoans								
	Hydractinia milleri	Hedgehog Hydroid	Rock				X	
	Plumularia sp.	Hydroid	Rock	X			X	
Anthozoans								
	Alcyonium rudyi	Octocoral	Rock				X	
	Ballanophyilla elegans	Orange cup coral	Rock					X
	Corynactis californica	Club-tipped anemone	Rock	X			X	X
	Lophogorgia chilensis	Red gorgonian	Rock				X	X
	Muricea californica	California golden gorgonian	Rock				X	X
	Muricea fruticosa	Brown gorgonian	Rock				X	X
	Pachycerianthus fimbriatus	Tube-dwelling anemone	Sand	X			X	X
Ectoprocts								
	Bugula californica	Moss animal	Rock				X	X
	Diaperoecia californica	Southern staghorn bryozoan	Rock				X	
	Membranopora sp.	Encrusting bryozoan	Rock					X
Sipunculids								
	Golfingia sp.	Peanut worm	Sand			X		
Phoronids								
	Phoronopsis californica	Phoronid worm	Mud	X		X		
Annelids								
Polychaetes								
	Amaeana occidentalis	Polychaete	Sand			X		
	Ceratonereis paucidentate	Polychaete	Sand			X		
	Euclymeninae	Polychaete	Sand			X		
	Exogone lourei	Polychaete	Sand			X		
	Exogone molesta	Polychaete	Sand			X		
	Lumbrineris zonata	Polychaete	Sand			X		
	Minuspio cirrifera	Polychaete	Sand			X		
	Myxicola infundibulum	Terebellid worm	Rock, Sand					X
	Paraonides	Polychaete	Sand			X		
	Phragmatopoma californica	Colonial sand tube worm	Rock				X	
	Phylo felix	Polychaete	Sand			X		
	Praxillella affinis pacifica	Polychaete	Sand			X		
	Salmacina tribranchiata	Fragile tube worm	Rock				X	
	Scolelepis	Polychaete	Sand			X		

Invertebrate Group	Species Name	Common Name	Substrate	Givens et. al. 1965	Givens et. al. 1977	SWRCB 1979	WMSC 2004 (South Wall)	WMSC 2004 (North Wall)
	Serpula vermicularis	Serpullid worm	Rock				X	X
	Spiochaetopterus costarum	Polychaete	Sand			X		
	Spirobranchus spinosus	Christmas tree worm	Rock	X	X	X	X	
	Tharyx (unidentifiable)	Polychaete	Sand			X		
	Thelepus crispus	Sabellid worm	Rock, Sand				X	X
Molluscs								
Bivalves								
	Chaceia ovoidea	Wart-necked piddock	Rock				X	
	Crassedoma giganteum	Rock scallop	Rock				X	X
	Periploma	Clam	Sand			X		
	Phacoides approximatus	Clam	Sand			X		
	Solen rosaceus	Rosy jackknife clam	Sand			X		
	Tagelus californianus	Clam	Sand			X		
	Tellina	Clam	Sand			X		
Gastropods								
	Conus californicus	California cone	Rock, Sand				X	X
	Cyprea spadicea	Chestnut cowry	Rock				X	
	Kelletia kelletii	Kellet's whelk	Rock					X
	Lithopoma undosum	Wavy turban snail	Rock				X	X
	Norrisa norrisi	Norris's top snail	Rock				X	X
	Olivella biplicata	Olive snail	Sand			X		
	Serpulorbis squamigerus	Scaled worm shell	Rock		X		X	X
	Tegula sp.	Turban snail	Rock				X	X
Arthropods								
Crustaceans								
	Ampelisca cristata	Amphipod	Sand			X		
	Janiridae (unidentifiable)	Isopod	Sand			X		
	Chthamalus fissus	Barnacle	Rock		X	X		
	Tetraclita squamosa elegans	Barnacle	Rock		X	X		
	Tetraclita squamosa rubescens	Barnacle	Rock		X	X		
	Pagurus sp.	Hermit crab	Rock				X	
	Panulirus interruptus	Spiny lobster	Rock				X	X
Echinoderms								
Asteroids								
	Linckia columbiae	Fragile star	Rock	X			X	X
	Ophiopsilla californica	Brittle star	Rock				X	
	Patiria miniata	Sea star	Rock		X	X		
	Pisaster giganteus	Giant spined sea star	Rock		X	X		X
Holothuroids								
	Parastichopus parvimensis	Warty sea cucumber	Rock, Sand		X	X	X	X
Echinoids								
	Lytechinus pictus	Urchin	Sand			X		
	Centrostephanus coronatus	Black sea urchin	Rock				X	X

Invertebrate Group	Species Name	Common Name	Substrate	Givens et. al. 1965	Givens et. al. 1977	SWRCB 1979	WMSC 2004 (South Wall)	WMSC 2004 (North Wall)
	Strongylocentrotus franciscanus	Red sea urchin	Rock				X	X
Chordates								
	Clavelina huntmani	Light bulb tunicate	Rock				X	X
	Didemnum carnulentum	Colonial tunicate	Rock				X	

Appendix D. Fish Species found at Big Fisherman Cove Presence listed by survey.

