



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Received
NOV 17 2005
895 Aerovista Place, Ste. 101
San Luis Obispo, CA 93401-79

OFFICE OF THE
REGIONAL ADMINISTRATOR

In Re:

CITY OF MORRO BAY/CAYUCOS
SANITARY DISTRICTS,
APPLICATION FOR A MODIFIED
NPDES PERMIT UNDER SECTION
301(h) OF THE CLEAN WATER ACT


TENTATIVE
DECISION OF THE
REGIONAL ADMINISTRATOR
PURSUANT TO 40 CFR PART 125,
SUBPART G

I have reviewed the attached evaluation analyzing the merits of the application of the City of Morro Bay/Cayucos Sanitary District (MBCSD) requesting a variance from secondary treatment requirements of the Clean Water Act (the Act) pursuant to section 301(h). It is my tentative decision that MBCSD be granted a variance in accordance with the terms, conditions and limitations of the attached evaluation, subject to concurrence by the State of California with the granting of a variance as required by section 301(h) of the Act. USEPA Region 9 will prepare a draft modified National Pollutant Discharge Elimination System (NPDES) permit in accordance with this decision.

Because my decision is based on available evidence specific to this particular discharge, it is not intended to assess the need for secondary treatment in general, nor does it reflect on the necessity for secondary treatment by other publicly owned treatment works discharging to the marine environment. This decision and the NPDES permit implementing this decision are subject to revision on the basis of subsequently acquired information relating to the impacts of the less-than-secondary discharge on the marine environment.

Under the procedures of the Permit Regulations, 40 CFR Part 124 (45 Fed. Reg. 33848 et seq.) public notice, comment and administrative appeals regarding this decision and accompanying draft NPDES permit will be made available to interested persons.

Dated: 11/10/05


WAYNE NASTRI
Regional Administrator

Item No. 11 Attachment No. 1
December 4-5, 2008 Meeting
Morro Bay/Cayucos WWTP

INTRODUCTION	1
DECISION CRITERIA	2
SUMMARY OF FINDINGS	5
CONCLUSION	6
RECOMMENDATION	6
DESCRIPTION OF THE TREATMENT SYSTEM	7
APPLICATION OF STATUTORY AND REGULATORY CRITERIA	9
1. Compliance with the California State Water Quality Standards	9
A. Suspended Solids	9
1. Solids Removal	9
2. Turbidity	10
3. Light Transmittance	10
4. Summary of Suspended Solids	11
B. Dissolved Oxygen	12
1. Dissolved Oxygen Depression Upon Initial Dilution	12
2. Dissolved Oxygen Depression Due to Biochemical Oxygen Demand in the Farfield	12
3. Conclusions on Dissolved Oxygen	12
C. pH Compliance	12
D. Conclusions on Applicable Water Quality Standards	13
2. Protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife, and allows recreational activities	13
A. Physical Characteristics of the Discharge	13
1. Outfall/Diffuser and Initial Dilution	13
2. EPA Water Quality Criteria and State Water Quality Standards	14
3. Dilution Water Recirculation	15
4. Transport and Dispersion of Wastewater and Particulates	15
B. Impact of Discharge on Public Water Supplies	17
C. Biological Impact of the Discharge	18
1. Benthic community structure	18
2. Fish	21
D. Impact of Discharge on Recreational Activities	21
E. Conclusions on Balanced Indigenous Population	23
3. Establishment of a Monitoring Program	24
4. Effect of Modified Discharge on Other Point and Nonpoint Sources	25
5. Toxics Control Program	25
A. Chemical Analysis	25
B. Toxic Pollutant Source Identification	26
C. Industrial Pretreatment Requirements	26
6. Urban Area Pretreatment Program	26
7. Nonindustrial Source Control Program	26
8. Increase in Effluent Volume or Amount of Pollutants	

Discharged	27
9. Compliance with Primary Treatment and Federal Water Quality Criteria	27
A. Primary Treatment Standards	27
B. U.S. EPA Water Quality Criteria	28
 COMPLIANCE WITH OTHER APPLICABLE LAWS	 28
1. State Coastal Zone Management Program	28
2. Marine Sanctuaries	29
3. Endangered or Threatened Species	29
 STATE CONCURRENCE IN VARIANCE	 30
REFERENCES	31
FIGURE ONE	32
FIGURE TWO	33
FIGURE THREE	34
FIGURE FOUR	35

INTRODUCTION

The City of Morro Bay and the Cayucos Sanitary District (the applicant) has requested a variance under section 301(h) of the Clean Water Act, 33 U.S.C. section 1311(h), from the secondary treatment requirements contained in section 301(b)(1)(B) of the Act, 33 U.S.C. section 1311(b)(1)(B). The variance is being sought for the Morro Bay-Cayucos Wastewater Treatment Plant, which is a publicly owned treatment works (POTW). The applicant is seeking permit renewal for a variance from secondary treatment requirements for the discharge of sewage into the Pacific Ocean (Estero Bay) located off of Central California. This document presents Findings, Conclusions, and Recommendations of the U.S. Environmental Protection Agency (EPA) Region 9, Water Division regarding the compliance of the applicant's proposed discharge with the criteria set forth in section 301(h) of the Act as implemented by regulations contained in 40 CFR Part 125, Subpart G (59 Fed. Reg. 40642, August 9, 1994).

Secondary treatment is defined in regulations (40 CFR Part 133) in terms of effluent quality for suspended solids (SS), biochemical oxygen demand (BOD) and pH. The secondary treatment requirements for SS, BOD and pH are listed below:

- SS: (1) The 30-day average shall not exceed 30 mg/L. (2) The 7-day average shall not exceed 45 mg/L. (3) The 30-day average percent removal shall not be less than 85%;
- BOD: (1) The 30-day average shall not exceed 30 mg/L. (2) The 7-day average shall not exceed 45 mg/L. (3) The 30-day average percent removal shall not be less than 85%;
- pH: The effluent limits for pH shall be maintained within the limits of 6.0 to 9.0 pH units.

A modified NPDES permit was issued to the City of Morro Bay and the Cayucos Sanitary District in March 1985 (Permit No. CA0047881) by the U.S. Environmental Protection Agency (EPA), Region 9 and the California Regional Water Quality Control Board, Central Coast (RWQCB). This original permit expired in March of 1990 and has been reissued by EPA and the RWQCB twice since, in March 1993 and March 1999. The current (re-issued) permit expired on March 1, 2004, and has been administratively extended until a decision regarding the application is made.

The current permit contains the following limits for SS and BOD:

- SS: (1) A 30-day average for suspended solids of 70 mg/L. (2) The maximum allowable at any time shall not exceed 105 mg/L. (3) The 30-day average percent removal shall not be less than 75%.

BOD: (1) The 30-day average shall not exceed 120 mg/L. (2) The maximum allowable at any time shall not exceed 180 mg/L..

The applicant submitted a renewal application for a modification of secondary treatment requirements in July 2003 requesting a continued variance for SS and BOD based on the current effluent limitations and characteristics.

The Morro Bay-Cayucos Wastewater treatment plant provides full primary and partial secondary wastewater treatment for a service population of about 13,800. The application is based on an average dry-weather flow of 2.06 million gallons per day (MGD). Based on the definition in 40 CFR 125.58(c), the applicant is considered to be a small discharger.

DECISION CRITERIA

Under section 301(b)(1)(B) of the Act, 33 U.S.C. section 1311(b)(1)(B), publicly owned treatment works (POTWs) in existence on July 1, 1977, were required to meet effluent limitations based upon secondary treatment as defined by the Administrator of EPA. Secondary treatment has been defined by the Administrator in terms of three parameters: biological oxygen demand (BOD), suspended solids (SS), and pH. Uniform national effluent limitations for these pollutants were promulgated and included in National Pollutant Discharge Elimination System (NPDES) permits for POTWS issued under section 402 of the Act. POTWS were required to comply with these limitations by July 1, 1977.

Congress subsequently amended the Act, adding section 301(h), which authorizes the Administrator, with State concurrence, to issue NPDES permits which modify the secondary treatment requirements of the Act [P.L. 95-217, 91 Stat. 1566, as amended by, P.L. 97-117, 95 Stat. 1623; and section 303 of the Water Quality Act (WQA) of 1987]. Section 301(h) provides that the Administrator, with the concurrence of the State, may issue a permit under section 402 [of the Act] which modifies the requirements of subsection (b)(1)(B) of this section [the secondary treatment requirements] with respect to the discharge of any pollutant from a publicly owned treatment works into marine waters, if the applicant demonstrates to the satisfaction of the Administrator that:

(1) there is an applicable water quality standard specific to the pollutant for which the modification is requested, which has been identified under section 304(a)(6) of this Act;

(2) the discharge of pollutants in accordance with such modified requirements will not interfere, alone or in combination with pollutants from other sources, with the attainment or maintenance of that water quality which assures

protection of public water supplies and the protection and propagation of a balanced, indigenous population (BIP) of shellfish, fish, and wildlife, and allows recreational activities, in and on the water;

(3) the applicant has established a system for monitoring the impact of such discharge on a representative sample of aquatic biota, to the extent practicable, and the scope of the monitoring is limited to include only those scientific investigations which are necessary to study the effects of the proposed discharge;

(4) such modified requirements will not result in any additional requirements on any other point or nonpoint source;

(5) all applicable pretreatment requirements for sources introducing waste into such treatment works will be enforced;

(6) in the case of any treatment works serving a population of 50,000 or more, with respect to any toxic pollutant introduced into such works by an industrial discharger for which pollutant there is no applicable pretreatment requirement in effect, sources introducing waste into such works are in compliance with all applicable pretreatment requirements, the applicant will enforce such requirements, and the applicant has in effect a pretreatment program, which, in combination with the treatment of discharges from such works, removes the same amount of such pollutant as would be removed if such works were to apply secondary treatment to discharges and if such works had no pretreatment program with respect to such pollutant;

(7) to the extent practicable, the applicant has established a schedule of activities designed to eliminate the entrance of toxic pollutants from nonindustrial sources into such treatment works;

(8) there will be no new or substantially increased discharges from the point source of the pollutant to which the modification applies above that volume of discharge specified in the permit;

(9) the applicant at the time such modification becomes effective will be discharging effluent which has received at least primary or equivalent treatment and which meets the criteria established under section 304(a)(1) of the Clean Water Act after initial mixing in the waters surrounding or adjacent to the point at which such effluent is discharged.

