NPDES PERMIT

CONTENTS

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
AND
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 9

NPDES Permit

FOR

CITY AND COUNTY OF SAN FRANCISCO
OCEANSIDE TREATMENT PLANT,
SOUTHWEST OCEAN OUTFALL,
AND
WESTSIDE WET WEATHER FACILITIES

NPDES PERMIT NO. CA 0037681

Order No. R2-2003-0073

Adopted on August 20, 2003

Effective starting October 1, 2003
Expires on September 30, 2008

ORDER NO. R2-2003-0073
NPDES PERMIT NO. CA0037681

REISSUING WASTE DISCHARGE REQUIREMENTS FOR:
OCEANSIDE WATER POLLUTION CONTROL PLANT, AND
WESTSIDE WET WEATHER COMBINED SEWER SYSTEM
SAN FRANCISCO, SAN FRANCISCO COUNTY

FINDINGS

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter called the Board), and the U.S. Environmental Protection Agency, Region 9 (hereinafter called U.S. EPA), find that:

1. ***Discharger and Permit Applications***
   The City and County of San Francisco, hereinafter called the Discharger or the City, has applied to the Board and the U.S. EPA for re-issuance of the permit and waste discharge requirements to discharge treated wastewater to waters of the State and the United States under the National Pollutant Discharge Elimination System (NPDES) program for the Oceanside Water Pollution Control Plant (Oceanside WPCP) including the Westside Wet Weather Combined Sewer System (NPDES Permit No. CA 0037681).

2. ***Permit Coverage***
   The City is the owner and operator of the Oceanside WPCP and the Westside Combined Sewer System (Westside CSS), a wastewater collection, treatment and disposal system which serves the west side of San Francisco. The Permit covers all discharges from the Discharger's Oceanside WPCP and Westside CSS to the Pacific Ocean. These flows originate from domestic and industrial wastewater from the west side of San Francisco and a small portion from the adjacent North San Mateo County Sanitation District. The Southwest Ocean Outfall (SWOO) carries effluent from the Oceanside WPCP and most flow from the Westside CSS to the Pacific Ocean, 3.75 miles offshore. This is considered Federal waters since it is beyond the three-mile limit of the State's territorial sea. The wet weather combined sewer discharge points are at the shoreline and are in State waters. These discharges were previously covered by Order No. 97-044.

3. ***Combined Sewer***
   The Discharger collects wastewater in a combined sewer system. This means that domestic sewage, industrial wastewater, and stormwater runoff are collected in the same pipes (combined sewer). Most other communities in California have a separated sewer system: one set of pipes for domestic sewage and industrial waste and another set for stormwater. The City has complied with federally mandated upgrades to secondary level treatment of its dry weather wastewater treatment plants to comply with the Clean Water Act (CWA) as required of Publicly Owned Treatment Works (POTW). The combined sewer system facilities are not POTWs subject to the secondary treatment regulations of 40 Code of Federal Regulation (CFR) Section 133. The U.S. EPA's Office of General Counsel has classified facilities that treat combined sewer overflows as point sources subject to Section 301(b)(1)(A), 301 (b)(1)(C), and 301(b)(2) of the CWA. Under wet weather conditions, the City's combined sewer system must comply with the Federal Combined

Sewer Overflow Control Policy, (59 CFR 18688). Operators of combined sewer systems must implement long-term control plans consistent with the policy in order to minimize CSOs. This includes providing storage capacity or treatment for wet weather flows, maximizing flows to treatment facilities, and minimizing combined sewer overflows.

Facilities Detail

4. ***Facility Location and Description***

a. Oceanside WPCP

The Oceanside WPCP is located at 3500 Great Highway in San Francisco. It is a secondary wastewater treatment plant with a peak secondary treatment capacity of 43 million gallons per day (MGD). During wet weather, the Oceanside wet weather facilities provide primary treatment up to an additional 22 MGD of mixed storm water and sewage.

b. Westside CSS Facilities

The City collects storm water runoff mixed with domestic and industrial wastewater in the Westside Wet Weather Facilities. The Westside system includes three large storage/transports: Westside Transport, Richmond Transport, and Lake Merced Transport. The Westside Transport is a 2.5-mile long box-like structure located beneath the Great Highway and has a storage capacity of 49.3 million gallons (MG). The Richmond Transport, located to the north, has a storage capacity of 12 MG; and the Lake Merced Transport located to the south, has a storage capacity of 10 MG. The combined storage capacity in all three transports (including 2.2 MG of sewers) is 73.5 million gallons. See Table 2 in the Fact Sheet for a breakdown in storage capacity.

The locations of the above facilities are shown in Attachments A (Discharge Facility Location Map), B (Combined Sewer Overflow Structures), and C (Discharge Facility Treatment Process Diagram).

5. ***Discharge Classification***

The U.S. EPA and the Board have classified discharges from the Oceanside Water Pollution Control Plant and the Wet Weather CSS as major discharges.

6. ***Dry and Wet Weather Classification***

a. Wet Weather Day

i. Definition: Wet weather day is defined as any day in which one of the following conditions exists as a result of rainfall:

1. Instantaneous influent flow to the Oceanside WPCP exceeds 43 mgd; or
2. The average daily influent flow concentration of TSS or BOD is less than 100 mg/L on the day the discharge occurs; or
3. The Westside storage/transport flow elevation exceeds 0 feet[1] in the west box or 18 feet in the east box

1 Flow is only decanted to the west box from the east box when the east box storage level exceeds 18 feet.

b. Dry Weather Day

ii. Definition: any day in the year that is not defined as a wet weather day.

iii. During dry weather, all the wastewater collected is treated to secondary levels at the Oceanside WPCP and discharged through the SWOO.

7. ***Oceanside WPCP Treatment Volume***

The Discharger presently discharges an average dry weather flow of 18 MGD from the Oceanside WPCP for discharge through the SWOO. See attachment C for diagram of dry weather treatment. Secondary treatment capacity is maximized at 43 MGD. Wet weather flows in excess of 43 MGD up to 65 MGD receive primary treatment at the Oceanside WPCP and are discharged to the SWOO along with the secondary effluent.

8. ***Westside CSS Treatment Volume***

Wet Weather flow treated at the Oceanside WPCP is maximized at 60 to 65 MGD. Flows above 65 MGD and up to 175 MGD receive flow-through treatment within the CSO structures and are discharged to the SWOO. Flows above 175 MGD also receive flow-through treatment within the CSO structures but are discharged at the shoreline (see later discussion, Finding 10.b.). Flow-through treatment in the CSO storage structures is equivalent to primary treatment in that solids are allowed to settle and a baffle system acts to retain floatable materials prior to discharge. See Attachment D for diagram of wet weather treatment.

9. ***Treatment Process Description***

a. Oceanside WPCP

All flow to the plant is pumped from the Westside Pump Station after coarse screening. The plant treatment process consists of a headworks with fine bar screens and grit removal, primary sedimentation tanks, pure oxygen aeration basins, and secondary clarifiers. During dry weather, all wastewater receives secondary level treatment via a pure oxygen activated sludge process (an average dry weather flow of 18 MGD, peak secondary treatment capacity of 43 MGD). During wet weather, additional treatment capacity is available for flows up to 65 MGD. These excess wet weather flows receive primary treatment using clarifiers prior to discharge to the ocean outfall. The Oceanside WPCP treatment process schematic is included as Attachment C of this order.

b. Westside CSS

During larger storms, when the Oceanside WPCP reaches maximum treatment capacity (65 MGD), storm flows that cannot be stored in the Westside storage/transport system (>73.5 MG) will pass over a weir and under a baffle into a second (west) box, called the decant structure; settleable solids and floatable materials remain in the first (east) box, and are flushed to the treatment plant after the storm subsides. The excess effluent is "decanted" from the east box to the west box and then pumped via the Westside Pump Station to the SWOO. Flows exceeding the discharge capacity of the SWOO (175 MGD contingent upon box levels and head pressure) are discharged to the shoreline via seven overflow structures. (See Attachment D for a diagram of the wet weather facilities.) This decanted effluent has received flow-through treatment equivalent to primary which includes screening (at pump stations) and removal of settleable solids and floatable pollutants.

In summary, wet weather combined sewer flows receive the following level of treatment on an annual basis. Percentages are based on the Westside System Model's estimate of the annual wet weather volume of wastewater (3,500 MG) from the Westside CSS.

1. Approximately 50% of the combined flow receives a combination of primary and secondary treatment at the Oceanside WPCP. The effluent generally meets secondary standards, and is discharged to the SWOO.

2. Approximately 37% of the combined flow receives "flow-through" treatment (equivalent to primary treatment) in the decant process of the Westside storage/transport and is discharged to the SWOO. A weir and baffle system retains settleable solids and floatable materials in the storage/transport structure, which are then flushed to the treatment plant after the rainstorm subsides.

3. Approximately 13% of the combined flow receives "flow-through" treatment (equivalent to primary treatment) in the storage/transport structures and is discharged to the shoreline via any of seven CSO structures.

Prior to the completion of the control program in 1997, over 80% of these flows were discharged untreated at the shoreline as combined sewer overflows (Table 1 in the Fact Sheet shows the decline in the number of overflows since 1992).

c. Deletion of Disinfection Requirements

On May 17, 1989, the Board adopted Order No. 89-71, amending Order No. 88-106 to delete the disinfection requirements. The Board action was based on the final technical report dated April 3, 1989, submitted by the Discharger entitled "Wastefield Transport and Bacteriological Compliance Studies of The San Francisco Ocean Outfall." The studies were conducted in 1987 and 1988. The findings indicate that the present non-disinfected wastewater discharge from the SWOO does not violate the California Ocean Plan bacteriological body-contact standards; these standards have not changed since the 1983 version. Monitoring since 1986 supports this conclusion. Therefore, this order does not require disinfection of the wastewater discharged.

10. Discharge Process

a. Oceanside WPCP

The Oceanside WPCP has the capacity to treat 65 MGD of combined storm water and wastewater during wet weather conditions. Up to 43 MGD receive secondary treatment, and the remaining flow receives primary treatment. All dry weather and wet weather flow from the Oceanside WPCP is discharged into the Pacific Ocean via the SWOO (E-007).

b. Westside Wet Weather CSS

i. The storage/transport structures operate to transport combined sewage and street runoff to the Oceanside WPCP during dry weather periods. During wet weather, these structures provide storage for additional storm water and wastewater flow, while pumping facilities

continue to transfer flow to the treatment facility. In the event that the capacities of the treatment plant and storage structures are exceeded, the combined storm water and wastewater receive the equivalent of primary treatment in the transport structures and are discharged into the Pacific Ocean via the SWOO or any of the seven (7) shoreline CSO structures (CSW 001 to CSW 007).

ii. Discharges from these structures occur only when the storm flow exceeds the combined storage capacity of the storage/transports and the capacity of the pumping facilities to transfer flows to the treatment plant and the SWOO.

11. Discharge Locations

The discharge locations are listed in Table 1.

Table 1. Discharge Locations

Outfall	Distance from shore/ Depth (Feet)	Receiving Water	Latitude	Longitude
Waste 001 – Waste 006 Discharge E-001, E-002, E-003, E-004, E-005, E-006	These discharges are not regulated by this permit and are only incorporated for reference. They are regulated in permit number CA0037664 for the City and County of San Francisco Southeast Water Pollution Control Plant, North Point Wet Weather Facility and Bayside Wet Weather Facilities.			
Waste 007 Discharge E-007 Oceanside WPCP (Southwest Ocean Outfall)	3.75 miles/80 feet MLLW	Pacific Ocean	37° 42.30'	122° 34.65'
Combined Sewer Overflow Sites				
Waste CSO 001 Discharge CSW-001	Shoreline Outfall	Fort Funston, Ocean Beach, Pacific Ocean	37° 42.915'	122° 30.272'
Waste CSO 002 Discharge CSW-002	Shoreline Outfall	Ocean Beach, Pacific Ocean	37° 34.270'	122° 30.481'
Waste CSO 003 Discharge CSW-003	Shoreline Outfall	Ocean Beach, Pacific Ocean	37° 45.834'	122° 30.695'
Waste CSO 004 Discharge CSW-004	Shoreline Outfall	Mile Rock, Pacific Ocean	37° 47.085'	122° 30.613'
Waste CSO 005 Discharge CSW-005	Shoreline Outfall	China Beach, Pacific Ocean	37° 47.264'	122° 29.504'
Waste CSO 006 Discharge CSW-006	Shoreline Outfall	Baker Beach, Pacific Ocean	37° 47.365'	122° 29.272'
Waste CSO 007 Discharge CSW-007	Shoreline Outfall	Baker Beach, Pacific Ocean	37° 47.368'	122° 29.220'
Waste CSO 008	Discharge Eliminated			

Outfall	Distance from shore/ Depth (Feet)	Receiving Water	Latitude	Longitude
Waste CSO 009 – CSO 043 Discharges CSN-009 – CSN-017; CSC-018 – CSC-035; CSS-037 – CSS-043	These discharges are not regulated by this permit and are only incorporated for reference. They are regulated in permit number CA0037664 City and County of San Francisco Southeast Water Pollution Control Plant, North Point Wet Weather Facility and Bayside Wet Weather Facilities.			
CSO-012, 014, 016, 020, 021, 034, 036, and 039	These discharges have been eliminated			

CSN = Combined Sewer North Drainage Basin
CSC = Combined Sewer Central Drainage Basin
CSS = Combined Sewer Southeast Drainage Basin
CSW = Combined Sewer Westside Drainage Basin

12. Solids Treatment, Handling and Disposal

a. Oceanside WPCP

Primary and secondary sludges are blended and thickened using gravity belt thickeners, and then anaerobically digested. The digested biosolids are dewatered and re-used or disposed of at permitted sites.

b. Westside Wet Weather CSS

All solids which settle out in the storage/transports are flushed to the Oceanside WPCP for treatment after the rainstorm subsides.

Combined Sewer Overflow

13. CSO Definition

U.S. EPA's 1994 CSO Control Policy defines CSOs as the following: "A CSO is the discharge from a Combined Sewer System (CSS) at a point prior to the POTW Treatment Plant. A combined sewer system is elsewhere defined as a wastewater collection system owned by a State or municipality...which conveys sanitary wastewater and storm water through a single-pipe system to a POTW." (FR, Vol 59, No. 75, Tuesday, April 19, 1994, 18689, Section I.A). According to this definition, the discharges described in the Findings above are considered "CSOs". Since the term "CSO" has generally applied to untreated discharges from a CSS, these discharges will be referred to as "treated CSOs" because of the flow-through treatment they receive.

14. Non-POTW Classification

U.S. EPA's Office of General Counsel has classified facilities that treat combined sewer overflows as point sources subject to Section 301(b)(1)(A) of the Clean Water Act. Thus, they are not Publicly Owned Treatment Works (POTWs) subject to the secondary treatment regulations of 40 Code of Federal Regulations (CFR) Section 133. This opinion is supported by subsequent case law (646 F.2d 568(1980); Montgomery Environmental Coalition V. Costle).

15. ***Facility Design and Annual Overflows***

In 1979, the San Francisco Bay Regional Water Quality Control Board "Board" issue Order No. 79-12 (See Attachment I) and the State Water Resources Control Board "State Board" issued Order 79-16 (See Attachment H) for the wet weather facilities; State Board Order No. 79-16 and Regional Board Order No. 79-12 found that a long term average of 8 overflows per year would provide adequate overall protection of beneficial uses. . The Westside CSS facilities have been designed so that dependent upon rainfall conditions, on average these shoreline discharges will occur 8 times per year. This overflow frequency was the criterion used to size the storage/transport and treatment facilities. The Discharger is responsible for operating wet weather facilities, storage, transport and pumping facilities at maximum efficiency in order to maximize treatment of wet weather flow. Treated CSOs to the shoreline will occur only when the storm flow exceeds the combined storage capacity of the storage/transports and the capacity of the pumping facilities to transfer flows to the Oceanside WPCP or the SWOO. The combined sewer flows discharged at the shoreline will have received flow-through treatment for the removal of settleable solids and floatable materials. The State Board Order No. 79-16 defined an overflow as the shoreline discharge from the combined sewer collection system. To be considered a discrete overflow event, the overflow must be separated by six hours in time from any other overflow.

The Discharger has successfully designed and completed construction of its wet weather facilities based upon criteria contained in Order No. 79-16. The system was designed and built based upon historical rainfall data to not exceed the overflow frequencies specified in Order No. 79-16. As specified in Order No. 79-12 and subsequent permits for these facilities, these long-term design criteria (the long term average of 8 overflows) will not be used to determine compliance or non-compliance nor used to negate the exception to the Ocean Plan. The Board and the U.S. EPA recognize that some years are wetter than others and may contribute more flow than anticipated in the system design criteria. The Discharger is required to maximize treatment and shall be considered in compliance as defined by adherence to the Wet Weather Effluent Performance Criteria in Section C of this permit, the Operations Plan, and other permit conditions. The operation and implementation of these facilities satisfies CSO Control Policy requirements. Specifically, these facilities implement the nine minimum controls as well as implement a completed long-term control plan as described in the CSO Control Policy (59 CFR 18688).

16. ***Capture and Storage of Wet Weather Flows***

The storage and transport structures, which surround the City like a moat, were designed with the capacity to capture and hold wet weather flows for later treatment and prevent shoreline overflows. The system capacity was measured, designed, and constructed based upon the previous 70 year rainfall history pattern for San Francisco to capture flows as necessary to achieve the criteria specified in State Board Order No. 79-16. In 1997, the Discharger completed the major components of the Wastewater Master Plan, and is in compliance with the Federal CSO Control Policy.

17. ***Sanitary Sewage Fraction of Overflows***

Wet weather flows are intermittent in nature and subject to a high degree of variability throughout the wet weather season. The sanitary fraction in controlled overflows averages 6% of the total flow.

18. Beach Postings and Bacteria Monitoring

In the event of any CSO events, the Discharger will post the beach as a preventative measure, and conduct shoreline monitoring for total coliform bacteria, E-coli (a surrogate of fecal coliform), and enterococcus pursuant to the Self-Monitoring requirements of this order, until these levels drop below the criteria contained in Section II of the attached Self-Monitoring Plan (SMP). Previous sampling indicates that elevated bacteria levels tend to be located only in the vicinity of the outfalls following a CSO discharge, and tend to decrease rapidly, typically within 24 hours after a CSO event. When the levels of all three indicators drop below these criteria, the Discharger may remove the beach postings. According to the draft U.S. EPA guidance document "Implementation Guidance for Ambient Water Quality Criteria for Bacteria," E-coli and enterococcus are considered better indicators of gastrointestinal illness than total coliform. Therefore, monitoring under this permit will include all three indicators – total coliform, E-coli (as a surrogate for fecal coliform), and enterococcus. Additionally, routine monitoring for these indicators will be conducted weekly regardless of the occurrence of CSO events. See Part B of the SMP Section II. and Section III and XII. in the Fact Sheet for further explanation on bacterial monitoring.

Applicable Plans, and Policies

19. Ocean Plan

The State Board adopted an amended Water Quality Control Plan for the ocean waters of California (Ocean Plan) on November 16, 2001. This updated and consolidated plan represents the master water quality control planning document for the State of California. The U. S. EPA approved the revised Ocean Plan on December 3, 2001. A summary of the regulatory provisions is contained in Title 23 of the California Code of Regulations, Section 3912. The Ocean Plan identifies beneficial uses and water quality objectives for ocean waters, which are those waters outside of enclosed bays, estuaries and lagoons and within the three-mile territorial marine waters of the State. The Ocean Plan also identifies discharge prohibitions intended to protect beneficial uses. The SWOO discharge is outside the State's territorial waters and the Ocean Plan does not apply at the point of discharge. For reasons described in Finding 29, this order implements water quality objectives borrowed from the California Ocean Plan.

Beneficial Uses

The Ocean Plan designates the following beneficial uses for the ocean waters of the state:

- 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 migration
- Fish spawning and shellfish harvesting

20. Combined Sewer Overflow Policy (CSO)

On April 11, 1994, U.S. EPA adopted the *Combined Sewer Overflow (CSO) Control Policy* (59 Federal Register 18688-18698). The CSO Control Policy was recently incorporated into the Federal CWA by the Wet Weather Water Quality Act of 2000 [House .Resolution (H.R.) 828] which is part of H.R. 4577, an omnibus funding bill. The CWA at Section 402(q)(1) now states: "...Each permit...pursuant to this Act...for a discharge from a municipal combined storm and sanitary sewer shall conform to the CSO Control Policy..." The CSO policy establishes a consistent national approach for controlling discharges from CSOs to the nation's water through the NPDES permit program. CSOs are defined as the discharge from the combined sewer system at a point prior to the POTW Treatment Plant (see Federal Register, Vol 59 No. 75, Tuesday, April 19, 1994 Section I.A.). A discharger's long-term CSO control plan includes the design and construction of additional facilities which constitute the CSO controls envisioned by the CSO Control Policy.

The CSO Policy initiates a two-phased process with higher priority given to more environmentally sensitive areas. During the first phase, the Discharger is required to implement the nine minimum controls. (See Finding 40.) These controls constitute the technology-based requirements of the CWA as applied to combined sewer facilities: best practicable control technology currently available (BPT), best conventional pollutant control technology, (BCT), and best available technology economically achievable, (BAT). These nine minimum controls can reduce the frequency of CSOs and reduce their effects on receiving water quality. During the second phase, the Discharger is required to complete and implement a long-term CSO control plan. The long-term CSO control plan includes the design and construction of additional facilities which constitute the CSO controls envisioned by the CSO Control Policy. In addition, the Discharger is required to continue the implementation of the nine minimum controls, properly operate and maintain the completed CSO controls in accordance with the operational plan, and continue to implement the post-construction monitoring program, e.g., CSO Monitoring.

21. Master Plan

In 1971 and 1974, the Discharger developed the "Master Plan for Wastewater Management" and "Master Plan Environmental Impact Statement and Report," respectively. These documents set the groundwork for the Discharger's wastewater control program by identifying the need for upgraded treatment levels and the principle of storing accumulated combined sewage flow during wet weather for later treatment at the wastewater treatment plant.

22. Operations & Maintenance Manual

An Operations and Maintenance Manual is maintained by the Discharger for purposes of providing plant and regulatory personnel with a source of information describing all equipment, recommended operation strategies, process control monitoring, and maintenance activities. In order to remain a useful and relevant document, this Order requires the Discharger to update the manual regularly to reflect significant changes in treatment facility equipment and operation practices.

Other Regulatory Bases

23. Water Quality Criteria/Objectives

Water quality objectives used to determine reasonable potential in this permit for E-007 (Southwest Ocean Outfall) during dry weather are based on the, *Quality Criteria for Water* (U.S. EPA 440/5-86-001, 1986 and subsequent amendments, "Gold Book"); applicable Federal Regulations (40 CFR Parts 122 and 131); December 27, 2002 "National Recommended Water Quality Criteria" compilation (Federal Register Vol. 63, No. 237, pp. 68354-68364). Additionally, parameters borrowed from the California Ocean Plan were incorporated. Discussion of the specific bases and rationale for effluent limits included in the permit are addressed in pages Section X of the Fact Sheet, which is incorporated by reference as part of this Order. (Also see Finding 29 – Basis for Water Quality Standards Applied to Discharge from SWOO.)

24. BCT/BAT Determination

U.S. EPA establishes some technology-based requirements by issuing industry-wide effluent guidelines. For CSOs, no effluent guidelines have been promulgated for BPT, BCT, or BAT. In the absence of effluent guidelines, the permit writer must use Best Professional Judgment (BPJ) to determine the level of treatment that BPT, BCT, and BAT represent. For the 1997 permit, the U.S. EPA performed a BPJ analysis (see Attachment 1 of Fact Sheet). The Board and the U.S. EPA continue to concur with the original findings of the BPJ analysis. These findings are as follows:

a. The completed Westside CSS facilities will provide overflow reduction at a cost in excess of that which would be required by BPT/BCT/BAT; and
b. No additional treatment facilities can be justified on a BPT/BCT/BAT cost basis; and
c. By including requirements in the NPDES permit to ensure the continued implementation of the nine minimum control technologies outlined in the CSO Policy, U.S. EPA and the Board have established the technology-based requirements mandated by the Clean Water Act and the California Water Code.

25. U.S. EPA Guidance Documents

Other U.S. EPA guidance documents used in the development of this permit may include in part:

- Technical Support Document for Water Quality Based Toxics Control (TSD) (March 1991) ;
- Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria, October 1, 1993;
- Whole Effluent Toxicity (WET) Control Policy, July 1994;
- National Policy Regarding Whole Effluent Toxicity Enforcement, August 14, 1995;
- Clarifications Regarding Flexibility in 40 CFR Part 136 Whole Effluent Toxicity (WET) Test Methods, April 10, 1996;
- Regions 9 & 10 Guidance for Implementing Whole Effluent Toxicity Programs Final, May 31, 1996;
- Whole Effluent Toxicity (WET) Implementation Strategy, November 19, 2002;
- *Combined Sewer Overflows, Guidance For Nine Minimum Controls*, EPA 832-B-95-003, May 1995;
- *Manual, Combined Sewer Overflow Control,* EPA/625/R-93/007, September 1993

- *Combined Sewer Overflows, Guidance For Permit Writers*, EPA 832-B-95-008, September 1995;
- *Combined Sewer Overflows, Guidance For Long-Term Control Plan*, EPA 832-B-95-002, September 1995;
- *Guidance: Coordinating CSO Long-Term Planning with Water Quality Standards Reviews*, EPA-833-R-01-002, July 31, 2001.

General Basis for Effluent Limitations

26. Federal Water Pollution Control Act

Effluent limitations and toxic effluent standards are established pursuant to sections 301 through 305, and 307 of the Federal Water Pollution Control Act and amendments thereto are applicable to the discharges herein.

27. 40 CFR 133

The secondary technology based limits for conventional pollutants for dry weather discharges at E-007 (SWOO) are established in accordance with 40 CFR 133, and the prior permit. During wet weather, the CSO Control Policy requirements apply.

28. State Board Order No 79-16

The State Board, in Order No. 79-16, determined that the combined sewer system, designed to capture 100% of the combined sewage and storm water runoff, and attaining a long-term average overflow frequency specified in that order, and maximizing treatment through appropriately sized facilities, would not compromise beneficial uses. The Discharger has successfully and adequately designed, built, and implemented control and treatment strategies that effectively address wet weather flow conditions.

29. Basis for Water Quality Standards Applied to Discharge from SWOO

Though the discharge is located 0.3 to 1.5 miles beyond State Waters, compliance with parameters borrowed from the Ocean Plan is required immediately after initial dilution. This requirement will assure that under worst-case conditions the receiving waters are protected. In addition state standards will be met within state waters. In addition, compliance with numbers borrowed from the Ocean Plan immediately after initial dilution is required to provide the basis for EPA's determination that the discharge will not cause unreasonable degradation of the marine environment as required by section 403 of the Act. Section 403(a) of the Act prohibits discharge to Ocean Waters except in compliance with guidelines established under section 403(c) of the Act. Section 403(c) of the Act requires that guidelines be promulgated for determining the degradation of marine waters. Federal Regulations at 40 CFR 125.122(b) (Determination of unreasonable degradation of the marine environment) state:

> *Discharges in compliance...with state water quality standards shall be presumed not to cause unreasonable degradation of the marine environment, for any specific pollutants or conditions specified in the... standard.*

The Ocean Plan is not directly applicable to the discharge from the SWOO at the point of discharge because the discharge occurs outside of state waters. However, because the discharge is

in compliance with numeric standards promulgated for ocean discharges within state waters (i.e. the 2001 California Ocean Plan) and because these standards address the criteria listed under 403(c)(1)of the Act, EPA concludes that compliance with numbers borrowed from the Ocean Plan provides a reasonable basis for concluding that the discharge from the SWOO is entitled to the presumption that it does not cause unreasonable degradation for the pollutants and conditions provided for in the Ocean Plan. EPA's review of the application and monitoring data supplied by the City of San Francisco provides no basis for rebutting this presumption. Therefore, EPA determines that the discharge is permitted under section 403 of the Act.

30. ***Applicable Water Quality Objectives – State Waters***

The Ocean Plan objectives apply to the shoreline CSOs to a limited extent. In Order WQ 79-16, the State Board granted an exception to bacterial water contact and shellfish harvesting standards in the California Ocean Plan for the shoreline CSOs. This exception was granted by the State Board because of the impracticality of shoreline discharges from a combined sewer system meeting these requirements. Order WQ 79-16 states that the exception will not compromise protection of ocean waters for beneficial uses, and the public interest will be served. The exception was conditional. Order WQ 79-16 limits the number of overflows to eight per year as a long term average. Also, it requires the Discharger to post beaches in the event of overflows until bacterial standards are met, operate facilities to conform with the physical, chemical, biological and radioactivity receiving water objectives of the Ocean Plan, and implement source control program for industrial users. Since Order 79-16, State Board has revised the Ocean Plan several times. The bacterial, physical, chemical, biological and radioactive objectives have remained relatively unchanged with two exceptions: 1) the addition of a list of numeric toxic pollutants to the chemical objectives, and 2) the addition of a narrative biological objective for bioaccumulation. Furthermore, the current Ocean Plan adopted 2001, specifies in III.A.4. that "not withstanding any other provisions in this plan, discharges from the City of San Francisco's combined sewer system are subject to the U.S. EPA's Combined Sewer Overflow Policy." Because the City has exceeded the minimum level of treatment outlined under Section II.C.4.A of the 1994 CSO Control Policy ("Presumption" approach), the wet weather facilities are "presumed to provide an adequate level of control to meet the water quality-based requirements of the CWA." Therefore, there are no numerical effluent limits applied to the treated shoreline CSOs. The City, however, is required to maintain and operate the Westside CSS facilities in accordance with its long term control plan to assure compliance with the CSO Control Policy as described previously.

The U.S. EPA approved the exception (as required in the Ocean Plan) in their letter of August 17, 1979.

31. ***Water Quality Based Effluent Limitations – Dry Weather***

During dry weather as defined by Finding 6.b., toxic substances in Discharge E-007 are regulated by water quality based effluent limitations (WQBELs) derived from the California Ocean Plan. WQBELs in this Order are revised and updated from the limits in the previous permit order and their presence in this Order is based on Reasonable Potential Analysis factors. Numeric WQBELs are required for all constituents that have reasonable potential to cause or contribute to an excursion above any State water quality objective. Numeric WQBELs are included in this permit for acute toxicity and for chronic toxicity.

32. Maximum Daily Effluent Limits – Dry Weather

Maximum Daily Effluent Limits (MDEL) are used in this permit to protect against acute water quality effects. It is impracticable to use weekly average limitations to guard against acute effects. Weekly averages are effective for monitoring the performance of biological wastewater treatment plants, whereas the MDELs are necessary for preventing fish kills or mortality to aquatic organisms.

NPDES regulations and U.S. EPA's Technical Support Document (TSD) provide the basis to establish MDELs. NPDES regulations at 40 Code of Federal Regulations section 122.45(d) state: "For continuous discharges, all permit effluent limitations, standards, and prohibitions, including those necessary to achieve water quality standards, shall *unless impracticable* be stated as:

(1) Maximum daily and average monthly discharge limitations for all discharges other than publicly owned treatment works; and

(2) Average weekly and average monthly discharge limitations for POTWs." (Emphasis added.)

The TSD (page 96) states daily maximum is appropriate for two reasons:

a. The basis for the 7-day average for POTWs derives from the secondary treatment requirements. This basis is not related to the need for assuring achievement of water quality standards.
b. The 7-day average, which could comprise up to seven or more daily samples, could average out peak toxic concentrations and therefore the discharge's potential for causing acute toxic effects would be missed. A maximum daily limit would be toxicologically protective of potential acute toxicity impacts.

33. Technology Based Effluent Limits – Dry Weather

Most permit effluent limits for conventional pollutants for the dry weather E-007 SWOO discharge are technology based. Limits in this permit based on the Secondary Treatment Regulations at 40 CFR 133.102 are the same as those in the prior permit for the following constituents: Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), Grease and Oil, Turbidity, and pH. The acute toxicity limit is now a water quality-based limitation. Technology-based effluent limitations are put in place to ensure that full secondary treatment is achieved by the wastewater treatment facility.

34. 303(d) Listed Constituents

On June 6, 2003, the U.S. EPA approved a revised list of impaired waterbodies prepared by the State. The list [hereinafter referred to as the 2002 303(d) list] was prepared in accordance with Section 303(d) of the federal Clean Water Act 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. Currently the receiving waters for the discharges covered by this permit are not impaired or listed on the 303(d) list.

35. Reasonable Potential Methodology

This reasonable potential analysis applies to dry weather effluent from the Oceanside WPCP (E-

007), but does not apply to wet weather effluent wastes from E-007, or to wastes CSO 001 through CSO 007. As specified by the CSO Policy, it is presumed that these wet weather discharges do not have reasonable potential to cause or contribute to an excursion above any state water quality standard as long as the Discharger implements and maintains the Nine Minimum Control measures, as well as the long-term control plan through implementation of the Wet Weather Operations Plan (also see Section C).

The Ocean Plan sets forth the water quality standards which are directly applicable to most discharges into state waters. U.S. EPA has determined that based on compliance with section 403 of the Act, it is necessary to borrow these standards for the discharge from the SWOO into Federal Waters.

The method for determining reasonable potential used in this permit closely follows the protocol described in U.S. EPA's *Technical Support Document for Water Quality-based Toxics Control*, EPA/505/2-90-001, March 1991 (TSD). The method projects a maximum effluent concentration with dilution, using a statistical approach that estimates the 99th percentile of the lognormal distribution of effluent concentrations. This maximum is then compared to an appropriate water quality objective. If the projected maximum is less than the water quality objective, there is no reasonable potential for the effluent to cause an excursion above the water quality standard.

CSO Control Policy Requirements – Wet Weather Controls

36. Conformance to CSO Control Policy

The Discharger is served almost 100% by combined sewers and thus is directly affected by the CSO Control Policy. In 1997, U.S. EPA and the Board reviewed this Policy together with documentation submitted by the Discharger and have made the following determinations:

a. The Discharger has demonstrated implementation of the nine minimum control technologies as specified in the Policy.
b. The Discharger has completed its Master Plan CSO control program and has otherwise demonstrated compliance with section I.C.1 of the CSO Control Policy. Therefore, the Discharger is not required to complete a (new) CSO long-term plan.
c. The Discharger has demonstrated compliance with the "Presumption" Approach for compliance during wet weather with water quality standards. (See Finding 38 for a discussion of the "Presumption" Approach.)
d. The Discharger's implementation of its wastewater Master Plan appropriately considered sensitive areas as required in the CSO Control Policy.
e. During wet weather, the Discharger operates its Oceanside WPCP at the maximum capacity compatible with safe operation and thus is in compliance with the CSO Control Policy provisions which allow for the discharge during wet weather of combined sewer flows which have received primary-only treatment.

In summary, the Board and U.S. EPA have determined that the Discharger's integrated approach to controlling storm flows is consistent with the CSO Control Policy.

37. Long-term Control Plan *(water quality-based requirements)*

In conformance with the CSO Control Policy, the Discharger developed a long-term control plan to select CSO controls to comply with water quality standards, based on consideration of the Discharger's financial capability. The purpose of this long-term control plan is to comply with the water quality requirements of the CWA. The CSO Control Policy provides two alternative approaches – the "demonstration" and the "presumption" approaches – that provide communities with targets for CSO controls that achieve compliance with the CWA, particularly protection of water quality and designated beneficial uses. The Discharger's program, which is already complete, complies with the presumption approach. This approach is defined in the CSO Control Policy as follows:

" '*Presumption Approach'*
A program that meets any of the criteria listed below would be presumed to provide an adequate level of control to meet the water quality-based requirements of the CWA, provided the permitting authority determines that such presumption is reasonable in light of the data and analysis conducted in the characterization, monitoring, and modeling of the system and the consideration of sensitive areas described above. These criteria are provided because data and modeling of wet weather events often do not give a clear picture of the level of CSO controls necessary to protect WQS [Water Quality Standards].

i. No more than an average of four overflow events per year, provided that the permitting authority may allow up to two additional overflow events per year. For the purpose of this criterion, an overflow event is one or more overflows from a CSS [Combined Sewer System] *as the result of a precipitation event that does not receive the minimum treatment specified below; or*

ii. The elimination or the capture for treatment of no less than 85% by volume of the combined sewage collected in the CSS during precipitation events on a system-wide annual average basis; or

iii. The elimination or removal of no less than the mass of the pollutants, identified as causing water quality impairment through the sewer system characterization, monitoring, and modeling effort, for the volumes that would be eliminated or captured for treatment under paragraph ii above.

Combined sewer overflows remaining after implementation of the nine minimum controls and within the criteria specified at II.C.4.a.i or ii, should receive a minimum of:

a. Primary clarification (Removal of floatables and settleable solids may be achieved by any combination-of treatment technologies or methods that are shown to be equivalent to primary clarification.);
b. Solids and floatables disposal; and
c. *Disinfection of effluent, if necessary, to meet WQS, protect designated uses and protect human health, including removal of harmful disinfection chemical residuals, where necessary."*

38. Conformance to "Presumption Approach"

The completed Master Plan Program exceeds the specifications of the Presumption Approach. The Discharger captures and provides treatment to 100% of the combined sewer flows rather than

the 85% identified in option ii. As defined in the CSO Control Policy, the Discharger has no remaining untreated overflow events; the overflows that occur in the City receives treatment (within the storage/transports) consisting of removal of floatable and settleable solids.

39. ***Implementation of Long-term Control Plan***
The wet weather conditions in this Order require continued implementation of the long-term plan and operation of all wastewater facilities such that pollutant removal from combined flow is maximized.