Fish Group	Species Name	Common Name	Substrate	Givens et. al. 1965	Givens et. al. 1977	SWRCB 1979	WMSC 2004 (South Wall)	WMSC 2004 (North Wall)
Clinidae								
	Gibbonsia elegans	Spotted kelpfish	Rock, Sand			X		
	Gibbonsia montereyensis	Crevice kelpfish	Rock					X
	Heterostichus rostratus	Giant kelpfish	Rock				X	
Embiotocidae								
	Brachyistius frenatus	Kelp perch	Pelagic				X	X
	Embiotoca jacksonii	Black perch	Pelagic					X
	Hyperprosopon argentum	Wall-eye perch	Pelagic				X	
	Hypsurus caryi	Rainbow perch	Pelagic				X	
	Rhacochilus toxotes	Rubberlip surfperch	Pelagic, Rock, Sand		X	X		
Gobidae								
	Lythrypnus dalii	Blue-banded goby	Rock			X	X	X
	Lythrypnus zebra	Zebra goby	Rock				X	X
	Rhinogobiops nicholsi (=Coryphopterus nicholsii)	Black-eyed goby	Rock, Sand	X	X	X	X	X
Haemulidae								
	Anisotremus davidsoni	Sargo	Rock				X	
Girellidae								
	Girella nigricans	Opaleye	Kelp, Rock, Sand		X	X	X	X
Scorpididae								
	Medialuna californiensis	Halfmoon	Pelagic		X	X		X
Labridae								
	Halichoeres semicinctus	Rock wrasse	Rock, Sand	X	X	X	X	X
	Oxyjulis californica	Señorita	Rock, Sand, Pelagic		X	X	X	X
	Semicossyphus (=Pimelometopon) pulchrum	California sheephead	Rock, Sand, Pelagic		X	X	X	X
Malacanthidae								
	Caulolatilus princeps	Ocean whitefish	Pelagic				X	
Muraenidae								
	Gymnothorax mordax	California moray	Rock		X	X		
Pomacentridae								
	Chromis punctipinnis	Blacksmith	Kelp, Rock, Sand			X	X	X
	Hypsypops rubicundus	Garibaldi	Kelp, Rock	X		X	X	X
Scorpaenidae								
	Sebastes serriceps	Treefish	Rock					X
Serranidae								
	Paralabrax clathratus	Kelp bass	Kelp, Rock, Sand		X	X	X	X
Urolophidae								
	Urolophus halleri	Round stingray	Sand				X	

Appendix E
Mussel Watch Data
Catalina Island West

Constituent	Jul-77	Dec-77	Aug-78	Dec-78	Dec-79	May-80	Dec-80	Dec-80	Sep-91	Mar-94	N	Median	Mean	Standard Deviation
Cadmium	1.01	1.4	1.02	1.26	1.04	3.49	1.25	1.36	0.8	1.2	10	1.23	1.38	0.763
Chromium	0.26	0.44	0.35	0.49	0.24	1.06	0.42	0.43	0.23	0.3	10	0.385	0.422	0.242
Copper	0.65	0.86	0.67	0.5	0.47	0.97	0.6	0.82	0.7	0.68	10	0.675	0.692	0.156
Mercury	0.013	0.025	0.042	0.039	0.046	0.040	0.030	0.034	0.02	0.031	10	0.033	0.032	0.010
Nickel	0.18	0.28	na	na	0.18	0.97	na	na	na	0.35	5	0.28	0.392	0.331
Lead	3.38	3.87	3.79	3.19	4.71	5.37	2.77	1.25	2.8	3.5	10	3.44	3.463	1.12
Selenium	na	na	na	na	na	na	na	na	na	0.36	1	0.36	0.36	-
Silver	0.118	0.387	0.237	0.246	0.201	0.115	0.318	0.067	0.17	0.15	10	0.186	0.201	0.099
Zinc	23.8	32.3	25	20.7	31.6	31.3	22.9	18.5	26	37	10	25.5	26.9	5.88
(units measured in ppm, wet weight)														
Total Chlordane	na	na	na	na	ns	ns	ns	ns	ns	nd	1	-	-	-
Total DDT	6.4	1.6	5.3	2.1	ns	ns	ns	ns	ns	2.0	5	2.1	3.48	2.21
Total of PCB arochlors	4.8	4.7	5.0	2.0	ns	ns	ns	ns	ns	5.0	5	4.8	4.30	1.42
Total of Endosulfan	na	na	na	na	ns	ns	ns	ns	ns	nd	1	-	-	-
(units measured in ppb, wet weight)														

nd=not detected (-8)
na=not analyzed (-9)
ns= not sampled