For the purposes of this subsection the phrase "the discharge of any pollutant into marine waters" refers to a discharge into deep waters of the territorial sea or the waters of the contiguous zone,

or into saline estuarine waters where there is strong tidal movement or other hydrological and geological characteristics which the Administrator determines necessary to allow compliance with paragraph (2) of this subsection, and section 101(a)(2) of this Act. For the purposes of paragraph (9), "primary or equivalent treatment" means treatment by screening, sedimentation, and skimming adequate to remove at least 30 percent of the biological oxygen demanding material and of the suspended solids in the treatment works influent, and disinfection, where appropriate. A municipality which applies secondary treatment shall be eligible to receive a permit under this subsection which modifies the requirements of subsection (b)(1)(B) of this section with respect to the discharge of any pollutant from any treatment works owned by such municipality into marine waters. No permit issued under this subsection shall authorize the discharge of sewage sludge into marine waters. In order for a permit to be issued under this subsection for the discharge of a pollutant into marine waters, such marine waters must exhibit characteristics assuring that water providing dilution does not contain significant amounts of previously discharged effluent from such treatment works.

No permit issued under this subsection shall authorize the discharge of any pollutant into saline estuarine waters which at the time of application do not support a balanced, indigenous population of shellfish, fish, and wildlife, or allow recreation in and on the waters or which exhibit ambient water quality below applicable water quality standards adopted for the protection of public water supplies, shellfish, fish, and wildlife or recreational activities or such other standards necessary to assure support and protection of such uses. The prohibition contained in the preceding sentence shall apply without regard to the presence or absence of a causal relationship between such characteristics and the applicant's current or proposed discharge. Notwithstanding any other provisions of this subsection, no permit may be issued under this subsection for discharge of a pollutant into the New York Bight Apex consisting of the ocean waters of the Atlantic Ocean westward of 73 degrees 30 minutes west longitude and northward of 40 degrees 10 minutes north latitude.

EPA regulations implementing section 301(h) provide that a 301(h) modified NPDES permit may not be issued in violation of 40 CFR 125.59(b), which requires among other things, compliance with the provisions of the Coastal Zone Management Act (16 U.S.C. 1451 et seq.), the Endangered Species Act (16 U.S.C. 1531 et seq.), the Marine Protection, Research, and Sanctuaries Act (16 U.S.C. 1431 et seq.), and all other applicable provisions of State or Federal law or Executive Order. In the discussion which follows, the data submitted by the applicant are analyzed in the context of the statutory and regulatory criteria.

SUMMARY OF FINDINGS

Based upon review of the data, references, and empirical evidence furnished in the 2003 re-application, and associated monitoring reports, EPA Region 9 makes the following findings with regard to compliance with the statutory and regulatory criteria:

1. The applicant's proposed discharge will comply with the California Ocean Plan water quality standards for suspended solids, dissolved oxygen, and pH. [Section 301(h)(1), 40 CFR 125.61].

2. The applicant's proposed discharge will not adversely impact public water supplies or interfere with the protection and propagation of a balanced, indigenous population of fish, shellfish, and wildlife, and will allow recreational activities in and on the water. [Section 301(h)(2), 40 CFR 125.62].

3. The existing monitoring program was last revised in 1998 and may be modified by EPA and the Central Coast Regional Water Quality Control Board during permit reissuance to better evaluate the effects of the discharge. [Section 301(h)(3), 40 CFR 125.63].

4. The applicant's proposed discharge will not result in any additional treatment requirements on any other point or nonpoint source. [Section 301(h)(4), 40 CFR 125.64].

5. The applicant is exempt from the pretreatment requirements specified under 40 CFR 125.66(c). The draft NPDES permit implements pollution prevention requirements specified in 40 CFR 125.66(d) in lieu of the General Pretreatment Regulations specified in 40 CFR 403. This finding is conditional upon receipt of documented certification from the applicant that there are no known sources of toxic pollutants or pesticides. [Section 301(h)(5), 40 CFR 125.66 and 125.68].

6. The applicant is a small discharger and exempt from the urban area pretreatment requirement. [Section 301(h)(6), 40 CFR 125.65].

7. The requirement for a nonindustrial source control program is being met through a Pollution Prevention Program (as specified in the draft NPDES permit) which implements public education and waste minimization/source reduction programs to limit entrance of toxic pollutants and pesticides into the treatment plant. [Section 301(h)(7), 40 CFR 125.66].

8. There will be no substantially increased discharge from the point source of the pollutants to which the variance would apply (BOD and SS), above those which would be specified in the section 301(h) permit. [Section 301(h)(8), 40 CFR 125.67].

9. The applicant has demonstrated through past performance

that its treatment facilities will be removing greater than 30% of the influent five-day biochemical oxygen demand (BOD) and suspended solids. The applicant will be in compliance with all applicable Federal water quality criteria, as established under Section 304(a) of the Clean Water Act. [Section 301(h)(9), 40 CFR 125.60]

10. The Central Coast Regional Water Quality Control Board will make a determination that the prospective NPDES permit contains provisions to ensure that the applicant's discharge will meet water quality standards for the Pacific Ocean and not require imposition of additional treatment or control requirements to be applied to other dischargers. Issuance of final waste discharge requirements will constitute the State's certification and concurrence under 40 CFR 124.54.

CONCLUSION

It is concluded that the applicant's proposed discharge will comply with the requirements of section 301(h) and 40 CFR Part 125, subpart G, as stated above.

RECOMMENDATION

Recently, the applicant, Morro Bay/Cayucos Sanitation District (MBCSD) and the Central Coastal Regional Water Quality Control Board have agreed to a 9.5 year infrastructure development and implementation plan which will provide for full-secondary treatment of the facility's wastewater by June 2015. As part of this process, MBCSD is also contemplating advanced tertiary treatment and a water re-use program for part or all of the wastewater it treats. MBCSD requested that EPA continue to evaluate and consider the ocean waiver reapplication, since it would be several years before MBCSD would achieve full secondary treatment. Until the MBCSD can provide full secondary treatment to their discharge, they would need to operate under a 301(h) variance.

The EPA completed the review of the reapplication. It is recommended that the applicant be allowed to retain the 301(h) variance in accordance with the above findings, contingent upon the satisfaction of the following conditions, and that a National Pollutant Discharge Elimination System (NPDES) Permit be renewed in accordance with the applicable provisions of 40 CFR Parts 122-125. The applicant's renewal of a section 301(h) variance is contingent upon:

1. Implementation of the approved monitoring program upon issuance of the renewed 301(h) modified permit (40 CFR 125.63).

2. The California Coastal Commission determination that the applicant's proposal is consistent with the relevant State Coastal Zone Program [40 CFR 125.59(b)(3)].

3. No findings from the U.S. Fish and Wildlife Service and the National Marine Fisheries Service that operation of the discharge will adversely impact threatened or endangered species or critical habitats pursuant to the Endangered Species Act [40 CFR 125.59(b)(3)].

4. Final concurrence from the Central Coast Regional Water Quality Control Board on the approval of a section 301(h) variance [40 CFR 125.59(i)(2)].

The draft NPDES permit is to include, in addition to all applicable terms and conditions required under 40 CFR Part 122, the following terms and conditions specific to section 301(h):

i. Final effluent limitations (including flows, concentrations and loadings) in accordance with the terms and conditions of this document.

ii. Reporting requirements in accordance with 40 CFR 125.68(d). These include reporting the monitoring results at the prescribed frequency in the approved monitoring program.

DESCRIPTION OF THE TREATMENT SYSTEM

The Morro Bay-Cayucos WWTP is located in the northwest sector of the City of Morro Bay, California, approximately midway between San Francisco and Los Angeles, on the California coast (Figure 1). The area served is the City of Morro Bay and the community of Cayucos, which is located seven miles to the north. The population of the areas served by the subject facility is approximately 13,800. The treatment plant is designed for an average dry weather flow of 2.06 MGD and a peak dry-weather flow of 6.64 MGD. The treatment plant discharged an annual average of just over 1.1 and 1.0 million gallons per day for 2002 and 2003, respectively.

The two major industrial sources are represented by a fish processing plant and a water softening plant. The Cayucos Sanitary District and City of Morro Bay have a separate storm water drainage system.

The existing system is a combined primary and secondary treatment plant. The plant was originally built in 1954 and expanded in 1964. A new outfall was constructed and came into operation in 1982.

The current treatment system includes primary treatment of all influent by screening, grit removal and primary sedimentation. In addition, a major portion of the primary effluent receives secondary treatment on a daily basis to achieve 75 percent solids removal in the subsequent primary and secondary blend, as reported by the applicant (see Section II-1 of the applicant's "2003 Permit Application Supplement", Marine Research Specialists, July 2003;

hereafter referred to as "the applicant's Supplemental Report"). The secondary treatment process consists of parallel single-stage, high-rate trickling filters whose combined outflow flows to a solid contact channel, and then to a secondary sedimentation tank. The secondary effluent is combined with the primary effluent and disinfected with chlorine prior to discharge to the ocean via an outfall/difuser system.

The outfall pipe is 27 inches in diameter and terminates to a 170-foot long multi-port diffuser, located approximately 2,900 feet from shore at a depth of approximately 50 feet. The discharge point coordinates are 35 23' 12" N latitude and 120 52' 27" W longitude.

Projected Flows: Based on the applicant's report, average wet weather flows in 2002 were 1.14 MGD. These flows are projected to slightly increase (with population growth) to 1.20 MGD in 2009 (based on 5.2% growth over that time period) and to 1.23 MGD in 2014 (based on a population increase of 9.8% between 2003 and 2014).

Performance: The average annual effluent concentration for SS between 1998-2003 was 41.4 mg/L (ranged from 37.4 to 49.2 mg/L). Annual removal efficiency for SS over the same time period averaged 87% (ranged from 84 to 89%). The COP requires at least 75% removal of SS. [Note: the concentrations for suspended solids being discharged by the applicant have consistently been below the permit limits].

The annual average BOD concentration in the effluent between 1998-2003 was 53.8 mg/L (ranged 39.1 to 67.5 mg/L). The removal efficiencies during this time period ranged from 81% to 83% with an average of 82% removal. The plant has been achieving removal rates greater than 80% since 1992. [Note: the concentrations for BOD being discharged by the applicant are well below the permit limits].

Mass emissions: In terms of mass (measured in weight), suspended solids loadings have ranged from 56 to 102 million tons per year (MT/yr) between 1998-2003. Given the small projected increases in population, loadings are not likely to increase substantially. The annual mass emissions limit in the existing permit is for 199 MT/yr and, as reported, the applicant's loadings to the receiving waters have consistently been well below this limit.

There are no proposed changes to the current configuration of the treatment system or outfall in the next five years. The applicant states that "over the next five years, no downgrading of effluent quality is anticipated given the limited projected growth in population and industry in the service area." The permit limits being requested are the same as in the last permit cycle. Therefore, the renewal application is based on the current

discharge.