40. ***Nine Minimum Controls***
The nine minimum controls in the CSO Control Policy are required by the permit to meet the technology-based requirements of the CWA for wet weather discharges and listed as follows:

a. Conduct proper operation and regular maintenance programs for the combined sewer system (CSS) and the CSO outfalls;
b. Maximize use of the collection system for storage;
c. Review and modify pretreatment programs to ensure that CSO impacts are minimized;
d. Maximize flow to the POTW for treatment;
e. Prohibit CSOs during dry weather;
f. Control solids and floatable materials in CSOs;
g. Develop and implement pollution prevention programs that focus on contaminant reduction activities;
h. Notify the public; and
i. Monitor to effectively characterize CSO impacts and the efficacy of CSO controls.

Specific Basis for Effluent Limitations

41. ***Dilution and Assimilative Capacity***
The Reasonable Potential Analysis for SWOO and the effluent limitations used a dilution factor of 76:1 for all toxic constituents. As provided in the TSD, different dilution factors may be considered for different toxic constituents depending on the nature of the compound. For non-bioaccumulative constituents (or non-bioconcentratable pollutants using TSD terminology), 76:1 is a highly conservative approach since it does not take into account the average exposures on which the risk assumptions are based for the chronic criteria. For bioconcentratable pollutants, the TSD recommends restrictions on the dilution factor to prevent tissue contamination of organisms. Since sediment and tissue data from the SWOO Report show no elevation in concentrations of a select list of bioconcentratable pollutants in the vicinity of the SWOO compared to reference sites, some dilution above zero is appropriate for the SWOO (See Southwest Ocean Outfall Regional Monitoring Program, Five Year Summary Report, 1997-2001, Water Quality Bureau, 2003. City and County of San Francisco, Public Utilities Commission). Thus, 76:1 was also used for bioconcentratable constituents as it maintains past and current conditions for the Discharger. Future permits may use more appropriate dilution factors based on EPA and State guidance and discussions between the Discharger and EPA and the Board. For additional information on the City's monitoring program for bioaccumalative pollutants see Section X: Initial Dilution in the Fact Sheet.

42. ***Receiving Water Ambient Background Data Used in the RPA***

Ambient background values are utilized in the reasonable potential analysis (RPA) for E-007 during dry weather. For RPA, the ambient background seawater concentrations listed in Table C of the Ocean Plan are used. These are arsenic (3 ug/l), copper (2 ug/l), mercury (0.0005 ug/l), silver (0.16 ug/l), and zinc (8 ug/l); for all other constituents, the Ocean Plan considers the background concentration to be zero.

43. ***Reasonable Potential Analysis (RPA)***

40 CFR 122.44(d)(1)(I) requires the permit to include limits for all pollutants "which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard." The City submitted RPA calculations that were reviewed and analyzed by the U.S. EPA and the Board (see Finding 44). The RPA assessed constituents of concern identified in Table B of the Ocean Plan; no constituents showed a reasonable potential to exceed the most stringent of the Ocean Plan standards (see Finding 44). Monitoring is required for most of these constituents. A re-opener provision is included in this permit that allows numeric limits to be added to the permit for any constituent of the Ocean Plan that in the future exhibits reasonable potential to cause or contribute to an exceedance of a water quality standard. This determination will be made by the Board and U.S. EPA based on monitoring results.

44. ***Summary of RPA Data and Results***

The following tables summarize the results of the reasonable potential calculations.
Table 2 summarizes information for metals, and Table 3 summarizes the organics information. Using even the most conservative water quality objective (Ocean Plan's 6-month median or 30-day average), no metals or organics exhibit reasonable potential. For some organics, there is not enough information to make a reasonable potential determination. For a number of organic pollutants, detection limits are higher than water quality standards even with dilution, and all samples collected are below detection limits. These situations are reflected in the last column of Table 3 as "undetermined." For TCDD equivalents (dioxin), three samples yielded quantifiable results, and 5 samples did not. Although the analysis showed no reasonable potential (assuming non-detects = 0), because detection limits are fairly high, reasonable potential is considered to be "undetermined." U.S. EPA and the Board recognize that uncertainties exist, and have included acute and chronic toxicity limits in the permit to ensure that any effluent toxicity is quickly identified and controlled.

TABLE 2
Summary of Reasonable Potential Analysis for Metals (in ug/l)

Constituent	Ocean Plan Objectives (6-month median)	Ocean Plan Objectives (24-hour)	Maximium Effluent Concentration	Projected Maximum with 76:1 Dilution	Reasonable Potential
Arsenic	8	32	5	3.1	No
Cadmium	1	4	0.88	0.03	No
Chromium	2	8	7.5	0.27	No
Copper	3	12	25.6	0.22	No

Constituent	Ocean Plan Objectives (6-month median)	Ocean Plan Objectives (24-hour)	Maximium Effluent Concentration	Projected Maximum with 76:1 Dilution	Reasonable Potential
Lead	2	8	7.1	0.19	No
Mercury	0.04	0.16	0.048	0.0016	No
Nickel	5	20	4.4	0.07	No
Selenium	15	60	4.61	0.06	No
Silver	0.7	2.8	1.7	0.19	No
Zinc	20	80	100.7	9.87	No

Constituent	Ocean Plan Objectives (30-day average)	Maximium Effluent Concentration	Projected Maximum with 76:1 Dilution	Reasonable Potential
Antimony	1,200	<1.0	0.0241	No
Beryllium	0.33	<1.0	0.0241	No
Thallium	2	<1.0	0.0241	No

TABLE 3
Summary of Reasonable Potential Analysis for Organics (in ug/l)

Constituent	Ocean Plan Objectives (30-day average)	Ocean Plan Objectives (6-month median)	Maximium Effluent Concentration	Projected Maximum with 76:1 Dilution	Reasonable Potential
Tributyltin	0.0014		0.011	0.0006	No
TCDD Equivalent (TEQ) pg/l	0.0039		0.07	0.0034	Undetermined
Ammonia (mg/l)		600	36.20	1.7418	No
2-Methyl 4, 6-Dinitrophenol	220		<0.64	0.0154	No
PAHs	0.0088		<0.14	0.0034	No
Carbon Tetrachloride	0.90		<0.5	0.0120	No
1,2-Dichloroethane	28		<0.5	0.0120	No
Chloroform	130		8.7	0.4186	No
Phenolics		30	<0.5	0.0120	No
Toluene	85,000		<0.5	0.0674	No
Benzene	5.9		<0.5	0.0120	No
Acrolein	220		<50	1.2029	No
Acrylonitrile	0.10		<50	1.2029	undetermined
Bis(2-Chloro ethyl) Ether	0.045		<0.91	0.0219	No
Bis(2-Chloroethoxy) Methane	4.4		<1.01	0.0243	No
Bis (2-Chloroisopropyl) Ether	1,200		<0.85	0.0204	No
Chlorobenzene	570		<0.5	0.0120	No
Diethyl Phthalate	33,000		<0.32	0.0077	No
Dimethyl Phthalate	820,000		<0.35	0.0084	No
1,2-Diphenylhydrazine	0.16			No data	undetermined
Ethylbenzene	4100		<0.5	0.0120	No

Constituent	Ocean Plan Objectives (30-day average)	Ocean Plan Objectives (6-month median)	Maximium Effluent Concentration	Projected Maximum with 76:1 Dilution	Reasonable Potential
Fluoranthene	15		<0.04	0.0010	No
Hexachlorocyclopentadiene	58		<0.33	0.0079	No
Hexachlorobutadiene	14		<0.55	0.0132	No
Hexachloroethane	2.5		<0.59	0.0142	No
Isophorone	730		<0.91	0.0219	No
Dichloromethane	450		<3	0.0722	No
N-Nitrosodiphenylamine	2.5		<20	0.8111	undetermined (Only 3 data)
N-Nitrosodimethylamine	7.3		<20	1.0676	undetermined (Only 2 data)
Nitrobenzene	4.9		<0.91	0.0219	No
Tetrachloroethylene	2.0		3.2	0.1540	No
1,1-Dichloroethylene	0.9		<0.5	0.0120	No
1,1,1-Trichloroethane	540,000		<0.5	0.0120	No
1,1,2-Trichloroethane	9.4		<0.5	0.0120	No
1,1,2,2-Tetrachloroethane	2.3		<0.5	0.0120	No
1.4-Dichlorobenzene	18		<0.5	0.0120	No
2,4-Dinitrotoluene	2.6		<0.96	0.0231	No
2,4-Dinitrophenol	4.0		<0.4	0.741	No
2,4,6-Trichlorophenol	0.29		<0.69	0.0166	No
3,3-Dichloro-Benzidine	0.0081		<2.77	0.0666	Undetermined
Bis(2-Ethylhexyl)Phthalate	3.5		<0.97	0.0233	No
Di-N-Butylphthalate	3500		<0.96	0.0231	No
Benzidine	0.000069		<0.05	0.0013	Undetermined
Vinyl Chloride	36		<0.5	0.0120	No
Trichloroethylene	27		<0.5	0.0120	No
Aldrin (ng/l)	0.022		<2.02	0.0486	Undetermined
Chlordane (ng/l)	0.023		<3.4	0.0818	Undetermined
DDT/DDD/DDE (ng/l)	0.17		<5.9	0.1419	No
Dieldrin (ng/l)	0.04		<1.93	0.0464	Undetermined
Endosulfan (ng/l)		9.0	<2.84	0.068	No
Endrin (ng/l)		2.0	<2.08	0.0500	No
Toxaphene (ng/l)	0.21		<35	0.842	Undetermined
Heptachlor (ng/l)	0.05		<1.0	0.0024	No
PCBs (ng/l)	0.019		<35	0.8420	Undetermined
Hexachlorobenzene (ng/l)	0.21		<5	0.1203	No
1,3-Dichloropropene	8.9		<0.5	0.0120	No
Hexachlorocyclohexane (HCH)		0.004	<0.33	0.0079	Undetermined
Halomethanes	130		<0.5	0.0120	No
Dichlorobenzenes	5100		<0.5	0.0289	No
Dieldrin (ng/l)	0.04		<1.93	0.0464	Undetermined
Endosulfan (ng/l)		9.0	<2.84	0.068	No

45. Limits for Acute and Chronic Toxicity

Based on the reasonable potential calculations using conservative assumptions and the TSD methodology, no reasonable potential was found for the metals or organic pollutants. However, based on the origin of the effluent as domestic and industrial wastewater, acute toxicity and chronic toxicity limitations are contained in the permit on a professional judgment basis.

46. Whole Effluent Toxicity Monitoring

Sections 308(a) and 402 of the Clean Water Act provide authority to U.S. EPA or the State to require that NPDES permittees/applicants use biological monitoring methods and provide chemical toxicity and in-stream biological data when necessary for the establishment of effluent limits, the detection of violations, or the assurance of compliance with water quality standards. Both acute and chronic toxicity will be measured in accordance with the 2001 Ocean Plan, as described in Section I of the Self Monitoring Program. Limitations for acute and chronic toxicity have been included in this permit.

Programs

47. Pollution Prevention and Pollutant Minimization

The Discharger submitted to the Board a program plan which described the implementation of its Water Pollution Prevention Program. This ongoing program is intended to prevent the disposal of toxic substances to the sewer system. The Discharger is currently in the process of developing a new comprehensive wastewater master plan. The "Screening of Feasible Technologies" (SOFT), 2000 draft report should be finalized for use in the master plan process. The Discharger is encouraged to continue to work with interested stakeholders in the development of the master plan. See Reassessment of Treated Overflows in the Fact Sheet for more information on SOFT. Specific activities associated with that program are presented in detail in Provision 3.

48. Pretreatment Program

The Discharger has implemented and is maintaining a U.S. EPA approved pretreatment program in accordance with Federal pretreatment regulations (40 CFR 403) and the requirements specified in Attachment E "Pretreatment Requirements" and its revisions thereafter.

Analysis of Impacts

49. Endangered Species Consultation

U.S. EPA conducted a consultation with NOAA and U.S Fish and Wildlife Service according to Section 7(a)(2) of the Endangered Species Act (ESA). NOAA and U.S Fish and Wildlife Service concurred with U.S. EPA's "will not adversely affect" determination. (See Attachment J for ESA species letter and Response to Comments for additional information)

Permit Administration

50. Previous Order

The Discharger was previously regulated by Waste Discharge Requirements in Order No. 97-044, effective May 9, 1997. This Order supercedes and rescinds the requirements of Order No. 97-044.

51. ***NPDES Permit***
This Order serves as an NPDES Permit, adoption of which is exempt from the provisions of Chapter 3 (commencing with Section 21100) of Division 13 of the Public Resources Code [California Environmental Quality Act (CEQA)] pursuant to Section 13389 of the California Water Code. In addition, adoption of this Order is exempt from CEQA pursuant to California Code of Regulations, Title 11, section 15301, involving negligible or no expansion of use of an existing facility.

52. ***Notification***
The Discharger and interested agencies and persons have been notified of the Board's intent to reissue requirements for the existing discharge and have been provided an opportunity to submit their written views and recommendations.

53. ***Fact Sheet and Response to Comments***
The Fact sheet and Response to Comments for this Order are hereby incorporated by reference as part of this Order.

54. ***Third Party Review of Pollution Prevention Program***
The Board staff intends to require an objective third party to establish model programs, and to review program proposals and reports for adequacy. This is to encourage use of Pollution Prevention measures and does not abrogate the Board's responsibility for regulation and review of the Discharger's Pollution Prevention Program. Board staff will work with the Discharger and other interested parties to identify the appropriate third party for this effort.

55. ***Public Hearing***
The Board and U.S. EPA in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, pursuant to the provisions of Division 7 of the California Water Code and regulations adopted hereunder, and to the provisions of the Clean Water Act and regulations and guidelines adopted hereunder, that the Discharger shall comply with the following:

A. DISCHARGE PROHIBITIONS

1. The discharge of treated wastewater from sources, or at locations, or in a manner different from that described in the Findings of this Order is prohibited, except as noted in Prohibition A.3.

2. Discharge of wastewater is prohibited unless discharged through the Southwest Ocean Outfall diffuser at 37° 42' 18" North latitude, 122° 34' 39" West longitude (start of diffuser), except discharges occurring on a wet weather day (as defined in Finding 6.a. above.)

3. Bypass of the secondary treatment facilities at Oceanside WPCP is prohibited, except during a wet weather day or as provided in Standard Provision #13.

4. Discharge of effluent from the Oceanside WPCP which does not receive an initial dilution of at least 76:1 is prohibited.

5. Discharge of CSO-001 through CSO-007 outside of the wet weather period as defined in Finding 6.a is prohibited.

6. The discharge of average dry weather flows from the Oceanside WPCP greater than 43 mgd is prohibited. The Discharger shall determine the average dry weather flow over three consecutive dry weather months each year.

7. The discharge of waste shall not create a condition of pollution or nuisance as defined in the California Water Code.

8. Degradation of harvestable shellfish in the area as a result of dry weather discharge is prohibited.

B. DRY WEATHER EFFLUENT LIMITATIONS

Representative samples of combined effluent discharged through the SWOO at sampling station E-007 (see "Self-Monitoring Plan"), shall not exceed the following limits during dry weather discharges:

1. **Technology-Based Limits based on the Secondary Treatment** Regulation at 40 CFR 133.102 and 133.103, and the previous permit limits.

a. Constituent	Units	Monthly Average	Weekly Average	Daily Maximum	Instantaneous Maximum
Biochemical Oxygen Demand (BOD_5)	mg/l	30	45	---	
Total Suspended Solids (TSS)	mg/l	30	45	---	
Grease and Oil	mg/l	25	40	---	75
Turbidity	NTU	75	100	225	---
pH		within 6 to 9 at all times			

b. BOD_5 and TSS 85% removal

The arithmetic mean of the biochemical oxygen demand (five-day, 20°C) (BOD_5) and total suspended solids (TSS) concentration, for effluent samples collected in a calendar month shall not exceed 15 percent of the arithmetic mean of the respective values for influent samples collected at approximately the same times during the same period. Measurements taken on wet weather days shall not be included in calculating percent removal.

2. **Water Quality-Based Limits**: Limits on acute and chronic toxicity are derived from the 2001 Ocean Plan. Acute and chronic Toxicity shall be measured in accordance with the attached Self Monitoring Program.

Constituent	Units	Daily Maximum.
Acute Toxicity	**TUa**	2.58
Chronic Toxicity	**TUc_2**	76

C. WET WEATHER EFFLUENT PERFORMANCE CRITERIA (Operation requirements for wet weather facilities)

Wet Weather Performance Requirements

1. The Discharger shall capture for treatment, or storage and subsequent treatment, 100% of the Westside combined sewage volume collected in the combined sewage system during precipitation events under design conditions. Captured combined sewage shall be directed either to the Oceanside WPCP or to the storage/transports. All combined sewage captured shall receive a minimum of the following treatment:

   a. Flow-through treatment (storage/transports)
   b. Primary treatment (Oceanside WPCP)
   c. Secondary treatment (Oceanside WPCP)

2. The Discharger shall provide documentation that addresses the following criteria for wet weather flows as part of the Monthly Self Monitoring Report requirements:

3. Wet Weather Operation of Westside Facilities

   a. WESTSIDE DRAINAGE BASIN: Oceanside WPCP operation depends on rainfall, forecasts, and storage conditions in the Westside Transport, Lake Merced Transport and Richmond Transport structures.
      1). Oceanside WPCP will have an influent flow rate of at least 43 MGD prior to initiating decant from the Westside Transport into the Pacific Ocean via the SWOO.
      2). SWOO will have an influent flow rate of at least 165 MGD within 2 hours of a discharge into the Pacific Ocean from CSW 002 or CSW 003.
      3). Sea Cliff Pump Station I is operated at maximum capacity before an overflow occurs from CSW 005.
      4). Sea Cliff Pump Station II is operated at maximum capacity before an overflow occurs from CSW 007.

   b. POST RAIN ACTIVITIES
      1). Post Wet Weather Event - Treatment at the Oceanside WPCP will continue until the Westside Drainage Basin storage/transports are substantially empty of stormwater flows.

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2 A TUc equals 100 divided by the no observable effect level (NOEL). The NOEL is determined from IC, EC, or NOEC values. Monitoring and TRE requirements may be modified by the Executive Officer in response to the degree of toxicity detected in the effluent or in ambient waters related to the discharge.

a). If the National Weather Service predicts a 30% chance of rain during the next 24 Hours:
   i. Pumping will be maximized from Westside storage and transport via the Westside Station (WSS) to the SWOO and Oceanside WPCP until the level of sewage/stormwater in the East Box is between 5-10 feet.
   ii. Pumping will be maximized from Westside storage and transport via WSS to SWOO and OSP until the level of sewage/stormwater in the West Box is essentially zero.

b). If the National Weather Service does not predict rain
   i. Pumping will be maximized from Westside storage and transport until the level of sewage/stormwater in the West Box is essentially zero and total flow to Oceanside WPCP is less than 43 MGD.

D. RECEIVING WATER LIMITATIONS (DRY WEATHER)

1. The discharge from the SWOO shall not cause the following water quality objectives to be violated in ocean waters upon completion of initial dilution. (These limits are derived from the California Ocean Plan and are incorporated herein based on U.S. EPA's determination that compliance with said provisions provides the basis for U.S. EPA's determination that the discharge will not cause unreasonable degradation as required by Section 403 of the Clean Water Act.):

   a. Physical Characteristics
      1. Floating particulates and grease and oil shall not be visible.
      2. The discharge of waste shall not cause aesthetically undesirable discoloration of the ocean surface.
      3. Natural light shall not be significantly reduced at any point outside the initial dilution zone as the result of the discharge of waste.
      4. 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.

   b. Chemical Characteristics
      1. The dissolved oxygen concentration shall not at any time be depressed more than ten percent from that which occurs naturally as a result of the discharge of oxygen demanding waste materials.
      2. The pH shall not be changed at any time more than 0.2 units from that which occurs naturally.
      3. The dissolved sulfide concentration of waters in and near sediments shall not be significantly increased above that present under natural conditions.
      4. The concentration of organic materials in marine sediments shall not be increased to levels which would degrade marine life.
      5. Nutrient materials shall not cause objectionable aquatic growths or degrade indigenous biota.

   c. Biological Characteristics
      1. Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded.

2. The natural taste, odor, and color of fish, shellfish, or other marine resources used for human consumption shall not be altered.
3. The concentration of organic materials in fish, shellfish or other marine resources used for human consumption shall not bioaccumulate to levels that are harmful to human health.

2. Receiving water monitoring shall be conducted in accordance with the attached Self-Monitoring Program, Parts A and B.

E. BIOSOLID MANAGEMENT PRACTICES

1. The Discharger presently re-uses all stabilized, dewatered sewage sludge (biosolids) from the Discharger's wastewater treatment plant by beneficially at permitted sites. If the Discharger desires to dispose of biosolids by a different method, the Discharger shall notify the Board and U.S. EPA in writing before start-up of the alternative disposal practice.

2. Biosolids that are disposed of in a municipal solid waste landfill must meet the requirements of 40 CFR 258. The Discharger's annual self-monitoring report shall include the amount of biosolid disposed of, and the landfill(s) to which it was sent.

3. All biosolids generated by the Discharger must be disposed of in a municipal solid waste landfill, or in accordance with the requirements of 40 CFR 503. All the requirements of 40 CFR Part 503 are enforceable whether or not they are stated in an NPDES permit or other permit issued to the Discharger.

4. Biosolid treatment, storage, and disposal or reuse shall not create a nuisance or result in groundwater contamination.

5. The treatment and temporary storage of biosolids at the Discharger's wastewater treatment facility shall not cause waste material to be in a position where it will be carried from the biosolids treatment and storage site and deposited in the waters of the State.

6. This permit does not authorize permanent on-site storage or disposal of biosolids at the Discharger's wastewater treatment facility. A report of Waste Discharge shall be filed and the site brought into compliance with all applicable regulations prior to commencement of any such activity by the Discharger.

F. PROVISIONS

1. ***Permit Compliance and Rescission of Previous Waste Discharge Requirements***
The Discharger shall comply with all sections of this Order beginning on October 1, 2003. Requirements prescribed by this Order supersede the requirements prescribed by Order No. 97-044. Order No. 97-044 is hereby rescinded upon the effective date of this Order (see Provision 17 for date).

Special Studies

2. ***Marine Mammal Report***
NOAA Fisheries (letter dated 5/26/03) and the U.S. Fish and Wildlife Service (letter dated 6/24/03) have expressed concern regarding the potential for stormwater and undisinfected wastewater from the SWOO to transmit pathogens to marine mammals. To begin to address this concern, the Discharger shall submit a report identifying monitoring methodologies to determine the presence in wastewater of pathogens with the potential to affect marine mammals. As appropriate, the Discharger will work with NOAA and other agencies working in this field, to gather appropriate information. This report shall be submitted to EPA and the Board no later than 2 years after the adoption date of this permit.

3. ***Pollution Prevention Program and Pollutant Minimization Program***
   a. The Discharger shall continue to improve its existing Pollution Prevention Program in order to reduce pollutant loadings to the treatment plant and therefore to the receiving waters.

   b. The Discharger is currently in the process of developing a new comprehensive wastewater master plan. The "Screening of Feasible Technologies" (SOFT), 2000 draft report should be finalized for use in the master plan process. The Discharger is encouraged to continue to work with interested stakeholders in the development of the master plan.

   c. The Discharger shall submit an annual report, acceptable to the Executive Officer, no later than August 30th of each calendar year. Annual reports shall cover July through June of the preceding year.

   Annual report shall include at least the following information:
   (i) *A brief description of its treatment plant, treatment plant processes and service area.*
   (ii) *A discussion of the current pollutants of concern.* Periodically, the Discharger shall analyze its own situation to determine which pollutants are currently a problem and/or which pollutants may be potential future problems. This discussion shall include the reasons why the pollutants were chosen.
   (iii) *Identification of sources for the pollutants of concern.* This discussion shall include how the Discharger intends to estimate and identify sources of the pollutants. The Discharger should also identify sources or potential sources not directly within the ability or authority of the Discharger to control such as pollutants in the potable water supply and air deposition.
   (iv) *Identification of tasks to reduce the sources of the pollutants of concern.* This discussion shall identify and prioritize tasks to address the Discharger's pollutants of concern. Tasks can target its industrial, commercial, or residential sectors. The Discharger may develop tasks themselves or participate in group, regional, or national tasks that will address its pollutants of concern. The Discharger is strongly encouraged to participate in group, regional, or national tasks that will address its pollutants of concern whenever it is efficient and appropriate to do so. A time line shall be included for the implementation of each task.
   (v) *Continuation of outreach tasks for City employees.* The Discharger shall continue outreach tasks for City and/or County employees. The overall goal of this task is to

inform employees about the pollutants of concerns, potential sources, and how they might be able to help reduce the discharge of pollutants of concerns into the treatment plant. The Discharger may provide a forum for employees to provide input to the Program.

(vi) *Continuation of a public outreach program.* The Discharger shall continue to develop a public outreach program to communicate pollution prevention to its service area. Outreach may include participation in existing community events such as county fairs, initiating new community events such as displays and contests during Pollution Prevention Week, implementation of a school outreach program, conducting plant tours, and providing public information in newspaper articles or advertisements, radio, television stories or spots, newsletters, utility bill inserts, and web site. Information shall be specific to the target audiences. The Discharger should coordinate with other agencies as appropriate.

(vii) *Discussion of criteria used to measure the Program's and tasks' effectiveness.* The Discharger shall establish criteria to evaluate the effectiveness of its Pollution Prevention Program. This shall also include a discussion of the specific criteria used to measure the effectiveness of each of the tasks in item b. (iv), b. (v), and b. (vi).

(viii) *Documentation of efforts and progress.* This discussion shall detail all of the Discharger's activities in the Pollution Prevention Program during the reporting year.

(ix) *Evaluation of Program's and tasks' effectiveness.* This Discharger shall utilize the criteria established in b. (vii) to evaluate the Program's and tasks' effectiveness.

(x) *Identification of specific tasks and time schedules for future efforts.* Based on the evaluation, the Discharger shall detail how it intends to continue or change its tasks in order to more effectively reduce the amount of pollutants to the treatment plant, and subsequently in its effluent. .

d. To the extent where the requirements of the Pollution Prevention Program and the Pollutant Minimization Program overlap, the Discharger is allowed to continue/modify/expand its existing Pollution Prevention Program to satisfy the Pollutant Minimization Program requirements.

These Pollution Prevention/Pollutant Minimization Program requirements are not intended to fulfill the requirements in The Clean Water Enforcement and Pollution Prevention Act of 1999 (Senate Bill 709).

CSO Requirements

4. ***Nine Minimum Controls***

The Discharger shall implement and comply with the following technology-based requirements for the Westside Wet Weather Facilities and Diversion Structures:

a. **Conduct Proper Operations and Regular Maintenance Programs.** The Discharger shall implement the Operations and Maintenance Plan for the combined sewer system that will include the elements listed below. The Discharger shall also update the plan to incorporate any changes to the system and shall operate and maintain the system according to the plan. The Discharger shall keep records to document the implementation of the plan.

i. **Designation of a Manager for Combined Sewer Overflows.** The Discharger shall designate a person to be responsible for the wastewater collection system and serve as the contact person regarding combined sewer overflows. The Discharger shall notify the U.S. EPA and the Executive Officer of the Board within 90 days of designation of a new contact person.

ii. **Inspection and maintenance of CSS.** The Discharger shall:
   1. Inspect and maintain all overflow structures, regulators, pumping stations, and tide gates to ensure that they are in good working condition and adjusted to minimize overflows and prevent tidal inflow.
   2. Inspect each overflow outfall at least once per year. The inspection shall include, but is not limited to, entering the regulator structure if accessible, determining the extent of debris and grit build-up, and removing any debris that may constrict flow, cause blockage, and result in a dry weather overflow. For overflow outfalls that are inaccessible, the Discharger may perform a visual check of the overflow pipe to determine whether or not the overflow occurred or could potentially occur during dry weather flow conditions.
   3. Record the results of the inspections in a maintenance log.

iii. **Provision for Trained Staff.** The Discharger shall provide an adequate number of full-time equivalents to carry out the operation, maintenance, repair and testing functions required to ensure compliance with the terms and conditions of this permit. Each member of the staff shall receive appropriate training.

iv. **Allocation of Funds for Operation and Maintenance.** The Discharger shall allocate adequate funds specifically for operation and maintenance activities. The Discharger shall submit a certification of assurance that the necessary funds, equipment, and personnel have been or will be committed to carry out the Operations and Management (O&M) Plan.

b. **Maximize Use of the Collection System for Storage.** The Discharger shall continue to maximize the inline storage capacity. (Note: This provision refers to using the sewers for storage to the maximum extent possible. It does not refer to the storage/transports.)

c. **Review and Modify Pretreatment Program.** The Discharger shall continue to implement selected controls to minimize the impact of non-domestic discharges. The Discharger shall re-evaluate every 3 years whether additional modifications to its pretreatment program are feasible or of practical value. The Discharger shall keep records to document this evaluation and to document implementation of the selected controls to minimize non-domestic discharges.

d. **Maximize Flow to Oceanside WPCP.** The Discharger shall operate the Oceanside WPCP at a maximum treatable flow during wet weather flow conditions. The Discharger shall report rainfall and flow data to the U.S. EPA and the Board as part of the Self-Monitoring Report.

The Discharger has prepared a facilities operation plan. This operation plan was

developed to achieve the following objectives:

1. Maximize the volume of wastewater treated at the Oceanside WPCP and discharged via the deep water outfall, consistent with the hydraulic capacities of the Discharger's storage, transport, treatment, and disposal facilities, and

2. Assure that all discharges from the diversion structures are first baffled to reduce floatable volume.

e. **Prohibit Combined Sewer Overflows During Dry Weather.** Dry weather overflows from outfalls CSO 001 through-007 are prohibited. All dry weather overflows must be reported to the U.S. EPA and the Board within 24 hours of when the Discharger becomes aware of a dry weather overflow. When the Discharger detects a dry weather overflow, the Discharger shall begin corrective actions immediately.

The Discharger shall inspect the dry weather overflow point each subsequent day of the overflow until the overflow has been eliminated. The Discharger shall record in the inspection log each dry weather overflow event, as well as the cause, corrective measures taken, and the dates of the beginning and cessation of the overflow.

f. **Control Solid and Floatable Materials in CSOs.** The Discharger shall continue to implement measures to control solid and floatable materials in its overflows. These measures shall include:
   1. Ensure that all overflows from the diversion structures are baffled or that other means are used to reduce the volume of floatable materials.
   2. Remove solid or floatable materials captured in the storage/transport in an acceptable manner prior to discharge to the receiving water.

g. **Develop and Implement Pollution Prevention Program.** The Discharger shall continue to implement a pollution prevention program focused on reducing the impact of combined sewer overflows on receiving waters. This pollution prevention program is authorized by Federal Regulations on CSOs. The Discharger shall keep records to document pollution prevention implementation activities. This program shall be developed and implemented in accordance with Provision 3.

h. **Notify the Public of Overflows.** The Discharger shall continue to implement a public notification plan to inform citizens of when and where overflows occur. The process must include:
   i. A mechanism to alert persons using all receiving bodies of water affected by overflows.
   ii. A system to determine the nature and duration of conditions that are potentially harmful to users of these receiving water bodies due to overflows.

Specifically, warning signs shall be posted at beach locations where water contact recreation is enjoyed by the public whenever there is a discharge from the diversion structures. Such warning signs shall be posted on the same days as the overflow unless

the overflow occurs after 4:00 p.m., in which case the signs shall be posted by 8:00 a.m. the next day. The Discharger shall keep records documenting public notification.

The City's current notification process fulfills these requirements. The process includes permanent information signs at all beach locations around the perimeter of San Francisco. These signs inform the public in English, Spanish and Chinese that international NO SWIMMING signs will be posted when it is unsafe to enter the water, and warns users that bacteria concentrations may be elevated during periods of heavy rainfall. NO SWIMMING signs are posted at beach locations whenever an overflow occurs in the vicinity. These signs remain posted until water sampling indicates the bacteria concentrations have dropped below the level of concern for water contact recreation. Both signs reference the City's toll free water quality hotline (1-877-SF BEACH) which is updated weekly or whenever beach conditions change. The Discharger also provides color coded descriptions of beach water quality conditions (green/open; yellow/caution; red/posted) on the web at http://beaches.sfwater.org.

i. **Monitor to Effectively Characterize Overflow Impacts and the Efficacy of CSO Controls.** The Discharger shall regularly monitor overflow outfalls to effectively characterize overflow impacts and efficacy of CSO controls.

In order to assess the impact of CSO discharges on water quality, additional monitoring that is not at this time contained in the self-monitoring program will be necessary. The self-monitoring program may be revised to implement additions. This includes follow-up monitoring on the Recreational Use Survey conducted during the prior permit cycle. The Discharger shall conduct the monitoring as follows:

	Task	Compliance Date
(A)	Study Plan	December 1, 2003

The Discharger shall develop and submit a study plan acceptable to the Executive Officer. The study shall at minimum propose follow-up monitoring to the Recreational Use Survey that will serve to track changes in uses over time, and include any other monitoring necessary to evaluate CSO controls and to conform with the CSO policy.

(B)	Annual Status Report	August 30th of each year

The Discharger shall submit to U.S. EPA and the Board an annual report including the following information:

1. Summary of existing data in order to show status and trends;
2. Evaluation of results in order to effectively characterize overflow impacts and efficacy of CSO controls (including pollution prevention efforts).
3. Review of CSO impacts and, if necessary, propose revisions to Westside CSO control program (including the nine minimum controls).

(C) Final Report — 1 year prior to permit expiration

The Discharger shall submit a final report, acceptable to the Executive Officer, documenting the results of the Overflow Impacts and the CSO Control Efficacy Study.

Toxicity Requirements

5. ***Acute Toxicity Requirements***
Compliance with the acute toxicity requirements of this Order for the dry weather discharge (E-007) shall be achieved in accordance with the following:

Acute toxicity shall be measured in accordance with Section I. of Part B of the attached SMP, as well as with the Ocean Plan and "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms" (EPA/600/4-90-027F, 1993). As described in the 2001 Ocean Plan, test organisms shall be West Coast marine organisms.

6. ***Chronic Toxicity Requirements***
Compliance with the chronic toxicity requirements of this Order for the dry weather discharge (E-007) shall be achieved in accordance with the following:

The Discharger shall conduct chronic toxicity monitoring in accordance with Section I. of the Part B of the SMP attached to this Order.

If the toxicity effluent limitation is exceeded, then within 15 days of exceedance, the Discharger shall begin conducting three additional tests, bi-weekly, over a six week period. If the toxicity effluent limitation is exceeded in any of these three additional tests, then the Discharger shall notify the Board and U.S. EPA. If the Executive Officer of the Board and the U.S. EPA determine that the discharge consistently exceeds a toxicity effluent limitation, then the Discharger shall initiate a TRE/TIE. If none of the three tests indicate toxicity, then the Discharger may return to the normal testing frequency.

The TRE shall be conducted in accordance with the following:

(1) The Discharger shall prepare and submit to the U.S. EPA and the Board for approval a TRE work plan. An initial generic work plan shall be submitted within 90 days of the date of adoption of this Order. The work plan shall be reviewed and updated as necessary in order to remain current and applicable to the discharge and discharge facilities.
(2) The TRE shall be initiated within 30 days of the date of completion of the accelerated monitoring test observed to exceed the permit limitation.
(3) The TRE shall be conducted in accordance with an approved work plan.
(4) The TRE needs to be specific to the discharge and Discharger facility, and be in accordance with current technical guidance and reference materials including U.S. EPA guidance materials. TRE shall be conducted as a tiered evaluation process, such as summarized below:
   (a) Tier 1 consists of basic data collection (routine and accelerated monitoring).
   (b) Tier 2 consists of evaluation of optimization of the treatment process including

operation practices, and in-plant process chemicals.

(c) Tier 3 consists of a toxicity identification evaluation (TIE).

(d) Tier 4 consists of evaluation of options for additional effluent treatment processes.

(e) Tier 5 consists of evaluation of options for modifications of in-plant treatment processes.

(f) Tier 6 consists of implementation of selected toxicity control measures, and follow-up monitoring and confirmation of implementation success.

(5) The TRE may be ended at any stage if monitoring finds there is no longer consistent toxicity.

(6) The objective of the TIE shall be to identify the substance or combination of substances causing the observed toxicity. All reasonable efforts using currently available TIE methodologies shall be employed.

(7) As toxic substances are identified or characterized, the Discharger shall continue the TRE by determining the source(s) 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 chronic toxicity evaluation parameters.

1. Many recommended TRE elements parallel required or recommended efforts of source control, pollution prevention and storm water control programs. TRE efforts should be coordinated with such efforts. To prevent duplication of efforts, evidence of complying with requirements or recommended efforts of such programs may be acceptable to comply with TRE requirements.

U.S. EPA and the Board recognize that chronic toxicity may be episodic and identification of causes of and reduction of sources of chronic toxicity may not be successful in all cases. Consideration of discretionary enforcement action by the Board will be based in part on the Discharger's actions and efforts to identify and control or reduce sources of consistent toxicity.

a. Chronic Toxicity Monitoring Screening Phase Requirements, Critical Life Stage Toxicity Tests and definitions of terms used in the chronic toxicity monitoring are identified in Part A of the SMP. The Discharger shall comply with the chronic toxicity screening requirements specified in this attachment as applicable to the discharge.

b. Reopener: This permit may be modified in accordance with the requirements set forth at 40 CFR Parts 122 and 124 to include appropriate conditions or limits to address demonstrated effluent toxicity based on newly available information.