APPLICATION OF STATUTORY AND REGULATORY CRITERIA

1. Compliance with the California State Water Quality Standards [Section 301(h)(1), 40 CFR 125.61]

Under 40 CFR 125.61, which implements section 301(h)(1), there must be a water quality standard applicable to the pollutants for which the modification is requested and the applicant must demonstrate that the proposed modified discharge will comply with these standards. The applicant must obtain a favorable State determination that the proposed discharge will comply with applicable provisions of State law including water quality standards. The applicable water quality standards are established in the California Ocean Plan (SWRCB, 2001).

Table A (Effluent Limitations) of the 2001 California Ocean Plan provides water quality standards for 1) Grease and Oil, 2) Suspended Solids, 3) Settleable Solids, 4) Turbidity, and 5) pH. According to the COP, as a 30-day average, the discharger shall remove 75% of suspended solids from the influent stream before discharging wastewaters to the ocean, except that the effluent limitation to be met shall not be lower than 60 mg/L. The COP specifies numeric water quality standards for turbidity for monthly (75 NTU), weekly (100 NTU), and maximum at any time (225 NTU) as effluent limitations, and narrative standards for light transmittance ("Natural light shall not be significantly reduced at any point outside the initial dilution zone as the result of the discharge of waste"). In lieu of specific numeric water quality standards for BOD, however, the COP (Water Quality Objectives, Water Contact Standards) specifies that the dissolved oxygen (DO) concentration shall not at any time be depressed more than 10% from that which occurs naturally, as the result of the discharge of oxygen demanding waste materials.

The applicant has requested modified requirements for biological oxygen demand (BOD) and suspended solids (SS). The applicant must demonstrate that it meets (and will continue to meet through the end-of-permit period) all effluent limits for suspended solids and turbidity and meets ambient standards for turbidity, light transmittance, and dissolved oxygen.

A. Suspended Solids.

1. Solids Removal. The California Ocean Plan (COP) calls for at least 75% removal of suspended solids (as a 30-day average). The applicant measures the suspended solids concentrations in the influent and effluent on at least a weekly basis. The applicant has demonstrated through past performance the ability to meet the 75% removal requirement and typically achieves removal efficiencies greater than 85% for suspended solids. Monthly removal

efficiencies averaged greater than 88% between 1986 and 2003; monthly removal efficiencies averaged 86% during the last permit cycle (1998-2003). The reissued NPDES permit will continue to require compliance with the 75% removal requirement of the COP.

The applicant reports that between 1993-2002 the subject facility failed to meet the required 30-day average of 75% removal of suspended solids from the influent stream before discharge for the following three months: January 1995, April 1999, and December 2002. The first two events (January 1995 and April 1999) were reportedly related to low concentrations of TSS in the influent due to high inflow into the collection system following significant precipitation events. The third event (December 2002), on the other hand, resulted from a malfunction in the secondary clarifier at the facility which resulted in a 74.8% 30-day average removal for that month, which is 0.2 % below the 75% removal requirement.

2. Turbidity. The COP establishes the following effluent limits for turbidity.

	<u>30-day Ave.</u>	<u>Weekly Ave.</u>	<u>Daily Max.</u>
Turbidity	75 NTU	100 NTU	225 NTU

These turbidity standards are established as permit limits in the existing permit. Effluent turbidity is measured by the applicant on a daily basis. The applicant has shown through past performance the ability to meet these limits. For example, monthly averages of turbidity concentrations ranged from 34 to 48 NTU for the last permit period (1998-2003). To ensure continued compliance with the COP, these effluent limits for turbidity will be retained in the reissued NPDES permit.

3. Light Transmittance. The COP states that "natural light shall not be significantly reduced at any point outside the zone of initial dilution as the result of the discharge."

Increased suspended solids concentrations associated with municipal discharges can cause a decrease in light penetration in the water column. A worst-case estimate of the increase in suspended solids concentration following initial dilution for this particular facility can be obtained by dividing the maximum allowable concentration in the permit (105 mg/L) by the critical initial dilution of 133 (see Section III.B.4 in the applicant's Supplemental Report, page III-7, for further discussion). Using this method, and by assuming an ambient suspended solids concentration of 0 mg/L, EPA estimated a suspended solids concentration of 0.79 mg/L in the receiving waters immediately following initial dilution (Tetra Tech, 1992).

Transmissivity profiles collected by the applicant over the last permit period indicate that rarely is natural light transmittance

impeded by effluent-related particulate (see Section III.B.6, page III-14, of the applicant's Supplemental Report for further discussion). Only one measure from 24 sampling efforts during this period indicate that particulate from the effluent may have inhibited the occurrence of natural light. This measure, taken on October 11, 1999, was collected from the seafloor area approximately 30 ft. from the outfall diffuser at a depth of 45 ft. However, the applicant reports that this transmissivity measure represents an approximate 6.9% decrease in natural light conditions relative to ambient measures taken at the same time.

The COP's narrative standard for light transmittance relies on the extent of variability between samples taken on the same day within the sampling area. If the results from a sample or samples are significantly different (using a 95% confidence interval) from other similar measures, in particular measures taken outside of the zone of initial dilution and the discharge area in general, the COP considers such results as indications of non-compliance with state water quality standards for light transmittance. Overall, the applicant's discharge has met the state's water quality standards for light transmittance save the one measure mentioned above. The fact that this measure only represented a 6.9% decrease in natural light (relative to other transmissivity measures taken that day), at a depth for which natural light in temperate marine waters is hardly a biological factor, is not worrisome to EPA given the overall results of the applicant's monitoring of the discharge and its impact to the receiving water environment.

4. Summary of Suspended Solids. EPA finds that the three instances of failure to meet 30-day average removal standards for suspended solids, and the one instance in which light transmittance was depressed 6.9% below natural light conditions, does not merit a denial of the current application; given the applicant's overall compliance with the TSS, Turbidity, and COP requirements for Light Transmittance over the last decade. The applicant has, without exception, met effluent turbidity limits over the last decade.

Based on the information reviewed, EPA believes that suspended solids concentrations around the discharge has not, and will not, significantly reduce light transmittance outside the zone of initial dilution. The State may comment on these conclusions during the 401 certification and concurrence on the waiver. In general, EPA believes that the applicant has successfully demonstrated (through past performance) the ability to meet effluent limitations for suspended solids and turbidity established by the COP. No changes to the current limits for suspended solids and turbidity will be included in the reissued NPDES permit. This will ensure continued compliance for these parameters by the applicant. Based on our review of the offshore monitoring data, in particular the biological infaunal information, EPA concludes that these limits are sufficient to ensure continued compliance with the ambient water quality standard for transmissivity.

B. Dissolved Oxygen.

The COP does not have an effluent limit for BOD. The COP provides that the "dissolved oxygen concentration shall not at any time be depressed more than 10 percent from that which occurs naturally, as the result of the discharge of oxygen-demanding waste materials."

The potential for outfall-related DO depressions was evaluated with respect to 1) initial dilution, and 2) BOD exertion in the farfield. The procedures for making these calculations are detailed in EPA's 301(h) Technical Support Document (EPA, 1982, 1994).

1. Dissolved Oxygen Depression Upon Initial Dilution. The applicant calculated a DO concentration following critical initial dilution of 6.2 mg/L, assuming an effluent concentration of 0 mg/L and an "immediate dissolved oxygen demand" (IDOD) of 3 mg/L. The applicant used a minimum initial dilution value of 133:1 which was originally provided by EPA (Tetra Tech, 1992). DO demands following initial dilution, therefore, would result in only minor depression (about 1%) of DO during periods of maximum stratification. Thus, the DO depression after initial dilution is considered to be negligible.

2. Dissolved Oxygen Depression Due to Biochemical Oxygen Demand in the Farfield. Subsequent to initial dilution, dissolved oxygen in the water column is consumed by the BOD in the waste field. This can be estimated using a simplified farfield oxygen depletion model for coastal waters as described in EPA, 1992. EPA predicted a maximum farfield depression of 0.045 mg/L based on worst-case assumptions (i.e., BOD of 180 mg/L, initial dilution of 133). The predicted farfield DO depression represents a 0.5% depression from ambient concentrations at trapping depth, and therefore, DO depression due to BOD exertion in the farfield is also considered to be negligible.

3. Conclusions on Dissolved Oxygen. The overall effect of the discharge on ambient DO concentrations is negligible and well below the 10% standard in the COP. There is no evidence from the applicant's monitoring efforts, be it from sediment chemistry, receiving water measures, and infaunal community structure, which indicates that the applicant's wastewater discharge is causing the depression of ambient dissolved oxygen levels in as much to cause measurable impact to the receiving water and its biological inhabitants. EPA concludes that the discharge currently meets (and will continue to meet through the end of the proposed permit period) COP's narrative standard for dissolved oxygen. The State may comment on these conclusions during the 401 certification and concurrence on the waiver.

C. pH Compliance.

The applicant has not requested a variance for pH. The COP states that "pH shall not be changed more than 0.2 units from that which occurs naturally." A review of the pH data provided by the applicant (for both effluent and receiving water) indicates that State standards for pH are being attained. The permit limits established in the permit are designed to meet the COP standard.

D. Conclusions on Applicable Water Quality Standards.

Based on the information provided by the applicant and a review of past performance, the discharge will be operated in a manner which ensures compliance with the State water quality standards relevant to suspended solids, BOD, and pH. This includes the effluent limits specified in the COP for suspended solids (75% removal), turbidity (75 NTU) and pH (6.0 to 9.0) and the ambient standards for dissolved oxygen and light transmittance. The reissued NPDES permit will contain effluent limitations for suspended solids, turbidity, BOD and pH to ensure continued compliance.

2. Protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife, and allows recreational activities [Section 301(h)(2), 40 CFR 125.62].

A. Physical Characteristics of the Discharge.

1. **Outfall/Diffuser and Initial Dilution.** 40 CFR 125.62(a)(1) provides that the proposed outfall and diffuser must be located and designed to provide adequate initial dilution, dispersion, and transport of wastewater to meet all applicable water quality standards at and beyond the boundary of the zone of initial dilution. This evaluation is based on conditions during periods of maximum stratification; and during other periods when discharge characteristics, water quality, biological seasons, or oceanographic conditions indicate more critical situations may exist.

Outfall/diffuser design. The existing outfall was constructed in 1982 with an upgraded 27-inch diameter steel pipe lined and coated with cement mortar. The outfall extends 4,756 feet from the wastewater facility to a water depth of 50 feet where it terminates in a 170-foot multi-port linear diffuser. Figure 2 shows the general location for the outfall, and offshore sampling region, relative to the wastewater treatment facility.

The linear diffuser section consists of 34 ports, each 2-inch diameter. The ports are spaced approximately 50 feet apart on alternating sides of the pipe. Currently, flow through the treatment plant requires the use of 28 of the available 34 ports.