Ongoing Programs

7. ***Pretreatment Program***

The Discharger shall implement and enforce its approved pretreatment program in accordance with Federal Pretreatment Regulations (40 CFR 403), pretreatment standards promulgated under Section 307(b), 307(c), and 307(d) of the Clean Water Act, and the requirements in Attachment E, "Pretreatment Requirements." The Discharger's responsibilities include, but are not limited to:

a. Enforcement of National Pretreatment Standards in accordance with 40 CFR 403.5 and 403.6;

b. Implementation of its pretreatment program in accordance with legal authorities, policies, procedures and financial provisions described in the General Pretreatment regulations (40 CFR 403) and the Discharger's approved pretreatment program;

c. Submission of reports to, the State Board and the Board, as described in Attachment E, "Pretreatment Requirements;"

The Discharger shall implement its approved pretreatment program and the program shall be an enforceable condition of this permit. If the Discharger fails to perform the pretreatment functions, the Board, the State Board, or the U.S. EPA may take enforcement actions against the Discharger as authorized by the Clean Water Act.

Facilities Status Reports and Permit Administration

8. ***Wastewater Facilities, Review and Evaluation, and Status Reports***
   a. The Discharger shall operate and maintain its wastewater collection, treatment and disposal facilities in a manner to ensure that all facilities are adequately staffed, supervised, financed, operated, maintained, repaired, and upgraded as necessary, in order to provide adequate and reliable transportation, treatment, and disposal of all wastewater from both existing and planned future wastewater sources under the Discharger's service responsibilities.
   b. The Discharger shall regularly review and evaluate its wastewater facilities and operation practices in accordance with section a. above. Reviews and evaluations shall be conducted as an ongoing component of the Discharger's administration of its wastewater facilities.
   c. Annually, by August 30th of each year, the Discharger shall submit to the Board a report describing the current status of its wastewater facility review and evaluation, including any recommended or planned actions and an estimated time schedule for these actions. This report shall include a description or summary of review and evaluation procedures, applicable wastewater facility programs or capital improvement projects, and an overview of the major maintenance activities performed in the facilities

9. ***Operations and Maintenance Manual, Review and Status Reports***
   The Discharger shall maintain an Operations and Maintenance Manual (O & M Manual) as described in the findings of this Order for the Discharger's wastewater facilities. The O & M Manual shall be maintained in useable condition, and available for reference and use by all applicable personnel.
   a. The Discharger shall regularly review, and revise or update as necessary, the O & M Manual(s) in order for the document(s) to remain useful and relevant to current equipment and operation practices. Reviews shall be conducted annually, and revisions or updates shall be completed as necessary. For any significant changes in treatment facility equipment or operation practices, applicable revisions shall be completed within 90 days of completion of such changes.
   b. Annually, by August 30th of each year, the Discharger shall submit to the Board a report describing the current status of its O & M Manual review and updating. This report shall include an estimated time schedule for completion of any revisions determined necessary, a

description of any completed revisions, or a statement that no revisions are needed.

10. Operation Plan Submittal

The Discharger shall review and update, as necessary, the Operation Plan at least annually. The Discharger shall submit a letter report to the Executive Officer, by July 1st of each year after the effective date of this permit. The report shall indicate that the review was completed, and describe what changes were made to the Operations Plan in the previous 12 months, or what changes are planned to be made.

11. Contingency Plan, Review and Status Reports

a. The Discharger shall maintain a Contingency Plan as required by Board Resolution 74-10 (Attachment F), and as prudent in accordance with current municipal facility emergency planning. The discharge of pollutants in violation of this Order where the Discharger has failed to develop and/or adequately implement a contingency plan will be the basis for considering such discharge a willful and negligent violation of this Order pursuant to Section 13387 of the California Water Code.

b. The Discharger shall regularly review, and update as necessary, the Contingency Plan in order for the plan to remain useful and relevant to current equipment and operation practices. Reviews shall be conducted annually, and updates shall be completed as necessary.

c. Annually, by August 30th of each year, the Discharger shall submit to the Board a report describing the current status of its Contingency Plan review and update. This report shall include a description or copy of any completed revisions, or a statement that no changes are needed.

12. Self-Monitoring Program

The Discharger shall comply with the SMP for this Order as adopted by the Board and U.S. EPA. U.S. EPA or the Board's Executive Director may make minor amendments to the SMP pursuant to U.S. EPA regulations 40 CFR 122.62, 122.63 and 124.5.

13. Standard Provisions and Reporting Requirements

The Discharger shall comply with all applicable items of the *Standard Provisions and Reporting Requirements for NPDES Surface Water Discharge Permits, August 1993* Attachment G, or any amendments thereafter. Where provisions or reporting requirements specified in this Order are different from equivalent or related provisions or reporting requirements given in 'Standard Provisions', the specifications of this Order shall apply.

14. Change in Control or Ownership

a. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Board.

b. To assume responsibility of and operations under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order (see *Standard Provisions & Reporting Requirements*, August 1993, Section E.4.). Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code.

15. Permit Reopener

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

b. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Clean Water Act, or amendments thereto, the Board and U.S. EPA will revise and modify this Order in accordance with such more stringent standards.

c. As new or revised water quality objectives come into effect for ocean waters and contiguous water bodies (whether statewide, regional or site-specific), effluent limitations in this Order will be modified as necessary to reflect updated water quality objectives. Adoption of effluent limitations contained in this Order are not intended to restrict in any way future modifications based on legally adopted water quality objectives.

d. This permit may be modified in accordance with the requirements set forth at 40 CFR Parts 122 and 124, to include appropriate conditions or limits to address demonstrated effluent toxicity based on newly available information, or to implement any EPA approved new State or Federal water quality standards applicable to effluent toxicity.

e. The Board and U.S. EPA may establish wet weather performance-based limitations in the future for the Oceanside WPCP after reviewing wet weather discharge data. This Order/Permit may be reopened for the inclusion of such limits.

f. If the U.S. EPA or the Board finds that the operation of the wet weather facilities results in unacceptable adverse impacts on beneficial uses or fails to meet water quality standards, the long-term average overflow frequency may be modified. Such action could require the modification of constructed facilities, the modification of the operation of constructed facilities, or the construction of additional facilities.

g. This Order may be reopened for the imposition of additional requirements should monitoring indicate that the current controls fail to meet water quality standards and/or not protect designated uses.

h. The U.S. EPA or the Board may amend this permit prior to expiration if changes occur in applicable state and federal biosolid regulations.

i. If the U.S. EPA determines that compliance issues may arise prior to the expiration of this permit as a result of the existing dilution allowance, the U.S. EPA shall reopen the permit to apply the dilution factor or factors contained in U.S. EPA's letter of determination dated March 1, 2004. The U.S. EPA will take into consideration any compliance concerns expressed by the City and County of San Francisco in determining if reopening the permit is appropriate.

16. *NPDES Permit*

This Order shall serve as a National Pollutant Discharge Elimination System (NPDES) permit pursuant to Section 402 of the Clean Water Act or amendments thereto, and shall become effective on October 1, 2003, provided the U.S. EPA Regional Administrator has no objection. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.

17. *Order Expiration and Reapplication*

a. This Order expires on September 30, 2008.

b. In accordance with Title 23, Chapter 3, Subchapter 9 of the California Administrative Code, the Discharger must file a report of waste discharge no later than 180 days before the expiration date of this Order as application for reissue of this permit and waste discharge requirements.

I, Loretta K. Barsamian, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on August 20, 2003.

Effective on: October 1, 2003

Alexis Strauss
Director, Water Division
U.S. Environmental Protection Agency, Region 9
for the Regional Administrator

Loretta K. Barsamian
Executive Officer
California Regional Water Quality Control Board
San Francisco Bay Region

Attachments:

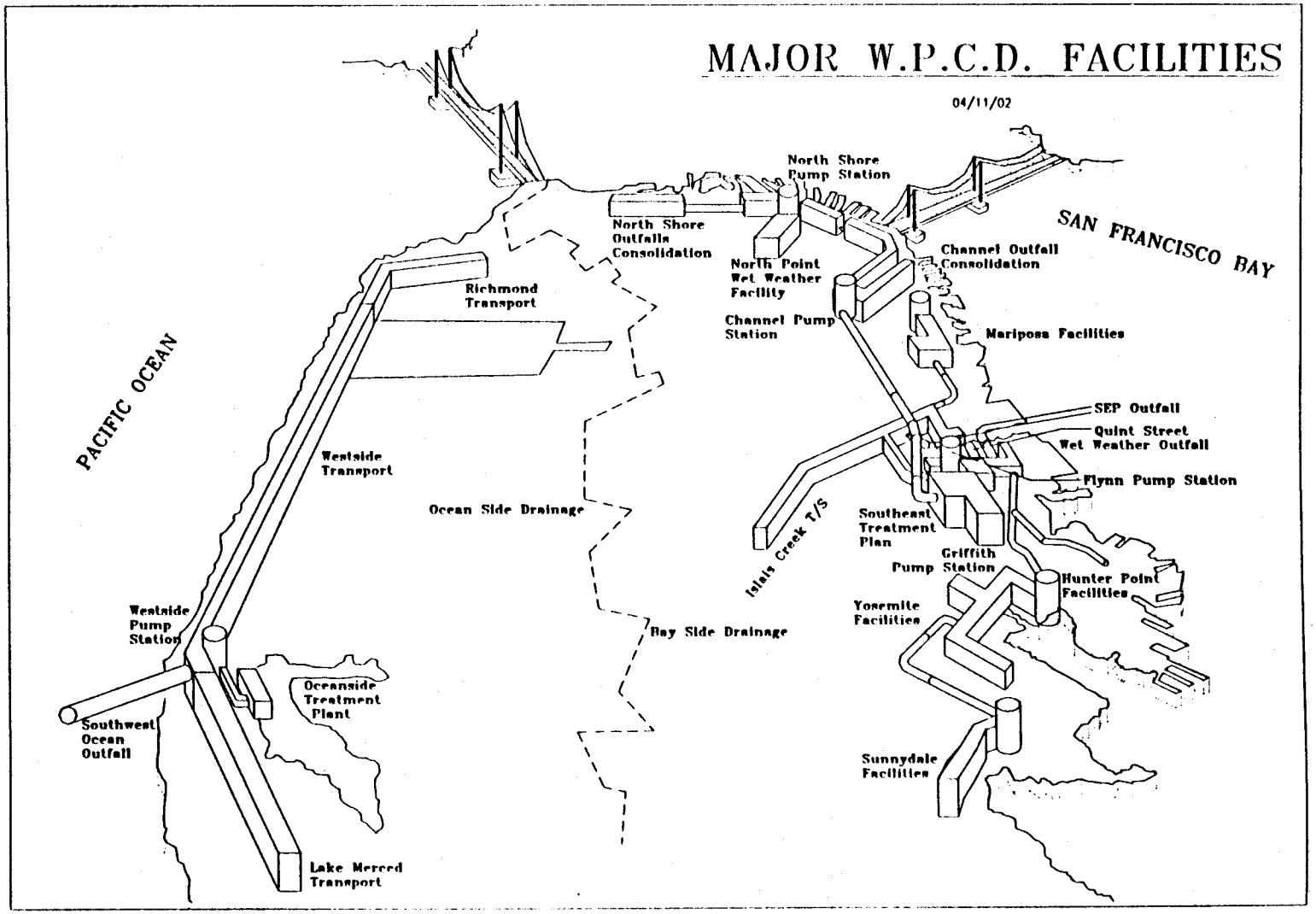
A. Discharge Facility Location Map
B. Combined Sewer Overflow Structure
C. Discharge Facility Treatment Process Diagram
D. Wet Weather Treatment Diagram
E. Pre-treatment
F Board Resolution No. 74-10*
G. Standard Provisions and Reporting Requirements (August 1993) *
H. State Board Order No. 79-16
I. Board Order No. 79-12
J. ESA Consultation Letters from NOAA (May 26, 2003) and USFWS (June 24, 2003)
K. Self-Monitoring Program Part A (August 1993)* and Part B
L. Fact Sheet, dated July 2, 2003

* *Note: Self-Monitoring Program Part A (August 1993), Standard Provisions and Reporting Requirements (August 1993), and Resolution No. 74-10 are not attached but are available for review or download on the Board's website at www.swrcb.ca.gov/rwqcb2."*

Attachment A

Discharge Facility Location Map

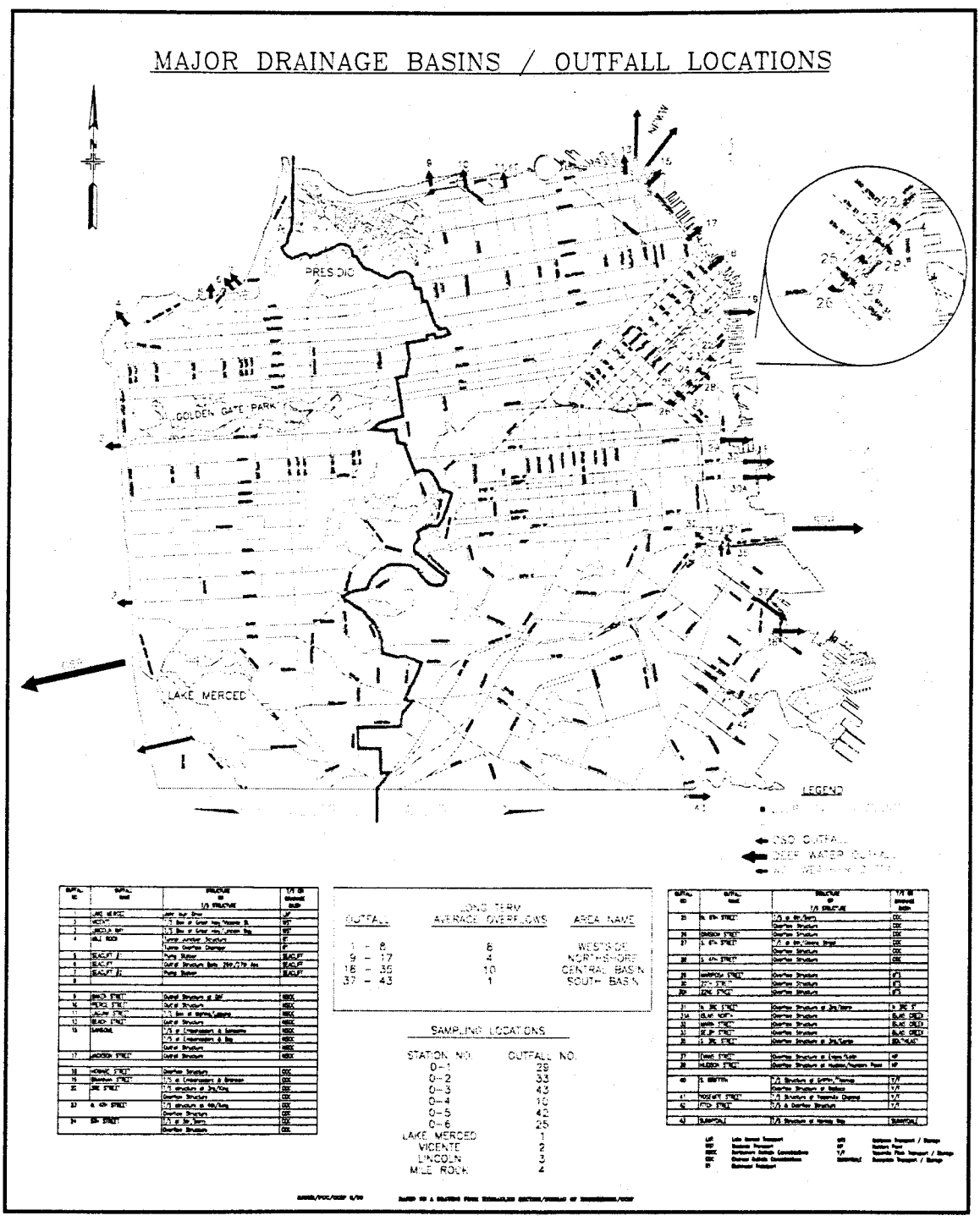
Attachment A - Discharge Facility Location Map



Attachment B

Combined Sewer Overflow Structure

Attachment B – Combined Sewer Overflow Structures



OUTFALL	LONG TERM AVERAGE OVERFLOWS	AREA NAME
1 – 8	6	WEST SIDE
9 – 17	4	NORTHSHORE
18 – 36	10	CENTRAL BASIN
37 – 43	1	SOUTH BASIN

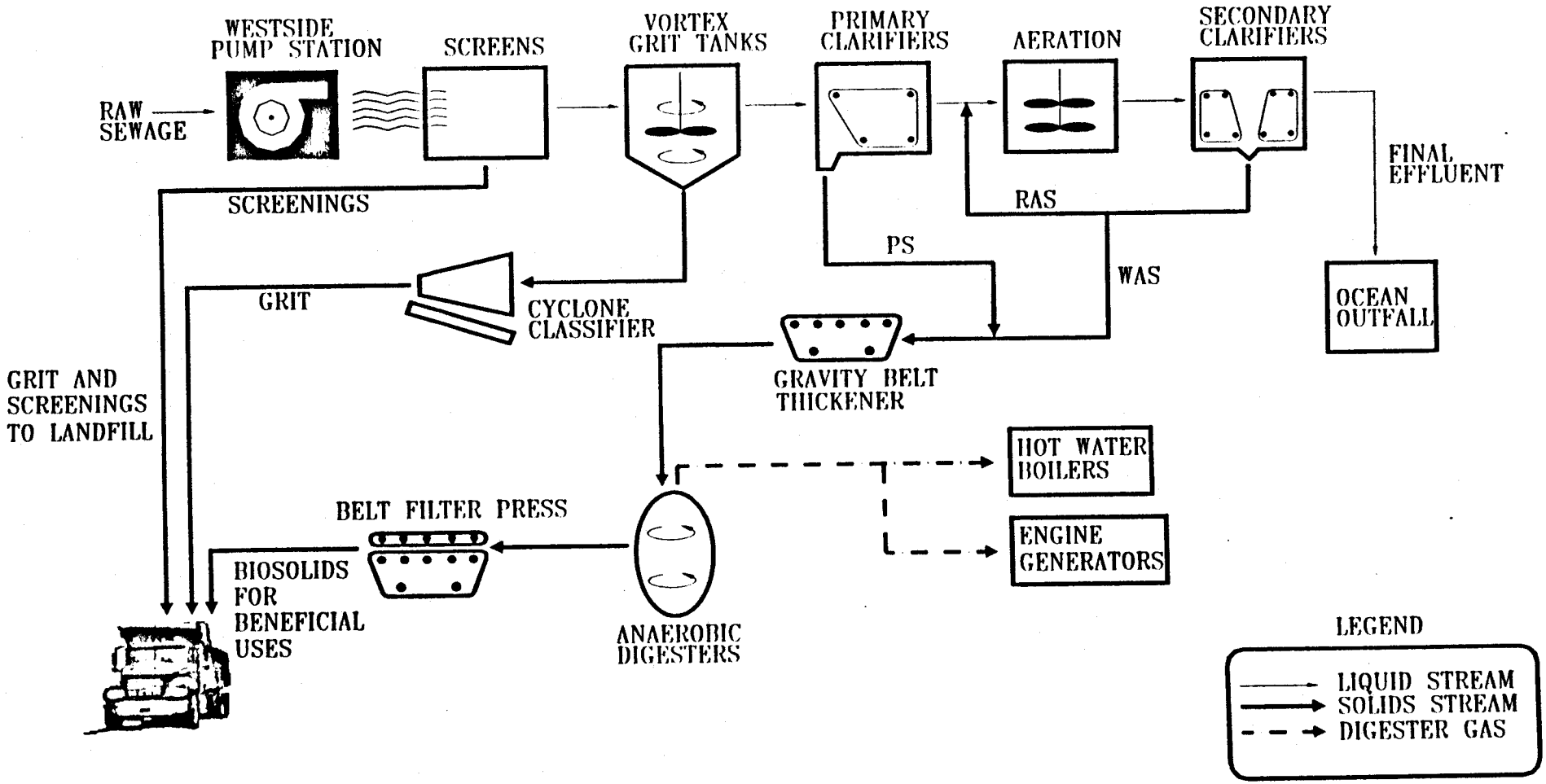
SAMPLING LOCATIONS

STATION NO.	OUTFALL NO.
0-1	29
0-2	33
0-3	43
0-4	10
0-5	42
0-6	25
LAKE MERCED	1
VICENTE	2
LINCOLN	3
MILE ROCK	4

Attachment C

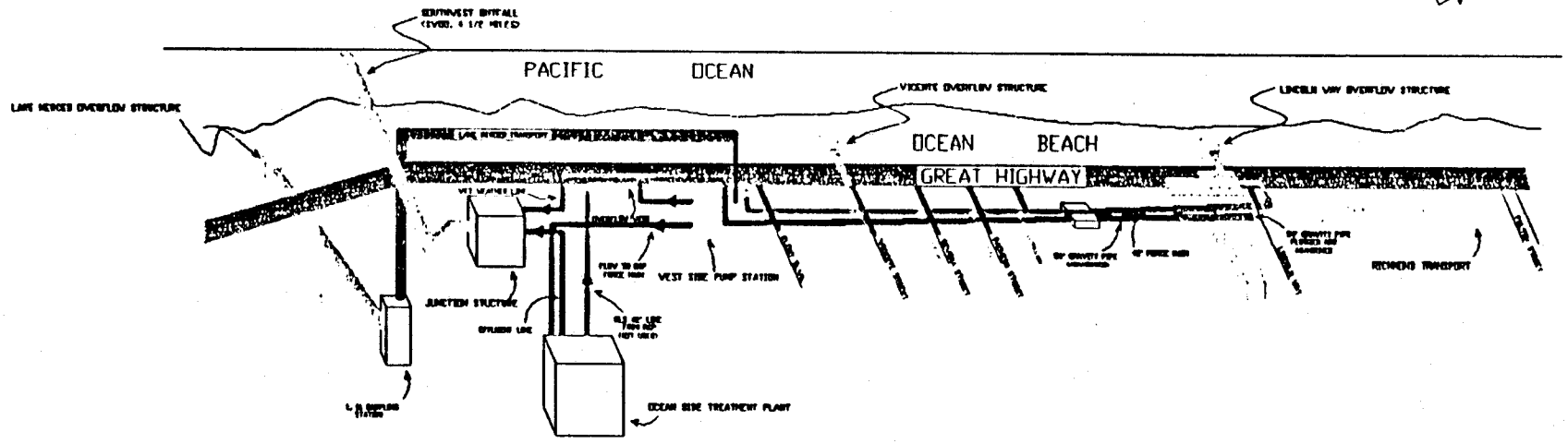
Discharge Facility Treatment Process Diagram

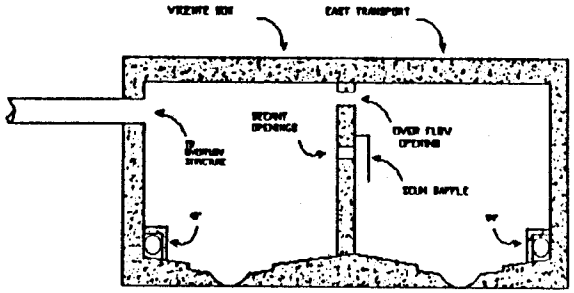
ATTACHMENT C – OCEANSIDE PLANT TREATMENT PROCESS DIAGRAM

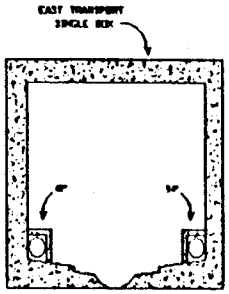


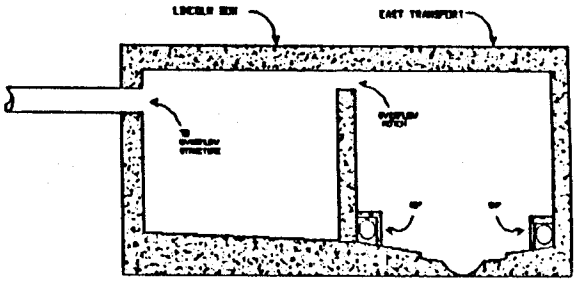
Attachment D
Wet Weather Treatment Diagram

OCEAN SIDE COLLECTION SYSTEM









Attachment E

Pre-treatment

Attachment E to the NPDES permit: Individual permit pretreatment language

Pretreatment Program Provisions

1. The Discharger shall implement all pretreatment requirements contained in 40 CFR 403, as amended. The Discharger shall be subject to enforcement actions, penalties, and fines as provided in the Clean Water Act (33 USC 1351 et seq.), as amended. The Discharger shall implement and enforce their respective Approved Pretreatment Programs or modified Pretreatment Programs as directed by the Board's Executive Officer or the EPA. The EPA and/or the State may initiate enforcement action against an industrial user for noncompliance with applicable standards and requirements as provided in the Clean Water Act.

2. The Discharger shall enforce the requirements promulgated under Sections 307(b), 307(c), 307(d) and 402(b) of the Clean Water Act. The Discharger shall cause industrial users subject to Federal Categorical Standards to achieve compliance no later than the date specified in those requirements or, in the case of a new industrial user, upon commencement of the discharge.

3. The Discharger shall perform the pretreatment functions as required in 40 CFR Part 403 and amendments or modifications thereto including, but not limited to:

   i) Implement the necessary legal authorities to fully implement the pretreatment regulations as provided in 40 CFR 403.8(f)(1);

   ii) Implement the programmatic functions as provided in 40 CFR 403.8(f)(2);

   iii) Publish an annual list of industrial users in significant noncompliance as provided per 40 CFR 403.8(f)(2)(vii);

   iv) Provide for the requisite funding and personnel to implement the pretreatment program as provided in 40 CFR 403.8(f)(3); and

   v) Enforce the national pretreatment standards for prohibited discharges and categorical standards as provided in 40 CFR 403.5 and 403.6, respectively.

4. The Discharger shall submit annually a report to the EPA Region 9, the State Board and the Regional Board describing the Discharger's respective pretreatment program activities over the previous twelve months. In the event that the Discharger is not in compliance with any conditions or requirements of this permit, the Discharger shall also include the reasons for noncompliance and a plan and schedule for achieving compliance. The report shall contain, but is not limited to, the information specified in **Appendix A** entitled, "Requirements for Pretreatment Annual Reports," which is made a part of this Order. The annual report is due on the last day of February each year.

5. The Discharger shall submit semiannual pretreatment reports to the EPA Region 9, the State Board and the Board describing the status of their respective significant industrial users (SIUs). The report shall contain, but not is limited to, the information specified in **Appendix B** entitled, "Requirements for Semiannual Pretreatment Reports," which is made part of this Order. The semiannual reports are due July 31st (for the period January through June) and January 31st (for the period July through December) of each year. The Executive Officer may exempt a Discharger from the semiannual reporting requirements on a case by case basis subject to State Board and EPA's comment and approval.

APPENDIX A

REQUIREMENTS FOR PRETREATMENT ANNUAL REPORTS

The Pretreatment Annual Report is due each year on the last day of February. [If the annual report is combined with the semiannual report (for the July through December period) the submittal deadline is January 31st of each year.] The purpose of the Annual Report is 1) to describe the status of the Publicly Owned Treatment Works (POTW) pretreatment program and 2) to report on the effectiveness of the program, as determined by comparing the results of the preceding year's program implementation. The report shall contain at a minimum, but is not limited to, the following information:

1) Cover Sheet

The cover sheet must contain the name(s) and National Pollutant Discharge Elimination Discharge System (NPDES) permit number(s) of those POTWs that are part of the Pretreatment Program. Additionally, the cover sheet must include: the name, address and telephone number of a pretreatment contact person; the period covered in the report; a statement of truthfulness; and the dated signature of a principal executive officer, ranking elected official, or other duly authorized employee who is responsible for overall operation of the POTW (40 CFR 403.12(j)).

2) Introduction

The Introduction shall include any pertinent background information related to the City/ District/Agency, the POTW and/or the Industrial base of the area. Also, this section shall include an update on the status of any Pretreatment Compliance Inspection (PCI) tasks, Pretreatment Performance Evaluation tasks, Pretreatment Compliance Audit (PCA) tasks, Cleanup and Abatement Order (CAO) tasks, or other pretreatment-related enforcement actions required by the Regional Board or the EPA. A more specific discussion shall be included in the section entitled, "Program Changes."

3) Definitions

This section shall contain a list of key terms and their definitions that the POTW uses to describe or characterize elements of its pretreatment program.

4) Discussion of Upset, Interference and Pass Through

This section shall include a discussion of Upset, Interference or Pass Through incidents, if any, at the POTW(s) that the Discharger knows of or suspects were caused by industrial discharges. Each incident shall be described, at a minimum, consisting of the following information:

a) a description of what occurred;
b) a description of what was done to identify the source;
c) the name and address of the IU responsible
d) the reason(s) why the incident occurred;
e) a description of the corrective actions taken; and
f) an examination of the local and federal discharge limits and requirements for the purposes of determining whether any additional limits or changes to existing requirements may be necessary to prevent other Upset, Interference or Pass Through incidents.

5) **Influent, Effluent and Sludge Monitoring Results**

This section shall provide a summary of the analytical results from the "Influent, Effluent and Sludge Monitoring" as specified in Appendix C. The results should be reported in a summary matrix that lists monthly influent and effluent metal results for the reporting year.

A graphical representation of the influent and effluent metal monitoring data for the past five years shall also be provided with a discussion of any trends.

6) **Inspection and Sampling Program**

This section shall contain at a minimum, but is not limited to, the following information:

a) Inspections: the number of inspections performed for each type of IU; the criteria for determining the frequency of inspections; the inspection format procedures;
b) Sampling Events: the number of sampling events performed for each type of IU; the criteria for determining the frequency of sampling; the chain of custody procedures.

7) **Enforcement Procedures**

This section shall provide information as to when the approved Enforcement Response Plan (ERP) had been formally adopted or last revised. In addition, the date the finalized ERP was submitted to the Regional Board shall also be given.

8) **Federal Categories**

This section shall contain a list of all of the federal categories that apply to the POTW. The specific category shall be listed including the subpart and 40 CFR section that applies. The maximum and average limits for the each category shall be provided. This list shall indicate the number of Categorical Industrial Users (CIUs) per category and the CIUs that are being regulated pursuant to the category. The information and data used to determine the limits for those CIUs for which a combined waste stream formula is applied shall also be provided.

9) **Local Standards**

This section shall include a table presenting the local limits.

10) **Updated List of Regulated SIUs**

This section shall contain a complete and updated list of the Discharger's Significant Industrial Users (SIUs), including their names, addresses, and the reason why the SIU is classified as "significant." The list shall include all deletions and additions keyed to the list as submitted in the previous annual report. All deletions shall be briefly explained.

11) **Compliance Activities**

a) **Inspection and Sampling Summary:** This section shall contain a summary of all the inspections and sampling activities conducted by the Discharger over the past year to gather information and data regarding the SIUs. The summary shall include:

(1) the number of inspections and sampling events conducted for each SIU;

(2) the quarters in which these activities were conducted; and

(3) the compliance status of each SIU, delineated by quarter, and characterized using all applicable descriptions as given below:

(a) in consistent compliance;

(b) in inconsistent compliance;

(c) in significant noncompliance;

(d) on a compliance schedule to achieve compliance, (include the date final compliance is required);

(e) not in compliance and not on a compliance schedule;

(f) compliance status unknown, and why not.

b) **Enforcement Summary:** This section shall contain a summary of the compliance and enforcement activities during the past year. The summary shall include the names of all the SIUs affected by the following actions:

(1) Warning letters or notices of violations regarding SIUs' apparent noncompliance with or violation of any federal pretreatment categorical standards and/or requirements, or local limits and/or requirements. For each notice, indicate whether it was for an infraction of a federal or local standard/limit or requirement.

(2) Administrative Orders regarding the SIUs' apparent noncompliance with or violation of any federal pretreatment categorical standards and/or requirements, or local limits and/or requirements. For each notice, indicate whether it was for an infraction of a federal or local standard/limit or requirement.

(3) Civil actions regarding the SIUs' apparent noncompliance with or violation of any federal pretreatment categorical standards and/or requirements, or local limits and/or requirements. For each notice, indicate whether it was for an infraction of a federal or local standard/limit or requirement.

(4) Criminal actions regarding the SIUs' apparent noncompliance with or violation of any federal pretreatment categorical standards and/or requirements, or local limits and/or requirements. For each notice, indicate whether it was for an infraction of a federal or local standard/limit or requirement.

(5) Assessment of monetary penalties. Identify the amount of penalty in each case and reason for assessing the penalty.

(6) Order to restrict/suspend discharge to the POTW.

(7) Order to disconnect the discharge from entering the POTW.

12) **Baseline Monitoring Report Update**

This section shall provide a list of CIUs that have been added to the pretreatment program since the last annual report. This list of new CIUs shall summarize the status of the respective Baseline Monitoring Reports (BMR). The BMR must contain all of the information specified in 40 CFR 403.12(b). For each of the new CIUs, the summary shall indicate when the BMR was due; when the CIU was notified by the POTW of this requirement; when the CIU submitted the report; and/or when the report is due.

13) **Pretreatment Program Changes**

This section shall contain a description of any significant changes in the Pretreatment Program during the past year including, but not limited to: legal authority, local limits, monitoring/ inspection program and frequency, enforcement protocol, program's administrative structure, staffing level, resource requirements and funding mechanism. If the manager of the pretreatment program changes, a revised organizational chart shall be included. If any element(s) of the program is in the process of being modified, this intention shall also be indicated.

14) **Pretreatment Program Budget**

This section shall present the budget spent on the Pretreatment Program. The budget, either by the calendar or fiscal year, shall show the amounts spent on personnel, equipment, chemical analyses and any other appropriate categories. A brief discussion of the source(s) of funding shall be provided.

15) **Public Participation Summary**

This section shall include a copy of the public notice as required in 40 CFR 403.8(f)(2)(vii). If a notice was not published, the reason shall be stated.

16) **Sludge Storage and Disposal Practice**

This section shall have a description of how the treated sludge is stored and ultimately disposed. The sludge storage area, if one is used, shall be described in detail. Its location, a description of the containment features and the sludge handling procedures shall be included.

17) **PCS Data Entry Form**

The annual report shall include the PCS Data Entry Form. This form shall summarize the enforcement actions taken against SIUs in the past year. This form shall include the following information: the POTW name, NPDES Permit number, period covered by the report, the number of SIUs in significant noncompliance (SNC) that are on a pretreatment compliance schedule, the number of notices of violation and administrative orders issued against SIUs, the number of civil and criminal judicial actions against SIUs, the number of SIUs that have been published as a result of being in SNC, and the number of SIUs from which penalties have been collected.

18) **Other Subjects**

Other information related to the Pretreatment Program that does not fit into one of the above categories should be included in this section.

Signed copies of the reports shall be submitted to the Regional Administrator at USEPA, the State Water Resources Control Board and the Regional Board at the following addresses:

Regional Administrator
United States Environmental Protection Agency
Region 9, Mail Code: WTR-7
Clean Water Act Compliance Office
Water Division
75 Hawthorne Street
San Francisco, CA 94105

Pretreatment Program Manager
Regulatory Unit
State Water Resources Control Board
Division of Water Quality
1001 I Street
Sacramento, CA 95814

Pretreatment Coordinator
NPDES Permits Division
SF Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

APPENDIX B:

REQUIREMENTS FOR SEMIANNUAL PRETREATMENT REPORTS

The semiannual pretreatment reports are due on July 31st (for pretreatment program activities conducted from January through June) and January 31st (for pretreatment activities conducted from July through December) of each year, unless an exception has been granted by the Board's Executive Officer. The semiannual reports shall contain, at a minimum, but is not limited to, the following information:

1) **Influent, Effluent and Sludge Monitoring**

The influent, effluent and sludge monitoring results shall be included in the report. The analytical laboratory report shall also be included, with the QA/QC data validation provided upon request. A description of the sampling procedures and a discussion of the results shall be given. (Please see Appendix C for specific detailed requirements.) The contributing source(s) of the parameters that exceed NPDES limits shall be investigated and discussed. In addition, a brief discussion of the contributing source(s) of all organic compounds identified shall be provided.

The Discharger has the option to submit all monitoring results via an electronic reporting format approved by the Executive Officer. The procedures for submitting the data will be similar to the electronic submittal of the NPDES self-monitoring reports as outlined in the December 17, 1999 Regional Board letter, Official Implementation of Electronic Reporting System (ERS). The Discharger shall contact the Regional Board's ERS Project Manager for specific details in submitting the monitoring data.

If the monitoring results are submitted electronically, the analytical laboratory reports (along with the QA/QC data validation) should be kept at the discharger's facility.

2) **Industrial User Compliance Status**

This section shall contain a list of all Significant Industrial Users (SIUs) that were not in consistent compliance with all pretreatment standards/limits or requirements for the reporting period. The compliance status for the previous reporting period shall also be included. Once the SIU has determined to be out of compliance, the SIU shall be included in the report until consistent compliance has been achieved. A brief description detailing the actions that the SIU undertook to come back into compliance shall be provided.

For each SIU on the list, the following information shall be provided:

a. Indicate if the SIU is subject to Federal categorical standards; if so, specify the category including the subpart that applies.

b. For SIUs subject to Federal Categorical Standards, indicate if the violation is of a categorical or local standard.

c. Indicate the compliance status of the SIU for the two quarters of the reporting period.

d. For violations/noncompliance occurring in the reporting period, provide (1) the date(s) of violation(s); (2) the parameters and corresponding concentrations exceeding the limits and the discharge limits for these parameters and (3) a brief summary of the noncompliant event(s) and the steps that are being taken to achieve compliance.

3) **POTW's Compliance with Pretreatment Program Requirements**

This section shall contain a discussion of the Discharger's compliance status with the Pretreatment Program Requirements as indicated in the latest Pretreatment Compliance Audit (PCA) Report, Pretreatment Compliance Inspection (PCI) Report or Pretreatment Performance Evaluation (PPE) Report. It shall contain a summary of the following information:

a. Date of latest PCA, PCI or PPE and report.
b. Date of the Discharger's response.
c. List of unresolved issues.
d. Plan and schedule for resolving the remaining issues.

The reports shall be signed by a principal executive officer, ranking elected official, or other duly authorized employee who is responsible for the overall operation of the Publicly Owned Treatment Works (POTW) (40 CFR 403.12(j)). Signed copies of the reports shall be submitted to the Regional Administrator at USEPA, the State Water Resources Control Board and the Regional Board at the following addresses:

Regional Administrator
United States Environmental Protection Agency
Region 9, Mail Code: WTR-7
Clean Water Act Compliance Office
Water Division
75 Hawthorne Street
San Francisco, CA 94105

Pretreatment Program Manager
Regulatory Unit
State Water Resources Control Board
Division of Water Quality
1001 I Street
Sacramento, CA 95814

Pretreatment Coordinator
NPDES Permits Division
SF Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

APPENDIX C

REQUIREMENTS FOR INFLUENT, EFFLUENT AND SLUDGE MONITORING

The Discharger shall conduct sampling of their respective treatment plant's influent, effluent and sludge at the frequency as shown in **Table 3** on **Page 9 of the Self Monitoring Program.**

The monitoring and reporting requirements of the POTW's Pretreatment Program are in addition to those specified in the individual POTW's NPDES permit. Any subsequent modifications of the NPDES requirements shall be adhered to and shall not affect the requirements described in this Appendix unless written notice from the Regional Board is received. When sampling periods coincide, one set of test results, reported separately, may be used for those parameters that are required to be monitored in both the Discharger's NPDES permit and Pretreatment Program. Monitoring reports required by this Order shall be sent to the Pretreatment Coordinator.

1. **Influent and Effluent Monitoring**

The Discharger shall monitor for the parameters using the required test methods listed in Table 3 (page 9). Any test method substitutions must have received prior written Regional Board approval. In addition, unless instructed otherwise in writing, the Discharger shall continue to monitor for those parameters at the frequency stated in Table 1. Influent and Effluent sampling locations shall be the same as those sites specified in the POTW's Self-Monitoring Program as set forth in its NPDES permit.

The influent and effluent sampled should be taken during the same 24-hour period. All samples must be representative of daily operations. A grab sample shall be used for volatile organic compounds, cyanide and phenol. In addition, any samples for oil and grease, polychlorinated biphenyls, dioxins/furans, and polynuclear aromatic hydrocarbons shall be grab samples. For all other pollutants, 24-hour composite samples must be obtained through flow-proportioned composite sampling. Sampling and analysis shall be performed in accordance with the techniques prescribed in 40 CFR Part 136 and amendments thereto. For effluent monitoring, the reporting limits for the individual parameters shall be at or below the minimum levels (MLs) as stated in the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (2000) [also known as the State Implementation Policy (SIP)]; any revisions to the MLs shall be adhered to. If a parameter does not have a stated minimum level, then the Discharger shall conduct the analysis using the lowest commercially available and reasonably achievable detection levels.

The following standardized report format should be used for submittal of the influent and effluent monitoring report. A similar structured format may be used but will be subject to Regional Board approval. The monitoring reports shall be submitted with the Semiannual Reports.

A. Sampling Procedures – This section shall include a brief discussion of the sample locations, collection times, how the sample was collected (i.e., direct collection using vials or bottles, or other types of collection using devices such as automatic samplers, buckets, or beakers), types of containers used, storage procedures and holding times. Include description of prechlorination and chlorination/dechlorination practices during the sampling periods.

B. Method of Sampling Dechlorination – A brief description of the sample dechlorination method prior to analysis shall be provided.

C. Sample Compositing – The manner in which samples are composited shall be described. If the compositing procedure is different from the test method specifications, a reason for the variation shall be provided.

D. Data Validation – All quality assurance/quality control (QA/QC) methods to be used shall be discussed and summarized. These methods include, but are not limited to, spike samples, split samples, blanks and standards. Ways in which the QA/QC data will be used to qualify the analytical test results shall be identified. A certification statement shall be submitted with this discussion stating that the laboratory QA/QC validation data has been reviewed and has met the laboratory acceptance criteria. The QA/QC validation data shall be submitted to the Regional Board upon request.

E. A tabulation of the test results shall be provided.

F. Discussion of Results – The report shall include a complete discussion of the test results. If any pollutants are detected in sufficient concentration to upset, interfere or pass through plant operations, the type of pollutant(s) and potential source(s) shall be noted, along with a plan of action to control, eliminate, and/or monitor the pollutant(s). Any apparent generation and/or destruction of pollutants attributable to chlorination/dechlorination sampling and analysis practices shall be noted.

2. **Sludge Monitoring**

Sludge should be sampled in the same 24-hour period during which the influent and effluent are sampled except as noted in (C) below. The same parameters required for influent and effluent analysis shall be included in the sludge analysis. The sludge analyzed shall be a composite sample of the sludge for final disposal consisting of:

A. Sludge lagoons – 20 grab samples collected at representative equidistant intervals (grid pattern) and composited as a single grab, or

B. Dried stockpile – 20 grab samples collected at various representative locations and depths and composited as a single grab, or

C. Dewatered sludge- daily composite of 4 representative grab samples each day for 5 days taken at equal intervals during the daily operating shift taken from a) the dewatering units or b) from each truckload, and shall be combined into a single 5-day composite.

The U.S. EPA manual, POTW Sludge Sampling and Analysis Guidance Document, August 1989, containing detailed sampling protocols specific to sludge is recommended as a guidance for sampling procedures. The U.S. EPA manual Analytical Methods of the National Sewage Sludge Survey, September 1990, containing detailed analytical protocols specific to sludge, is recommended as a guidance for analytical methods.

In determining if the sludge is a hazardous waste, the Dischargers shall adhere to Article 2, "Criteria for Identifying the Characteristics of Hazardous Waste," and Article 3, "Characteristics of Hazardous Waste," of Title 22, California Code of Regulations, Sections 66261.10 to 66261.24 and all amendments thereto.

Sludge monitoring reports shall be submitted with the appropriate Semiannual Report. The following standardized report format should be used for submittal of the report. A similarly structured form may be used but will be subject to Regional Board approval.

A. Sampling procedures – Include sample locations, collection procedures, types of containers used, storage/refrigeration methods, compositing techniques and holding times. Enclose a map of sample locations if sludge lagoons or stockpiled sludge is sampled.

B. Data Validation – All quality assurance/quality control (QA/QC) methods to be used shall be discussed and summarized. These methods include, but are not limited to, spike samples, split samples, blanks and standards. Ways in which the QA/QC data will be used to qualify the analytical test results shall be identified. A certification statement shall be submitted with this discussion stating that the laboratory QA/QC validation data has been reviewed and has met the laboratory acceptance criteria. The QA/QC validation data shall be submitted to the Regional Board upon request.

C. Test Results – Tabulate the test results and include the percent solids.

D. Discussion of Results – The report shall include a complete discussion of test results. If the detected pollutant(s) is reasonably deemed to have an adverse effect on sludge disposal, a plan of action to control, eliminate, and/or monitor the pollutant(s) and the known or potential source(s) shall be included. Any apparent generation and/or destruction of pollutants attributable to chlorination/ dechlorination sampling and analysis practices shall be noted.

The Discharger shall also provide any influent, effluent or sludge monitoring data for nonpriority pollutants that the permittee believes may be causing or contributing to Interference, Pass Through or adversely impacting sludge quality.

Attachment F

Board Resolution No. 74-10

Attachment G

Standard Provisions and Reporting Requirements
(August 1993)

Attachment H

State Board Order No. 79-16

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Request for An Exception to the 1978 Water Quality Control Plan for Ocean Waters of California by the City and County of San Francisco for the Richmond Sunset Sewerage Zone Wet Weather Diversion Structures.	Order No. WQ 79-16

BY THE BOARD:

The City and County of San Francisco (dischargers) have a combined storm and wastewater collection system. When rainfall exceeds 0.02 inches per hour, untreated domestic wastewater mixed with stormwater runoff is discharged into the Pacific Ocean through any of eight wet weather diversion structures in the Richmond Sunset Sewerage Zone. These facilities are located on the West or Ocean side of the penninsula.

On March 16, 1976, the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Board) adopted Order No. 76-23, Waste Discharge Requirements for the wet weather diversion structures. Order No. 76-23 required the discharger to reduce the frequency of discharge from diversion structures from an average of 114 overflow events per year to an average of one overflow event per year and to undertake a study to better define the cost and water quality benefits of facilities designed to achieve various overflow frequencies. Upon completion and submittal of the study on

December 15, 1978, the discharger requested the Regional Board to consider an increase in the allowable frequency of the discharge for the wet weather diversion structures from an average of one overflow per year to an average of eight overflows per year.

Broadly speaking, the 1978 Water Quality Control Plan for Ocean Waters of California (Ocean Plan) prohibits the discharge or by-pass of wastewater to the ocean not conforming to the standards in the Ocean Plan. Exceptions to the standards contained in the Ocean Plan may be granted on a case by case basis. Untreated wet weather diversions require an exception to the Ocean Plan.1/

On January 16, 1979, the Regional Board adopted Order No. 79-12, amending Order No. 76-23 to allow an average of eight overflows per year. Based on the evidence presented at public hearing, the Regional Board determined that an exception to the Ocean Plan is warranted. By letter dated February 5, 1979, the Regional Board requested the State Water Resources Control Board (State Board) to review and approve exceptions to the Ocean Plan as recommended by Regional Board Order No. 79-12.

On March 16, 1979, the State Board held a public hearing to receive evidence pertaining to the request for an exception to the Ocean Plan.

1/ See discussion under II. Ocean Plan, page 7.

I. EXISTING WASTE COLLECTION AND DISPOSAL SYSTEM COMPARED TO THE PROPOSED SYSTEM.

San Francisco is the only city in California with a completely combined sanitary and stormwater system.[2/] The City and County of San Francisco is comprised of three hydrographic sub-units and the plans for the collection and treatment of wastewater and stormwater runoff correspond to the sub-units. The Richmond Sunset Sewerage Zone corresponds to the most western sub-unit and may be defined, generally, as that portion of the County north of the San Francisco-San Mateo county line and draining the western slope of the coastal hills dividing the County. Currently, all sewered wastes are routed to the waste treatment plant situated in the western end of the Golden Gate Park. The plant provides primary treatment and chlorination to wastewater prior to ocean discharge. As indicated previously, when rainfall exceeds 0.02 inches per hour, untreated domestic wastewater mixed with stormwater runoff is by-passed from the sewer lines carrying wastewater and runoff to the treatment plant into the ocean through any of eight wet weather diversion structures. From south to north, the diversion structures are situated near Lake Merced, Vicente Street, Lincoln Way, Mile Rock and four are grouped on Bakers Beach.

2/ Water Quality Control Plan Report, San Francisco Bay Region, Chapter 16, page 73.

The outfalls range widely in size and discharge onto the Beach at or near the waters edge. For instance, the outfall at Lake Merced is about ten feet by eleven feet, the outfall at Vicente Street is two barrels about five feet in diameter and the smallest outfall, near Bakers Beach, is eighteen inches in diameter.

The discharger is proposing to construct storage, pumping, treatment and outfall facilities in the Richmond Sunset Zone to comply with waste discharge requirements including the requirement that (with the exception of an average of eight allowable overflows per year) the discharge of untreated waste is prohibited.3/

> "The concept which underlies all overflow alternatives in the Great Highway is an "intercepting system" whereby the sewer functions as a storage facility and as a transport conduit. By maximizing the continuous movement of sewage in a storage facility, excessive deposition of solids is prevented. The major storage facility (Westside Transport) is located under the Upper Great Highway between Fulton Street and the Westside Pump Station just south of Sloat Boulevard. The Richmond and Lake Merced area flows will be collected and directed to storage in the Westside Transport via tunnels.4/

3/ As amended by Order 79-12, Regional Board Order No. 76-23, Discharge Prohibition A.1 provides in part:

> Discharge of untreated waste to waters of the State is prohibited with the exception of allowable overflows as defined below. The City shall design and construct facilities for diversion structures No. 1-8 to achieve a long term average of 8 overflows per year from these facilities.

4/ Abstract Report Westside Wet Weather Facility Revised Overflow Control Study, December 1978, Section IV, page 4

"Storm flows would be by gravity to the Westside Transport for storage and transport to the Westside Pump Station, then pumped to the proposed Southwest Water Pollution Control Plant (SWWPCP) south of the Zoo for treatment. Effluent would be discharged into the ocean two miles offshore via a deep-water outfall. When storage and withdrawal rates are exceeded, by-passing would occur with some control through the Vicente and Lincoln Way Outfalls, Lake Merced and Bakers Beach (Richmond) Outfalls with possible selectivity into the Mile Rock Outfall... The existing Richmond Sunset Water Pollution Control Plant located in Golden Gate Park will be abandoned, thereby returning four acres of park land to recreational uses.

* * *

"The Mile Rock Outfall (shoreline discharge) now functions as both the effluent outfall for the Richmond Sunset plant and as a wet weather overflow discharge for flows originating in the westerly portion of the Richmond Sunset district. Upon relocation of the dry-weather treatment to the Southwest side, dry-weather discharges to Mile Rock would cease and wet weather discharges would be reduced to the specified frequency."5/

The proposed Southwest Water Pollution Control Plant referred to in the foregoing quotations would be located immediately south of the grounds of the Fleishhacker Playground and Zoo and Sloat Boulevard. As envisioned, currently, a storage facility designed for a rate of eight overflows/year would consist of a channel seventeen and one-half wide and twelve to forty-five feet deep, running along the Great Highway between Fulton to Lincoln Way. The discharger does not propose to make any physical alterations to the existing wet weather outfalls.

5/ Section IV, page 5 of report cited previously. (Note 4).

The following table abstracted from Finding 4 of Regional Board Order No. 79-12 provides a comparison between the performance of the existing facilities and the performance anticipated in a system designed for an average of eight overflow incidents annually.

Average Number of Overflows Per Year	Existing 114	Proposed 8
Minimum/maximum number of overflows per year	26/193	1/18
Percent of annual combined wastewater treated (avg.)	74.1	95.9
Percent of annual combined wastewater which overflows (avg.)	25.9	4.1
Volume of overflow (Million gallons/ year, avg.)	2870	449
Total hours of overflow per year (avg.)	372	32
Minimum/maximum hours of overflow per year	163/617	2/78
Average duration of overflow (hours)	3.3	4
Composition of overflows (avg.)		
Percent sewage	12	6.5
Percent storm water	88	93.5
Percent reduction in BOD_5 and Suspended Solids discharged from existing overflows (avg.)	base	84
Average number of days nearshore water adjacent to discharge points exceed coliform standards for body contact recreation		
days greater than 1000 MPN/100 ml	119	25
days greater than 10,000 MPN/100 ml	70	10

II. THE OCEAN PLAN

The Ocean Plan was adopted to protect a wide range of beneficial uses[6], Order No. 76-23 indicates that to some degree the following beneficial uses are made of the ocean waters in the vicinity of the diversion structures: (1) Water Contact Recreation; (2) Non-contact Water Recreation; (3) Marine Habitat; (4) Commercial and Sport Fishing; (5) Fish Migration; and (6) Wildlife Habitat.[7]

To protect beneficial uses, the Ocean Plan provides for the concurrent application of certain regulatory mechanisms (standards) to discharges into ocean waters. These mechanisms can be broadly identified as including:

1) Water Quality Objectives (Chapter II).
2) General Management Requirements (Chapter III).
3) Effluent Quality Requirements (Chapter IV).
4) Discharge Prohibitions (Chapter V).

6/ Chapter I, Ocean Plan.

7/ For definitions of these uses, see Chapter 4, pages 1-5, Water Quality Control Plan Report, San Francisco Bay Region.

Exception to the standards contained in Chapters II through V, is provided for in Section G, Chapter VI., which provides:

> "The State Board may, subsequent to a public hearing, and with the concurrence of the Environmental Protection Agency, grant exceptions to any provision of this Plan where the Board determines:
>
> 1) The existence of unusual circumstances not anticipated at the time of the Plan's adoption;
>
> 2) The exception will not compromise protection of ocean waters for beneficial uses; and
>
> 3) The public interest will be served.

To some degree, authorization of the continued use of the wet weather diversion structures will require an exception to each of these regulatory mechanisms.

A. CIRCUMSTANCES NOT ANTICIPATED

Examination of the record in this matter clearly indicates "[t]he existence of unusual circumstances not anticipated at the time of the Plan's adoption." One such circumstance arises out of the Ocean Plan's failure to address, directly, how it would regulate the by-passing of combined waste flows.

Referring to the record pertaining to the State Board's adoption of the 1978 amendments to the Ocean Plan, it is patently clear that it was realized it was inappropriate to apply Ocean Plan standards strictly to combined waste and stormwater discharges. The record indicates, further, that rather than address this problem in the 1978 Ocean Plan amendments, directly, it was decided to deal with such problems on a case-by-case basis via the exception mechanism. Plainly it was not considered possible to anticipate in what manner the Ocean Plan should be modified to deal with the circumstances that would be presented by particular combined wet weather discharges. Additionally, it was realized that the discharges in question here would, in all probability be the subject of an exception proceeding under the Ocean Plan.8/

Finally, it should be recognized that, with the exception of the planned eight overflow events, the City will be providing waste treatment to all stormwater runoff contained in the proposed system (about 86 percent). This contrasts, markedly, with the vast majority of communities that collect and discharge stormwater runoff without any treatment because runoff is not comingled with domestic waste flows. We conclude, therefore, that present in this request for an exception are unusual circumstances not anticipated at the time of the Ocean Plan's adoption.

8/ Position Paper 7, Proposed Amendment of Ocean Plan, December 29, 1977

B. PROTECTION OF WATERS FOR BENEFICIAL USES

No exception to the Ocean Plan may be granted if protection of ocean waters for beneficial uses will be compromised. Considering the testimony presented at the March 16, 1979, hearing and reviewing the Regional Board's record on this matter, it appears that those beneficial uses of concern are: contact and non-contact water recreation; marine habitat and sport fishing. The proposed wet weather diversions have three characteristics which may adversely affect these beneficial uses, that is, toxicity, coliform and floatables.

A wet weather diversion may contain toxic components which pose a threat to marine habitat and sport fishing. Table B of the Ocean Plan provides specific limitations for certain toxic materials.[9] Relying upon the discharger's Abstract Report Westside Wet Weather Facility Revised Overflow Control Study, December 1978 (Abstract Report) the Department of Fish and Game[10] testified that the discharger's investigation indicated that lead, copper and zinc would be present in the wastewaters by-passed in excess of permissible Table B concentrations.[11]

9/ Chapter IV, Ocean Plan.

10/ Testimony by Mike Martin, Ph.D.

11/ Table V-3.

Although stormwater is initially high in concentrations of toxic materials, the concentrations are rapidly diluted by additional stormwater runoff. Averaging four hours in duration, the discharges are intermittent. Bioassays involving placement of three spine stickleback in undiluted combined effluent for 96 hours resulted in one hundred percent survival of the fish more than fifty percent of the time. Although this fish is more pollutant tolerant, no organisms in the marine environment would ever be exposed to undiluted overflow for more than a few hours.12/ It should be noted, additionally, that the Department indicated it had no specific information showing that marine habitat had been impaired from the many years of by-passing of these metals at high frequencies and concentrations. It is anticipated that the proposed system will provide waste treatment to about eighty-six percent of stormwater runoff. In the long run, therefore, the amount of toxic substances entering the ocean from the proposed system will be substantially less than from other communities that do not have a combined system. Under these circumstances, we do not conclude that the marine habitat and sport fishing beneficial uses will be compromised because of toxic concentrations of lead, copper and zinc. However, special provisions to reduce the concentration of toxic materials will be made a condition of the exception granted by this Order.

12/ Section V, page 4, Abstract Report.

Coliform are a group of bacteria predominantly inhabiting the intestines of man or animals. Coliform organisms are used as indicators of the possible presence of disease organisms. Of concern, to health officials are the diseases of Shigellosis, Salmonellosis and Hepatitis A. Provision A "Bacteriological Characteristics", Chapter II, of the Ocean Plan contains coliform standards intended to prevent the transmission of disease.

Wet weather discharges may contain coliform in concentrations that would make contact and non-contact recreation uses unsafe. Disease organisms may also contaminate shellfish, making harvesting unsafe for short periods of time. Coliform will be present in the wet weather discharges for which exception is sought due to the comingling of untreated domestic wastewater and stormwater runoff in the combined sewer system. Untreated wastewater will make up about 6.5 percent of the total volume of overflows if San Francisco implements the eight by-pass proposal.

Under current wet weather discharge conditions, the beach areas are posted as being unsafe for contact recreation from about October to April of each year due to high coliform concentrations. Twenty-five years of epidemiological data, however, shows no clinically confirmed cases of enteric disease from either recreational contact with ocean waters or the consumption of shellfish harvested from those waters.[13/] It is estimated that the proposed facilities will result in coliform concentrations requiring posting of the beaches for an average of about twenty-five days per year.[14/] In addition, based on

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13/ Section V, page 13, Abstract Report.

14/ Plate 7, Reference Plates, Abstract Report.

data contained in the Abstract Report it is reasonable to conclude that recreational uses of the beach areas and waters will be minimal and that shell fishing will be unlikely to occur during and immediately following the winter storms that will result in an overflow.[15] Given these circumstances, we do not believe that the elevated coliform concentrations for the time in question constitute a compromise of contact and non-contact recreational uses.

Floatables include fecal matter and other organic and inorganic substances. Such materials may shelter coliform and prolong coliform concentrations in the receiving water. Also, for aesthetic reasons, floatables may interfere with contact and non-contact recreation uses. Chapter III, B, requires that "[w]aste discharged to the ocean must be essentially free of: 1. material that is floatable...".

Current wet weather discharges contain substantial quantities of floatables. By installing a baffling system, it is anticipated that the proposed facilities will reduce the discharge of floatables as much as seventy to ninty-five percent from existing levels.[16] In addition, the storage capacity being built into the proposed facility will result in substantial reduction of the amount of settleable solids discharged. As noted under our previous discussion regarding coliform, epidemiological data does not indicate the existence of adverse public health problems associated with the current wet weather discharges. Considering the foregoing discussion, we do not conclude that the beneficial uses under consideration will be compromised by the proposed discharges.

15/ Plate 6, Reference Plates, Abstract Report.

16/ Section VII, page 2, Abstract Report.

C. PUBLIC INTEREST CONSIDERATIONS

Exemptions to the Ocean Plan cannot be granted unless the public interest will be served by granting such exemptions. Analysis of whether the public interest will be served in this matter necessarily involves protection of beneficial uses of ocean waters, the uniqueness of the discharger's sewer system, and economic impacts in terms of capital costs, operation and maintenance costs and user charges.

The discharger's sewer system is a combined system which collects and routes to the treatment plants both sanitary sewage and stormwater. Whenever rainfall exceeds 0.02 inches per hour, this combined wastewater by-passes the treatment plants and discharges to waters of the United States. This occurs on the average of 114 times per year from various overflow structures located throughout the treatment area. This totally combine system is unique and the only major system of its kind in the state of California. Consequently, when the discharger completes the projects and facilities discussed previously in this Order, presuming eight overflows, they will not only be treating ninty-nine percent of sanitary wastewater but will also be treating eighty-six percent of stormwater runoff. This combined treatment will substantially reduce pollutant loadings to the ocean from urban runoff, an accomplishment unique to the discharger's system. Unquestionably this serves the public interest.

We have previously discussed protection of beneficial uses. This is an integral part of serving the public interest. Further, the Central Coast Regional Coastal Commission (Regional Commission) has denied the discharger a required development

permit based on one overflow in part based on the size and location of the transport necessary for a one overflow system. The Regional Commission's concerns related to future beach erosion, sewer exposure and seismic and groundwater problems. An allowance of eight overflows will allow a smaller transport system to be built. The State Commission has now assumed jurisdiction in this matter.

The cost impacts and savings of allowing eight overflows on the westside are enormous. Considerable evidence was introduced in the Regional Board record and at the hearing regarding these costs and savings. Capital costs of the Westside project assuming one overflow are $299,000,000 and $189,000,000 assuming eight overflows. Thus, an increase in the number of overflows from one to eight would result in a $110,000,000 capital cost saving. The annual operation and maintenance cost savings would be $10,000,000. Table IV-1 of the Abstract Report shows detailed cost comparisons for the various parts of the Westside project. Plate 5 of the Abstract Report tabulates the cost of suspended solid, BOD, and coliform benefits for different overflow levels. The testimony presented indicates substantially diminishing benefit returns per dollar spent as the number of overflows diminishes below eight. This is clearly demonstrated by the Regional Board graph dated January 15, 1979.

Considerable written and oral testimony was presented to the State Board and the Regional Board regarding citizen concern for user charges. This testimony included comments from The West of Twin Peaks Central Council, The Citizens Advisory Committee for Wastewater Management, The Hotel Employers Association, The Sunset Coalition, The Sunset-Parkside Education and Action Committee, Paul D. Berrigan, Brig. Gen. Retd., Descon Corporation, The San Francisco Bay Chapter Sierra Club, and The Parkside District Improvement Club, Inc.. The user charge based on eight overflows is more reasonable than for one or zero.

Based upon the factors above, we find the public interest will be served by granting the discharger an exemption to the Ocean Plan to allow an average of eight overflows per year.

III. EXCEPTION SUBJECT TO CONDITIONS

Subject to the following conditions, this Order excepts the proposed by-passes from the terms of the Ocean Plan.

1. The discharger shall perform a self-monitoring program in accordance with the specifications prescribed by the Regional Board as indicated in Provision 12 of Regional Board Order No. 79-12. All beaches affected by the wet weather overflows shall be posted with warning signs for the period of time beginning when the overflow commences and continuing until analysis indicates the water quality of the affected areas is meeting bacteriological standards for recreation.

   At all areas where shellfish may be harvested for human consumption warning signs shall be posted for the period of time beginning when the overflow commences and continuing until the City and County Health Department indicates that no further posting is required.

2. Excepting provision Chapter II. A., to the greatest extent practical, the discharger shall design, construct and operate facilities which will conform to the remaining standards set forth in Chapter II of the Ocean Plan.

3. To the greatest extent practical, the discharger shall design, construct and operate facilities that will comply with the conditions controlled by the requirements provided by Chapter III, Sections A and B of the Ocean Plan.

4. The discharger shall develop the conceptual proposals for the design to be used and the technologies to be installed in the facilities intended to assure compliance with conditions 2 and 3. The proposals shall be submitted to the State Board and the EPA for approval within sixty days following adoption of this Order.

5. Excepting an average of eight overflows per year, the discharger shall design and construct facilities that will contain all other stormwater runoff.[17/] The discharge of all other untreated waste to waters of the state is prohibited.

6. The State Board Division of Water Quality shall critically review the discharger's grant application and subsequent design and construction and the Regional Board shall review operating performance to assure compliance with conditions 1, 2, 3 and 5.

7. The discharger shall fully comply with any federal and state source control program in order to minimize the entry of toxic substances into the waste collection system from in-

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17/ For the purpose of this Order, allowable overflows are those overflows permitted by Discharge Prohibitions A.1., Order No. 76-23 as amended by Order No. 79-12. In addition, any two overflows within one storm or a series of storms, separated by six or more hours shall be considered two separate overflow events. This requirement for an average of eight overflows is based upon the 62 year period of rainfall record used by the City in developing its facility design.

dustrial dischargers. To the extent that Section 208 studies being conducted by ABAG conclude there are feasible measures for reducing the entry of toxic substances into the collection system from stormwater runoff, the discharger shall implement such measures in accordance with a plan approved by the Regional Board.

8. Notwithstanding this Order, if the Regional Board finds that changes in location, intensity or importance of affected beneficial uses or demonstrated unacceptable adverse impacts as a result of operation of the constructed facilities have occurred, it may require the construction of additional facilities or modification of the operation of existing facilities.

As noted earlier, the exception granted by this Order is subject to the concurrence of the EPA. The EPA may attach, independently, other conditions upon the discharger as a condition of granting an exception.

IV. ADDITIONAL CONSIDERATIONS

The discharger completed a final EIR/EIS for the Wastewater Master Plan in May 1974. The discharger completed a final EIR for the Westside Transport facility in July 1977, which addressed overflows from diversion structures Nos. 2 and 3. This EIR identified potential adverse water quality impacts from this project related to seismic activity and the project has been modified to mitigate this potential impact. This EIR will be amended by the discharger following adoption of this Order. The discharger has commenced preparation of a draft EIR for the Richmond Tunnel facility which will address overflows from diversion structures Nos. 4 through 8, and has indicated they will prepare

an EIR for the Lake Merced Transport facility which will address overflows from diversion structure No. 1. Upon completion of the amendment to the Westside Transport facility EIR, the final EIR for the Richmond Tunnel facility, and the final EIR for the Lake Merced Transport facility, the State Board will review any adverse impacts identified, and if necessary, make appropriate revisions of this Order.

V. CONCLUSIONS

After review of the record and for the reasons heretofore expressed, we have reached the following conclusions:

1. Subject to the conditions set forth in "III. EXCEPTION SUBJECT TO CONDITIONS," the proposed wet weather discharges by the City and County of San Francisco from the eight diversion structures in the Richmond Sunset Sewerage Zone are excepted from the requirements of the Ocean Plan.
2. Revisions may be made to this Order upon completion of the amendment to the Westside Transport facility EIR, the final EIR for the Richmond Tunnel and the final EIR for the Lake Merced Transport facility.

VI. ORDER

IT IS HEREBY ORDERED that the discharger's request for an exemption is granted subject to the conditions contained in "III. EXCEPTION SUBJECT TO CONDITIONS". Revisions may be made to this Order upon completion of additional environmental documents.

Dated: March 23, 1979

W. Don Maughan, Chairman

William J. Miller, Member

L. L. Mitchell, Member

Attachment I

Regional Board Order No. 79-12

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 79-12

NPDES PERMIT NO. CA0038415

AMENDING ORDER NO. 76-23 REGARDING
CITY AND COUNTY OF SAN FRANCISCO
RICHMOND SUNSET SEWERAGE ZONE
WET WEATHER DIVERSION STRUCTURES

The California Regional Water Quality Control Board, San Francisco Bay Region, hereinafter called the Board, finds that:

1. The City and County of San Francisco, hereinafter called the discharger, presently discharges untreated domestic and industrial wastewater mixed with storm water runoff, all containing pollutants, into the Pacific Ocean, a water of the United States, through any of eight (8) wet weather diversion structures in the Richmond Sunset Sewerage Zone. These discharges occur only when rainfall exceeds 0.02 inches per hour.

2. Order No. 76-23 required the discharger to reduce the frequency of discharge for diversion structures No. 1 through 8 to an average of one overflow event per year and to undertake a citywide overflow control study to better define the cost and water quality benefits of facilities designed to achieve various overflow frequencies.

3. The discharger has undertaken an overflow control study and has requested the Regional Board to consider an increase in the allowable frequency of discharge for diversion structures No. 1 through 8 from an average of 1 overflow per year to an average of 8 overflows per year.

4. The following table provides a comparison of improvement obtainable by reducing the average overflows from diversion structures No. 1 through 8 to eight (8), four (4) and one (1) overflow per year compared to the existing average of 114 per year. Data was derived from the discharger's predictive computer model and are therefore approximations.

Average Number of Overflows Per Year	Existing 114	8	4	Order No. 76-23 1
Minimum/maximum number of overflows per year	26/193	1/18	0/11	0/4
% of annual combined wastewater treated (avg.)	74.1	95.9	98.1	99.53
% of annual combined wastewater which overflows (avg.)	25.9	4.1	1.9	0.47
Volume of overflow (Million gallons/ year, avg.)	2870	449	213	52
Total hours of overflow per year (avg)	372	32	15.4	3.5
Minimum/maximum hours of overflow per year	163/617	2/78	0/42	0/18
Average duration of overflow (hours)	3.3	4	3.9	3.5
Composition of overflows (avg)				
% sewage	12	6.5	6.5	6.2
% storm water	88	93.5	93.5	93.8
% reduction in BOD_5 and Suspended Solids discharged from existing overflows (avg)	base	84	92.5	98
Average number of days nearshore water adjacent to discharge points exceed coliform standards for body contact recreation				
days greater than 1000 MPN/100 ml	119	25	13	4
days greater than 10,000 MPN/100 ml	70	10	6	1
Cost of facilities (millions of dollars)				
Capital cost (total)	base	189	242	299
Storage		150	161	182
Pumping		13.5	21.5	25.5
Treatment/outfall		25.5	59.1	91.6
Annual cost	base	14	19	24

5. Overflows will occur from storage structures which will be designed to provide for additional removal of settleable and floatable solids. Removal of these solids will provide further mitigation of the aesthetic and public health impacts over and above the mitigation provided by reduction in the frequency of overflows.

6. The discharger completed a final EIR/EIS for the Wastewater Master Plan in May 1974. The discharger completed a final EIR for the Westside Transport facility in July, 1977, which addressed overflows from diversion structures Nos. 2 and 3. This EIR identified potential adverse water quality impacts from this project related to seismic activity and the project has been modified to mitigate this potential impact. This EIR will be amended by the City following adoption of this order. The discharger has commenced preparation of a draft EIR for the Richmond Tunnel facility which will address overflows from diversion structures Nos. 4 through 8 and has indicated they will prepare an EIR for the Lake Merced Transport facility which will address overflows from diversion structure No. 1. Upon completion of the amendment to the Westside Transport facility EIR, the final EIR for the Richmond Tunnel facility, and the final EIR for the Lake Merced Transport facility, the Board will review any adverse water quality impacts identified, and if necessary, make appropriate revisions of this Order. The issuance of waste discharge requirements for this project is exempt from the provisions of Chapter 3 (commencing with Section 21000) of Division 13 of the California Public Resources Code (CEQA) in accordance with Water Code Section 13389.

7. The Board has notified the discharger and interested agencies and persons of its intent to amend Order No. 76-23 and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

8. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

9. The combined sewer collection system of San Francisco, designed to transport both sanitary and storm flows, presents a unique problem regarding total compliance with the Basin Plan prohibition against the discharge of untreated waste. The Basin Plan recommends that exceptions to compliance be allowed for wet weather discharges, provided that beneficial uses are not adversely affected; however, a specific exception clause was not included. It is clear that the intent of the Basin Plan is to allow exceptions and this Board will consider inclusion of a specific exception clause during the next Basin Plan updating.

10. Based upon the presently available planning information contained in these findings and evidence presented at the public meeting concerning the cost differences of facilities necessary to achieve specific overflow frequencies and the water quality benefits derived from construction of those facilities and considering the location and intensity of existing beneficial uses; a long term average of eight (8) overflows per year for diversion structures No. 1 through 8, will provide adequate overall protection of beneficial uses; provided however that further study to comply with the discharge prohibitions No. A.2 and A.3 is required by the discharger especially where existing discharge points are located in areas which do not have adequate exchange with ocean water and may not provide adequate protection of adjacent nearshore beneficial uses. Further mitigation may be required in the future, after facilities are placed in operation, if it is determined that beneficial uses are not adequately protected.

11. The Federal Water Pollution Control Act and amendments thereto require that point source discharges comply with appropriate standards by July 1, 1977. The discharger has not started construction of facilities to comply with the prohibitions and provisions of Order No. 76-23 as amended by this Order. The Board will consider an appropriate enforcement order which will include a time schedule for compliance with Order No. 76-23 as amended by this order within 90 days of the date of this order.

IT IS HEREBY ORDERED, that Order No. 76-23 is amended as follows:

A. Finding No. 1, page 1, is amended to read:

1. The City and County of San Francisco, hereinafter called the discharger, presently discharges untreated domestic and industrial wastewater mixed with storm water runoff, all containing pollutants, into the Pacific Ocean, a water of the United States.

B. Finding No. 8, page 2, is deleted.

C. Finding No. 9, page 2, is amended to read:

9. The beneficial uses of the Pacific Ocean in the vicinity of these diversion structures are:

Water contact recreation
Non-contact water recreation
Marine habitat
Commercial and sport fishing
Fish migration
Wildlife habitats

D. Discharge prohibition A.1, page 3, is amended to read:

1. Discharge of untreated waste to waters of the State is prohibited with the exception of allowable overflows as defined below. The City shall design and construct facilities for diversion structures No. 1-8 to achieve a long term average of eight (8) overflows per year from these facilities. These long term overflow frequencies shall not be used to determine compliance or noncompliance with the exception. Allowable overflows from these facilities are defined as those discharges which occur when all of the following criteria are met:

a. All storage capacity within a storage facility is fully utilized; and

b. Maximum installed pumping capacity or some lower rate based on limits of downstream transport or treatment capabilities is being utilized to withdraw flows from the storage facility; and

c. All citywide treatment facilities, excluding the Golden Gate Park reclamation facility, are being operated at capacity or at some lower rate consistent with the maximum withdrawal and transport rates; and

d. Overflow occurs from a facility employing baffles or other equivalent means to reduce the discharge of floatables.

Overflows which occur when criteria a, b, c, and d are not being met shall be considered violations of this discharge prohibitions.

E. Provision B.3.a., page 3, is amended to delete the following:

"(1) 1/ Reduce frequency of discharge for diversion structures No. 1 through 8 to an average 2/ of one overflow event per year.

1/ This Board will consider amendment of this order to further reduce frequency of discharge after review of the information requested in Provision B.4. below.

2/ Method of computing average to be developed in self-monitoring program."