Initial Dilution. The COP states that "waste effluents shall be discharged in a manner which provides sufficient initial dilution to minimize the concentrations of substances not removed in the

treatment." In the COP, minimum initial dilution is defined as the "lowest average initial dilution within any single month of the year." Dilution estimates are "based on observed waste flow characteristics, observed receiving water density structure and the assumption that no currents (of sufficient strength to influence the initial dilution process) flow across the discharge structure."

In 1992, EPA calculated a critical initial dilution of 133:1 for the outfall using the UMERGE model. The UMERGE model was run using a maximum flow of 6.64 MGD and zero currents, and a trapping depth of 6.37 m (associated with critical density profile). These worst-case assumptions result in a conservative estimate of initial dilution.

The initial dilution of 133:1 was used by Region IX in the re-issuance of MBCSD's permit in 1993 and 1999 for calculations of effluent limits, and is used similarly in the current review for assessing compliance with the COP standards, Federal Marine Water Quality Criteria, and the nine 301(h) criteria. No significant increases or changes related to the applicant's discharge (i.e., flow, capacity, treatment capabilities, etc.) have come to light, or have been proposed, during this review. Therefore, the application of the initial dilution of 133:1 in this case is both consistent and appropriate.

2. EPA Water Quality Criteria and State Water Quality Standards. State standards for a variety of toxic materials are established in the COP. The receiving water standards for the protection of marine aquatic life and the protection of human health (noncarcinogens and carcinogens) are listed in Table B of the COP. In addition, it must be shown that the discharge will not result in exceedances of EPA water quality criteria for those pollutants where there is no corresponding state water quality standard.

EPA reviewed the results of effluent monitoring which occurred over the last two permit periods (1993-1998 and 1998-2003) or decade. The data reviewed, which was provided by the applicant, was collected as part of the NPDES monitoring requirements. Of the approximate 780 effluent samples collected and analyzed for Table B constituents over the last decade, results show that all but three samples complied with receiving-water standards. The pollutant concentrations which exceeded effluent limits (or narrative standards) were for: 1) gross-Beta radioactivity (January 1994), 2) DDT (July 1998), and 3) Dioxin (July 2002). Aside from these single instances, none of the other Table B pollutants measured from the effluent exceeded water quality standards during the last decade, and thus no pattern of concern has emerged or been brought to light. Given the over-riding trend of compliance for Table B constituents over the last decade, EPA expects that the subject discharge will likely continue to comply with Table B standards during the up-coming permit period.

3. Dilution Water Recirculation. Under section 303(e) of the WQA, before a 301(h) permit may be issued for discharge of a pollutant into marine water, such marine waters must exhibit characteristics assuring that the water providing dilution does not contain significant amounts of previously discharged effluent from the treatment works.

The applicant has claimed that under normal circumstances little, if any, previously discharged effluent would recirculate through the ZID and be re-entrained in the plume. The rationale for this is predicated on flow measurements taken by the discharger and the turbulent, open-ocean conditions in which the discharge occurs. The applicant submits that the only potential mechanism for recirculation would be under unusual tidally induced conditions, however given a 6.5-hour semidiurnal tidal cycle, wastewater contaminants normally disperse farfield before tide changes making re-entrainment highly unlikely.

EPA accepts this reasoning. In previous evaluations with large dischargers in Southern California, EPA found that the net effect of re-entrainment on reducing initial dilution in the open coastal environment is small (i.e., less than 10%). Such a reduction in initial dilution would not alter EPA's conclusions regarding the applicant's ability to comply with State standards or EPA water quality criteria.

4. Transport and Dispersion of Wastewater and Particulates. Accumulation of suspended (settleable) solids in and beyond the vicinity of the discharge can have adverse effects on biological communities. Following initial dilution, the diluted wastewater and particulate must be transported and dispersed so that water use areas and areas of biological sensitivity are not adversely affected [40 CFR 125.62(a)(2)].

In addition, the COP has narrative standards related to the deposition of outfall-related solids, the accumulation of organic material in sediments, and the concentrations of contaminants in sediments as these relate to biological communities around the outfall.

Solids Deposition. The COP states that "The rate of deposition of inert solids and the characteristics of inert solids in ocean sediments shall not be changed such that benthic communities are degraded."

Sediment, biological data (see Section 2C), and annual outfall inspections (diver surveys) conducted by the discharger indicate that, over the last decade, there is no evidence of significant accumulation of effluent-related solids on the benthos in the area of the outfall. In addition, analyses of sediment samples collected from benthic monitoring stations (see Figure 3 for the location of the benthic sampling stations relative to the outfall

location) over the last 15 years show that there is no evidence of buildup of fine particulate matter (silts and clay materials) in the vicinity of the outfall. Results show that the surrounding benthic environment is primarily dominated by medium grain-sized sands (see Section III.A.4, pages III-5 and III-6, of the applicant's Supplemental Report for further discussion). In EPA's view, the lack of effluent-related solids accumulation in the vicinity of the outfall is primarily related to two factors: 1) the applicant's SS removal rate is consistently above the 75% removal requirement, and 2) the discharge environment itself is an extremely well-flushed and dynamic open-ocean setting. Because the applicant is not projecting any changes to their discharge, relative to previous permit periods, EPA believes that the re-issuance of the applicant's permit will not lead to benthic impacts from solids build-up during the next permit cycle.

Deposition and Accumulation of Organic Matter. The COP states that "The concentration of organic materials in marine sediments shall not be increased to levels that would degrade marine life."

Results from the applicant's benthic monitoring efforts, over the last 15 years, suggest that the Morro Bay discharge does not cause significant organic deposition and accumulation in the vicinity of the outfall, which would negatively impact the occurrence and health of nearby benthic communities. In this case, benthic communities consist of those marine organisms (such as polychaete and tube worms, snails and bivalves, various crustaceans such as amphipods, mysids and crabs, and fishes such as blennies, various flatfish and rockfish species) which live in the vicinity of the outfall and are sensitive to unnatural accumulations of organic materials on and in marine sediments.

For this review, EPA evaluated the last 10-years worth of sediment data collected by MBCSD to determine if there were any patterns of organic accumulation in the sediments in the vicinity of the outfall. High concentrations of sediment BOD, total volatile solids (TVS) or total Kjeldahl nitrogen (TKN) around the outfall area would be indicative of an outfall related effect. Such spatial patterns in the concentrations for these constituents are not evident from the applicant's monitoring results. In fact, patterns of concentrations for these constituents did not show any significant differences between the sediment areas adjacent to the outfall diffuser and the sediments collected/analyzed at the applicant's reference station (Station 1; see Fig. 3). Based on these results, EPA concludes that organic material is not accumulating around the outfall and that organic concentrations in sediments around the MBCSD outfall are not degrading marine life.

Contaminant Concentrations in Sediments. Contaminants associated with effluent wastewater have the potential to accumulate in sediments. The COP states that "The concentration of toxics substances in marine sediments shall not be increased to levels

that would degrade marine life."

Overall, organic pollutants such as pesticides, polychlorinated pesticides, polycyclic aromatic hydrocarbons have not been detected in sediments associated with the outfall. On the other hand, metal contaminants (arsenic, chromium, copper, lead, nickel, zinc) have been consistently measured at detectable concentrations from sediments obtained by the applicant's benthic monitoring program. Benthic sediment data from 1986-2002 (collected by the applicant) were reviewed by EPA to determine if any of the metal contaminants occur in a pattern which would indicate that the source of the benthic metals is originating from the outfall itself. Results from this review indicate no discernable patterns (temporal or spatial) for metal contaminants in local benthic sediments that would indicate the outfall as a contributing source.

The concentrations of arsenic, chromium, copper, lead, and zinc were all below the NOAA toxicological "Effects-Range Low" (ERL) benchmark, for which contaminant concentrations are unlikely to cause adverse biological effects (Long and Morgan, 1991; Long et al., 1995). Nickel concentrations, on the other hand, were consistently above the associated ERL, but below the NOAA Effects-Range Median (ERM) benchmark which is the concentration above which biological effects are thought to be likely. It is unlikely that the nickel concentrations in the local benthic sediments are related to the outfall since no outfall patterns are discernable and nickel concentrations measured from the effluent samples were consistently not detectable. In addition, nickel is reportedly a naturally occurring element in marine benthic sediments from this part of the California coastal region (Steinhauer et al., 1994).

EPA finds no evidence of any outfall-related patterns with regard to the occurrence of contaminants in benthic sediments in the vicinity of the outfall, and that contaminant concentrations in the vicinity of the outfall are causing adverse degradation to local marine life. This is based on the applicant's marine monitoring data collected over the last two permit cycles (i.e., decade).

B. Impact of Discharge on Public Water Supplies. The applicant's discharge, alone or in combination with other pollutant sources, must allow for the attainment or maintenance of water quality which assures protection of public water supplies and must not interfere with the use of planned or existing public water supplies.

The City of Morro Bay has a desalinization plant located near the MBCSD wastewater treatment plant. The intake structure for this facility draws brackish water from saltwater wells located onshore and 16 km from the MBCSD outfall. Given the distance between the wells and the diffuser ports, and the physical (land) and oceanographic barriers between the two, it is unlikely that the outfall would have any adverse affect on the quality of water at the desalinization intake wells should the facility go into

operation.

C. Biological Impact of the Discharge. The proposed modified discharge must allow for attainment or maintenance of water quality to protect a balance indigenous population (BIP) of shellfish, fish, and wildlife. The applicant must demonstrate that a BIP of shellfish, fish, and wildlife will exist in all areas beyond the zone of initial dilution (ZID) that might be affected by the current and proposed modified discharge.

A BIP is generally defined in the section 301(h) regulations [40 CFR 125.58(f)] as an *ecological community* which exhibits characteristics similar to those of nearby, healthy communities existing under comparable but unpolluted environmental conditions. Consequently, for the purpose of 301(h), the term *population* should be interpreted to mean biological communities and the terms *shellfish, fish and wildlife* should be interpreted to include any or all biological communities that might be adversely affected by the discharge.

The COP states that "Marine communities, including vertebrate, invertebrate, and plant species shall not be degraded."

The applicant has provided a substantial and in depth analysis of the infaunal community data collected from the benthic environment in association with applicant's discharge monitoring program over the last three permit cycles. This analysis is presented in Section III.D of the applicant's Supplemental Report, pages III-50 through III-63. EPA has reviewed this analysis and finds it to be scientifically sound. A variety of statistical methodologies were applied to the infaunal data by the applicant which, ultimately, resulted in the same conclusion: infaunal communities in the vicinity of the discharge are not being degraded.