F. Provision B.3.a is amended to add the following on page 5:

Task	Completion Date
"(d) Full compliance with Discharge Prohibition A.1.	by July 1, 1977"

G. Provision B.3.b. is amended to add the following on page 5:

Task	Completion Date
"(3) Full compliance with Discharge Prohibition A.2. and A.3.	by July 1, 1977"

H. Provision B.3.c. is amended to add the following on page 6:

Task	Completion Date
"(2) Full compliance with Provision B.1.	by July 1, 1977"

I. Provisions No. B. 10., 11., and 12. are added on page 7 as follows:

"10. The City and County of San Francisco is required to submit to the Regional Board by the first day of every month a report, under penalty of perjury, on progress towards compliance with this Order. Said report shall include the status of progress made toward compliance with all tasks of this Order. If noncompliance or threatened noncompliance is reported the reasons for noncompliance and an estimated completion date shall be provided.

11. The long term average overflow frequency prescribed in this Order is based on information available at the time of adoption of this Order. If the Board finds that changes in the location, intensity or importance of affected beneficial uses or demonstrated unacceptable adverse impacts as a result of operation of the constructed facilities have occurred they may require the construction of additional facilities or modifications of the operation of existing facilities.

12. The City and County of San Francisco shall perform a self-monitoring program in accordance with the specifications prescribed by the Executive Officer of the Regional Board. The City and County's Health Department is requested to post warning signs on all beaches affected by the wet weather overflows for a period of time commencing with the day of overflow and continuing until the water analyses indicate the water quality of the affected areas have recovered and are meeting bacteriological standards for water contact sport recreations in the beach areas."

I, Fred H. Dierker, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on January 16, 1979.

FRED H. DIERKER
Executive Officer

Attachments:
Reporting Requirements 8/8/73
Standard Provisions 8/8/73

Attachment J

ESA Consultation Letters

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802- 4213

In reply please refer to:
May 26, 2003 151422SWR02SR8258:MEM;JJD

MAY 30 2003

Nancy Yoshikawa
CWA Standards and Permits Office
U.S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, CA, 94105

Dear Ms. Yoshikawa:

Thank you for your request of February 12, 2003, to initiate section 7 consultation with the National Marine Fisheries Service (NOAA Fisheries) regarding the joint U.S. Environmental Protection Agency's (EPA) and Regional Water Quality Control Board's proposed issuance of the National Pollutant Discharge Elimination System (NPDES) permit for the City and County of San Francisco's Oceanside Treatment Plant, Southwest Ocean Outfall (SWOO), and Westside Wet Weather facilities. The permit would regulate the discharge of treated wastewater through the SWOO, which is located beyond the three mile limit of the territorial sea into federal waters. The permit would also regulate the discharge of seven Combined Sewer Overflow (CSO) points along the western edge of San Francisco. NOAA Fisheries provided a list of Federally listed (or proposed for listing) threatened or endangered species or critical habitat under our jurisdiction that may be affected by the proposed permit by letter dated September 19, 2002.

The City and County of San Francisco (CCSF) operates a combined sewer collection system into which both sewage and storm water runoff flow. Effluent is discharged 3.75 miles offshore of Ocean Beach through the SWOO. Effluent may be treated to a primary or secondary level, depending on volume, but is not disinfected. Primary treatment entails separation of solids from liquid fractions. Secondary treatment entails microbial "digestion" of solid fractions. Discharges in dry weather average 18 million gallons per day (MGD). In wet weather, effluent discharges from the Oceanside Plant may increase up to 65 MGD, 43 MGD of which is treated to secondary standards, and then blended with 22 MGD treated to primary standards. Flows above 65 MGD (up to 175 MGD) receive primary treatment in the CSO structures before being discharged through the SWOO. Flows in excess of 175 MGD are discharged directly to the shoreline via seven overflow structures.

The effluent may contribute significant levels of bacteria, heavy metals, and organic pollutants (e.g. pesticides and pesticide residues, pharmaceutical compounds) to the receiving ocean waters. To monitor these effects during the past five years, the CCSF has conducted extensive beach and offshore monitoring from Point San Pedro to Point Bonita, and offshore approximately eight miles.

Endangered Species Act

Available information indicates that the following listed species (Evolutionarily Significant Units) may occur in the project areas:

Anadromous Salmonids

Sacramento River winter-run chinook salmon (*Oncorhynchus tshawytscha*)
endangered (January 4, 1994, 59 FR 440)
Central Valley spring-run chinook salmon (*Oncorhynchus tshawytscha*)
threatened (September 16, 1999, 64 FR 50394)
Central California Coast coho (*Oncorhynchus* kisutch)
threatened (October 31, 1996, 64 FR 56138)
Central California Coast steelhead (*Oncorhynchus mykiss*)
threatened (August 18, 1997, 62 FR 43937)
Central Valley steelhead (*Oncorhynchus mykiss*)
threatened (March 19, 1998, 63 FR 13347)

All the above anadromous salmonids enter the ocean as juveniles following 6-months to 2 years of freshwater residence. Upon entering the ocean as smolts, our understanding of ocean migratory behavior and distribution patterns is limited. Movement and distribution fluctuates with ocean temperatures, food availability, salmonid race (i.e. area of origin), and ocean environmental conditions. After one to four years in the ocean, salmon and steelhead return as adults to their natal streams to spawn

Cetaceans

Fin Whale (*Balaenoptera physalus*)
endangered (Dec 28, 1973, Public Law 93-205)
Blue Whale (*Balaenoptera musculus*)
endangered (Dec 28, 1973, Public Law 93-205)
Humpback Whale (*Megaptera novaengiae*)
endangered (Dec 28, 1973, Public Law 93-205)
Sperm Whale (*Physeter macrocephalus*)
endangered (Dec 28, 1973, Public Law 93-205)

Pinnipeds

Steller Sea Lion (*Eumetopias jubatus*)
threatened (November 26, 990, 50 FR 227)

Sea Turtles

Leatherback sea turtle (*Dermochelys coriacea*)
endangered (June 2, 1970)
Loggerhead Sea Turtle (*Caretta caretta*)
threatened (July 28, 1978, 43 FR 82808)
Green Sea Turtle (*Chelonia mydas*)
threatened (July 28, 1978, 43 FR 82808)
Olive Ridley sea turtle (*Lepidochelys olivacea*)
threatened (July 28, 1978, 43 FR 82808)

Tissues of English sole (*Pleuronectes vetulus*), and Dungeness crab (*Cancer magister*) collected from the SWOO study area and from reference sites were examined for organic and inorganic pollutants (CCSF 2001). Elevated levels of polyaromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), DDT and arsenic were detected in fish and crab tissues. Screening values for PAHs were exceeded in fish muscle and liver tissues. While PAH contaminants probably degrade rapidly in sunlight, they have been implicated in hyperplasia (excessive cell growth) and neoplasia (tumors), in aquatic invertebrates and fish (Eisler 2000).

Screening values for PCBs and DDT were exceeded in crab hepatpancreas tissues. Marine mammals are the most vulnerable to PCB contamination, because these compounds are widely distributed, found in marine mammal prey species, and accumulate in body fatty tissues. These compounds adversely affect patterns of survival, reproduction, growth, metabolism, and accumulation in all tested organisms. Chinook salmon, for example, had decreased hatch success when their eggs contained as little at 1 microgram PCB per kilogram of weight. Deleterious effects to mammals were significant on growth survival, reproduction, or metabolisms from chronic daily exposures of as little as 0.008 milligrams/kilogram (Eisler 2000).

Sediment monitoring for both organic compounds and metals reveal no increasing or decreasing trend in sediment contamination. Concentrations around the outfall were not significantly higher than other sampling sites in the study area (CCSF 2001). The CCSF also conducted voluntary "whole sediment toxicity testing" during the 2000 survey. Along with sediment chemistry and benthic community analysis, these tests assess possible contaminant effects that could be missed in other analyses. Results indicated no detectable toxicity at any of the sample sites.

NOAA Fisheries has examined the results of these monitoring efforts which include levels of bacterial coliforms and concentrations of inorganic and organic pollutants in tissues and in sediment. Comparison of data from the extensive monitoring program with reference sites indicates that discharge of effluent under the existing NPDES permit has not adversely affected conditions to the extent that loading or trends can be distinguished from background levels. In regards to pathogenic organisms, there are no known incidents of marine mammals listed under the ESA which were affected by pathogens likely associated with this project. However the data set is also extremely limited (Gulland pers. com. 2003).

Based on the best available information, I concur with your determination that this project is not likely to adversely affect threatened and endangered species of anadromous salmonids, cetaceans, pinnipeds, or sea turtles. This concludes section 7 consultation for listed species under the jurisdiction of NOAA Fisheries in accordance with 50 CFR §402.14(b)(1) for the proposed issuance of the NPDES permit for the CCSF's Oceanside and Westside facilities. However, further consultation may be required if (1) new information becomes available indicating that listed species or critical habitat may be adversely affected by the project in a manner not previously considered, (2) current project plans change in a manner that affects listed species or critical habitat, or (3) a new species is listed or critical habitat designated that may be affected by the action.

Magnuson-Stevens Fishery Conservation and Management Act - Essential Fish Habitat

The project site is located within an area identified as Essential Fish Habitat (EFH) for various life stages of fish species managed with the following Fishery Management Plans (FMP) under the Magnuson-Stevens Fishery Conservation and Management Act (MSA):

Pacific Groundfish FMP - (starry flounder, English sole, sand sole, leopard shark, spiny dogfish, brown rockfish, etc.)
Coastal Pelagics FMP - (northern anchovy, Pacific sardine)
Pacific Coast Salmon FMP - (chinook and coho salmon)

NOAA Fisheries has evaluated the proposed project for potential adverse effects to EFH pursuant to Section 305(b)(2) of the MSA. Based on the best available information, EFH Conservation Recommendations are not necessary. However, if the proposed action is modified in a manner that may adversely affect EFH, or if continued monitoring shows contaminants beginning to accumulate in EFH above current conditions, the EPA may need to reinitiate EFH consultation with NOAA Fisheries.

Marine Mammal Protection Act

The purpose of the MMPA is to prevent the taking of marine mammals and to provide for their conservation and management. Operation of the project has the greatest potential to affect harbor seals *(Phoca vitulina richardsi)* by introducing pathogens into the water column via the SWOO

or the seven shoreline overflow sites. Usage of the shoreline overflow sites is rare while effluent is constantly discharged through the SWOO. Other marine mammals such as California sea lion *(Zalophus californianus)* are known to utilize the area and may be affected. Documented cases have not been noted at this time, but the available data set is very small.

Pacific harbor seals have been found in areas near San Francisco infected with pathogens that may be introduced through the SWOO. The two most prominent pathogens are both protozoans and are also known to infect other mammal species. The first is *Sarcocystis neurona*, which has been implicated in harbor seal infections and mortality in several instances (Lapointe, et. al. 1998, Miller, et. al. 2001). It is considered a well established pathogen in harbor seals affecting mostly older animals (Miller, pers. comm. 2003). The second is *Toxoplasma gondii* which has been found in a harbor seal in the Monterey Bay (Miller, et. al. 2001), but is a more prominent pathogen in southern sea otters (Miller, et. al. 2002). These pathogens are known to enter coastal waters in freshwater runoff (Miller, et. al. 2002).

During discussions with EPA and the CCSF, NOAA Fisheries expressed concern about the possible introduction of morbilliviruses to the water column as a result of the project. The morbillivirus family includes measles in humans, canine distemper, phocine distemper, dolphin distemper and a few other varieties. Morbilliviruses are responsible for episodes of mortality in Caspian seals *(Phoca caspica)* in the Caspian sea (Kennedy, S., et. al. 2000) and harbor seals *(Phoca vitulina)* in northwestern Europe (Taubenberger, et. al. 1996). They have been isolated from harbor porpoises *(Phocoena phocoena)* that died along the Irish coast, striped dolphins *(Stenella coeruleoalba)* in the Mediterranean Sea and bottlenose dolphins along the U.S. Atlantic and Gulf of Mexico coasts (Taubenberger et. al. 1996). NOAA Fisheries consulted with experts at The Marine Mammal Center in Sausalito, California to see if there are any episodes of morbillivirus infection in the San Francisco area. To date, they have recorded no episodes of infection, however antibodies to morbillivirus have been found in common dolphins *(Delphinus delphis)* off the Southern California coast. This indicates that the animals have been exposed to some form of morbillivirus, but which form is not known. West coast populations are not be expected to have resistance to infectious strains though because they are not known to have been exposed (Gulland, pers. comm. 2003).

Due to the design of the CCSF's West Side combined sewer system these pathogens can be introduced to the water column through the SWOO as well as to the shoreline from runoff or CSO overflows. NOAA Fisheries requests that the CCSF conduct testing of the effluent for *Sarcocystis neurona*, *Toxoplasma gondii* and morbilliviruses at least twice a year during the upcoming permit cycle. Sampling should occur once during dry weather conditions and once during wet weather conditions when primary treated effluent is being discharged. This testing would be in addition to the *E. coli* and *enterocoocus* monitoring proposed as part of the draft discharge permit currently out for public comment. NOAA Fisheries recognizes that proper methodologies for this examination will have to be determined and, if requested, we will aid the CCSF in organizing a technical advisory committee to determine the scope of the work.

If you have questions concerning this consultation, please contact Maura Eagan Moody at (707) 575-6092 or Joe Dillon at (707) 575-6093. Thank you for your cooperation on this complex matter. We look forward to working with you in the future.

Sincerely,

Rodney R. McInnis
Acting Regional Administrator

cc: James H. Lecky, NOAA Fisheries, Long Beach, California
Dan Buford, USFWS, Sacramento, California
Abigail Smith, SF RWQCB, Oakland, California
Dan Russell, USFWS, Sacramento, California
Joe Cordaro, NOAA Fisheries, Long Beach, California
Tina Fahy, NOAA Fisheries, Long Beach, California
Arleen Navarret, San Francisco Public Utilities Commission

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

JUN 26 2003

IN REPLY REFER TO
1-1-03-I-2235

JUN 24 2003

Mr. Terry Oda
Manager, Clean Water Act Standards and Permits Office
U.S. Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, California 94105-3901

Subject: Informal Consultation for NPDES Permit (#CA0037681) for San Francisco's Westside (Correspondence Reference - WTR-5)

Dear Mr. Oda:

This letter is in response to your February 12, 2003, request to initiate informal consultation on a draft National Pollutant Discharge Elimination System (NPDES) permit for the City and County of San Francisco's Oceanside Treatment Plant, Southwest Ocean Outfall, and Westside Wet Weather Facilities pursuant to the Endangered Species Act of 1973, as amended (Act). This draft NPDES permit, a renewal of an existing permit, is jointly issued by the U.S. Environmental Protection Agency (EPA) and the State of California's San Francisco Bay Regional Water Quality Control Board. This permit is issued pursuant to Section 402 of the Clean Water Act for the discharge of treated wastewaters to waters of the State and United States from the Oceanside Water Pollution Control Plant (WPCP) and the Westside Wet Weather Combined Sewer System (WWWCSS). In addition to your informal consultation letter, you provided a draft Biological Evaluation (BE) of the joint NPDES permit. Based on this BE, the EPA has determined that issuance of the proposed permit may affect, but is not likely to adversely affect, the southern sea otter (*Enhydra lutris nereis*) (sea otter). The EPA is requesting the Service's concurrence with this determination.

The Oceanside WPCP and the WWWCSS provide treatment for sewage and storm water from the west side of the City of San Francisco. During dry weather and smaller wet weather events, all flows receive secondary treatment at the Oceanside WPCP and are discharged through the Southwest Ocean Outfall (SWOO) into Federal waters of the Pacific Ocean [6 kilometers (km) offshore, 80 feet deep from Mean Lower Low Water (MLLW)]. In larger wet weather events, the SWOO discharge increases and includes primary treated effluent from the Oceanside WPCP and the WWWCSS. During very large storms, the SWOO pumping capacity is exceeded and combined sewer overflows (CSOs) occur at seven discharge points along the City's shoreline.

Dry weather discharges average 18 million gallons per day (MGD). Effluent discharges from the Oceanside WPCP may increase to 65 MGD during wet weather events; 43 MGD which receives secondary treatment from the WPCP and 22 MGD which receives the equivalent of primary treatment from the WWWCSS. Flows above 65 MGD (up to 175 MGD) receive primary treatment in the CSO structures before being discharged through the SWOO. Flows in excess of 175 MGD are discharged directly to the shoreline via seven outflow structures. None of the effluent, whether in primary or secondary treatment, receives disinfection treatment. The effluent may contain numerous organic and inorganic pollutants as it enters ocean waters. The City and County of San Francisco's (CCSF) Public Utilities Commission, Water Quality Bureau, has conducted beach and offshore monitoring for several years to assess the impact of these discharges (CCSF, 2001).

Based on the Southwest Ocean Outfall Regional Monitoring Program's Five-Year Summary Report (CCSF, 2001), sediment monitoring for metal and organic pollutants revealed no increasing or decreasing trend in contamination. In 2000, sediment samples were collected at 24 sites and used in 'whole sediment' toxicity testing, using an amphipod (*Eohaustorius* spp.) as the test organism. Detectable toxicity was not observed at any of the sample sites. Although screening values for a number of pollutants (*e.g.*, polyaromatic hydrocarbons, polychlorinated biphenyls, DDT, arsenic) were exceeded in fish and crab tissues sampled from the SWOO study area, no clear trends were observed between study sites. This monitoring effort indicates that effluent discharged under the existing NPDES permit has not adversely affected environmental conditions to the extent that loading or trends can be distinguished from background levels.

As noted above, none of the effluent resulting from this NPDES permit undergoes disinfection before discharge. The EPA's draft BE discusses recent speculation that undisinfected wastewater might be a source of disease for marine mammals, including the sea otter. The BE cites a study (Miller *et al.*, 2002) in which serological data from 223 live and dead sea otters from the Morro Bay region were examined between 1997 and 2001. Otters sampled near areas with freshwater runoff were approximately three times more likely to be seropositive for *Toxoplasma gondii*, a virus found in cat feces, than otters sampled in other areas. In addition to *T. gondii*, another pathogen (*Sarcocystis neurona*) which may potentially be introduced through undisinfected wastewater has been implicated in harbor seal infections and mortality (Dillon, pers. comm., 2003). Miller et al. (2002) found no evidence of a relationship between seropositivity to *T. gondii* and exposure to municipal sewage and believe the reason is that the major municipal sewage outfalls are located far offshore (greater than 0.5 km) and nearly all otters were sampled at locations greater than 5 km from the nearest major municipal sewage outfall. The authors concluded that exposure of sea otters to sewage plumes derived from major municipal sources was low in their study. The Oceanside outfall is located 6 km from shore and is 24 km from the northern most range of the sea otter.

Questions about pathogens in undisinfected wastewater and their potential impact on marine mammals is proposed to be addressed in the NPDES permit through a full literature review to be completed by the discharger. However, as little is yet known about the magnitude of potential

marine mammal pathogens in undisinfected wastewater or about the environmental fate and transport of these organisms once introduced into the marine ecosystem, the Service recommends additional monitoring requirements be included in the permit. Effluent should be tested for both *Sarcocystis neurona* and *Toxoplasma gondii* at least twice a year during the upcoming permit cycle. Sampling should occur once a year during dry weather conditions and once a year during wet weather conditions when primary-treated effluent is discharged. This testing would be in addition to the bacteriological monitoring requirements already in the draft permit.

The known northernmost range of the sea otter (Half Moon Bay) is approximately 24 km (15 miles) from both the SWOO and the WWWCSS discharges (Sander, pers. comm., 2003). Based on this information, and the results of the ongoing Southwest Ocean Outfall Regional Monitoring Program, the Service concurs with the EPA's determination that issuance of the existing NPDES permit is not likely to adversely affect the sea otter.

These comments are provided in accordance with the Act and conclude informal consultation. However, further consultation may be required if: (1) new information becomes available indicating that listed species or critical habitat may be adversely affected by the project in a manner not previously considered, (2) current project plans change in a manner that affects listed species or critical habitat, or (3) a new species is listed or critical habitat designated that may be affected by the action. Should you have any questions about these comments, please contact Tom Maurer of the Environmental Contaminants Division at (916) 414-6590 or Dan Buford of the Endangered Species Division at (916) 414-6625.

Sincerely,

Doug Weinrich

Doug Weinrich
Acting Chief, Endangered Species Program

cc:
EPA, Region IX, San Francisco, CA (Attn.: Nancy Yoshikawa)
NOAA Fisheries, Santa Rosa, CA, (Attn.: Joe Dillon)
SFRWQCB, Oakland, CA, (Attn.: Abigail Smith)
VFWO, Ventura, CA, (Attn.: Greg Sanders)

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Attachment K

Self-Monitoring Program

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
AND
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 9

SELF-MONITORING PROGRAM

FOR

CITY AND COUNTY OF SAN FRANCISCO
OCEANSIDE TREATMENT PLANT,
SOUTHWEST OCEAN OUTFALL,
AND
WESTSIDE WET WEATHER FACILITIES

NPDES PERMIT NO. CA 0037681

CONSISTS OF
PART A, dated August 1993

AND

PART B (attached), effective October 1, 2003

** Note: Self-Monitoring Program Part A (August 1993), Standard Provisions and Reporting Requirements (August 1993), and Resolution No. 74-10 are not attached but are available for review or download on the Board's website at www.swrcb.ca.gov/rwqcb2."*

SELF-MONITORING PLAN

CONTENTS

I. Oceanside Wastewater Treatment Plant, Dry Weather Discharge Monitoring

A. Influent and Effluent Monitoring Stations

Discussion

Effluent monitoring is conducted to determine compliance with effluent limitations in the permit. Influent monitoring is necessary to determine compliance with percent-removal requirements for BOD and suspended solids and to assess overall plant performance.

Requirements:

Description of Sampling Stations

1. Influent

Station	Description
A-003	At any point in the treatment facilities headworks at which all waste tributary to the system is present and preceding any phase of treatment, and exclusive of any return flows or process side streams

2. Effluent

Station	Description
E-007	At any point in the sewerage system between the point of discharge and the point at which all wastes have gone through the treatment processes, and before mixing with any effluent from the Westside Transport.

Sampling Schedule

The schedule of sample, analysis, and observations shall be that given in Table 2 and its footnotes, and as stated below.

B. Whole Effluent Toxicity (WET) Testing

Discussion:

Sections 308(a) and 402 of the Clean Water Act provide authority to EPA or the State to require that NPDES permittees/applicants use biological monitoring methods and provide chemical toxicity and instream biological data when necessary for the establishment of effluent limits, the detection of violations, or the assurance of compliance with water quality standards. Further rationale regarding test protocols is provided in the document *Regions 9 &10 Guidance for Implementing Whole Effluent Toxicity Testing Programs*, May 31, 1996.

Requirement:

The permittee shall perform (Whole Effluent Toxicity) WET testing as described in the 2001 California Ocean Plan (Ocean Plan), in accordance with the following:

1. Acute Toxicity

a. Definition:

i) TUa = 100 / 96-hour LC 50.

ii) LC50 (percent waste resulting in a 50% decrease in survival of test organisms) shall be determined by static renewal bioassay techniques using standard marine test species as specified in 40 CFR Part 136. 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 LC50 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 following expression:

$$TUa = \log(100-S)/1.7$$

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

b. Test Species and Methods:

Compliance monitoring for the acute toxicity objective TUa shall be determined using a U.S. EPA approved protocol as provided in 40 CFR PART 136. Acute toxicity testing shall be conducted using marine test species. Acute toxicity testing using the most sensitive species shall be conducted monthly for the first year. If the first 12 months of data do not detect acute toxicity, annual testing may be conducted thereafter during this permit cycle. After the first annual test, subsequent annual tests shall be conducted in a different month than that of the previous year. One year prior to the expiration of this permit, a screening for the most sensitive species shall be conducted.

2. Chronic Toxicity

a. Definition:

Chronic toxicity measures a sublethal effect (e.g,. reduced growth, reproduction) to test organisms exposed to an effluent or ambient water compared to that of the control organisms. Results shall be reported in TUc, where TUc = 100/NOEC (in percent effluent). The no observed effect concentration (NOEC) is the highest concentration of toxicant to which organisms are exposed in a chronic test, that causes no observable adverse effect on the test organisms (e.g. the highest concentration of toxicant to which the values for the observed responses are not statistically significant different from the controls).

b. Test Species and Methods:

i) In the 1997 NPDES permit, the Discharger conducted chronic toxicity screening using Giant Kelp, *Macrocystis* pyrifera (alga), Topsmelt, *Atherinops* affinis (fish), and Abalone, *Haliotis* rufescens (invertebrate). Each screening event during the permit cycle indicated

the invertebrate was most sensitive to the OWPCP final effluent. In preparation for NPDES permit re-issuance, the discharger conducted an expanded chronic screening of the OWPCP final effluent in June, July and December of 2001 and February of 2002 including three species of invertebrates (*Haliotus rufescens*, *Strongylocentrotus* purpuratus and *Mytilus* spp.) and the previously tested fish and algal species. Results of that screening indicated that all invertebrate species were more sensitive to the Oceanside final effluent, with the echinoderm development test showing the most sensitivity. Based on those results, the Discharger shall conduct tests on a monthly basis using *Strongylocentrotus* purpuratus in the Echinoderm Development test (*Dendraster excentricus* may be substituted if there is seasonal unavailability). ii) Every 2 years, the Discharger shall re-screen for the most sensitive species, for one month at different times from the prior year and continue to monitor with the most sensitive species.

iii) The presence of chronic toxicity shall be estimated as specified using U.S. EPA's *Short-term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to West Coast Marine and Estuarine Organisms*, EPA/600/R-95-136, August, 1995, Chapman, Denton and Lazorchak. (Hereafter referred to as "test methods manual.")

iv) If chronic toxicity as defined [i.e., the permit limit] is detected and the Discharger demonstrates to the satisfaction of the Executive Officer that the cause of the observed toxicity is due only to ammonia, the test event will not be considered in violation of the permit limit provided the Discharger also demonstrates that the discharge has not caused an exceedance of either of the California Ocean Plan objectives for ammonia in the receiving water outside of the 76:1 mixing zone. The Discharger must initiate accelerated testing and submit a report documenting the test results and toxic ammonia contribution.

c. Whole Effluent Toxicity QA, TRE, TIE and Reporting

i. Quality Assurance

a. The in-stream waste concentration (IWC), four concentrations bracketing the IWC and a control will be tested for each species. The IWC is the concentration of effluent at the edge of the mixing zone.

b. Concurrent testing with reference toxicants shall be conducted.

c. If either of the reference toxicant tests or the effluent tests do not meet all test acceptability criteria as specified in the test methods manual, then the Discharger must re-sample and re-test as soon as possible.

d. If the effluent sample is significantly different from the control sample, and the minimum significant difference (%MSD) is less than 5%, the City at its option may exclude this result and repeat the test. If control sample variability in the effluent test exceeds the upper limit of 20 % MSD which is the same as the reference toxicant, the City must re-sample and re-test as soon as possible.

ii. Preparation of TRE Workplan

The Discharger shall submit to U.S. EPA and the Board a copy of the Discharger's TRE workplan (1-2 pages) within 90 days of the effective date of this permit. This plan shall describe the steps the Discharger intends to follow if toxicity is detected, and should include provisions for, at minimum:

a. Information gathering phase to investigate and evaluate information for potential causes/sources of toxicity, effluent variability, treatment system efficiency;

b. Steps for maximizing in-house treatment efficiency and good housekeeping; and

c. If a toxicity identification evaluation (TIE) is necessary, who will conduct it (i.e., is there in-house expertise, or will the study be sent out to contractor?).

iii. Toxicity Reduction Evaluation (TRE):

a. If chronic toxicity as defined [i.e., the permit limit] is detected then, in accordance with the Discharger's TRE workplan and U.S. EPA manuals EPA/600/4-89/001A (municipal), the Discharger shall initiate a TRE within fifteen (15) days of the exceedance to reduce the cause(s) of toxicity.

b. If chronic toxicity as defined [i.e., the permit limit] is detected, then the Discharger shall conduct three more tests, bi-weekly (every two weeks).

iv. Toxicity Identification Evaluation (TIE)

a. If chronic toxicity is detected in any of the three bi-weekly tests, then the discharger shall in accordance with EPA acute and chronic manuals EPA/600/6-91/005F(Phase I), EPA/600/R-96/054 (Phase I), EPA/600/R-92/080 (Phase II), and EPA-600/R-92/081 (Phase III), initiate a TIE to identify the causes of toxicity.

b. If none of the three tests indicates toxicity, then the Discharger may return to the normal testing frequency.

v. Reporting

a. The Discharger shall submit the results of the toxicity tests, including any accelerated testing conducted during the month, in TUs with the discharge monitoring reports (DMR) for the month in which the tests are conducted.

b. The full report shall be submitted by the end of the month in which the DMR is submitted.

c. The full report shall consist of: (1) the toxicity test results; (2) the dates of sample collection and initiation of each toxicity test; (3) the source water; (4) the effluent discharge flow rate from the day of sample collection; and (5) the results of the effluent analyses for chemical/physical parameters required for the outfall as defined in Part B of the Self-Monitoring Program.

d. Test results for chronic tests shall be reported according to the chronic manual chapter on Report Preparation, and shall be attached to the DMR.

e. The Discharger shall notify U.S. EPA and the Board in writing within thirty (30) days of exceedance of the limit trigger of

(1) Any findings of the TRE/TIE or other investigation to identify the cause(s) of toxicity;

(2) Actions the Discharger has taken or will take to mitigate the impact of the discharge, to correct the noncompliance and to prevent the recurrence of toxicity;

(3) An expeditious schedule under which corrective actions will be implemented where corrective actions including a TRE/TIE have not been completed; and

(4) The reason for not taking action, if no actions have been taken.

II. Shoreline Monitoring (Surf Zone Sampling)

Discussion

Shoreline monitoring is conducted to assess bacteriological conditions in areas used for water contact recreation (e.g. swimming, surfing). The permit issued in 1997 required monitoring for total coliform only. However, based on scientific evidence that *E. coli* and enterococcus are better indicators of gastrointestinal illness than total coliform (see U.S. EPA's draft "Implementation Guidance for Ambient Water Quality Criteria for Bacteria,") monitoring under this permit will include all three indicators—total coliform, E-coli (as a surrogate for fecal coliform), and enterococcus.

Requirements

A. Routine Monitoring

The Discharger shall conduct shoreline monitoring at six stations located from Baker Beach along the shoreline perimeter to Sloat Blvd on Ocean Beach one day per week (Monday through Friday, excluding holidays). Samples shall be collected in the surf and sampled for total coliform bacteria, *E-coli* (as a surrogate for fecal coliform), and enterrococcus. All indicator organisms may be measured using the Quanti-Tray method of analysis, with total coliform and *E coli.* bacteria measured using the Colilert 18™ medium and enteroccocus measured using theEnterolert™ medium. Also, water temperature shall be taken at each beach.

B. Monitoring in Response to a CSO

Whenever a CSO occurs, the Discharger shall post the beach as a preventative measure in the vicinity of the CSO discharge, and shall conduct shoreline monitoring for total coliform bacteria, *E-coli* (as a surrogate or fecal coliform), and enterococcus at a minimum of ten stations located from Baker Beach along the shoreline perimeter to Fort Funston on Ocean Beach as soon as practicable with regard to safety. (Tidal conditions and storm related wave activity may prevent samples from safely being collected immediately following a CSO event. Sampling should be conducted as soon as safely possible following a CSO discharge.) Shoreline monitoring shall be conducted at those locations in closest proximity to the CSO discharge (see Station Descriptions below). Samples shall be collected in the surf and sampled for total coliform bacteria, *E. coli* (as a surrogate for fecal coliform), and enterrococcus. All indicator organisms may be measured using the Quanti-Tray method of analysis, with total coliform and *E coli.* bacteria measured using the Colilert 18™ medium and enteroccocus measured using theEnterolert™ medium. Monitoring shall be conducted daily, and the beach shall remain posted until levels of all of the three indicators drop below the following:

Total Coliform: 10,000 per 100 ml_1
E-coli (surrogate for fecal coliform): 400 per 100 ml_2
Enteroccocus: 104 per 100 ml_3

The above criteria for the 3 indicators are the single sample minimum protective bacteriological standards contained in the California Department of Health Services regulations for public beaches and ocean water contact sports (AB 411). Although San Francisco's beaches are not regulated under AB 411, use of these standards will maintain consistency with other California beaches. Additionally, although the Ocean Plan does not contain a single sample number for enteroccocus, the total coliform and fecal coliform standards are consistent with the Ocean Plan, and thus also with State Board Order No. 79-16 that requires posting until standards are met.

E-coli is commonly used as a surrogate for fecal coliform for beach monitoring in California. *E. coli* is a subset of fecal coliforms.

Location of Shoreline Stations

Weekly Monitoring

Station	Description
15(east)	In the surf at a point east of station 15
15	In the surf at the terminus of Lobos Creek along Baker Beach

1 These are all single sample levels requirements because they apply to each CSO event.
2 These are all single sample levels requirements because they apply to each CSO event.
3 These are all single sample levels requirements because they apply to each CSO event.

17	In the surf along China Beach
18	In the surf along Ocean Beach at the foot of Balboa St.
19	In the surf along Ocean Beach at the foot of Lincoln Ave., opposite the Lincoln overflow structure
21.1	In the surf along Ocean Beach at the foot of Sloat Blvd.

CSO Monitoring

Discharge Location	Station	Description
Sea Cliff 2 Pump Station	15(east)	In the surf at a point east of station 15
Sea Cliff 2 Pump Station	15	In the surf at the terminus of Lobos Creek along Baker Beach
Sea Cliff 2 Pump Station	16	In the surf opposite the Sea Cliff 2 Pump Station
Sea Cliff 1 Pump Station	17	In the surf along China Beach
Lincoln CSO Structure	18	In the surf along Ocean Beach at the foot of Balboa St.
Lincoln CSO Structure	19	In the surf along Ocean Beach at the foot of Lincoln Ave., opposite the Lincoln overflow structure
Lincoln/Vicente CSO Structure	20	In the surf along Ocean Beach at the foot of Pacheco St.
Vicente CSO Structure	21	In the surf along Ocean Beach at the foot of Vicente St., opposite the Vicente overflow structure
Vicente CSO Structure	21.1	In the surf along Ocean Beach at the foot of Sloat Blvd.
Lake Merced CSO Structure	22	In the surf along Ocean Beach at Fort Funston, opposite the Lake Merced overflow structure

III. Westside Treated Combined Sewer Overflow (CSO) monitoring

Discussion

The purpose of this program is to effectively characterize overflow events and impacts.

Requirements

The discharger shall provide the following non-sampling information during CSOs:

a. Date and time that CSO discharge started;
b. Frequency, duration, and (if possible) volume of discharge;
c. Rainfall intensity and amount (hourly data, aggregated);
d. Summary data to support estimate of discharge volume; and
e. Summary data to document conformance with operation plan for wet weather facilities.

The representative station for the Westside CSO Control System is the Vicente Box. This station is located at a point prior to discharge where all waste tributary to the diversion structure is present and all treatment (i.e. baffling) is complete. Effluent sampling will be required only during discharge events, which may last from less than an hour to over a day. Composite sampling shall commence within 1 hour after a discharge begins and continue until the discharge ceases, but not to exceed 24 hours. Samples shall be taken according to the following schedule:

Parameter	Sample Type	Sample Frequency
Flow (mgd)[5]	Continuous	Continuous during discharge
BOD (mg/l)	C-X[1] (X<24)	1/occurrence
Suspended Solids(mg/l)	C-X[1] (X<24)	1/occurrence

Ammonia as N (mg/l)	C-X[1] (X<24)	1/ occurrence
Oil and Grease (mg/l)	C-X[1] (X<24)	1/ occurrence
pH	C-X[1] (X<24)	1/ occurrence
Pesticides and PCBs[2]	C-X[1] (X<24)	1/ occurrence
Trace Metals[3]	C-X[1] (X<24)	1/ occurrence
PAHs[4]	C-X[1] (X<24)	1/ occurrence

Notes:

1. Composite sample (1/hour) over X hours (the duration of the discharge), not to exceed 24 hours.
2. Pesticides and PCBs as identified in EPA Method 608
3. Measure concentrations of ten metals: arsenic cadmium, chromium (total), copper, lead, mercury, nickel, silver, zinc, and selenium. Ultra Clean methods shall be employed for mercury to the maximum extent practicable. Hydride generation methods shall be used for selenium and arsenic. These precautions are necessary to minimize positive interferences.
4. Polynuclear aromatic hydrocarbons, as identified in the California Ocean Plan.
5. Models may be used to estimate flow.

IV. Offshore Monitoring

Discussion

The Ocean Outfall Monitoring Program is designed to determine environmental effects from the discharged secondary treated effluent (18 MGD, average dry weather flow) from the City and County of San Francisco's, Oceanside Water Pollution Control Plant.

The study plan characterizes the area outside San Francisco Bay between Rocky Point in Marin County and Point San Pedro in San Mateo County. Randomized sampling locations were determined using the EPA's EMAP grid system within specified depth strata (Figure I). The purpose of this effort is to: 1) evaluate gradient effects near the discharge pipe and gradient effects from San Francisco Bay; 2) characterize non-affected areas that can be combined to define reference conditions; and 3) provide information on sediment and infaunal characteristics in the area between the discharge pipe and the Monterey Bay National Marine Sanctuary boundary.

Sampling is conducted annually in the fall during the period when sediments are least disturbed and may show the highest concentrations of contaminants. Focusing the sampling effort on a single index period (fall), eliminates the need to account for seasonal variability in the analysis of the data. This savings in effort is used to increase the number of sample locations to better evaluate any spatial patterns in the data that might be attributed to the outfall and to provide information on reference conditions which can then be used to evaluate any outfall-related effects.