1. Benthic community structure. Benthic infaunal data were evaluated relative to (1) number of species per unit area, (2) numbers of individuals per unit area, (3) measures of community structure such as diversity, evenness and dominance, and (4) species composition. As with sediment chemistry, the data from 1986 to 2002 were reviewed to determine if there were any outfall-related trends related to benthic community structure. Infaunal data from the ZID boundary stations (Stations 4 and 5), nearfield stations (Stations 3, 6, 8 and 9), and farfield stations (Stations 2 and 7) were also evaluated relative to the information collected at the designated reference station (Station 1); see Figure 4 for relative locations of the benthic monitoring stations and the ZID. Some of the monitoring locations (i.e., stations) for the existing permit (issued in 1998) differ from those associated with the permit issued in 1993. Therefore, direct comparisons between the two permit periods (1993-1998 and 1998-2003) regarding local benthic community structure is not possible. However, general trends related to community structure in the discharge area over

the entire period of data collection (15 years) can be assessed and are discussed below.

Species Richness. A decrease in the number of benthic species near an outfall relative to a reference station would generally indicate an outfall-related effect. The monitoring data collected by the applicant over the last two permit cycles indicates that there is no discernable outfall-related trend relative to the number of benthic species at each of the monitoring stations and the proximity of the stations to the outfall. The data indicates that spatial differences between stations are small for each sampling event and temporal differences between sampling events (i.e., seasons and/or years) proved variable. All stations tend to track this temporal variability as a group, indicating that such patterns are in response to natural variability in environmental conditions (such as periods of up-welling, El Nino, etc.). Moreover, there are no temporal trends in the data that indicate an increasingly degraded benthic environment in the entire sampling area, whether it be at, near or away from the outfall location.

Abundance. Empirical studies have shown that species abundances in marine benthic communities generally increase in response to organic enrichment from anthropogenic sources. Such enrichment is not generally considered adverse unless it is accompanied by a reduction in the number of total species (relative to adjacent, unperturbed areas) and the dominance of a few, opportunistic species. High abundances of a few species associated with reduced number of total expected species would be considered an indication of an adverse outfall-related effect. Where organic enrichment is extremely high, and results in anoxic conditions, abundances of all infaunal species would show a distinct decline or absence. Such a pattern in species abundances would be indicative of severely degraded conditions.

While total species abundance has proved variable over time, the differences between stations at any given time (i.e., sampling event) have generally been small. As with species richness, species abundances at each station have been generally similar between stations for each sampling event. The applicant's monitoring data does not indicate that species abundances at the ZID, nearfield, or farfield stations differ significantly. Such a pattern is indicative of a pollutant-free environment in the vicinity of the applicant's outfall.

Other Measures of Community Structure. Diversity, evenness, and dominance are three common measures used to evaluate changes in the relative abundance of species.

Species diversity (H') combines species richness and the relative abundances of species. Low diversity near the outfall relative to the reference station would indicate an outfall related effect. Although diversity has been variable over time, there are no

spatial or temporal trends which would indicate an outfall-related effect. Species diversity values at the ZID, nearfield, and farfield stations are similar to those found at the reference station.

Evenness is a measure of diversity which emphasizes regularity in the relative abundance of species in a sample. In theory, a stressed or impacted environment would have a more uneven or irregular distribution of species relative to areas not perturbed. The applicant's monitoring data indicates that there is no pattern of decreased evenness in the abundance of species monitored at the study area over the last two permit cycles.

Dominance is in essence the opposite of evenness. One simple measure of dominance is the number of species representing 75% of the total abundance in a given sample. Increased dominance by opportunistic or pollution tolerant species (resulting in fewer species comprising 75% of the sample abundance) would be indicative of an outfall effect. Of the benthic organisms measured in relation to the subject discharge, the Pacific Sand Dollar (*Dendraster exentricus*) has shown to be a variable and sometimes dominant species in the sampling area over the seventeen years of monitoring. In fact, sand dollars have often comprised approximately 75% of the taxa identified from the benthic samples analyzed per sampling event. However, sand dollars are known to be transient species, have strong recruitment episodes, and respond to environmental conditions such as upwelling events and El Nino events. Moreover, the occurrence of sand dollars, although dominant at times, tended to occur equally at all stations sampled for each sampling event. Thus no pattern of species dominance showed a strong spatial association relative to the location of the outfall. This is not only true for the Pacific Sand Dollar but for all other infaunal species sampled from the monitoring area.

Species composition. Perhaps the most direct measure of infaunal community health is the abundance of individual species. Certain benthic species tend to be more sensitive to outfall effects while others are more tolerant. Patterns in the abundances of sensitive species verses tolerant species can be used to infer outfall-related effects.

Over the entire seventeen years of monitoring, species composition has proved variable not only between stations but also between sampling events. This is likely reflective of the way in which benthic samples are collected (Van-veen grabs), the variable number and locations for which samples are collected per sampling event, and the temporal environmental conditions which influence the seasonal and inter-annual occurrences of infaunal species in the sampling area. Having said this, however, it is possible to discern general spatial and temporal patterns of species occurrence and abundance from the applicant's monitoring data. Such patterns can provide an insight to the overall health, or temporal and/or

spatial degradation, of the discharge environment. For example, and as mentioned above, some infaunal species are more sensitive to contaminated sediments than others, and changes in the relative occurrence and abundance of such species, both over space and time, can be an indication of whether sediments in and around the outfall area are contaminated or polluted.

The applicant's monitoring data suggests that the types and abundances of organisms that inhabit the sediment around the outfall area are indigenous and are also represented by those species which typically live in clean or non-polluted sediments. Also, the applicant's monitoring data shows that the types and relative abundances of organisms occurring near the outfall are similar to those occurring farther away from the outfall. That is, there is no spatial gradient in the general occurrence and abundance of sediment infauna radiating outward from the outfall area. Finally, the applicant's monitoring data shows that there is no significant change in the types and abundances of infauna around the outfall area over the course of the monitoring period (15 plus years). If the applicant's effluent was causing pollution to build-up in the sediments around the outfall, clear spatial and temporal patterns in the types, occurrences, and abundances of infaunal species sampled from the monitoring area would reflect this. Such is not the case.

2. Fish. Commercial and recreational fish species are present in the area of the outfall and likely to be exposed to some degree, to the wastewater being discharged. Because the MBCSD facility qualifies as a small discharger with a limited potential for adverse biological impact, sampling of fish assemblages occurring in the vicinity of the discharge was not required as part of the applicant's monitoring program. Therefore, no biological data on local fish assemblage was provided by the applicant for permit renewal purposes.

Given the relatively small volume of discharge and small area of potential impact, EPA finds that potential for impacts to local fish populations to be unlikely. This is supported by the low concentrations and/or absence of toxics in the effluent which ensure that water quality standards are being met and the lack of impact to the benthic communities.

D. Impact of Discharge on Recreational Activities. Under section 125.62(d), the applicant's proposed modified discharge must allow for the attainment or maintenance of water quality which allows for recreational activities at and beyond the zone of initial dilution, including, without limitation, swimming, diving, boating, fishing, picnicking and sports activities along shorelines and beaches. In addition, there must be no Federal, State or local restrictions on recreational activities within the vicinity of the applicant's outfall unless such restrictions are routinely imposed around sewage outfalls regardless of the level of treatment.

The COP applies the following bacterial standards for shoreline and body contact sports areas:

Total Coliform bacteria: Samples of water from each sampling station shall have a density of total coliform organisms less than 1,000 per 100 ml (10 per ml); provided that not more than 20 percent of the samples at any sampling station, in any 30-day period, may exceed 1,000 per 100 ml (10 per ml), and provided further that no single sample when verified by a repeat sample taken within 48 hours shall exceed 10,000 per 100 ml (100 per ml).

Fecal Coliform bacteria: The fecal coliform density based on a minimum of not less than five samples for any 30-day period, shall not exceed a geometric mean of 200 per 100 ml nor shall more than 10 percent of the total samples during any 60-day period exceed 400 per 100 ml.

In shellfish harvest areas, total coliform shall not exceed a median value of 70 MPN per 100 ml and not more than 10% of the samples shall exceed 230 MPN per 100 ml.

The NPDES permit requires that total coliform concentrations measured from the effluent before discharge shall not exceed a 30-day median of 23 MPN per 100 ml and a maximum of 2400 MPN. The applicant chlorinates the effluent prior to discharge. Total coliform concentrations in the effluent are monitored five days a week. EPA's review of the applicant's data indicates that coliform densities in effluent samples are consistently low with the exception of a few occasions (specific dates in September and October 1996, August 1998, and February 1999) when the 30-day median extended above the permitted limit. With regard to these episodes, specific malfunctions in facility operations have been linked to the causes of these exceedances.

The applicant does not currently monitor total and fecal coliform in the offshore (i.e., receiving) waters. Instead, the applicant monitors the shoreline along Atascadero State Beach (located south and east of the outfall location) for both total coliforms and fecal coliforms as part of their NPDES permit. Eight surfzone sampling stations are positioned at gradient distances from Station C, which is the closest onshore station to the offshore location of the discharge; see Figure 5 for the general locations of the surfzone monitoring stations. Samples are collected weekly at each station during summer months (May through October), and at least monthly during the winter months (November through April). Between 1998-2002 the applicant reports that of 200 samples collected there have been a 17 surfzone samples which have exceeded COP's most stringent standard for bacterial limits (70 per 100 ml for shellfish harvesting). Of these 17, only one sample taken concomitantly from the effluent exceeded this COP limit, indicating that the other 16 samples were likely a result of sources other

than the discharge.

In addition to the applicant's monitoring of the surfzone stations, the San Luis Obispo County Health Department has been monitoring shoreline stations since 1999 in the vicinity of the applicant's discharge along the southern portion of Atascadero State Beach, north of Morro Rock. To date, the County has reported no beach closures at Atascadero Beach due to unacceptable levels of bacterial contamination.

The overall results of the shoreline fecal coliform monitoring effort for the last permit period indicates that shoreline contamination by way of the applicant's discharge is not of reasonable concern. This is likely due to the fact that the applicant disinfects its effluent prior to discharge. In contrast, fecal coliform concentrations from non-point sources, such as Morro Creek, likely contribute more significantly to shoreline bacterial contamination.

There are no Federal, State or locally imposed restrictions on recreational activities in the vicinity of the applicant's outfall.

E. Conclusions on Balanced Indigenous Population. EPA concludes that a balanced indigenous population is being maintained in the vicinity of the outfall and recreational activities are protected. This conclusion is based on the following considerations:

1. The discharge meets all COP standards and EPA water quality criteria. EPA models indicate that the outfall design and location result in a high degree of initial dilution. The applicant's discharge meets effluent limitations specified in the existing permit.

2. No substantial increase in solids deposition near the outfall is evident by the monitoring data, and there is no indication of organic accumulation in the vicinity of the outfall. Thus, benthic infaunal communities in the vicinity of the outfall are not degraded by the discharge. The health of the benthic community is compelling evidence that the applicant's discharge is not degrading marine life in the vicinity of the discharge.

3. Benthic infaunal communities in the vicinity of the outfall appear not to be degraded by sediment contamination. Organic pollutants and metal concentrations in sediments are not present at levels that would be considered potentially toxic to marine organisms.

4. Benthic monitoring data for infaunal communities does not indicate or suggest outfall-related perturbations based on species composition, number of species, abundance, diversity, evenness, or species dominance. Although not specifically sampled, local fish populations are not likely to be impacted by the quality and

quantity of effluent being discharged.

5. Effluent coliform data indicates that, in general, the treatment works is discharging effluent which is not causing unacceptable levels of total and fecal coliform bacteria either in the receiving waters and along the nearby shoreline. This is primarily due to the requirement for the treatment works to disinfect its effluent prior to discharge. Periodic bacterial monitoring along the adjacent beaches indicate that, overall, water quality standards are being met.

6. Effluent monitoring results, for the most part, indicate that unacceptable levels of toxic constituents (metals, pesticides, organic pollutants, etc.) are not found in the applicant's effluent prior to discharge; see Section III-H of the applicant's Supplemental Report for a complete discussion. In fact, relative to the federal and state applicable water quality standards for the subject discharge, no significant and/or consistent occurrence of toxic constituents have been measured from the applicant's effluent during the last two permit cycles (i.e., 10 years). Likewise, no significant and/or consistent occurrence of toxic constituents have been measured from the applicant's benthic sediments and biosolids monitoring efforts over the last ten years.

Since the subject application is not proposing modifications to the current, authorized discharge, continued maintenance of the BIP through the next permit cycle is likely assured. Current NPDES permit limits will be maintained, or new ones established where applicable, to ensure future and continued compliance with state standards and to protect marine resources.

3. Establishment of a Monitoring Program [Section 301(h)(3), 40 CFR 125.63].

Under 40 CFR 125.63, which implements section 301(h), the applicant must have a monitoring program designed to evaluate the impact of the modified discharge on the marine biota, demonstrate compliance with applicable water quality standards, measure toxic substances in the discharge, and have the capability to implement the program upon issuance of a 301(h) modified NPDES permit. The frequency and extent of the monitoring program are to be determined by taking into consideration the applicant's rate of discharge, quantities of toxic pollutants discharged, and potentially significant impacts on receiving water, marine biota, and designated water uses.

The applicant has proposed a number of changes to the current monitoring program; see Section III.F for complete discussion of these proposed changes. No significant changes to the current monitoring program, such as the complete elimination of the current infaunal community assessment, has been proposed by the applicant. Rather, the applicant is proposing to adjust some field methodologies and sampling locations, and also to reduce some

sampling in association with receiving water, sediment, and surf zone monitoring. EPA will discuss these proposed changes with the state, in coordination with the applicant, and will adopt changes only if the integrity of the current monitoring program is not compromised, and the public is assured that reasonable measures remain in place to adequately gage the overall health of the discharge environment.

The final and approved monitoring plan will be developed by the state and EPA and will be incorporated into the final NPDES permit. In accordance with 40 CFR 125.63(a)(2), the applicant's monitoring programs are subject to revision as may be required by EPA.

4. Effect of Modified Discharge on Other Point and Nonpoint Sources [Section 301(h)(4), 40 CFR 125.64].

Under 40 CFR 125.64, which implements section 301(h)(4), the applicant's proposed modified discharge must not result in the imposition of additional treatment requirements on any other point or nonpoint source. The MBCSD outfall is isolated from any intake pipe which could potentially be affected by the discharge. Given the small amount of discharge (less than 1.2 MGD), and the significant dilution of the wastewater provided, by the time it approaches any pipe, there will be no imposition to any point or nonpoint source for additional treatment requirements.

The State will provide its views on this issue in the certification required pursuant to 40 CFR 125.64(b).

5. Toxics Control Program [Section 301(h)(5), 40 CFR 125.66(a)-(c)].

The toxics control program is designed to identify and ensure control of toxic pollutants and pesticides discharged to the POTW. The Section 301(h) toxics control regulations require both industrial and nonindustrial source control programs. These regulations provide certain exemptions for small dischargers. Small dischargers are defined in the 301(h) regulations as having average dry weather flows less than 5.0 MGD and a service population less than 50,000. Morro Bay is a small discharge designed for an average dry weather flow of 2.06 MGD and a service population of approximately 13,800.

A. Chemical Analysis. Under 40 CFR 125.66(a), applicants are required to submit chemical analyses of its effluent discharge for specific toxic pollutants and pesticides. Small section 301(h) applicants, which certify that there are no known or suspected sources of toxic pollutants or pesticides and document the certification with an industrial user survey, are exempt from the chemical analyses specified under 125.66(a). EPA reviewed effluent data submitted by the applicant and found that concentrations of toxics and pesticides in the effluent have remained insignificant

throughout the last ten years of sampling.

B. Toxic Pollutant Source Identification. Under 40 CFR 125.66(b), the applicant must submit an analysis of the sources of toxic pollutants identified in section 125.66(a) and to the extent practicable categorize the sources according to industrial and nonindustrial types. The results of industrial waste surveys performed by the City of Morro Bay and the Cayucos Sanitation District in 1994, 1999 and 2002 indicate that there were no significant sources of toxic pollutants from industrial waste entering the collection system that conveys the community's wastestream to the treatment plant.

C. Industrial Pretreatment Requirements. Under 40 CFR 125.66(c), applicants with known or suspected industrial sources of toxic pollutants must have an approved industrial pretreatment program. The control of industrial sources is also addressed by the pretreatment program regulations [40 CFR 403.8(d)]. Small discharges with no known or suspected sources of toxic pollutants are exempted from the 301(h) pretreatment requirements. The applicant originally provided such certification in the first renewal process in 1993. Based on this certification, EPA and the Central Coast Regional Water Quality Control Board exempted MBCSD from the pretreatment requirements. The applicant was required to implement a Pollution Prevention Plan to meet the requirements for a Nonindustrial Source Control Program (See Section 7 below).

6. Urban Area Pretreatment Program [Section 301(h)(5), Section 303(c) of the Water Quality Act of 1987].

Large applicants for a modified NPDES permit under section 301(h) of the Act that receive one or more toxic pollutants from an industrial source are required to comply with the urban area pretreatment requirements. As a small discharger, MBCSD is exempt from the urban area pretreatment requirement.

7. Nonindustrial Source Control Program [Section 301(h)(7), 40 CFR 125.66(d)].

Under 40 CFR 125.66(d), which implements section 301(h)(7), the applicant must have a proposed public education program designed to minimize the entrance of nonindustrial toxic pollutants and pesticides into their water pollution control facility (40 CFR 125.66(d)(1)). In certain cases, applicants may be required to implement additional nonindustrial source control programs (40 CFR 125.66(d)(2)).

The applicant has reported that they maintain an on-going Pollution Prevention Program to minimize the introduction of pollutants and pesticides into the treatment plant process; see Section III.H.3 of the applicant's Supplemental Report for complete discussion. This

program was required as a provision of the existing NPDES permit to meet the requirements for a nonindustrial source control program under 40 CFR 125.66(d)(1). The program, as described by the applicant, incorporates three major aspects toward pollution prevention: 1) public outreach/education, 2) industrial waste reduction, and 3) pollution source identification. As part of this program, the applicant has implemented a hazardous waste disposal and recycling program designed to allow local residents and businesses to properly dispose of unwanted and unused materials (such as organ solvents, pesticides, car batteries, etc.) which might otherwise be dumped into the facilities collection system and/or municipal storm drains. Other measures, such as grease-trap inspections and source identification efforts are being implemented by the applicant in an effort to minimize the introduction of pollutants and pesticides into the treatment plant process.

Implementation of additional nonindustrial source control programs is not required for small dischargers which certify that there are no known or suspected water quality sediment accumulation, or biological problems related to pollutants or pesticides in its discharge. The applicant has stated that "there are no known sources of priority pollutants or pesticides within the collection system that feeds the MBCSD WWTP" and that "the absence of significant nonindustrial input of toxins is supported by the lack of toxic pollutants in either the WWTP effluent or sludge over the past 4.5 years." Based on this information, EPA finds that no additional nonindustrial source control programs are required.

8. Increase in Effluent Volume or Amount of Pollutants Discharged [Section 301(h)(8), 40 CFR 125.67]

Under 40 CFR 125.67, which implements section 301(h)(8), the applicant's proposed modified pollutant discharge may not increase above the amount specified in the 301(h) modified NPDES permit. The NPDES permit establishes the following limits based on an average dry weather flow of 2.06 MGD:

Suspended Solids:

70 mg/L (30-day ave.); 105 mg/L (Instant. Max.); 199 MT/yr (Ann. ave.)

BOD:

120 mg/L (30-day ave.); 180 mg/L (Instant. Max.)

9. Compliance with Primary Treatment and Federal Water Quality Criteria [Section 301(h)(9), Section 303(d)(1) and (2) of the Water Quality Act of 1987].

A. Primary Treatment Standards.

Under Section 303(d)(1) of the Water Quality Act of 1987 (WQA), the

applicant's wastewater effluent must be receiving at least primary treatment at the time their Section 301(h) permit becomes effective. Section 303(d)(2) of the WQA states that, "Primary or equivalent treatment means treatment by screening, sedimentation, and skimming adequate to remove at least 30 percent of the biological oxygen demanding material and other suspended solids in the treatment works influent, and disinfection, where appropriate." In addition, the COP requires 75% removal of suspended solids based on a 30-day average. To meet the 30-day average permit limit for BOD (120 mg/L) the plant must remove greater than 30% of BOD.

Over the time period between 1986 and 2002, on average, the applicant removed 88% of TSS and 79% of BOD on an annual basis. Monthly TSS removal efficiencies for 2001 and 2002 averaged 89% and 86%, respectively. Monthly BOD removal efficiencies for the same years averaged 83% and 82%, respectively. The applicant has demonstrated the ability to meet the 30% removal requirement of TSS and BOD and the COP requirement for 75% removal of TSS. Effluent limitations being established as part of the 301(h) modified NPDES permit will continue to ensure that this requirement is met throughout the permit term.

B. U.S. EPA Water Quality Criteria.

Under section 303(d)(1) of the WQA, a discharger must be in compliance with the criteria established under section 304(a)(1) of the Clean Water Act at the time their 301(h) permit becomes effective. These criteria include saltwater Water Quality Criteria, and 301(h) pesticides Water Quality Criteria.

Based on a review of the applicant's discharge data, EPA concludes that all federal criteria will be met after initial dilution (See Section 2A). NPDES permit limits have been established along with effluent monitoring requirements to ensure continued compliance with EPA criteria.