This program will be implemented dynamically to maximize the amount of relevant and useful data that can be gathered within the five-year permit life by allowing the EPA, the Regional Board, and the City and County of San Francisco to agree to program corrections in response to ongoing analyses of monitoring data. The level of effort defined in the original program will not be exceeded in subsequent years. All data will be reported to EPA and the Board by July of the following year to allow time to make modifications in the program for the following sampling effort. Summary data analysis will be provided for each year's data set. A comprehensive cumulative summary report will be generated in 2005 and 2009 comprising long term data analysis from 1997 through 2004 and 1997 through 2007 respectively.

A. Benthic Monitoring (Sediment and Infauna)

Discussion

Benthic sampling includes collection from 7 fixed historical stations to maintain time series data comparison (Fixed stations 1, 2, 4, 6, 25, 28, 31). Forty randomized sampling locations using the EPA's EMAP grid system were generated in 1997 (EMAP Station #s R1-R40) to monitor the expanded sampling area. During the previous permit cycle, data from those randomized sampling stations located within the sand bar (R-10, R-11, R-13, R-15, R-18) characterized an area not comparable to the rest of the study area, and those stations have been removed from the program. Seven additional fixed sites located south of the SWOO discharge pipe (SWOO Pipe Stations 73-79) have been added to better characterize an outfall effect. Depending on the results of each year's data analysis, the number of samples in subsequent years may increase or decrease as approved by the Executive Officer and the U.S. EPA.

Requirements

Collect 44 benthic samples in the first year of the permit cycle. These include 7 fixed historical stations to maintain time series data comparison. Depending upon the results of each year's data analysis, the number of samples in subsequent years may increase or decrease as approved by the Executive Officer and the U.S. EPA.

All benthic samples shall be collected using a 0.1 m^2 Smith McIntyre grab sampler. An adequate number of grab samples, dependent upon volume needs, shall be collected from each location and composited for sediment analysis. The top 2-5 centimeters of sediment shall be removed from the surface of each grab, uniformly mixed, and analyzed for:

1. total volatile solids;
2. total organic carbon;
3. Kjeldahl nitrogen;
4. grain size including fractions of silt and clay;
5. Inorganic priority pollutant analysis (Al, As, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Ni, Se, Ag, Zn).
6. DDT, PCB congeners and PAHs

Based on data analysis, U.S. EPA, the Executive Officer, and the City may increase or decrease the number of stations as appropriate for the analysis of the identified constituents.

One benthic grab sample shall be collected from each location for infaunal analysis. Each sample shall be passed through 1.0 mm and 0.5 mm sieves. The organisms retained on each sieve shall be relaxed and preserved for later taxonomic determination to the lowest taxon possible and enumerated.

Stations:

Fixed Sampling Locations

Historical

Station	Latitude	Longitude
1	37 42 12.00	-122 34 31.20

SWOO Pipe Stations

Station	Latitude	Longitude
73	37 42 45.00	-122 33 53.28

2	37 42 37.80	-122 34 30.00	74	37 42 16.56	-122 32 59.64
4	37 42 42.00	-122 35 42.00	75	37 42 41.40	-122 31 56.64
6	37 40 00.00	-122 32 15.00	76	37 41 40.20	-122 33 20.88
25	37 42 13.80	-122 34 30.00	77	37 42 05.04	-122 32 17.88
28	37 41 54.00	-122 34 28.80	78	37 41 03.12	-122 33 03.96
31	37 43 28.80	-122 34 01.80	79	37 41 55.68	-122 30 54.72

Randomized Sampling Locations

EMAP Station #	SWOO Station #	Longitude	Latitude
R1	32	37 52 04.77	-122 38 28.60
R2	33	37 51 06.14	-122 36 00.87
R3	34	37 51 04.65	-122 38 50.77
R4	35	37 50 53.96	-122 40 45.11
R5	36	37 50 15.84	-122 37 12.27
R6	37	37 50 11.61	-122 35 41.45
R7	38	37 49 40.86	-122 39 18.05
R8	39	37 49 19.20	-122 41 25.50
R9	40	37 48 31.68	-122 37 29.76
R10		37 47 48.31	-122 29 57.44
R11		37 47 10.02	-122 30 46.18
R12	43	37 47 07.88	-122 36 57.88
R13		37 46 39.77	-122 34 22.04
R14	45	37 46 29.37	-122 38 38.38
R15		37 46 23.73	-122 32 08.26
R16	47	37 45 39.83	-122 37 04.52
R17	48	37 45 33.87	-122 38 55.98
R18		37 45 24.69	-122 33 44.13
R19	50	37 45 00.01	-122 39 56.01
R20	51	etc.	etc.
R21	52		
R22	53		
R23	54		
R24	55		
R25	56		
R26	57		
R27	58		
R28	59		
R29	60		
R30	61		
R31	62		
R32	63		
R33	64		
R34	65		
R35	66		
R36	67		
R37	68		
R38	69		
R39	70		
R40	71	37 36 16.73	-122 33 03.03
	72	37 48 13.20	-122 39 19.80

B. Trawls

Discussion

Trawls shall be conducted to assess the presence or absence of a balanced indigenous population of demersal fish and epibenthic invertebrates, and to determine the bioaccumulation of priority pollutants in targeted organisms.

Requirements

To assess bioaccumulation effects, one fish and one macroinvertebrate species shall be collected near the SWOO and at one or more reference locations. This will occur once per year, during the fall season. The preferred species for use in the bioaccumulation studies are English sole (*Pleuronectes vetulus*) and the dungeness crab (*Cancer magister*). Three composites of 10 or more organisms of similar size from each station will be collected for priority pollutant analysis. Muscle and liver/hepatopancreas tissues will be analyzed for metals (As, Cd, Cr, Cu, Pb, Hg, Se, Ag, Zn), DDT, PCB congeners and PAHs.

A fish community analysis shall also be conducted once per year during the fall season—a minimum of one trawl at an outfall location and one trawl at a reference location will be sampled. Fish and invertebrates collected in each trawl will be identified to the lowest identifiable taxon and enumerated. Abnormalities and disease symptoms (e.g. fin erosion, lesions, tumors) shall be recorded and itemized. Standard length of all fish specimens will be measured, disk width will be measured for skates and rays, and the carapace length of shrimp and carapace width of crabs will be measured. Shrimp will be separated as gravid females and unsexed individuals, and crabs will be sexed.

V. Pretreatment Monitoring Requirements

Table 1 Oceanside Pretreatment Monitoring Requirements

Constituents / EPA Method	Influent A-001	Effluent E-001	Sludge
VOC / 624	2/Y	2/Y	
BNA / 625	2/Y	2/Y	
Metals [1]	M	M	
O-Pest / 614	N/A	N/A	
C-Pest / 632	N/A	N/A	
Sludge [2]			2/Y

Definition of terms in Table 1:

M = once each month

2/Y = twice each calendar year (at about 6 month intervals, once in the dry season, once in the wet season)

VOC= volatile organic compounds

BNA = base/neutrals and acids extractable organic compounds

O-Pest = organophosphorus pesticides, no monitoring required for this constituent

C-Pest = carbamate and urea pesticides, no monitoring required for this constituent

Key to notes used in Table 1:

[1] Same EPA method used to determine compliance with the respective NPDES permit. The parameters are copper, lead, mercury, nickel, silver, zinc, and cyanide.

[2] EPA approved methods.

VI. Reporting Requirements

A. Self-Monitoring Reports for each calendar month shall be submitted monthly, to be received no later than the 30th day of the following month. The required contents of these reports are specified in section G.4. of Part A of the Self Monitoring Program and include effluent monitoring data, CSO monitoring data, and shoreline monitoring data.

B. An annual report covering effluent sampling from the previous calendar year shall be submitted to the Board by January 30 of the following year. The annual summary of wet weather activities and receiving water results will be submitted by August 30. The required contents of the annual report are specified in section G.5 of Part A of the Self Monitoring Programs.

C. Any overflow, bypass or other significant non-compliance incident that may endanger health or the environment shall be reported according to sections G.1 and G.2 of Part A of the Self Monitoring Program.

D. An annual report of the offshore monitoring data shall be submitted by August 30 of each calendar year. The report shall include raw data tables and summary data analyses for each monitoring component. A comprehensive cumulative summary report will be generated in 2005 and 2009 comprising long term data analysis from 1997 through 2004 and 1997 through 2007 respectively.

Attachments: Part A, dated August 1993
Table 2

Table 2
INFLUENT AND EFFLUENT MONITORING SCHEDULES FOR OCEANSIDE WATER POLLUTION CONTROL PLANT

Parameter	Influent A- 007			Effluent E-007		
(In ug/l unless otherwise noted)	C-24	Grab	Cont.	C-24	Grab	Cont.
Flow Rate (MGD)[1]			D			D
BOD (5-day) (mg/l)	1/W [8]			1/W [8]		
Total Suspended Solids (mg/l)	5/W			5/W		
Grease & Oil (mg/l) [2]	M			M		
Turbidity (NTU)				W		
pH (units)		5/W			5/W	
Acute Toxicity (TUa)[3]				M[9]		
Chronic Toxicity (TUC)[4]				M		
Arsenic (ug/l)[5]				M		
Hexavalent Cadmium (ug/l)				M		
Chromium (ug/l) [6]				M		
Copper (ug/l)				M		
Lead (ug/l)				M		
Mercury (ug/l)[5]				M		
Nickel (ug/l)				M		
Selenium (ug/l)[5]				M		
Silver (ug/l)				M		
Zinc (ug/l)				M		
Cyanide (ug/l) [7]				M		
Ammonia as Nitrogen				Q		
Endosufan (ng/l)				Q		

Parameter	Influent A- 007			Effluent E-007		
(In ug/l unless otherwise noted)	C-24	Grab	Cont.	C-24	Grab	Cont.
Endrin (ng/l)				Q		
HCH (ng/l)				Q		
Radioactivity (pci/l)				A		
Acrolein				Q		
Antimony				Q		
Bis(2-chloroethoxy) methane				Q		
Bis(2-chloroisopropyl) ether				Q		
Chlorobenzene				Q		
Chromium III				Q		
Di-n-butyl phthalate				Q		
Dichlorobenzene				Q		
1,1 dichloroethylene				Q		
Diethyl phthalate				Q		
Dimethyl phthalate				Q		
4,6, dinitro-2 methylphenol				Q		
2,4 dinitrophenol				Q		
Ethylbenzene				Q		
Flouranthene				Q		
Hexachlorocyclopentadiene				Q		
Isophorone				Q		
Nitrobenzene				Q		
Thallium				Q		
Toluene (Methylbenzene)				Q		

Parameter	Influent A- 007			Effluent E-007		
(In ug/l unless otherwise noted)	C-24	Grab	Cont.	C-24	Grab	Cont.
1,1,2,2 tetrachloroethane				Q		
Tributyltin	Q			Q		
1,1,1 trichloroethene				Q		
1,1,2 trichlorethane				Q		
Acrylonitrile				Q		
Aldrin				Q		
Benzene				Q		
Benzidine				Q		
Beryllium				Q		
Bis(2-chloroethyl) ether				Q		
Bis(2-ethylhexyl) phathalate				Q		
Carbon tetrachloride				Q		
Chlordane				Q		
Chloroform				Q		
DDT				Q		
1,4, dichlorobenzene				Q		
3,3 dichlorbenzidine				Q		
1,2 dichloroethane				Q		
dichloromethane				Q		
1,3 dichlorpropene				Q		
Dieldrin				Q		
2, 4, dinitrotoluene				Q		
1,2 diphenyhydrazine				Q		
Halomethanes				Q		
Halomethanes (All)				Q		
Heptachlor				Q		
Hexachlorobenzene				Q		
Hexachlorobutadiene				Q		
Hexachloroethane				Q		

Parameter	Influent A- 007			Effluent E-007		
(In ug/l unless otherwise noted)	C-24	Grab	Cont.	C-24	Grab	Cont.
N-nitrosodimethylamine				Q		
N-nitrosodiphenylamine				Q		
PAHs				Q		
PCBs				Q		
TCDD equivalents (Dioxin)	Q			Q		
Tetrachloroethylene (PERC)				Q		
Toxaphene				Q		
Trichloroethylene				Q		
2,4,6 trichlorophenol				Q		
Vinyl chloride				Q		
1,1, dichloroethylene				Q		
Isophorone				Q		
1,1,2,2 tetrachloroethane				Q		
1,1,2 trichloroethane				Q		

LEGEND FOR TABLE

Types of Samples

C-24 Flow-weighted composite sample (24 hours)
Grab Grab Sample
Cont. Continuous sample

Sampling Frequency

D Once per day
W Once per calendar week
M Once per calendar month
2/W Two days per calendar week
5/W Five days per calendar week
2/M Two days per
A Annual
Q Quarterly

TABLE NOTES:

1. Effluent flows from the Westside Transport (decant) shall also be measured and reported.

2. Grease and oil sampling shall consist of 3 grab sample taken at 8 hour intervals during the sampling day, with each grab being collected in glass container and analyzed separately. Results shall be expressed as a weighted average of the three results, based on the instantaneous flow rates at the time each grab sample was collected.

3. Bioassay samples shall be collected on days coincident with effluent composite sampling. The Discharger may use the static renewal method for the 96-hour bioassay (renewal with 24-hour composite sample at 24-hour intervals during the test). Un-ionized ammonia concentrations shall be determined whenever bioassay results violate effluent limits. Refer to Section II for Testing Procedures.

4. Bioassay sample shall be collected on days coincident with effluent composite sampling. Refer to Section II for testing procedures.

5. Ultra Clean methods shall be employed for mercury to the maximum extent practicable. Quantifications shall be at 2 ug/l or lower. Hydride generation methods shall be used for selenium and arsenic. These precautions are necessary to minimize positive interferences

6. The discharger may, at its option, analyze for total chromium. The discharger shall specify in the monitoring reports whether the value is total or hexavalent chromium.

7. The discharger may, at its option, analyze for cyanide as Weak Acid Dissociable Cyanide using protocols specified in Standard Method Part 4500-CN-1, U.S. EPA Method 01 1677, or equivalent alternatives in the latest edition. Alternative methods of analysis must be approved by the Executive Officer.

8. BOD shall be monitored weekly and COD shall be 5/W.

9. Acute toxicity shall be measured monthly for the first year (12 months). If acute toxicity is not present, annual testing may be conducted thereafter. Subsequent annual testing shall be conducted during a different month than that of the previous year.

Attachment L

Fact Sheet

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
AND
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 9

FACT SHEET

FOR MAILING TO INTERESTED PERSONS AND GOVERNMENT AGENCIES

FOR

CITY AND COUNTY OF SAN FRANCISCO
OCEANSIDE TREATMENT PLANT,
SOUTHWEST OCEAN OUTFALL,
AND
WESTSIDE WET WEATHER FACILITIES

NPDES PERMIT NO. CA 0037681

July 2, 2003

FACT SHEET

CONTENTS

LIST OF TABLES

I. PUBLIC NOTICE

Written Comments

- Interested persons are invited to submit written comments concerning this draft permit.
- Comments should be submitted to the Regional Board no later than 5:00 p.m. on June 13, 2003.
- Send comments to: The San Francisco Regional Water Quality Control Board, 1515 Clay St. Suite 1400, Oakland, CA. 94612. ATTN: Abigail Smith

Public Hearing

- The draft permit will be considered for adoption by the Regional Board and the U.S. EPA at a public hearing during the Regional Board's regular monthly meeting at: Elihu Harris State Office Building, 1515 Clay Street, Oakland, CA; 1st floor Auditorium.
- This meeting will be held on July 16, 2003, starting at 9:00 am.

Additional Information

- For additional information about this matter, interested persons should contact Regional Board staff member: Ms. Abigail Smith, Phone: (510) 622-2413; email: ahs@rb2.swrcb.ca.gov

This Fact Sheet contains information regarding an application for waste discharge requirements and National Pollutant Discharge Elimination System (NPDES) permit for the City and County of San Francisco for discharges from the City's Oceanside Water Pollution Control Plant, and Westside Wet Weather Facilities. The Fact Sheet describes the factual, legal, and methodological basis for the proposed permit and provides supporting documentation to explain the rationale and assumptions used in deriving the limits.

II. INTRODUCTION

The City and County of San Francisco (hereinafter Discharger) has applied to the Environmental Protection Agency, Region IX (EPA), and to the California Regional Water Quality Control Board (the Board) for re-issuance of its NPDES permit (CA0037681) for discharge of pollutants to Federal and State waters.

The discharger is also the owner and operator of a wastewater collection, treatment, and disposal system which serves the east side of San Francisco. The Discharger's collection system meets the regulatory definition of a Combined Sewer System (CSS)*. During wet-weather, most of the combined sewage and stormwater in excess of the Oceanside Water Pollution Control Plant (Oceanside WPCP) capacity is accumulated in three storage/transports on the Westside. When treatment and storage capacity is exceeded, San Francisco discharges storm water runoff including a component of domestic and industrial wastewater runoff from these transports into the Pacific Ocean first through the Ocean Outfall (into Federal waters) and, in major storms, through any of seven wet weather discharge points along the Oceanside shoreline (into State waters). These discharges meet the regulatory definition of Combined Sewer Overflows (CSOs). Prior to completing the Westside wet weather control facilities, treated CSOs occurred when rainfall intensity exceeded 0.02 inches/hour, and occurred as many as 53 times per year. Beginning in 1997 with the completion of all control structures, the average long-term shoreline treated overflow design rate is eight per year for the entire Westside. To be considered a discrete "overflow event," the overflow must be separated by six hours in time from any other overflow. (This criterion was established by State Water Resources Control Board Order 79-16).

Wastewater from the east side of the City is discharged to San Francisco Bay and is covered by NPDES Permit No. CA0037664 issued to the City and County of San Francisco.

*Note:
CSO is defined under Section I.A. of EPA's 1994 CSO Control Policy as "the discharge from a combined sewer system (CSS) at a point prior to the Publicly Owned Treatment Works (POTW) treatment plant." A CSS is defined as "A wastewater collection system owned by a State or municipality which conveys sanitary wastewater (domestic, commercial, and industrial wastewater) and storm water through a single pipe system to a POTW treatment plant."

III. DISCHARGE DESCRIPTION

The Oceanside Water Pollution Control Plant
The Oceanside WPCP came on-line in September 1993 and replaced the Richmond-Sunset WPCP. The Oceanside WPCP provides secondary level treatment for an average dry weather flow of about 18 MGD with a peak secondary treatment capacity of 43 MGD. The maximum design flow is up to 65 MGD; flow above 43 MGD receives primary treatment. This extra treatment capacity is intended for use only during wet weather to treat the greatly increased storm flows. The City collects the wastewater in a combined sewer system. That is, the domestic sewage, industrial wastewater, and storm water runoff are all collected in the same pipes (combined sewer). Most other communities in California have a separated sewer system: one set of pipes for domestic sewage and industrial wastes and another set for storm water. Under wet weather conditions, the Oceanside WPCP operates as a CSO treatment facility (primary only), and is regulated under the Federal Combined Sewer Overflow Control Policy, (59FR 18688). Combined sewer system wet weather facilities must provide storage capacity for wet weather flows, maximize flow to treatment facilities, and minimize combined sewer overflows. Flows receiving less than secondary treatment during wet weather periods and discharged directly to the SWOO are considered CSOs, but are not considered in the evaluation of the long term average designated for shoreline discharges.

Southwest Ocean Outfall (SWOO)
The SWOO is 4 miles long. It carries the treated wastewater out to a diffuser system beginning approximately 3.75 miles from shore and at a depth of 78 feet. The end of the outfall consists of a diffuser section approximately 900 meters in length and 3.5 meters in diameter, with risers located every 11 meters. Twenty- one out of 85 risers are currently in operation to maintain port velocity because the present dry-weather flow through the outfall is only 20% of capacity. Every other riser located along the outer 439 meters of the diffuser section is active. Each riser is constructed with eight discharge points.

The Discharger completed construction of the SWOO in 1986 and began discharging Richmond-Sunset plant effluent to federal waters via the new outfall in September 1986. After completion of the Oceanside WPCP in 1993, the Richmond-Sunset plant was abandoned and eventually razed. The flow through the SWOO varies from the dry weather average of 18 MGD to a maximum wet weather rate of approximately 175 MGD_1. The potential maximum flow varies with both the tides and volume of combined storm flows accumulated in the Westside Transport. Dye studies of the effluent conducted in 1988 indicated that the minimum dilution is at least 100:1 and generally exceeds 200:1.

Westside Storage/Transport Treatment
The discharges to the receiving water from the storage/transports through the wet weather control facilities have received flow-through treatment to remove settleable solids and floatable materials. This treatment is equivalent to the minimum treatment specified by the *Combined Sewer Overflow Control Policy* (59 FR 18688) for the "Presumption" Approach (See Section VII of this Fact Sheet).

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1 The maximum design capacity of the SWOO is approximately 400-450 MG. It was designed with this overall capacity to accept flows from the entire County of San Francisco.

Westside Treatment Design Goal for Wet Weather
During dry weather all wastewater receives secondary level treatment. During wet weather the combined sewer flows receive approximately the following level of treatment (discharge location in parenthesis). Percentages are based on the Westside System Model's estimate of the annual volume of wastewater (3,500 MG) from the Westside Wet Weather System.

	Percentage of Predicted Annual Wastewater Volume (3,500 MG)
Treatment at Oceanside WPCP (Ocean Outfall discharge)	Approximately 50% of the combined flow receives a combination of secondary and/or primary treatment which generally meets secondary standards.
Flow-through (Ocean Outfall discharge)	Approximately 37% of the combined flow receives "flow-through" treatment (equivalent to primary treatment) in the decant process of the Westside storage/transport and is discharged to the SWOO. A weir and baffle system retains settleable solids and floatable materials in the storage/transport structure, which are then flushed to the treatment plant after the rainstorm subsides
Flow-through (Shoreline discharge)	Approximately 13% of the combined flow receives "flow-through" treatment (equivalent to primary treatment) in the storage/transport structures and is discharged to the shoreline via any of seven CSO structures.

- All flow to the Oceanside WPCP is pumped from the Westside Pump Station after coarse screening. The plant treatment process consists of a headworks with fine bar screens and grit removal, primary sedimentation tanks, pure oxygen aeration basins, and secondary clarifiers. During dry weather, all wastewater receives secondary level treatment via a pure oxygen activated biosolids process (an average dry weather flow of 18 MGD, peak secondary treatment capacity of 43 MGD). During wet weather, additional primary treatment capacity is available for flows to 65 MGD at the Oceanside WPCP. These excess wet weather flows receive primary treatment using clarifiers prior to discharge to the ocean outfall.

Combined Sewer Flows Discharged Directly to the SWOO
During larger storms, the Oceanside WPCP reaches maximum treatment capacity. If it appears that the combined sewer flows will continue to increase and exceed the capacity of the treatment plant and the storage capacity of the Storage/Transports, the excess effluent is "decanted" directly from the Westside Transport to the SWOO. This decanted effluent has received flow-through treatment within the Westside Transport as discussed above and is also screened at the pump station with mechanically cleaned 3/4 inch bar screens. Such discharges are considered CSOs, but are not included in the determination of the long-term average design goals for shoreline discharges.

Treated Combined Sewer Overflow Shoreline Discharges
Table 1. Shows the number of controlled overflows and untreated overflows that have taken place since 1992.

Table 1. Historical Data for Overflows at Controlled and Uncontrolled Portions of the Westside CSS

Wet Weather Year	Untreated overflows (uncontrolled areas)	Controlled overflows (facilities in place)	Annual Rainfall (West-side) in inches	Comments
1992-1993	59	5	22.45	Westside Transport completed September 1986
1993-1994	38	2	12.73	Lake Merced Transport completed July 1993 Oceanside WPCPP completed September 1993
1994-1995	67	5	27.26	
1995-1996	46	9	22.35	
1996-1997	0	8	20.75	Richmond Transport completed January 1997
1997-1998	0	14	41.14	All facilities on line
1998-1999	0	7	18.86	
1999-2000	0	7	23.19	
2000-2001	0	3	13.76	
2001-2002	0	7	22.25	
2002-2003	***0***	***8***	-	*Expected performance based on design*

Note: The Westside Transport was operational in 1987 and therefore Ocean Beach has been in the controlled overflow category for the years listed above. The shoreline discharges occur only when the storm flow exceeds the combined storage capacity of the storage/transports and the capacity of the pumping facilities to transfer flows to the Oceanside WPCP (for eventual discharge through the SWOO) or directly to the SWOO where flows bypass secondary treatment at the Oceanside WPCP but receive primary treatment in the storage structures. The Westside combined sewage control facilities have been designed so that on average these shoreline discharges will occur up to eight times per year (as a long-term average). By definition, a new overflow event occurs if the discharge is interrupted for six or more hours. The combined sewer flows discharged during these 8 occurrences will have

received flow-through treatment for the removal of settleable solids and floatable material. When these shoreline overflows occur, the beach is posted with warning signs to avoid water contact recreation and daily shoreline water samples are collected and analyzed for bacteria until concentrations drop below the criteria listed in Section 12B of the Self-Monitoring Program. Although these criteria do not apply for compliance purposes, they provide a useful basis for determining when public health warnings should be posted. Previous sampling indicates that elevated bacteria levels tend to be located only in the vicinity of the outfalls and tend to decrease rapidly, typically within 24 hours.

The previous permit listed a total of eight CSO discharge locations. There are currently only seven CSO discharge locations because one CSO site was eliminated during the construction of the Richmond Transport System. The current list of CSO discharge locations is included in the permit.

Storage/Transports

During wet weather, the City collects storm water runoff mixed with domestic and industrial wastewater in Storage/Transports. The Westside system includes three large Storage/Transports: Westside Transport, Richmond Transport, and the Lake Merced Transport. Their combined storage capacity (including 2.2 MG in sewers) is 73.5 million gallons. They are designed to hold combined sewage during wet weather for later treatment at the Oceanside WPCP. They also provide flow-through treatment for any excess flows which are discharged either directly to the SWOO or to the shoreline. Flow-through treatment includes the removal of settleable solids and floatable pollutants. This treatment is equivalent to the minimum treatment specified by the *Combined Sewer Overflow Control Policy* (59 FR 18688) for the "Presumption" Approach (the "Presumption" Approach is discussed in Section III of the fact sheet).

The Westside wastewater system has been built with significant standby capacity to be used during wet weather. Table 2. Summarizes these capacities.

Table 2. Westside Wastewater System Treatment and Storage Capacity

	Dry Weather	Wet Weather
Oceanside Water Pollution Control Plant Treatment Capacity	(MGD)	(MGD)
Secondary level	18 (avg.)	43 (max.)
Primary (only)	-	22
Storage Capacity		(million gallons, MG)
Westside Transport (1)	-	49.3
Lake Merced Transport (2)		10.0
Richmond Transport(3)	-	12
Sewer Lines (4)	-	2.2
System Capacity		(MGD)
Oceanside WPCP	-	65 (max.)
Southwest Ocean Outfall	-	175 (max)

(1) Construction completed in 1986.
(2) Construction completed in 1993.
(3) Construction completed in 1997
(4) The storage/transports allows the sewer lines to store an additional 2.2 million gallons of wet weather

combined wastewater.

Bypass
The Ocean Plan prohibits by-passing of untreated wastes.

Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:
(A) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
(B) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, [40 CFR 122.41(m)(4)]

"Bypass" is defined in the Federal regulations as:

Bypass means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(I)]

The Combined Sewer Overflow Control Policy provides an interpretation of these requirements for publicly owned treatment works such as the Oceanside WPCP, that treat significant quantities of combined sewage in addition to dry weather flow. Such facilities normally have secondary treatment capacity sufficient to handle dry weather flows plus additional treatment capacity for combined flows. However, such facilities often need the operational flexibility to divert some excess combined sewage flows around certain treatment processes (such as biological treatment units) to avoid damage to those treatment processes. Without such flexibility, these treatment works would need to limit flow to the treatment plants to the capacity that could be treated through all the treatment processes at the plant. This would be counterproductive in that it would result in these diverted flows being discharged to the environment untreated. The CSO Policy recognizes the value of maximizing treatment at the publicly owned treatment plant, and therefore explicitly authorizes bypasses as necessary to assure that flows are not needlessly diverted from the treatment plant. This is consistent with the City's policy of operating the Oceanside WPCP at maximum capacity during storm events.

The City's Westside system has been designed and constructed to maximize flows to the Oceanside WPCP. The Oceanside WPCP provides up to 43 MGD of secondary treatment capacity (average dry-weather flow is about 18 MGD), and another 22 MGD of primary treatment capacity during wet-weather periods, for a total treatment capacity of 65 MGD during wet weather. Treated effluent is combined prior to discharge to the Pacific Ocean via the SWOO. Flows to the Oceanside WPCP or SWOO are maximized prior to any discharge to the near-shore waters of the Pacific Ocean.

While the City can treat 65 MGD of flow to primary levels at the Oceanside WPCP, the plant can provide secondary treatment for only 43 MGD. Thus, when wet weather flows exceed 43 MGD, Oceanside WPCP is designed to allow excess flows (between 43 MGD and 65 MGD) to bypass the secondary treatment processes and discharge to the SWOO after receiving only primary treatment. The CSO Policy describes the circumstances where such bypassing may be explicitly authorized in a CSO permit. 59 FR 18693.

For such bypassing to be permitted, the permittee must justify the cut-off point at which the flow will be diverted from the secondary treatment portions of the treatment plant, and provide a benefit-cost analysis demonstrating that the conveyance of wet weather flow to the POTW for primary treatment is more beneficial than other CSO abatement alternatives such as storage and pump back for secondary treatment, sewer separation, or satellite treatment.

The City performed a benefit-cost on CSO abatement alternatives as part of its 1971 Master Plan. The system currently being implemented was determined to be significantly more beneficial than any of the other options analyzed. In particular; the Master Plan determined that sewer separation was extremely costly, highly

disruptive, and undesirable in that it would not address storm water pollution. In addition, the BPJ analysis performed by EPA Region 9, for the 1997 permit, demonstrated that providing either additional storage (to increase secondary treatment of stored wastewater) or additional secondary treatment capacity is both extraordinarily expensive and highly disruptive to the local community. (See attachment 2)

In addition, the permittee must demonstrate compliance with the requirements of 40 CFR 122.41(m)(4) for the bypass to be permitted. The bypass must be unavoidable to prevent loss of life, personal injury or severe property damage. For purposes of CSO permits, severe property damage includes situations where flows above a certain level wash out the POTW's secondary treatment system. See 59 FR 18694. There must be no feasible alternatives to the bypass. For purposes of CSO permits, this provision is met if the secondary treatment system is properly operated and maintained, the secondary system has been designed to meet secondary limits for flows greater than peak dry weather flow, plus an appropriate quantity of wet weather flow, and it is either technically or financially infeasible to provide secondary treatment at the existing facilities for a greater amount of wet weather flow. Finally, the permittee must provide notice of the need for the bypass. This last provision is satisfied by the City's NPDES permit application describing the Oceanside WPCP facilities and its wet-weather operation plans.

The Oceanside WPCP can provide 43 MGD of secondary treatment; more than double the average dry weather flow of 18 MGD. If the City attempts to provide secondary treatment to more than 43 MGD of flow during wet weather, the City risks washing out its biological treatment processes. This would result in serious property damage at the Oceanside WPCP. In addition, it would degrade treatment performance significantly until the biological treatment process could be reestablished. The Master Plan for the City's Westside facilities documents the financial infeasibility of providing more secondary treatment capacity for wet weather flows at the Oceanside WPCP. In addition, the location of the Oceanside WPCP near (and under) the San Francisco Zoo is very physically limited. Expansion of the treatment works on site is essentially impossible without severe disruption to zoo facilities.

The proposed permit requires the City to provide secondary treatment for all flows reaching the Oceanside WPCP up to 43 MGD. The City must provide primary treatment at the Oceanside WPCP for the flows in excess of 43 MGD up to 65 MGD. In addition, the City is required to use the storage capacity in the Westside Transport to maximize, to the extent feasible, storage of wet-weather flows for later treatment during dry weather periods.

The second potential issue concerns the wet weather discharge from the storage transports directly to the shoreline diversions structures. These discharges receive flow-through treatment but will not meet all the requirements of the Ocean Plan Tables A and B. In January 1979, the State Board adopted Order 79-16 which identified 8 overflows per year as the Oceanside Wet Weather Control Facilities design goal. In Order WQ79-16, the State Board found that:

1. The exception will not compromise protection of ocean waters for beneficial uses, and

2. The public interest will be served.

Beginning in 1997, all shoreline overflow discharges from the storage/transports have received flow-through treatment. The bypass provision applies only to discharges from publicly owned treatment works (POTWs) and does not apply to discharges from collection systems (such as the shoreline discharges). These shoreline discharges are not covered by the bypass provision but rather covered by other permit provisions as supported by the *Combined Sewer Overflow Control Policy*.

IV. PLANNING

Master Plan

The 1971 Master Plan for Wastewater Management and the 1974 Master Plan Environmental Impact Statement and Report (EIR/S) set the groundwork for the City's wastewater control program. The Master Plan and the EIR/S identified the need for a new and upgraded wastewater treatment plant on the Westside and a new ocean outfall. These documents also established the principal of storing accumulated combined sewage flows during wet weather for later treatment at the treatment plant.

In order to determine the size of the storage transports it was first necessary to identify an acceptable overflow frequency for the treated overflows. (This design goal was also necessary in order to set the wet weather design capacity of the Oceanside WPCP.) To provide a basis for this decision, the City completed engineering and cost-effectiveness studies and in December 1978 submitted the *Westside Wet Weather Control Facilities Overflow Control Study*. In January, 1979, the State Water Quality Control Board adopted Order 79-16 which designated a long term average of 8 overflows per year as the Westside design goal. A permit finding noted that this frequency would "provide adequate overall protection of beneficial uses." The agency deliberations were accompanied by an extensive public participation process.

In response to objectives set forth by the City's 1974 Master Plan Environmental Impact Statement and Report, the City has spent over 1.6 billion dollars City-wide on construction projects to reduce the water quality impact of the combined sewer system. The majority of these expenditures have been directed toward controlling the wet weather storm flows. Table 3 summarizes the costs of the Master Plan projects.

Table 3. Master Plan Projects Cost Estimates and Expenditures

Projects Completed by 2002	Costs
Bayside Core	$ 408,700,000
Westside Core	$ 410,700,000
Oceanside Plant	$ 261,700,000
Southeast Facilities	$ 515,200,000
Subsequent Bayside Improvements	$42,000,000
TOTAL PROJECTS	$1,638,300,000

Source: City and County of San Francisco
Public Utilities Commission

Reassessment of Treated Overflows

All facilities became operational in early 1997. Since that time, the City has investigated several alternatives for providing additional wastewater controls and further reductions in overflows. The "Westside System Evaluation," 2002, summarized a preliminary engineering assessment of various combinations of additional storage capacity and additional pumping capacity. The goal was to reduce the frequency of the shoreline discharges. Additional treatment or storage is prohibitive for several reasons. Increasing treatment capacity at the Oceanside WPCP would require the development of additional land of which there is none available at the facility; increasing storage capacity requires land acquisition or installation under existing roadways, for which the costs of construction are very high. Additional pumping would transfer more of the stored wet weather flows from the storage/transports directly to the Ocean Outfall. Providing additional pumping capacity appears more viable than providing additional storage. However, because the City is meeting the Westside CSO design criteria (long term average of 8 overflows per year), no additional measures are required at this time. Under the post construction monitoring required by this draft permit pursuant to Phase II of the CSO Policy, the City will monitor to determine if additional controls are

necessary for compliance, or if changes in beneficial uses or changes in objectives (e.g. wet weather standards) are necessary so that the fully implemented CSO control program complies with water quality standards. If controls are determined to be necessary, the feasibility of additional pumping capacity and other measures will be further evaluated at that time.

In addition to the Westside System Evaluation, the City supported the preparation of the report: "Screening of Feasible Technologies" (SOFT), 2000 (Draft), which examined various wastewater control options such as reducing runoff volume and providing decentralized treatment. The report notes that as CSO volume is reduced, each marginal reduction becomes increasingly difficult and more expensive. The City is currently initiating the development of a comprehensive wastewater master plan, and within that process will continue to evaluate the feasibility of implementing such options as those described in the SOFT report.

Wet Weather Day Definition

Definition of a wet weather day:

"Wet weather day" is defined in this permit as any day which any of the following conditions exist as result of rainfall:

a. The instantaneous influent flow to the Oceanside Water Pollution Control Plant is exceeding 43 MGD; or

b. The average daily influent concentration of TSS or BOD is less than 100 mg/L on the day the discharge occurs; or

c. The Westside storage/transport flow elevation exceeds 0 feet from the bottom of the west box and then 18 feet in the east box..

Condition (a) reflects the maximum flow that the designers of the treatment plant believe could be processed by the biological secondary units. Condition (b) allows the discharger to treat and discharge storm water stored in the transport following significant storm events (in order to prepare for the next storm event). Because the influent is so dilute following significant storm events (as evidenced by the fact that TSS is less than 100 mg/l) percent removal requirements are often impossible to meet. (See Section 1.2. above). Condition (c) allows the discharger to effectively reduce the volume of combined storm water and wastewater flows in the storage/transport structures in preparation for the next storm event.

*Note

Storm events can result in significant increases in flows to the Oceanside WPCP. In fact, any flows greater than 20 MGD are likely the result of storm events. However, "wet weather day" is defined as the above specific conditions which may result in an allowable treated CSO or in a "bypass" of portions of Oceanside WPCP facilities. In other words, "wet-weather" discharges are those which may not receive secondary treatment and therefore, may not be able to meet the technology-based requirements for POTWs.

Pollution Prevention and Pollution Minimization

Pollution prevention measures include source reduction and other practices that reduce or eliminate pollutants through the increased efficiency in the use of resources or the protection of resources by conservation. Two major source reduction efforts, implemented by the City's Bureau of Environmental Regulation and Management (BERM) focus on reducing the pollutants released to the environment through the sewer system: (1) the development of an overall pollution prevention program and (2) the implementation of a wastewater waste minimization program as part of the pretreatment requirements. The City's water pollution prevention and pretreatment programs minimize the introduction of toxic pollutants into the CSS. (The pretreatment program is discussed in greater detail in Attachment E.)

The City undertook a study of Best Management Practices (BMPs) to determine which would provide the most cost-

effective reduction in pollutant loadings into the CSS during both dry- and wet-weather periods[2]. The most important pollutants of concern at that time during wet-weather periods include PAHs, copper, lead, and cyanide. The main sources of these pollutants are automobiles and automotive-related businesses; other sources include tar shingles, wood preservatives, paints, algicides, and manufacturing. The Water Pollution Prevention Program therefore tailored campaigns to reduce pollutants from these sources, and has since created programs for additional pollutants of concern such as mercury.

A key BMP is the City's street sweeping program, which directly reduces pollutants originating from street surfaces; all City streets are swept at least once per week with vacuum sweepers. Catch basins are also cleaned, as necessary, which helps to reduce pollutant loading during storm events. Other BMPs selected for implementation include a pollution prevention education program, provision of alternative disposal methods for residential hazardous waste, regulatory measures to reduce the risk of toxic spills, and public agency measures to prevent contact of rainfall runoff with potential contaminants.

The NPDES permit requires the implementation and continual development of a Pollution Prevention Plan. This plan is subject to the review and approval of the Board. This requirement represents a BAT control because it primarily results in the removal of toxic pollutants. Table 4 is a list of pollution prevention activity highlights prepared by the City.

TABLE 4
SAN FRANCISCO WATER POLLUTION PREVENTION HIGHLIGHTS SINCE 1990

Years	Action/Activities
1990	• Water Pollution Prevention Program initiated • Local limits in Pretreatment Program reviewed • Large dischargers (and some small dischargers) required to prepare pollution prevention plans
1991	• Consumer products heavy metals inventory study completed • *Combined Sewerage System* – Educational brochure for residents describing the combined sewer system
1992	• Plumbing corrosion identified as a significant copper source in wastewater • Pollution prevention workshops conducted for painting contractors, vehicle repair shops, hospitals, and photofinishers • Consumers receive *Less Toxic Shopping*, a guide for selecting less toxic household products • Public survey reveals lack of awareness among residents about proper handling and disposal of household hazardous waste such as used motor oil • San Francisco hosts the first annual West Coast Wastewater Pollution Prevention Symposium
1993	• Copper-based root killers utility bill insert • Medical and research facilities receive BMPs • *Bugged?* – Integrated Pest Management (IPM) guide developed and distributed at IPM workshops, public events, street fairs, direct mailings • *Water Pollution Begins in Your Home* – guide for residents on how to protect the San Francisco Bay and Pacific Ocean with tips on proper handling and

2 James M. Montgomery, Consulting Engineers, Inc. *City and County of San Francisco, Department of Public Works, Best Management Practices Study*, August 1992

	disposal of household hazardous waste
1994	• Dentists identified as major mercury source in San Francisco wastewater (>100 samples collected) • Auto Repair Facility program initiated – 3-year audit/inspection pilot program • Regional outreach on copper-based root control products • *Mass Loadings of Used Motor Oil and Latex Paints to the Sewerage System* study completed • Public Survey conducted
1995	• Latex Paint Recycling Initiative – 7 drop-off locations established throughout San Francisco to accept unwanted latex paint from residents; all paint is recycled • *Grow It!* – the guide for less toxic gardening methods for residents was created (available in English, Spanish, and Chinese) • Storm Water Pollution Prevention Program initiated • Cooling tower study completed • Cooling tower and commercial building managers receive BMPs • Dental Mercury Steering Committee - stakeholders convene to review and evaluate dental mercury pollution prevention • Plumbing corrosion inhibitors study initiated • Co-sponsored 3rd annual West Coast Wastewater Pollution Prevention Symposium • Significant Industrial Users required to submit Hazardous Waste Reduction Assessment Checklist and Storm Water Pollution Prevention Assessment Checklist
1996	• Completed Auto Repair Facility pollution prevention audits – 3-year effort with 372 audits conducted • Pollution source identification investigations of screen printers, jewelers, and machine shops (*1995/96 Scoping Study Report)* • *Toxic Organic Pollutant (TOP) Management Study* (Phase I began in 1995, Phase II in 1996) – multi-year study with a broad scope running from TOP source identification to control measure implementation including public education. Related work included surveying residents regarding pesticide use and disposal. • San Francisco began funding the "Green Gardener" training program which has resulted in development and maintenance of scores of organically-grown gardens throughout San Francisco's communities and schools, and engaged thousands of local community members and school children in organic gardening projects • Public survey reveals 40% of households received impressions from the Water Pollution Prevention Program
1997	• Integrated Pest Management Ordinance adopted • Chinese *Clean It!* and *Fix It!* and Spanish *Grow It!* and *Fix It!* distributed • *Clean It!* survey results indicate that methods in the guide were useful for guide recipients in using less toxic methods for cleaning • Auto Repair Facility program results indicate > 75% compliance with BMPs
1998	• Curbside pickup of household hazardous waste for elderly and handicapped residents available • Public survey conducted; results were helpful to determine where to focus new pollution prevention strategies • Local limits reviewed • *Only Rain Down the Drain* - storm water pollution prevention brochure distributed to businesses with potential to contribute to pollution in storm water runoff
1999	• Initiated dioxin detection limit study to attain lower detection limits • Healthy Air and Smog Prevention Ordinance adopted • Environmentally Preferable Purchasing Policy adopted by the Board of Supervisors

	• IPM Partnership launched • *Never Down the Drain* – Dental mercury BMP brochure mailed to all San Francisco dentists • Community outreach on local Chinese and Spanish television stations on pesticide, paint, and motor oil pollution prevention • Stenciled over 1,000 storm drains on the west side of San Francisco with "Don't Dump – Protect the Ocean" message • Latex paint drop-off sites established at local hardware stores throughout San Francisco • Less toxic pest control *Control It!* published (available in English, Spanish, and Chinese) • Pollutant removal study conducted to determine the removal efficiency for five toxic heavy metals (including copper; mercury results were consistently below detection limits) - *Identifying Potential Storm Water Pollution Sources Using a Geographic Information System and Estimating Sediment Catch Basin Efficiencies*
2000	• *Dioxin in San Francisco Wastewater – Identification and Treatment* - completed a study of dioxin in wastewater; probably the most comprehensive study of its kind in the nation • Ban on mercury fever thermometers adopted by City and County of San Francisco • Completed dioxin detection limit study as part of the aforementioned investigation of dioxin in wastewater • • Pest Control Operator IPM workshops conducted • *Keep it On Site* – educational brochure developed for the construction industry pollution prevention • Storm Water Phase II NPDES compliance planning initiated • San Francisco co-sponsored the ninth annual West Coast Wastewater Pollution Prevention Symposium • Restaurant IPM outreach conducted in pilot area • Developed restaurant IPM poster in English and Spanish – *"Don't Set a Table for Pests"*
2001	• *IPM Innovator* award for City and County of San Francisco from the California Department of Pesticide Regulation • San Francisco participated in a national pollution prevention case study to test a model framework of effectiveness measurement tools for pollution prevention programs. *Tools to Measure Source Control Program Effectiveness* (2000) – Prepared by Larry Walker Associates for the Water Environment Research Federation (document D00302) • Conducted dental mercury wastewater sampling to test BMP impacts on POTW influent as part of a national study on BMPs. *Mercury Pollution Prevention Program Evaluation* (March 2002) - Prepared by Larry Walker Associates for Association of Metropolitan Sewerage Agencies. • Janitorial products study of less toxic alternatives initiated • Database and GIS systems launched to track water pollution prevention activities, communications, and outreach materials, and to create links with new and ongoing business licenses • San Francisco voters approve the Solar Energy bond measure • Curbside pickup of used motor oil and latex paint permanent program • Expanded the IPM Partnership program • Heron's Head Park Living Classroom project to assist local youth in environmental

	education receives funding • Strybing Arboretum receives funding for horticultural jobs training; training will focus on less toxic methods for horticulture • MUNI launched low-emission bus pilot program • San Francisco Board of Supervisors adopts rechargeable battery purchasing plan • San Francisco Board of Supervisors and Mayor of San Francisco urge the U.S. Environmental Protection Agency to require full disclosure of all inert ingredients on pesticide labels • Launched one of the region's first biodiesel stations • Purchased over 400 new compressed natural gas vehicles since 1998 • Green Business program planning initiated
2002	• San Francisco was instrumental in securing funding to build the region's first liquefied natural gas (LNG) fueling station and for waste hauling company Norcal to convert from diesel to LNG, offsetting air pollution generated by 2,200 cars • *Best program: Used Oil Collection* from the North America Hazardous Materials Association • *Best program: Electronic Waste* award from California Environmental Proctection Agency • *Best program: Electronic Waste* award from California Resource Recovery Association • Dentist database updated and contacts made for dental mercury BMP education opportunities

V. STATUTORY AND REGULATORY BACKGROUND

Clean Water Act (CWA)
The Clean Water Act established the National Pollutant Discharge Elimination System (NPDES) permit program. All point source discharges to waters of the U.S. must have permits issued under this program. The Clean Water Act also established the criteria which EPA and the states use in issuing permits to these discharges. Essentially, the discharges have to comply with three sets of requirements:

- Technology-based minimum requirements which apply to all dischargers of a specified class (CWA section 301(b)(1)(A) and (B) and 301(b)(2)).
- More stringent effluent limits if needed for the discharge to meet water quality standards (CWA section 301(b)(1)(C)).
- For marine discharges, the Ocean Discharge Criteria (CWA section 403(c)).

Federal Regulations Implementing the CWA - technology-based requirements
The requirements of the Clean Water Act are more specifically defined in the implementing regulations. The technology-based requirements for publicly owned treatment works (POTWs) such as the Oceanside Plant are the secondary treatment standards as defined in the regulations at 40 CFR 133.102.

Federal Regulations Implementing the CWA - water quality-based requirements
In addition to the technology-based standards, the wastewater discharges must comply with water quality standards if these are more stringent than the technology-based standards. As will be discussed in detail in Section B (Effluent Limitations), water quality considerations have compelled the permitting agencies (EPA and the Board) to issue permits in previous years which have required construction of facilities which have a pollutant control performance significantly beyond the technology-based requirements of BCT and BAT.

For discharges to State Waters, the water quality standards which pertain to these discharges are those contained in the 2001 California Ocean Plan (Water Quality Control Plan, Ocean Waters of California). And, as noted above, the *Combined Sewer Overflow Control Policy* establishes a methodology for applying water quality standards to CSOs.

For discharges from the Ocean Outfall, state water quality standards are not directly applicable at the point of discharge (which is into Federal Waters). However, the discharges must comply with Section 403, Ocean Discharge Criteria, of the Clean Water Act. These criteria are established in the regulations at 40 CFR 125.120 et seq. Compliance with water quality objectives borrowed from the Ocean Plan provides the basis for EPA's determination that discharges from the Ocean Outfall comply with Section 403. The following sections provide more detail on the Ocean Plan, the *Combined Sewer Overflow Control Policy* and the Ocean Discharge Criteria.

The California Ocean Plan and Federal Ocean Discharge Criteria
The Ocean Plan designates the following beneficial uses for State ocean waters:

- Industrial water supply
- Water contact and non-water contact recreation
- Navigation
- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of Areas of Special Biological Significance
- Preservation of rare and endangered species
- Preservation of marine habitat
- Fish migration
- Fish spawning and shellfish harvesting

The discharge is located from 0.3 to 1.5 miles beyond State Waters, and, therefore, the Ocean Plan is not directly applicable to the discharge from the Southwest Ocean Outfall. However, compliance with numbers borrowed from the Ocean Plan is required immediately after initial dilution. This requirement will assure that under worst-case conditions, state standards will be met within state waters, and provides the basis for EPA's determination that the discharge will comply with the requirements of section 403 of the Act.

Section 403(a) of the Clean Water Act (hereinafter referred to as "the Act") prohibits discharge to Ocean Waters except in compliance with guidelines established under section 403(c) of the Act. Section 403(c) of the Act requires that guidelines be promulgated for determining the degradation of marine waters. Federal Regulations at 40 CFR 125.122(b) (Determination of unreasonable degradation of the marine environment) state:

Discharges in compliance...with state water quality standards shall be presumed not to cause unreasonable degradation of the marine environment, for any specific pollutants or conditions specified in the... standard.

Because the discharge is in compliance with standards promulgated within state water quality standards (i.e. the 2001 California Ocean Plan) and because these standards address the criteria listed under 403(c)(1)of the Clean Water Act, the discharge from the SWOO is presumed not to cause unreasonable degradation. EPA's review of the application and monitoring data supplied by the City of San Francisco provides no basis for rebutting this presumption. Therefore, EPA determines that the discharge is permitted under section 403 of the Act.

The Ocean Plan contains water quality objectives intended to protect designated beneficial uses. These include bacteriological, physical, chemical, and biological objectives. Table B of the Ocean Plan includes numerical objectives for various toxic pollutants.

State Water Code
The California Water Code beginning with Section 13370 implements the NPDES program in State waters. As noted previously, the SWOO discharges to Federal waters (beyond the three mile limit). The shoreline combined sewer overflow (CSO) discharges are to State waters. The underlying statutory and regulatory basis for both the Federal and State programs are similar.

Marine Protection, Research, and Sanctuaries Act (MPRSA)
The Monterey Bay National Marine Sanctuary (MBNMS) was established in 1992, and is administered by the National Oceanic and Atmospheric Administration (NOAA). A Memorandum of Agreement between NOAA and various agencies, including EPA and the Board, establishes procedures for addressing Sanctuary concerns through existing regulatory programs. (See Attachment 3 for MOA Agreement) The MOA creates a buffer zone encompassing the anticipated discharge plume from San Francisco's Ocean Outfall. The MPRSA and its implementing regulations do not apply to the buffer zone.

An additional requirement is contained in the regulations which implement the Ocean Discharge Criteria (CWA section 403(c)). These regulations require that the determination of unreasonable degradation address marine sanctuaries (40 CFR 125.122(a)(5)).

Regulatory Status of a CSO
An opinion by the U.S. EPA's Office of General Counsel has classified facilities that treat combined sewer overflows as point sources subject to section 301(b)(1)(A), 301(b)(1)(C), and 301(b)(2) of the Clean Water Act (hereinafter referred to as "the Act"). Thus, they are not Publicly Owned Treatment Works (POTWs) and are not subject to the secondary treatment regulations of 40 CFR 133. This opinion is supported by subsequent case law (Montgomery Environmental Coalition v. Costle 646 F.2d 568 (1980)).

San Francisco's wet weather combined sewer flows have a more complicated regulatory status. On San Francisco's Westside, there are two types of treated combined sewer overflows (CSOs): the flows decanted from the Westside storage transport directly to the Ocean Outfall, and the flows decanted from the storage/transports to the shoreline combined sewer overflow (CSO) points. Both of these treated CSOs must meet the following technology-based requirements of the Act as follows:

Best practicable control technology currently available (BPT)
BPT is the basic control level which all discharges must attain (other than publicly owned treatment works (POTWs)). BPT was the initial technology-based control level required by the Clean Water Act. This treatment level is determined first and is used in calculating both of the following control levels which may be more stringent.

Best conventional pollutant control technology (BCT)
BCT is an incremental level of control beyond BPT for Suspended Solids, BOD, Oil & Grease, pH, and coliform bacteria. BCT is a technology-based control requirement.

Best available technology economically achievable (BAT)
BAT is the level of treatment beyond BPT which applies to toxicants and other non-conventional pollutants. BAT is also a technology-based control requirement.

A detailed evaluation performed by EPA Region 9, for the 1997 permit, concluded that the construction and operation of San Francisco's Oceanside wastewater treatment systems and CSO storage/transport facilities comply with BPT, BCT, and BAT requirements (for EPA's analysis please refer to the attachment 2). This analysis concluded:

a. The completed Westside facilities will provide effluent reduction at a cost in excess of that which would be

required by BPT/BCT/BAT; and

b. No additional treatment facilities can be justified on a BPT/BCT/BAT cost basis.
c. By including requirements in the NPDES permit to ensure the continued implementation of the nine minimum control technologies outlined in the CSO Policy, the Board and EPA have established the technology-based requirements mandated by the Clean Water Act.

Combined Sewer Overflow Control Policy

On April 11, 1994, the EPA adopted the *Combined Sewer Overflow Control Policy* (50 FR 18688). This Policy establishes a consistent national approach for controlling discharges from CSOs to the Nation's waters through the National Pollutant Discharge Elimination System (NPDES) permit program. In 2000, the CWA was amended to include a reference to this Policy. Section 402(q) of the CWA now states:

> "...Each permit, order or decree issued pursuant to the Act...from a municipal combined storm and sanitary sewer shall conform to the Combined Sewer Overflow Control Policy..."

The Combined Sewer Overflow Control policy was developed through a negotiated process with environmental groups, federal and state officials, and representatives from municipalities.

San Francisco is served almost 100% by combined sewers and thus is directly affected by the CSO Control Policy. The CSO Control Policy addresses planning requirements, system performance, enforcement, and permitting. The key elements of the CSO Control Policy which affect this permit are the following.

(a) the permit and performance evaluation must address the system as a whole; the goal is to maximize system-wide pollutant removal,

(b) nine minimum control technologies are identified,

(c) flow to the treatment facilities must be maximized; the intent here is also to maximize system-wide pollutant removal,

(d) compliance with water quality standards during wet weather is based on the "presumption" approach (i.e., construction and implementation of a specified level of combined sewer controls places the system in compliance presumptively).

This Tentative Order in Section A. Discharge Prohibitions, Section B – Dry Weather Effluent Limitations, C. - Wet Weather Effluent Performance Criteria, and Section F. - Provisions, implements the *Policy* using the best professional judgment (BPJ) process.

Furthermore, all requirements recommended in the Policy for a Phase II CSO Permit have been included. These include:

(a) Requirements to implement technology-based controls including nine minimum controls (see Permit Provision 4 and Section C.);
(b) Narrative requirements which ensure that selected CSO controls are implemented, operated and maintained as described in Long Term CSO Control Plan (see Permit, Section C);
(c) Water quality-based effluent limits as described in "Presumption" approach (see Permit, Section C);
(d) Requirement to implement Post-Construction water quality assessment program (see Permit Provision 4.i);
(e) Requirement to maximize treatment of wet weather flows at the POTW (See Permit Provision 4.d.); and
(f) A re-opener clause authorizing the NPDES authority to implement additional requirements if CSO controls fail to meet WQS or to protect designated uses (See Permit Provision 15.e.).

Based on the CSO Control Policy, the permit includes limitations to control wet weather discharges.

During wet weather, Oceanside WPCP's secondary hydraulic capacity is 43 MGD with an additional primary hydraulic capacity of 22 MGD for a combined wet weather capacity of 65 MGD. During wet weather, the dry weather effluent limits do not apply to the SWOO discharge due to the large variability of flows and pollutant levels during storm events. Effluent discharges to the SWOO outfall during wet weather periods will be governed by the following effluent requirements:

1. The Discharger shall maximize the delivery of flows during wet weather to the treatment plant for treatment. In so doing, the Discharger will maximize the use of the available treatment facilities consistent with the reliable operations of these facilities.

2. The Discharger shall provide the maximum secondary treatment available in accordance with the operating manual and all wet weather flows passing the headworks shall receive at least primary clarification (defined as solids and floatable material removal and disposal) and any other treatment that can reasonably be provided with the existing facilities.

Water Quality Standards Review:
The CSO Policy calls for the development of a long-term control plan (LTCP) and also specifies that "[d]evelopment of the long-term plan should be coordinated with the review and appropriate revision of water quality standards (WQS) and implementation procedures on CSO-impacted receiving waters to ensure that the long-term controls will be sufficient to meet water quality standards" (59 FR 18694). Water quality standards reviews are an important step in integrating the development and implementation of affordable, well-designed and operated CSO control programs with the requirements of the Clean Water Act (CWA).

VI. EFFLUENT QUALITY

Dry Weather Values:
Average daily dry-weather values in 2002 for discharges from the Oceanside Water Pollution Control Plant are described below:

Table 5. – Effluent Quality

Constituents	ml/l-hr	mg/l
Settleable Matter	0.01	---
Biochemical Oxygen Demand (BOD)	---	15
Suspended Solids (TSS)	---	11
Grease and Oil	---	<5
Ammonia Nitrogen	---	32

Constituent - Turbidity	Nephelometric turbidity units (NTU)
Turbidity	6.0

Constituents - Toxicity (bioassay)		Toxicity Units (TUa^1/TUc^2)
Acute Toxicity	(Topsmelt)	0.0
Acute Toxicty	(Rainbow Trout)	0.46
Chronic Toxicity (Abalone)		31.6
Chronic Toxicity (Echinoderms)		13.3

1. TU_a (Toxic Units acute) equals log (100-S)/1.7 when percent survival in 100% effluent is >50%. (S equals % survival). Tu_a equals $100/LC_{50}$ when percent survival in 100% effluent is <50%. (LC_{50} is the effluent concentration at which 50% mortality occurs).
2. TUc (Toxic Units chronic) equals 100/NOEC, where NOEC is the no observed effect concentration, the highest effluent concentration to which organisms are exposed in a chronic test that causes no observable adverse effect on the test organisms.

Constituents (metals, other toxicants)
Dry weather monitoring was completed for 11 metals 28 times between January 2000 and December 2002. The highest concentration detected in any monitoring round is listed. Most were not detected in every sampling round.

Metals	µg/l
Arsenic	4.5
Cadmium	0.88
Chromium	7.5
Copper	25.6
Lead	14.4
Mercury	0.062
Nickel	4.4
Selenium	1.7
Silver	1.7
Zinc	102.9
Cyanide	<10

Constituents - Synthetic Organics
Dry weather monitoring was completed for 61 synthetic organic constituents and other toxicants eight times between January 1999 and December 2002. The following were detected in at least one monitoring effort. The highest concentration detected in any monitoring round is listed. Most were not detected in every sampling round.

Synthetic Organics and other toxicants	µg/l	(unless otherwise noted)
Toluene	1.4	
Tetrachloroethylene	11.0	
Dichlorobenzene	1.5	
Xylenes	0.7	
Chloroform	8.7	
Tributyltin	0.011	
Dioxins (picograms/l; TEQ)	0.71 (pg/l)	
Radiation	pCi/l	
Alpha	3.23	
Beta	39	

VII. REVIEW OF THE PRESUMPTION APPROACH

This section reviews San Francisco's system as compared with the Presumption approach specified in the Combined

Sewer Overflow (CSO) Control Policy.

The CSO Control Policy in Section II.C.4.a. outlines the requirements of the "presumption" approach:

This section states:
"a. Presumption Approach

A program that meets any of the criteria listed below would be presumed to provide an adequate level of control to meet CWA requirements, provided the permitting authority determines that such presumption is reasonable in light of the data and analysis conducted in the characterization, monitoring, and modeling of the system and the consideration of sensitive areas described above. These criteria are provided because data and modeling of wet weather events often do not give a clear picture of the level of CSO controls necessary to protect WQS. However, this presumption will not apply if the permitting authority determines that the long-term CSO control plan will not result in attainment of CWA requirements.

i. no more than an average of four overflow events per year, provided that the permitting authority may allow up to two additional overflow events per year. For the purpose of this criterion, an overflow event is one or more overflows from a combined sewer system as the result of a precipitation event that does not receive the minimum treatment specified below; or

ii. the elimination or the capture for treatment of no less than 85% by volume of the combined sewage collected in the combined sewer system during precipitation events on a system-wide annual average basis; or

iii. the elimination or reduction of no less than the mass of the pollutants, identified as causing water quality impairment through the sewer system characterization, monitoring, and modeling effort, for the volumes that would be eliminated or captured for treatment under paragraph ii. above.

Combined sewer flow remaining after implementation of the nine minimum controls and within the criteria specified at II.C.4.a.i, ii or iii, should receive a minimum of:

> Primary clarification. (Removal of floatable materials and settleable solids may be achieved by any combination of treatment technologies or methods that are shown to be equivalent to primary clarification.);
>
> Solids and floatable materials disposal; and
>
> Disinfection of effluent, if necessary, to meet WQS, protect designated uses and protect human health, including removal of harmful disinfection chemical residuals, where necessary."

<u>San Francisco Program compared with the Presumption Approach</u>

In this comparison, we examine San Francisco's performance under the criteria of items 1., 2. and 3. above. However, compliance with only one is required.

1. <u>Discharge of no more than 4 untreated overflows per year (average.)</u>

The permitted overflow frequencies for San Francisco range from one per year to ten per year depending on the discharge zone. (Areas with more sensitive beneficial uses have lower frequencies.) All of San Francisco's overflows are discharges from the storage/transports and will have received flow-through treatment which meets the definition of treatment under the Policy. Thus, San Francisco has no untreated overflows. The storage/transports are specifically designed to provide both settling and floatable material

removal as required in the Policy. Additionally, the performance of the storage/transports is in the range of the wet weather performance of primary clarifiers.

2. Treatment of 85% of the wet weather combined flow

This compliance option requires the combined sewer system to provide treatment (equivalent to primary clarification) to 85% of the combined flows on a system-wide annual basis. The San Francisco facilities provide secondary treatment to 39% of the flow, primary to 38% of the flow, and flow-through treatment within the storage/transports to the remaining 23%. Assuming that flow-through treatment meets the Policy's definition of treatment, as discussed above, then San Francisco provides 100% treatment and meets the criteria. By providing secondary level treatment to much of the storm flow, the City system's annual performance is much superior to a program which only meets the minimum requirements of this option (85% of flow receiving primary treatment, 15% untreated). See the following discussion.

3. The reduction (in discharge) of an equivalent mass of pollutants to option 2.

This compliance option requires the municipality to achieve a pollutant reduction performance equivalent to a community which has implemented option 2. This option was included for those communities, such as San Francisco, which have implemented site-specific control programs.

Option 2 requires a community to provide primary clarification to 85% of the combined flow. For this calculation, assume that primary treatment will achieve 50% removal of TSS. Therefore, the overall performance of a community implementing option 2 would be:

85% (of flow) X 50% (removal of suspended solids) = 42.5% overall removal.

- Overall removal refers to removal from the entire waste stream.
- The 50% removal efficiency assumed for primary clarifiers in wet weather is optimistic, as discussed earlier, and would likely be lower. Thus the overall removal for option 2 would probably be less than 42.5%.

San Francisco's overall pollutant removal has been calculated based on the following performance assumptions:

Treatment Process (San Francisco)	Wet Weather Pollutant Removal Efficiency (Percentage of TSS)
Secondary	80
Primary	55
Storage/Transports	30

The 30% removal efficiency for the storage/transports is a conservative assumption based on performance studies of the Westside Transport. Depending on the type of performance assessment, the TSS removal of the Westside Transport varied from 25% to 54% (long-term average). It is very difficult to determine the removal efficiencies of the storage/transports because of the variability of pollutant loading in the storm flows and the frequent inability to obtain representative and reproducible samples.

Using the data above, San Francisco obtains an overall pollutant removal from the combined sewer flows of 59%. This compares very favorably with the 42.5 % overall removal required by option 3 of the presumptive approach.

An additional requirement for options 1 and 2 of the presumptive approach, is that the treatment, as used in these options, should meet certain specifications:

The treatment must be:

a. "Primary clarification" (or technology equivalent to primary clarification that removes floatable materials and settleable solids).

b. Solids and floatable materials disposal

c. Disinfection, if necessary, and removal of disinfection residuals as necessary.

San Francisco's secondary and primary facilities provide, at least, primary clarification. Solids and floatable materials are removed, digested, and re-used in landfills or in land application. The Ocean discharge is 3.75 miles from shore and does not require chlorination to meet State WQS. As discussed previously, the flow-through treatment in removing floatable materials and settleable solids meets the requirements under the definition of primary clarification. The solids and floatable materials removed during the flow-through treatment are flushed to the treatment plants after the storms subside and receive the normal treatment and disposal.

The flow-through discharge is not chlorinated. The Discharger has evaluated disinfection for the storm flow overflow points and has determined that chlorination/de-chlorination of the shoreline discharges was neither cost-effective, technically viable, nor the environmentally preferred option. Particularly important is the fact that adequate time is not available to remove disinfection byproducts. Chlorine is acutely toxic and if not properly dosed and neutralized will kill fish and other aquatic life. Other alternatives were implemented including baffling, posting of the shoreline, and reduction of the annual overflow frequencies in critical areas.

In summary, the Discharger's wastewater facilities provide more treatment than that required by the "presumption"approach as outlined in the *Combined Sewer Overflow Control Policy*.

VIII. DETERMINATION OF TECHNOLOGY-BASED LIMITS FOR CSOs.

See EPA's BAT/BCT Determination, Fact Sheet: Attachment 1. This determination was based on the CSO Control Policy which equates the nine minimum controls with the technology-based requirements. This analysis was completed for the 1997 permit.

IX. BIOLOGICAL CONSIDERATIONS

Monterey Bay National Marine Sanctuary Concerns

The Sanctuary boundary lies 5,000 meters to the west of the end gates of the Southwest Ocean Outfall (Point B on Attachment 2). For several reasons, the treated effluent discharged through the Ocean Outfall is not expected to adversely impact the Sanctuary. The instantaneous dilution of the effluent (at least 76:1 and generally greater than 200:1) means that it is very unlikely that elevated concentrations caused by the wastewater discharge could occur within the Sanctuary.

The treated effluent plume responds primarily to the ebb and flood of the tidal cycle of San Francisco Bay and thus tends to move in northeast/southwest oscillation. The most probable point of contact on the Sanctuary boundary northerly of the outfall is 9.6 km north of the diffuser. Worst case analysis of total dilution averaged across the

cross-section of the plume is estimated as follows:

Condition	Max. Flow (mgd)	Point A - Northerly Contact with Sanctuary	Point B - Westerly Contact with Sanctuary	Point C - Southerly Contact with Sanctuary
Dry weather	25.6	3,200:1	910:1	2,900:1
Wet weather	145	1,700:1	530:1	1,500:1

Reference: CH2M-Hill Technical Memoranda #2 and #3, March 25, 1993.

The self-monitoring program begun in 1997 greatly expanded the SWOO study area by incorporating additional randomly located stations that extend into the Sanctuary boundary from Rocky Point in Marin County to Point San Pedro in San Mateo County. This new regional monitoring design has been successful in addressing shortcomings in the previous monitoring efforts by accounting for effects of outflow through the Golden Gate and placing the discharge area in context of the larger region. The biggest advantage of the regional approach has been the characterization of reference areas that allow comparison of outfall stations to background conditions. Annual sampling of sediment quality (including contaminant loads) and analysis of invertebrate and fish communities (including body burdens) has shown that, when compared to appropriate reference areas outside the range of effluent discharge effects, there are no detectable differences. Sampling stations within the Sanctuary are included as part of the reference stations to which outfall stations are compared. These data provide additional information on Sanctuary conditions for the NOAA Sanctuary Program.

Also important are the existing requirements that the discharge comply with the technology-based and water quality-based standards of the Clean Water Act. In particular, the permit requires compliance with the chronic toxicity requirements of the Ocean Plan. This bioassay test is probably the most accurate method of determining if the wastewater presents a risk to the biota in the receiving water. The critical life stages of five organisms (including a fish, an invertebrate, and an aquatic plant) were tested using Oceanside WPCP effluent: *Atherinops affinis* (topsmelt), *Macrocystis pyrifera* (giant kelp), *Haliotis rufescens* (red abalone), *Mytilus* spp. (bivalve), *and Strongylocentrotus purpuratus* (purple urchin). Three different invertebrate tests (abalone development, bivalve development, and echinoderm development) were measured because invertebrates displayed the most sensitivity to the OWPCP effluent. Of the three tests performed, the abalone and echinoderm development tests were more sensitive than the bivalve test. Monthly testing using the red abalone *Haliotis rufescens* was initiated in 1997 and compliance with the chronic effluent limit has consistently been achieved. Testing using either bivalve larvae or echinoderm larvae were conducted when abalone stock organisms did not properly respond to test protocol. Figure 2 shows the location of the Ocean Outfall discharge, the buffer zone, and the Sanctuary.

Endangered Species Consultation
EPA is currently in the process of consulting with the U.S. National Marine Fishery Service and U.S. Fish and Wildlife Service as mandated by Section 7(a)(2) of the Endangered Species Act. The consultation may result in the need for the Discharger to perform special studies to ensure that federally-listed species are protected.

X. DETERMINATION OF WATER QUALITY BASED LIMITS

Reasonable Potential Determination
40 CFR 122.44(d)(1)(I) requires the permit to include limits for all pollutants "which the Director determines are or

may be discharged at a level which will cause, have the reasonable potential to cause or contribute to an excursion above any State water quality standard." The Ocean Plan sets forth the water quality standards which are directly applicable to the discharges into state waters. EPA has determined that based on compliance with section 403 of the Act, these standards are also applicable to the discharge from the SWOO into Federal Waters.

There are no requirements in the Ocean Plan as to how "reasonable potential" must be determined. Typically, the permit writer will review effluent data, mixing zones, and the water quality standards. EPA's Technical Support Document also suggests statistical approaches that can be used to compare effluent data with standards.

In August 2002 the City submitted draft reasonable potential calculations for the City's wastewater discharge through the SWOO. EPA has thoroughly reviewed the City's calculations, and has used them to conduct a reasonable potential analysis. The TSD procedures (discussed below) were followed as closely as possible. EPA's analysis of the reasonable potential calculations differed slightly from the City's analysis, but the conclusions were the same for pollutant-specific reasonable potential: no reasonable potential was found for any specific organic or inorganic pollutants. EPA used Ocean Plan criteria and background concentration levels, while the City used Federal criteria and a background concentration for copper that differed from values listed in the Ocean Plan.

As a result of the reasonable potential analysis, only effluent limits for Acute and Chronic Toxicity are retained in the permit. The previous permit contained a limit for mercury, however, based on the past three years of data, EPA does not find reasonable potential for mercury. Based on the origin of the effluent as domestic and industrial wastewater, acute toxicity and chronic toxicity limitations are contained in the permit on a professional judgement basis.

Whole Effluent Toxicity Testing is included in this permit to assure that the wastewater does not contain pollutants which, in combination, exhibit toxicity. Furthermore, monitoring of all priority pollutants listed in the Ocean Plan is still required throughout the life of the permit. Finally, a re-opener clause allows the permit to be reopened for the imposition of water-quality based effluent limitations if any of the WET testing or chemical specific monitoring indicates to EPA or the Board the need for such limits.

Technical Support Document (TSD) Procedures for determining Reasonable Potential

EPA's *Technical Support Document for Water Quality-based Toxics Control*, EPA/505/2-90-001, Washington March, 1991 (TSD) contains a protocol for determining "reasonable potential" based on statistical evaluation of the effluent monitoring data. The TSD procedures were followed as closely as possible to determine reasonable potential. For criteria based on human health this is an extremely conservative approach because it does not take into account exposure rates of the human health non-carcinogens and carcinogens. In other words, it assumes that only one exceedance of the criteria at the edge of the zone of initial dilution (ZID) is enough to cause human health impact. In actuality, the human health criteria are derived assuming lifetime exposure (approximately 70 years).

To account for this longer exposure time, EPA would typically use a long-term dilution factor (e.g. 200:1)which would be greater than the worst-case 76:1 initial dilution used for these calculations. However, EPA is applying criteria from the 2001 California Ocean Plan which requires use of the "minimum probable initial dilution" in calculating the Waste Load Allocation

Tables 2 and 3 in the permit summarize the data collected and the reasonable potential conclusions. The attached reasonable potential calculations pages (Attachment 2) show all the data used for the calculations, and provide the results of each calculation.

Initial dilution:

The treated wastewater is discharged from SWOO through diffuser ports that are designed to promote rapid mixing with seawater. The discharge is freshwater and is more buoyant than seawater. It rises rapidly and the initial flow is turbulent. Eventually, the upward turbulent motion ceases and subsequent dilution is "passive" – resulting from currents, wave motion, and diffusion.

The area of mixing is called the mixing zone. The acute mixing zone is sometimes defined as the area of initial dilution, and may be referred to as the Zone of Initial Dilution (ZID). Acute criteria can be exceeded within the zone but must be met at its edge. The zone is sized for quick mixing and preventing lethality to passing organisms. Beyond the acute mixing zone and of larger area is the chronic mixing zone where, at the edge of this zone, chronic criteria must be met. Both mixing zones typically have maximum size and location restrictions and are sized to minimize impact upon the environment. Estimating dilution can either be accomplished through mathematical modeling (initial dilution models) or through dye studies.

The Ocean Discharge Criteria at 40 CFR 125.121(c) allow a 100-m (330-ft) radius mixing zone for initial dilution of discharges (or greater if the initial mixing zone is larger). At the edge of the mixing zone, marine water quality criteria shall be met. (For this permit, the criteria are the objectives borrowed from the Ocean Plan which are very similar to the U.S. EPA marine criteria.) Thus the Ocean Discharge Criteria establish a single regulatory mixing zone. The determination of whether a discharge meets water quality criteria at the edge of a mixing zone requires the computation of the amount of dilution that occurs in the mixing zone between the discharge location and the edge of the mixing zone. The calculated or measured dilution factor is used to determine the allowable pollutant concentration in the effluent before discharge.