COMPLIANCE WITH OTHER APPLICABLE LAWS.

40 CFR 125.59(b)(3) provides that a 301(h) modified NPDES permit may not be issued if such issuance would conflict with applicable provisions of State, local, or other Federal laws or Executive Orders.

1. State Coastal Zone Management Program [40 CFR 125.59(b)(3)].

40 CFR 125.59(b)(3) provides that issuance of a 301(h) modified NPDES permit must comply with the Coastal Zone Management Act, 16 U.S.C. 1451 et seq. In accordance with 16 U.S.C. 1456(c)(3)(A), a 301(h) modified NPDES permit may not be issued unless the proposed discharge is certified by the State to comply with the applicable State coastal zone management program(s) approved under the Coastal Zone Management Act, or the State waives such certification.

2. Marine Sanctuaries [40 CFR 125.59(b)(3)].

40 CFR 125.59(b)(3) provides that issuance of a 301(h) modified NPDES permit must comply with Title III of the Marine Protection, Research, and Sanctuaries Act, 16 U.S.C. 1431 et seq. In accordance with 16 U.S.C. 1432(f)(2), a 301(h) modified permit may not be issued for a discharge located in a marine sanctuary designated pursuant to Title III if the regulations applicable to the sanctuary prohibit issuance of such a permit.

The MBCSD discharge into Estero Bay is approximately 20 miles south of the southern border of the Monterey Bay National Marine Sanctuary, which was established by NOAA in 1992. In addition, the subject discharge is located within 1.5 miles of the mouth of Morro Bay, which has been designated as a National Estuary by the federal government. However, the applicant's discharge is too small and too far from the Sanctuary and Estuary to have any possible adverse impact to either waterbody.

The discharge is not near areas of special biological significance designated by the California State Water Resources Control Board.

3. Endangered or Threatened Species [40 CFR 125.59(b)(3)].

40 CFR 125.59(b)(3) provides that issuance of a 301(h) modified NPDES permit must comply with the Endangered Species Act, 16 U.S.C. 1531 et seq. In accordance with 16 U.S.C. 1536(a)(2), a 301(h) modified NPDES permit may not be issued if the proposed discharge will adversely impact threatened or endangered species or critical habitats listed pursuant to the Endangered Species Act.

In 1983, EPA designated MBCSD as their non-Federal representative to the US Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) to conduct informal consultation on the potential impact of the discharge on endangered species under section 7 of the Endangered Species Act.

In the original application in 1987, compliance with the Endangered Species Act was established based on the transitory nature of the gray whale and California sea otter, and a lack of toxic pollutants and pesticides to affect the California brown pelican and American peregrine falcon by the USFWS and NMFS. Since that time the gray whale populations recovered sufficiently to be removed from the list on June 16, 1994. There have been no significant changes in plant operations or effluent quality that would change the level of impacts to endangered species. Both federal agencies reaffirmed their approval of the last permit, as provided in correspondence by the USFWS in a letter dated 21, 1998, and by the NMFS in a letter dated July 30, 1998.

Relative to the current application, the applicant has obtained a

compliance assurance letter from NMFS, dated August 12, 2003, and has requested a compliance assurance letter from the USFWS. EPA understands that no new listing(s) (or de-listing) of endangered species, which potentially may be influenced by the applicant's discharge, by the USFWS during the last permit cycle have taken place.

In recent years, infections of southern sea otters along the Central Coast were occurring due to *Toxoplasma gondii*, a protozoan parasite known to originate primarily from felines. Scientists speculated that flushable cat litter may be a source of *T. gondii* from wastewater. Early studies detected *Toxoplasma* in lab-exposed mussels (Miller et al., 2002). Therefore, the MBCSD voluntarily collaborated with U.C. Davis in conducting bioaccumulation studies in 2003 and 2004 using bagged mussels deployed at an outfall buoy. The mussels were analyzed for *Toxoplasma* RNA. *Toxoplasma* RNA was not detected in any of the 120 mussels from the outfall buoy site.

STATE CONCURRENCE IN VARIANCE.

Section 301(h) and 40 CFR 125.59(i)(2) provide that a 301(h) variance may not be granted until the appropriate State certification/concurrence is granted or waived pursuant to 40 CFR 124.54. In accordance with the procedures of 40 CFR 124.53(a), before EPA may issue the applicant a 301(h) modified NPDES permit, the State must either grant certification pursuant to section 401 of the Act or waive certification. Such action by the State will serve as State concurrence in the variance.

EPA Region IX and the California State Water Resources Control Board have developed a Memorandum of Understanding (MOU; May 1984) outlining the procedures that each agency will follow to coordinate the implementation of section 301(h) and State waste discharge requirements. The MOU specifies that the joint issuance of an NPDES permit which incorporates both 301(h) decision and State waste discharge requirements will serve as the State's concurrence.

The applicant submitted a letter to the Central Coast Regional Water Quality Control Board requesting state concurrence under 40 CFR 125.61(b)(2) and 125.64(b) (Letter from Bruce Keogh to Roger Briggs dated June 23, 2003).

REFERENCES

California Ocean Plan. 2001. Water Quality Control Plan, Ocean Waters of California. State Water Resources Control Board. Sacramento, CA.

Long, E.R., D.D. MacDonald, S.L. Smith, and F.D. Calder. 1995. Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments. *Environmental Management* 19:81-97.

Long, E.R. and L.G. Morgan. 1990. The potential for biological effects of sediment-sorbed contaminants tested in the National Status and Trends Program. NOAA Tech Memo OMA 52. US National Oceanographic and Atmospheric Administration. Seattle, WA.

Miller, M.A., I.A. Gardner, C. Kreuder, D.M. Paradies, K.R. Worcester, D.A. Jessup, E. Dodd, M.D. Harris, J.A. Ames, A.E. Packham, P.A. Conrad. 2002. Coastal freshwater runoff is a risk factor for *Toxoplasma gondii* infection of southern sea otters (*Enhydra lutris nereis*). *International Journal for Parasitology* 32:997-1006.

Steinhauer, M., E. Crecelius, and W. Steinhauer. 1994. Temporal and spatial changes in the concentrations of hydrocarbons and trace metals in the vicinity of an offshore production platform. *Marine Environmental Research* 37:129-163.

Tetra Tech. 1992. Technical Review of City of Morro Bay, CA Section 301(h) Application for modification of secondary treatment requirements for discharge into marine waters. Prepared by Tetra Tech Inc., Lafayette CA for US Environmental Protection Agency, Region IX, San Francisco CA.

USEPA. 1994. Amended Sections 301(h) Technical Support Document. EPA 842-B-94-07. US Environmental Protection Agency, Office of Wetlands, Oceans and Watersheds. Washington, DC.

USEPA. 1992. Analysis of the Section 301(h) secondary treatment variance application by City of Morro Bay - Cayucos Sanitary District for Morro Bay - Cayucos wastewater treatment plant. Prepared by US Environmental Protection Agency, Region IX, San Francisco, CA.

USEPA. 1982. Revised Section 301(h) Technical Support Document. EPA 430/9-82-011. US Environmental Protection Agency, Office of Water Operations. Washington DC.

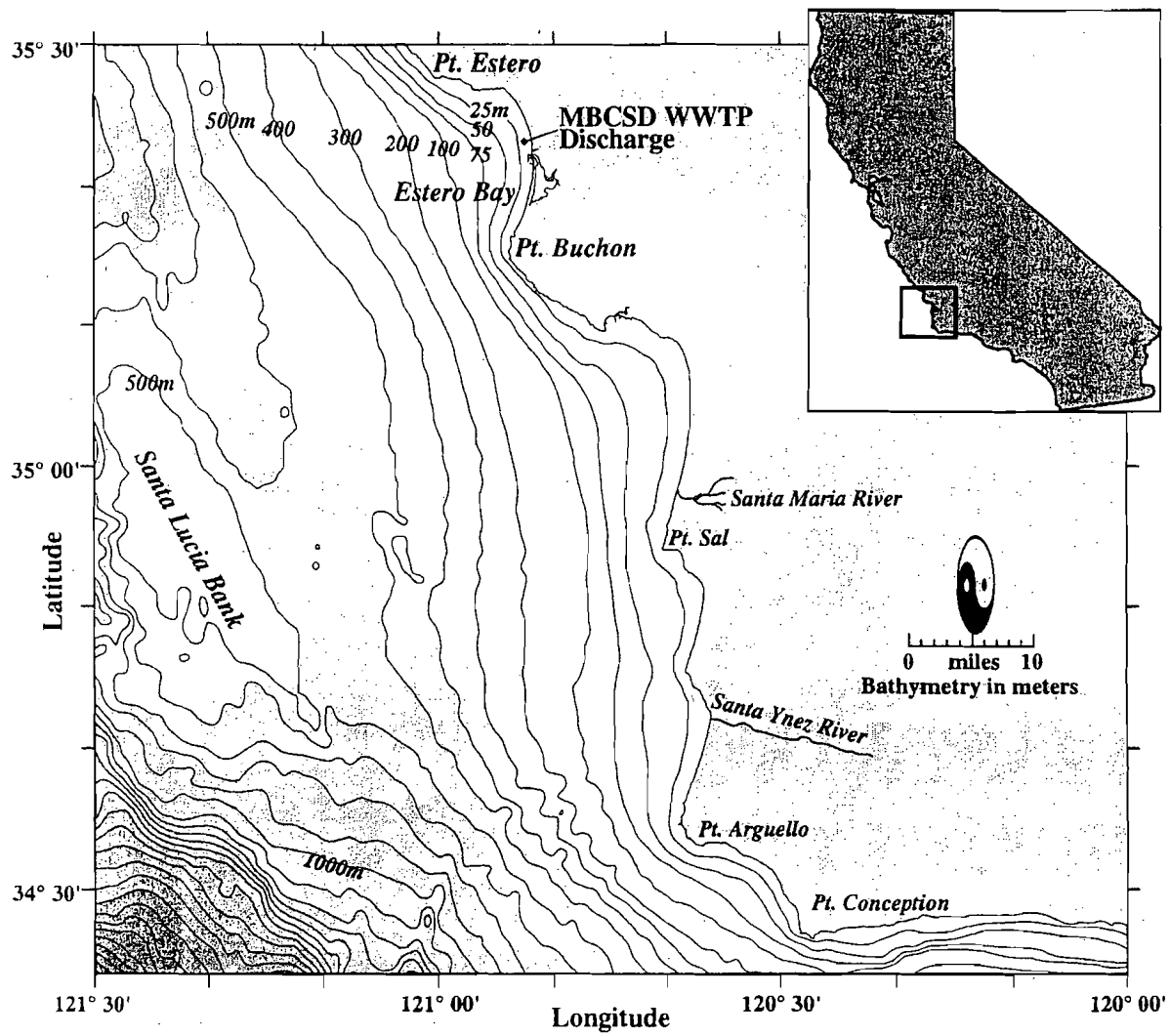


Figure 1. Location of the MBCSD Facility

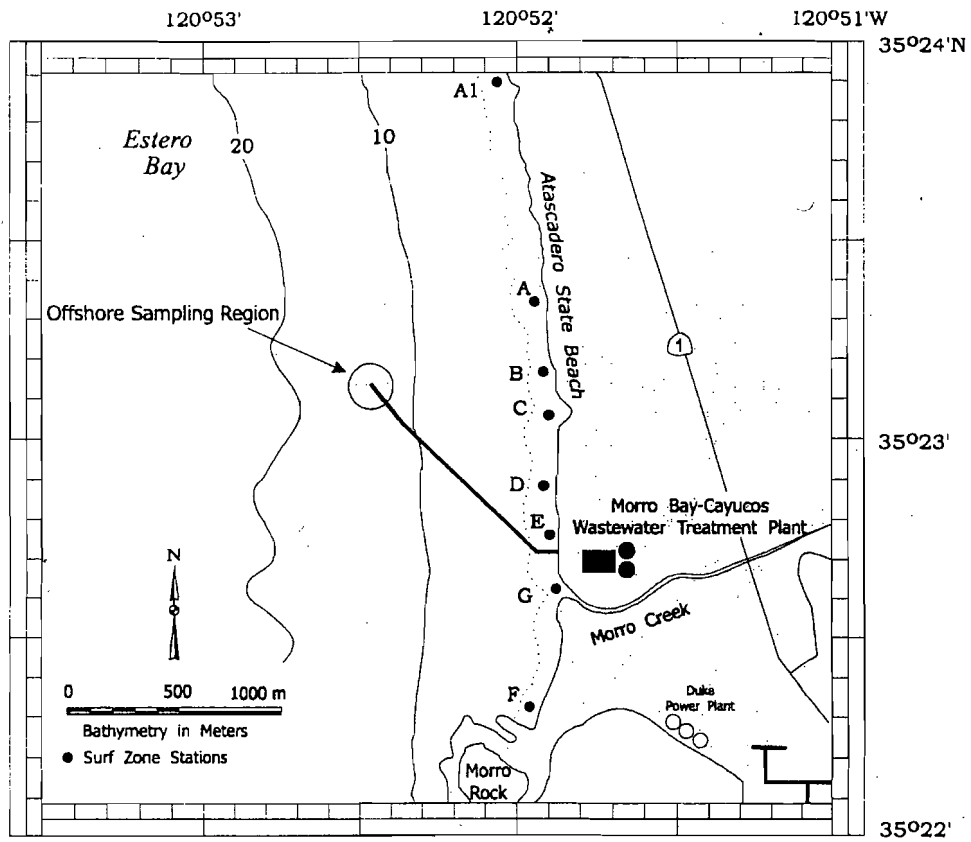


Figure 2. Location of MBCSD Outfall and Shoreline Monitoring Stations

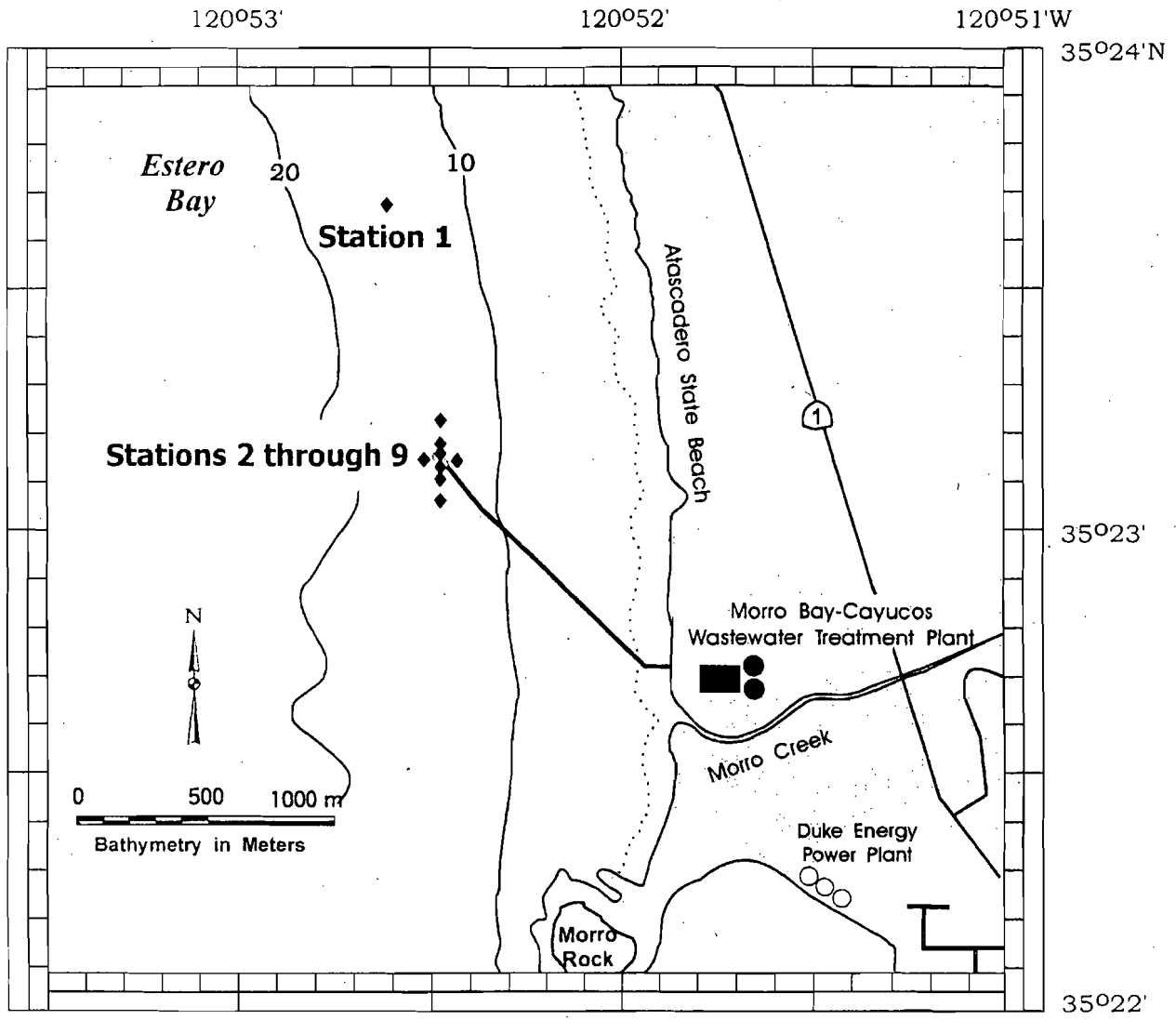


Figure 3. Benthic Sampling Stations

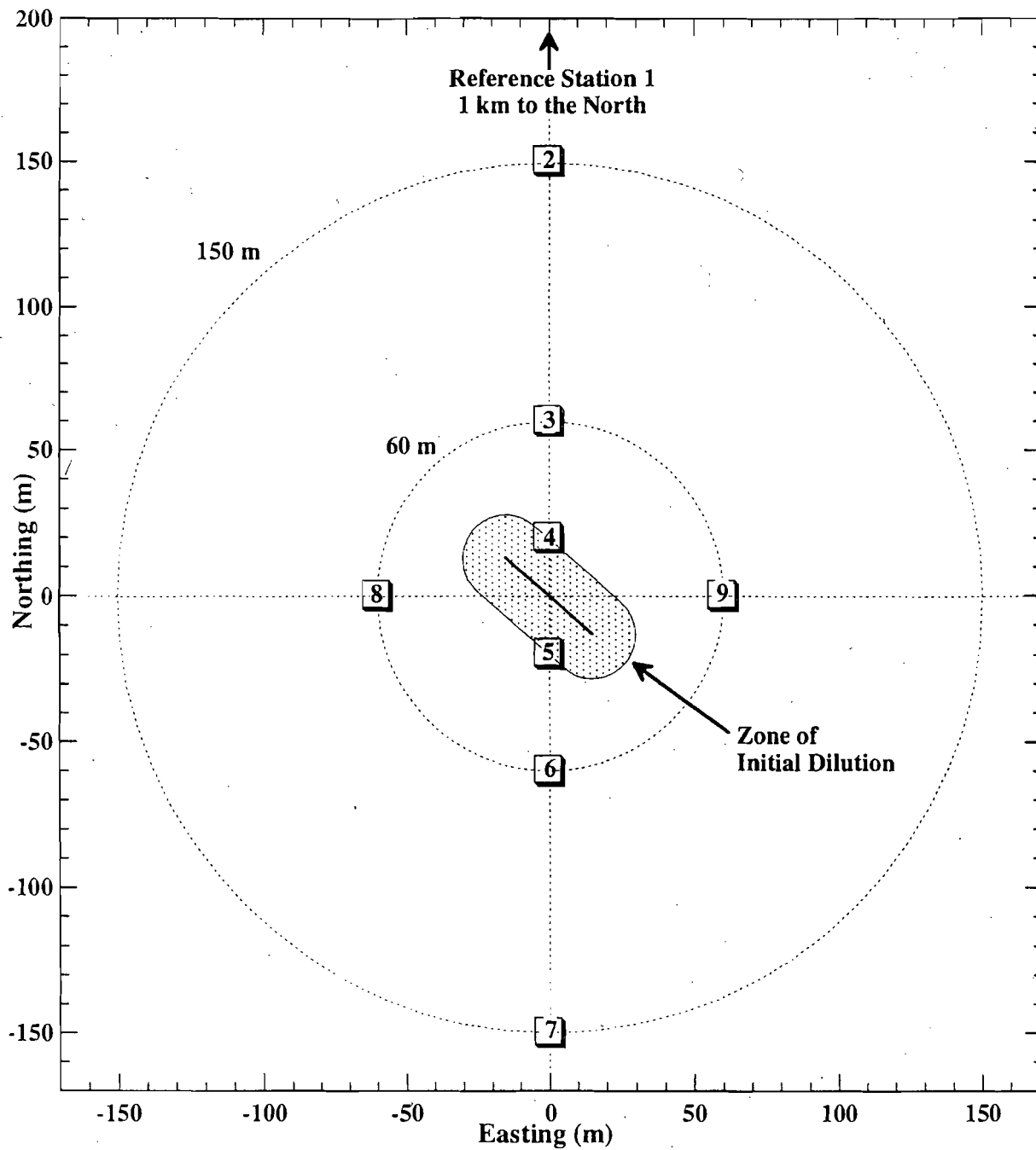


Figure 4. Benthic Sampling Stations Relative to the ZID