For San Francisco, the measured dilution factor using dye studies in the zone of initial dilution was generally over 200:1 (two hundred parts seawater to one part wastewater). The average measured dilution factor was 473:1. The calculated dilution factor using the UDKHDEN model was 76:1 using conservative assumptions (e.g., no current, high flow, maximum measured density stratification). A conservative dilution is appropriate for comparison with acute criteria intended to protect marine biota from short-term exposures to worst case discharge situations. In effect, this establishes a relatively small "acute mixing zone." However, the San Francisco PUC has maintained that maximum 4-day average conditions are more appropriate for comparison with the chronic criteria (based on 4-day exposure). Furthermore, they suggest that long-term average conditions should be used for the dilution factor applied to the human health criteria (multi-year exposure).

The California Ocean Plan (COP) does not currently provide for different mixing zones for toxic pollutant objectives. It only provides for use of more than one mixing zone for whole effluent toxicity objectives. The COP identifies a minimum initial dilution factor that is applicable to the chronic toxicity objective based on the lowest average initial dilution for any single month of the year. The COP also identifies an acute toxicity mixing zone based on one tenth the mixing achieved in the chronic zone.

However, the use of more than one mixing zone is consistent with the EPA Technical Support Document for Water Quality-based Toxics Control (TSD) and the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). Generally, both these references provide for smaller mixing zones for acute standards as compared to the larger ones for chronic standards. For human health protective standards, specifically those relating to bioconcentratable pollutants, both the TSD and the SIP suggest further restrictions on the size of the mixing zone to prevent tissue contamination of organisms. In summary, there are various approaches used for identifying the dilution factors to be used in calculating effluent limits.

The Reasonable Potential Analysis for SWOO and the effluent limitations used a dilution factor of 76:1 for all toxic constituents. As provided in the TSD, different dilution factors may be considered for different toxic constituents depending on the nature of the compound. For non-bioaccumulative constituents (or non-bioconcentratable pollutants using TSD terminology), 76:1 is a highly conservative approach since it does not take into account the average exposures on which the risk assumptions are based for the chronic criteria. For bioconcentratable pollutants, the TSD recommends restrictions on the dilution factor to prevent tissue contamination of organisms. Since

sediment and tissue data from the SWOO Report show no elevation in concentrations of a select list of bioconcentratable pollutants in the vicinity of the SWOO compared to reference sites, some dilution above zero is appropriate for the SWOO (See Southwest Ocean Outfall Regional Monitoring Program, Five Year Summary Report, 1997-2001, Water Quality Bureau, 2003. City and County of San Francisco, Public Utilities Commission). Thus, 76:1 was also used for bioconcentratable constituents as it maintains past and current conditions for the Discharger. Future permits may use more appropriate dilution factors based on EPA and State guidance and discussions between the Discharger and EPA and the Board.

Contaminants in sediments and organism tissues have been monitored since 1997 (see Self Monitoring Program). Sediments throughout the study area were monitored for inorganic pollutants (Al, As, Ag, Cd, Cr, Cu, Fe, Hg, Mg, Ni, Pb, Se, Zn) and organic pollutants (PCBs, PAHs, DDT). English sole and Dungeness crab muscle tissues and liver/hepatopancreas tissues were measured for the same pollutants from organisms collected in the vicinity of the SWOO pipe and from organisms collected from the reference study area.

A comparison of data from 1997 through 2001 included in the 2003 Southwest Ocean Outfall Regional Monitoring Program, Five Year Summary Report, 1997-2001. (Water Quality Bureau, City and County of San Francisco, Public Utilities Commission) indicate some fluctuations in concentrations were measured between years. However, according to the Five Year Summary Report there were no increasing concentration trends for either inorganic or organic contaminants in any of the matrices measured. The Report also concluded that concentrations of contaminants in sediments and tissues in the vicinity of the SWOO were similar to reference station concentrations. Future permits may use more appropriate dilution factors based on U.S. EPA and State guidance and discussions between the discharger and U.S. EPA and the Board.

Acute and Chronic Toxicity

These effluent limitations are based on numbers borrowed from the Water Quality Control Plan for Ocean Waters of California (2001 Ocean Plan), and a technical study of initial dilution achieved by the discharger's outfall. The Ocean Plan sets forth the water quality standards which are directly applicable to the discharges into state waters. EPA has determined that based on compliance with section 403 of the Act, these standards borrowed from the Ocean Plan are also applicable to the discharge from the SWOO into Federal Waters. According to the Ocean Plan, effluent limitations for the acute toxicity objective shall be determined using the following formula:

. According to the Ocean Plan, effluent limitations for acute toxicity objective shall be determined using the following formula:

$$C_e = C_a + (0.1)\, D_m\, (C_a)$$

Where:

Ce = the effluent concentration limit,
Ca = the concentration (water quality objective) to be met at the edge of the acute mixing zone.
Dm = minimum probable initial dilution expressed as parts seawater per part wastewater (This equation only applies when Dm > 24).

XI. PERMIT SECTIONS A-G: SPECIFIC RATIONALE

The following provides a specific rationale for the proposed permit requirements in the Tentative Order:

SECTION A - Discharge Prohibitions:

a) Prohibition A.1 (no discharges other than as described in the permit): This prohibition is based on the

previous permit and BPJ.

b) Prohibition A.3 (no bypass) . This prohibition is based on general concepts contained in Sections 13260 through 13264 of the California Water Code that relate to the discharge of waste to State waters without filing for and being issued a permit. Under certain circumstances, as stated in 40 CFR 122.41(m)(4), the facilities may bypass waste streams in order to prevent loss of life, personal injury, or severe property damage, or if there were no feasible alternatives to the bypass and the Discharger submitted notices of the anticipated bypass. This prohibition pertains to dry weather discharges only. Wet weather discharges are regulated under the EPA *Combined Sewer Overflow Control Policy* (59 FR 18688).

c) Prohibition A.4 (Minimum initial dilution of 76:1): This Dilution is based on the most conservative modeling procedures as required by the Ocean Plan, 76:1 is the worst-case minimum initial dilution from the SWOO. Since the acute toxicity limit and reasonable potential for toxic pollutants are based on 76:1, a prohibition of less than 76:1 is necessary to ensure protection of water quality.

d) Prohibition A.5 (no discharges from wet weather outfalls during dry weather period): This prohibition is based on the Nine Minimum Controls, previous permit, and BPJ. EPA's *Combined Sewer Overflow Control Policy* established a national policy on the regulation of combined sewer overflow. This Policy recommends the prohibition of CSOs during dry weather. It is the best professional judgment of the Board and EPA that this is an appropriate prohibition to apply to the San Francisco wastewater system. The Westside system is designed to transfer all dry weather flow to the Oceanside WPCP. Any discharge of dry weather effluent through the wet weather Combined Sewer Overflow points would indicate a failure of the dry weather collection and treatment system. Additionally, it is unlikely that any such dry weather discharge would comply with the Clean Water Act requirements that all dry weather effluent receive secondary treatment as defined in 40 CFR 133.

e) Prohibition A.6 (flow limit): This prohibition is based on the treatment capacity of the plant. Flows in excess of this rate will not receive adequate treatment and so, should be prohibited.

f) Prohibition A.7 (pollution or nuisance). This prohibition is self-explanatory and based on the California Water Code.

f) Prohibition A.8 (no degradation of shellfish harvest during dry weather): This prohibition is based on previous permit and protection of the beneficial uses defined for the receiving waters.

SECTION B – Dry Weather Effluent Limitations

Basis for Dry Weather Effluent Limitations

1. Technology-Based Limits based on the Secondary Treatment Regulation at 40 CFR 133.102 and 133.103, and the previous permit limits.

a. Constituent	Units	Monthly Average	Weekly Average	Daily Maximum.	Instantaneous Maximimum
Biochemical Oxygen Demand (BOD_5)	mg/l	30	45		---
Total Suspended Solids (TSS)	mg/l	30	45		---
Grease and Oil	mg/l	25	40	---	75
Turbidity	NTU	75	100	225	---
pH	within 6 to 9 at all times				

b. BOD_5 and TSS 85% removal

The arithmetic mean of the biochemical oxygen demand (five-day, 20°C) (BOD_5) and total suspended solids (TSS) concentration, for effluent samples collected in a calendar month shall not

exceed 15 percent of the arithmetic mean of the respective values for influent samples collected at approximately the same times during the same period. Measurements taken on wet weather days shall not be included in calculating percent removal.

Basis:

a) Effluent Limitations B.1.a limits are technology-based limits representative of and intended to ensure adequate and reliable secondary level wastewater treatment during dry weather. These limits are based on Secondary Treatment Regulation at 40 CFR 133.102 and 133.103, and the previous permit . All limits apply independently to dry weather discharges to the Pacific Ocean.

b) BOD and TSS, 30 mg/L monthly average and 45 mg/L weekly average (Effluent Limitation B.1.a.): These are standard secondary treatment requirements, and existing permit effluent limitations that are based on numbers borrowed from the California Ocean Plan derived from federal requirements (40 CFR 133.102). These effluent limitations apply only to dry weather discharges.

c) Effluent Limitation B.1.b. (BOD and TSS monthly average 85 percent removal): These are standard secondary treatment requirements and existing permit effluent limitations are derived from federal requirements (40 CFR 133.102; definition in 133.101). Compliance has been demonstrated by existing plant performance for dry weather flows. During the past 3 years, the Discharger has consistently met these removal efficiency limits.

d) Oil & Grease and Turbidity. These limits are based on existing permit effluent limitations.

e) Effluent Limitation B.1.a. (pH): The pH limit is based on 40 CFR 133.102, which applies to indirect industrial dischargers. Based on Regional Board staff's professional judgment, the excursion allowance is extended to the Discharger.

2. Water Quality-Based Limits: Limits on acute and chronic toxicity are borrowed from the 2001 Ocean Plan. Acute and chronic Toxicity shall be measured in accordance with the attached Self Monitoring Program.

Constituent	Units	Daily Maximum.
Acute Toxicity	TUa	2.58
Chronic Toxicity	TUc	76*

* See specific quidance related to ammonia toxicity in the Self Monitoring Program

SECTION C – Wet Weather Effluent Performance Criteria (Including Nine Minimum Controls):

The CSO Control Policy identifies the nine minimum controls as meeting the technology-based requirements of the Act. For more detailed analysis of these requirements and a determination of the technology-based limitations for San Francisco's, Westside Wet Weather Control Facilities, please refer to EPA's BAT/BCT Determination in Attachment 1.

Basis:

a) These criteria were derived from the design criteria of the wet weather facilities. This requirement is based on the CSO Policy.

SECTION D - Receiving Water Limitations (Dry Weather)

Receiving Water Limitations are based on water quality objectives for physical, chemical and biological characteristics borrowed from Chapter II of the Ocean Plan. The Ocean Plan sets forth the water quality standards which are directly applicable to the discharges into state waters. EPA has determined that based on compliance with section 403 of the Act, these standards are borrowed for the discharge from the SWOO into Federal Waters. The rationale of the ocean monitoring program is found in Part B of the permit.

SECTION E - Basis for Self Monitoring Program Requirements

See Section VII. for the basis for the Self-Monitoring Program

SECTION F– Basis for Biosolid Management Practices

These requirements are derived from 40 CFR Parts 257, 258, and 503 and 13050 (l) and (m) of the California Water Code. The requirements in the permit are all applicable to the permittee, since as the biosolid preparer, the permittee is the person ultimately responsible for ensuring compliance with 40 CFR 503, as per 503.7. The language in the permit is intended to clarify certain sections of 503, and provides for adequate tracking of compliance with all aspects of 503.

SECTION G – Basis for Provisions

a) Provisions 1. (Permit compliance and rescission of previous permit): Time of compliance is based on 40 CFR 122. The basis of the order superseding and rescinding the previous permit order is 40 CFR 122.46.
b) Provision 2. (Marine Mammal Report). This provision is based on Professional Judgement. Human sewage has pathogens, viruses and bacteria. There is concern that marine mammals in the ocean could be adversely affected by un-disinfected discharges. The draft permit requires the Discharger to conduct a study to further investigate the potential affects of human sewage to marine mammals in general and to better ascertain the potential impacts to marine mammals to determine if further study is necessary.
c) Provision 3. (Pollution Prevention and Pollutant Minimization Program): This provision is based on the nine minimum controls).
d) Provision 4. (Nine Minimum Controls): This provision establishes technology based requirements for the Discharger's wet weather operations. This is based on the CSO Policy, Nine Minimum Controls, previous permit, and Professional Judgement.
e) Provision 5. (Whole Effluent Acute Toxicity): This provision is based on Professionial Judgement . See Finding 45 in the Permit for more detail.
f) Provision 6. (Whole Effluent Chronic Toxicity): This provision is based on Professional Judgement. See Finding 45 in the Permit for more detail.
g) Provision 7. (Pretreatment Program): The Discharger has implemented and is maintaining a U.S. EPA approved pretreatment program in accordance with Federal pretreatment regulations (40 CFR 403) and the requirements specified in Attachment E "Pretreatment Requirements" and its revisions thereafter.
h) Provision 8. (Wastewater Facilities, Review and Evaluation, and Status Reports): This provision is based on the previous Order.
i) Provision 9. (Operations and Maintenance Manual, Review and Status Reports): This provision is based on the requirements of the 40 CFR 122 and the previous permit.
j) Provision 10. (Operation Plan Submittal)
k) Provision 11. (Contingency Plan). The Contingency Plan provision is based on the requirements stipulated

in Board Resolution No. 74-10 and the previous permit.

l) Provision 12. (Self-Monitoring Program Requirement): The Discharger is required to conduct monitoring of the permitted discharges in order to evaluate compliance with permit conditions. Monitoring requirements are given in the Self Monitoring Program (SMP) of the Permit. This provision requires compliance with the SMP, and is based on 40 CFR 122.44(i), 122.62, 122.63 and 124.5. The SMP is a standard requirement in almost all NPDES permits (including the Order) issued by the Regional Board. In addition to containing definitions of terms, it specifies general sampling/analytical protocols and the requirements of reporting of spills, violations, and routine monitoring data in accordance with NPDES regulations, the California Water Code, and Board's policies. The SMP also contains a sampling program specific for the Discharger's treatment facilities. It defines the sampling stations and frequency, pollutants to be monitored, and additional reporting requirements. Pollutants to be monitored include all parameters for which effluent limitations are specified. Additional constituents, for which no effluent limitations are established, are also required to be monitored to provide data for future determination of their reasonable potential of exceeding the applicable WQOs or WQCs in the receiving water.

m) Provision 13. (Standard Provisions and Reporting Requirements): The purpose of this provision is to require compliance during dry weather with the standard provisions and reporting requirements given in this Board's document titled, Standard Provisions and Reporting Requirements for NPDES Surface Water Discharge Permits, August 1993, or any amendments thereafter. This document is included as part of the permit as an attachment of the permit. Where provisions or reporting requirements specified in the permit are different from equivalent or related provisions or reporting requirements given in 'Standard Provisions', the specifications given in the permit shall apply. The standard provisions and reporting requirements given in the above document are based on various state and federal regulations with specific references cited therein.

n) Provision 14. (Change in Control or Ownership): This provision is based on 40 CFR 122.61.

o) Provision 15. (Permit Reopener): This provision is based on 40 CFR 123.

p) Provision 15.c. (New Water Quality Objectives): This provision allows future modification of the permit and permit effluent limits as necessary in response to updated water quality objectives that may be established in the future. This provision is based on 40 CFR 123.

q) Provision 16. (NPDES Permit and U.S. EPA concurrence). This provision is based on 40 CFR 123.

r) Provision 17 (Permit Expiration and Reapplication): This provision is based on 40 CFR 122.46 (a)

XII. MONITORING PROGRAM.

Self-Monitoring Program Background

The near shore/offshore monitoring program is described in the Self -Monitoring Program (SMP), a document that is incorporated in but is separate from the permit. The SMP is intended to be a dynamic document, with requirements that may change throughout the life of the permit in order to provide the most relevant information possible.

The SMP has been changed from the 1997 version in several ways. Acute toxicity monitoring requirements, such as the new requirement to use marine species for acute toxicity, have been changed to reflect the 2002 amendments to the California Ocean Plan.

Another change is the addition of monitoring requirements for E. coli as a surrogate for fecal coliform, and enterocoocus, in addition to the total coliform monitoring requirement. These monitoring requirements were added because scientific evidence has shown that E. coli and enterococcus may be better indicators of gastrointestinal illness than total coliform. (See U.S. EPA guidance document "Implementation Guidance for Ambient Water Quality Criteria for Bacteria.") Although the discharger will now be required to analyze for 3 constituents rather than one (total coliform), routine shoreline monitoring has been reduced in the new permit from 3 times/week to one time/week. EPA and the Board have proposed this change because monitoring over the past permit cycle has satisfactorily characterized the area (Baker Beach at the outflow of Lobos Creek) where bacteriological

contamination is routinely found in the absence of a CSO.

As is presently the Discharger's practice, monitoring and posting of the beach after a CSO will be conducted daily (unless impracticable) until bacteriological levels drop below the levels specified in the SMP. The beach will be posted after a CSO until all three of the monitoring results drop below the following criteria (contained in the Self-Monitoring Program):

Total Coliform: 10,000 per 100 ml
E-coli (surrogate for fecal coliform): 400 per 100 ml
Enteroccocus: 104 per 100 ml

These three criteria are single sample maximums used by the California Department of Health Services and are contained in California's AB 411 language "Regulations for Public Beaches and Ocean Water-Contact Sports Areas" located in Title 17 of the California Code of Regulations. Under this regulation, San Francisco's beaches are not subject to this law because they do not meet the criteria for beaches "adjacent to storm drains." However, EPA and the Board believe that the use of the AB411 single sample maximums for posting after a CSO is reasonable, and is generally consistent with California Ocean Plan requirements, and thus with the posting requirement of State Board Order 79-16..

Metals
For all metals, monthly monitoring is required. For the other toxic constituents quarterly monitoring is required. These frequencies are reasonable to access impacts to receiving waters and to determine maximium effluent concentrations. These frequencies may be changed if required by modifying the self-monitoring plan.

Whole Effluent Toxicity Testing
Toxicity limits are borrowed from the California Ocean Plan (2001). California Ocean Plan requirements for chronic toxicity have not changed since the expired permit was issued in 1997, but the California Ocean Plan amendments adopted in 2001 included a change to acute toxicity requirements. Under the 2001 California Ocean Plan, acute toxicity is water quality-based rather than technology-based, and must use marine species instead of freshwater species. The acute toxicity limitation for this permit was calculated according to the water quality criteria borrowed from the 2001 California Ocean Plan (see Table B). Because no acute toxicity was measured during the last permit cycle, monitoring requirements for acute toxicity shall be conducted monthly for the first year. If the first 12 months of data do not detect acute toxicity, annual testing may be conducted thereafter during this permit cycle.

This Order gives the Discharger special allowances for chronic toxicity if they can demonstrate that the toxicity is caused by solely by ammonia and that the ammonia is within the Ocean Plan objectives. Based on toxicity work done by the Discharger for its Bayside discharge, the chronic toxicity organisms that will be used for Oceanside discharge are sensitive to ammonia at levels which may cause an exceedance of the chronic toxicity limit. The purpose of the chronic toxicity limit is to protect against synergistic effects of mixtures of pollutants, and as yet unknown pollutants. It's purpose is not as a substitute for ammonia, which is already guarded against by the Ocean Plan objectives for ammonia. It is appropriate therefore to grant the Discharger this special allowance.

Sections 308(a) and 402 of the Clean Water Act provide authority to EPA or the State to require that NPDES permittees/applicants use biological monitoring methods and provide chemical toxicity and in-stream biological data when necessary for the establishment of effluent limits, the detection of violations, or the assurance of compliance with water quality standards.

40 CFR Part 122.44(d)(1)(ii) discusses procedures to be used to determine if a discharge causes, has a reasonable potential to cause, or contributes to an excursion of a water quality standard. The procedures include consideration of four general factors: "...existing controls on point and non point sources...variability of the pollutant...in the

effluent, the sensitivity of the species to toxicity testing...and...the dilution of the effluent in the receiving stream."

Because of the variability of pollutants inherent in POTW discharges, reasonable potential does exist to require whole effluent toxicity testing and permit limitations.

June 13, 2003

Comments on Tentative Order, Self Monitoring Program and Fact Sheet (NPDES Permit No. CA 0037681) for City and County of San Francisco Oceanside Treatment Plant, Southwest Ocean Outfall, and Westside Wet Weather Facilities (*San Francisco Bay Regional Water Quality Control Board (Board) and U.S. Environmental Protection Agency (U.S. EPA) final draft for public comment*)

San Francisco Public Utilities Commission, Planning Bureau
415 934-5700

The comments that follow include general concept issues as well as specific recommendations on changes to document language for accuracy and clarification.

SWOO Discharge

Issue 1: CALIFORNIA OCEAN PLAN

Inappropriate Application of the California Ocean Plan

Basis for Water Quality Standards Applied to Discharge from SWOO – Finding 29 of the Tentative Order and various parts of the Fact Sheet in Sections V, X, XI and XII

Finding 29 accurately states that the SWOO discharge is located outside State waters and that, the California Ocean Plan does not directly apply to the SWOO at the point of discharge. Federal regulations and Federal water quality criteria which ensure receiving waters are protected, are available and San Francisco considers those guidance documents appropriate use for the SWOO discharge which is in Federal waters. Federal Ocean Discharge Criteria regulations exist (40 CFR part 125, subpart M) which include guidance to "prevent unreasonable degradation of the marine environment and to authorize imposition of effluent limitations, including a prohibition of discharge, if necessary, to ensure this goal" (45 FR 65942, October 3, 1980). It is San Francisco's position that Federal marine water quality criteria (Federal Register Vol. 63, No. 237, December 10, 1998) and U.S. EPA's Quality Criteria for Water 1986 (the "Gold Book") are the appropriate guidance to use in evaluating compliance of the SWOO discharge with the Ocean Discharge Criteria regulations. For ammonia, criteria are from U.S. EPA's Ambient Water Quality Criteria for Ammonia (Saltwater)-1989.

U.S. EPA has stated that it is necessary to use water quality criteria from the California Ocean Plan to determine SWOO compliance in order to ensure that the discharge will not cause unreasonable degradation as stated in 40 CFR 125.122(b). However, additional Federal guidance indicates the use of State criteria is not the only option to ensure against unreasonable degradation.

> *EPA criteria/toxic benchmark recommendations are considered by the States in developing water quality criteria for State waters. The criteria are not steadfast standards in federal offshore waters, but EPA takes them into account in making a determination of whether a discharge will cause* ***unreasonable degradation*** *of the marine environment (See 40 CFR Part 125.122(a)(10).*

Finding 29 further indicates that the U.S. EPA has elected to use water quality criteria from the 2001 California Ocean Plan to determine SWOO compliance: "compliance with parameters borrowed from the Ocean Plan is required immediately after initial dilution". The rationale given for using Ocean Plan numeric criteria is to ensure that State standards will be met within State waters. Because the Ocean Plan does not apply to the SWOO

discharge (the discharge is in Federal waters), the U.S. EPA can only legally "borrow" the numbers, as is so indicated in the first sentence of Finding 29. However, because the Ocean Plan does not legally apply to the SWOO discharge it is necessary that any reference to the use of Ocean Plan criteria throughout all permit documents be accurately prefaced as being 'borrowed". (Note that the use of Ocean Plan criteria is unnecessary and inappropriate, as Federal criteria exist which can be used.) San Francisco, also, firmly insists that although U.S. EPA is intent on using a guidance option that allows Federal compliance determination based on borrowed State water quality criteria, the Ocean Plan in its entirety does not and cannot be applied to regulate the SWOO discharge.

The following sentences in Finding 29 need to be modified in order to correctly and legally reference the California Ocean Plan.

- Paragraph 1, sentence 4: "In addition, compliance with numbers borrowed from the Ocean Plan immediately after initial dilution..."
- Paragraph 2, sentence 2: "However, because the discharge is in compliance with numeric standards promulgated for ocean discharges within state waters (i.e., the 2001 California Ocean Plan) and because these standards address the criteria listed under 4003(c)(1) of the Act, EPA concludes that compliance with numbers borrowed from the Ocean Plan provides a reasonable basis for concluding that the discharge from the SWOO..."

The following sentences in the Fact Sheet need to be modified in order to correctly and legally reference the California Ocean Plan.

- Section V. Federal Regulations Implementing the CWA – water quality-based requirements, paragraph 3, sentence 4: "Compliance with water quality objectives borrowed from the Ocean Plan provides the basis for EPA's ..."
- Section V. The California Ocean Plan and Federal Ocean Discharge Criteria, paragraph 1, sentence 2: "However, compliance with numbers borrowed from the Ocean Plan is required..."
- Section X. Acute and Chronic Toxicity, paragraph 1, sentence 1: "These effluent limitations are based on numbers borrowed from the Water Quality Control Plan for Ocean Waters of California (2001 Ocean Plan), ..."
- Section X. Acute and Chronic Toxicity, paragraph 1, sentence 3: "EPA has determined that based on compliance with section 403 of the Act, these standards borrowed from the Ocean Plan, are also applicable to the discharge from the SWOO into Federal Waters."
- Section XI. B.1.b.b), Discharge Prohibition, BOD and TSS: Change to read: "These are standard secondary treatment requirements, and existing permit effluent limitations that are based on numbers borrowed from the California Ocean Plan derived from federal requirements (40 CFR 133.102)."
- Section XI. B.2., Water Quality-Based Limits, sentence 1: "Limits on acute and chronic toxicity are borrowed from the 2001 Ocean Plan."
- Section XI. D. Receiving Water Limitations (Dry Weather), sentence 1: "Receiving Water Limitations are based on water quality objectives for physical, chemical and biological characteristics borrowed from Chapter II of the Ocean Plan."
- Section XII. Whole Effluent Toxicity Testing, paragraph 1, sentence 1: "Toxicity limits are borrowed from the California Ocean Plan (2001)."

- Section XII. Whole Effluent Toxicity Testing, paragraph 1, sentence 4: "The acute toxicity limitation for this permit was calculated according to water quality criteria borrowed from the 2001 California Ocean Plan (see Table B)."

Issue 2: INITIAL DILUTION

Basis for Dilution Credit, Tentative Order (Finding 29, Finding 41) and Fact Sheet

As discussed above, the California Ocean Plan is not applicable to the SWOO at the point of discharge, because the SWOO discharge is in Federal waters. The discharge is located between 0.3 and 1.5 miles beyond State waters. Although U.S. EPA has borrowed numerical standards from the Ocean Plan to assess compliance of this permit in order to ensure that State standards will be met in State waters and that there is no unreasonable degradation of marine waters as allowed in 40 CFR 125.122(b), the Ocean Plan in its entirety does not apply. It is noted that the cited regulation used to determine "no unreasonable degradation" in Finding 29 and Section V of the Fact Sheet is only one of many recommended options that could be used to ensure such conditions, and may be unnecessarily restrictive.

In the design stages of the Oceanside Water Pollution Control Plant, the City requested a 301(h) waiver from secondary treatment as allowed in the Clean Water Act. That waiver was granted by U.S. EPA. In order to receive a 301(h) waiver, a discharge must have applicable State standards, and therefore State standards are "extended" into Federal waters for such discharges. Discharges into State waters are governed by the Ocean Plan, which specifies that the mixing zone is defined by the area of initial mixing and also assumes no current. Using a very conservative approach as is noted in Finding 41 of the Tentative Order and Section X of the Fact Sheet, the initial dilution for the SWOO discharge was calculated as 76:1. The City conducted dye studies in conjunction with U.S. EPA and the National Oceanic and Atmospheric Administration (NOAA) under worst case field conditions and calculated infield initial dilutions generally greater than 200:1. In 1989, the City withdrew its request for waiver from secondary treatment and designed the Oceanside facility to provide full secondary treatment for up to 43 MGD. Dilution was never recalculated using Federal criteria, and the dilution credit of 76:1 continues to be retained in the Oceanside permit.

Because the SWOO discharge is in Federal waters, Federal regulations apply, specifically 40 CFR 125.121(c), which states that discharges to Federal waters are allowed a mixing zone of 100 meters. Therefore, although U.S. EPA is borrowing Ocean Plan numeric standards, the entire Ocean Plan cannot be borrowed, and dilution must be calculated using Federal Regulations. There is no justification for the U.S. EPA to apply "minimum probably initial dilution" from the Ocean Plan in calculating Waste Load Allocation to the SWOO, because the Ocean Plan does not apply to the SWOO discharge (Fact Sheet, Section X). Discussions among the City, the Board, and U.S. EPA on the dilution credit applied to the SWOO discharge recognized the fact that the SWOO discharge was allowed a recalculation of dilution credit for aquatic life and human health criteria under Federal Regulations, as is also noted in Section X in the Fact Sheet, "To account for this longer exposure time, EPA would typically use a long-term dilution factor (e.g. 200:1) which would be greater than the worst-case 76:1 initial dilution used for these calculations.". San Francisco strongly insists that a dilution factor based on the Federal mixing zone be used for compliance purposes for chronic and human health criteria and purposes of any future reasonable potential analysis.

The City has prepared a draft report (attached) on dilution modeling for the SWOO discharge in which dilution ratios using a mixing zone based on Federal guidance are calculated. (Note that preliminary calculations indicate a dilution ratio of 465:1 for the SWOO discharge.) The City has submitted the dilution modeling report to Dr. Philip Roberts (Georgia Tech University), a renowned expert in the field of ocean discharge modeling, for review. In his review (attached), Dr. Roberts indicates that the original dilution model used for the SWOO discharge was overly conservative and incorporated inaccurate assumptions. Dr. Roberts indicates that "considerable advances have been made in understanding the mixing and dynamics of buoyant outfall plumes [since 1990], and earlier predictions are now archaic". Dr. Roberts states "[c]learly, the dilution value of 76:1 used in the previous [SWOO NPDES] permit is unrealistically low". Although all of the assumptions in the City dilution model are not yet verified, Dr. Roberts suggests a more accurate dilution factor for the SWOO would range from 200:1 to 985:1. The City intends to continue to refine the SWOO dilution modeling efforts with the aid of Dr. Roberts, and finalize the document within the next month. San Francisco expects the SWOO dilution factor of 76:1 will be revised prior to re-issuance of the Oceanside permit, or that the inclusion of language that allows such a revision within the current permit cycle, based upon said studies, will be included.

Specific Language Changes

a) Tentative Order, Finding 29: Based upon the previous discussion and the inappropriateness of using California Ocean Plan initial dilution models for the SWOO discharge, the following language in this Finding must be changed. Change the phrase "after initial dilution" in sentence 1 of the Finding to "at the edge of the mixing zone as defined in 40 CFR 125.121(c)." Change the phrase "after initial dilution" in sentence 4 of the Finding to "at the edge of the mixing zone as defined in Federal Regulations".
b) Tentative Order, Finding 41: Change sentence 4 of this Finding to read: "For compliance purposes and for any future Reasonable Potential Analysis the dilution factor of 465:1, based on the Federal mixing zone will be used."
c) Tentative Order, Finding 41, and Fact Sheet Section X, Paragraph 7: The third sentences of Finding 41 and Paragraph 7 reference the SWOO dilution factor and bioconcentratable pollutants. The sentences do not make sense and do not provide any additional information, so should be deleted.
d) Tentative Order, Discharge Prohibition A.4: Change to read: "Discharge of effluent from the Oceanside WPCP which does not exhibit a dilution of at least 465:1 at the edge of the mixing zone as defined in Federal Regulations is prohibited." Change similar language in the Fact Sheet in Section XI.A.c).
e) Tentative Order, Dry Weather Effluent Limitations B.2, Chronic Toxicity; and Fact Sheet, Section XI.B.2.: Change the chronic toxicity limit from 76 to 465.
f) Fact Sheet, Section V. The California Ocean Plan and Federal Ocean Discharge Criteria, Paragraph 1, sentence 2: Change to read: "However, compliance with numbers borrowed from the Ocean Plan is required immediately at the edge of the mixing zone as defined in Federal Regulations."

Issue 3: SPECIAL STUDIES

Marine Mammal Report, Tentative Order, Section F, Provision 2; Fact Sheet Section IX, G.

There is no causal link justifying inclusion of this issue as a provision requirement in the Oceanside permit. While there has been some speculation by researchers that the recent deaths of sea otters along the central California coast may be due to infection by feline virus associated with storm water runoff this theory has not been corroborated. If those agencies and scientific research groups that are tasked with studying marine mammals along the California coast cannot come to a consensus on the origin of the infection and the transport path of infectious agents to marine mammals, then a requirement in the Oceanside permit for the City to develop a study plan and marine mammal report appears to be premature. A coastal watershed approach addressing all storm water and wastewater discharges along the central coast may provide information needed by the research community. A small isolated study by San Francisco would not be money well spent nor would it likely provide information to address this problem.

The City recognizes that the issue of marine mammal infections is currently of concern, and the City is agreeable to including language addressing this issue into the permit. However that language should reflect and support current scientific findings. There is no justification to require the City to initiate research for this issue, which may likely be a statewide problem and may be best addressed through a watershed approach. The topic in the Tentative Order should be identified as the "Marine Mammal Program" both in Section F. Provision 2 and the Table of Contents, as well as in the Fact Sheet. The following language can be substituted in Provision 2.

> "The U.S. EPA, in consultation with NOAA, is concerned about the effects of viruses on marine mammals, especially federally listed species. If it is demonstrated in other ongoing investigations that there is a connection between non-disinfected municipal or industrial wastewater and marine mammal viral infections, the discharger shall work cooperatively with the U.S. EPA and other parties to develop a coordinated approach to address this issue."

The Fact Sheet (Section XI.,G – Basis for Provisions) indicates the inclusion of this issue on marine mammals in the Oceanside permit is based on Professional Judgment. Although the SWOO discharge is not disinfected, there is no indication that infections marine mammals from the central California coast are attributable to the Oceanside discharge. Therefore, the inclusion of such a provision in the Oceanside permit is inappropriate, as no marine mammals have reportedly been infected in the area of the discharge. The fact that infections are occurring along the central California coast indicates that the transport path must be something other than non-disinfected wastewater. If further research concludes that storm water is determined to be the source of the virus infections, then a watershed-based approach would be the most appropriate means to deal with this issue. This provision requires that San Francisco engage in a research effort to assess the affects of human sewage on marine mammals in general, an effort as indicated above which would not be money well spent nor would it likely provide useful information to address this problem. The language in Section G. b) should be changed to indicate:

There is a growing concern about the effects of viruses on marine mammals. Future research may indicate the need to address this issue locally with individual dischargers, or globally using a watershed-based approach.

Issue 4: BACTERIA MONITORING

a) The requirement for Total Coliform Bacteria monitoring for the duration of the permit cycle is inappropriate and unwarranted.

The Tentative Order, the Self Monitoring Program (SMP) and the Fact Sheet require the analysis of total coliform, *E. coli* (as a surrogate for fecal coliform), and enterococcus as indicator organisms in shoreline bacteria monitoring. The permit discusses this issue in Finding 18, Beach Postings and Bacteria Monitoring. The SMP discusses it in Section II Shoreline Monitoring (Surf Zone Sampling) under both A. Routine Monitoring and B. Monitoring in Response to a CSO. The Fact Sheet discusses bacteria monitoring in Section XII, Self Monitoring Program Background. All permit documents justify the inclusion of *E. coli* (as a surrogate for fecal coliform) and enterococcus into the beach monitoring program with reference to the most recent draft U.S. EPA guidance document "Implementation Guidance for Ambient Water Quality Criteria for Bacteria" which states that "E-coli and enterococcus are considered better indicators of gastrointestinal illness than total coliform." The guidance document more specifically states that *E. coli* is the recommended indicator organism over fecal coliform for fresh water systems, while enterococcus is a better bacteria indicator for marine systems. The guidance document does not recommend the collection of, or analysis for total coliform bacteria as a useful indicator organism for any water contact recreation assessment.

During the previous permit cycle, the City conducted shoreline bacteria monitoring using only total coliform bacteria as an indicator organism. The recent inclusion of bacteria indicators such as *E. coli* and enterococcus in other bacteria monitoring programs has resulted in a greater frequency of samples that exceed water contact recreation standards and a greater incidence in the number of times beaches are posted. In order for the City to assess past shoreline bacteria concentrations and posting responses, with concentrations and postings generated using the added bacteria indicators of *E. coli* and enterococcus under this new permit, monitoring using all three indicator organisms (total coliform, *E. coli*, and enterococcus) is appropriate for a designated time period.

However, since total coliform is not a recommended bacteria indicator, there is no justification to require the continued collection of total coliform bacteria data for the life of the permit once the relationship with previous data is established; a period of one year of data collection for all three indicators should be adequate. After one year of data collection using all three indicator organisms, shoreline monitoring should include *E. coli* (as a surrogate for fecal coliform) and enterococcus as recommended by U. S. EPA guidance. This level of monitoring is recommended by the U.S. EPA and follows the guidance of the State of California Water Resources Control Board in current efforts to coordinate and standardize beach water quality monitoring along the coast of California.

b) Routine Shoreline Bacteria Monitoring

There is no legal basis for requiring the City to conduct weekly shoreline monitoring for bacteria "regardless of the occurrence of CSO events". This statement is made in Finding 18 of the Tentative Order, and an inference to this monitoring is made in Section II.A of the SMP and in the Fact Sheet under Section XII. Shoreline bacteria monitoring is the responsibility of local county health departments. The only reasonable justification to include shoreline sampling in the City's NPDES permit is to monitor the effects of CSO events which is appropriately required in the SMP under Section II.B. There is no reasonable potential for elevated bacteria counts observed during dry weather or during wet weather in the absence of a CSO event to be attributable to the City's wastewater treatment system. Although the San Francisco PUC may elect to coordinate monitoring with the City Health Department for public health concerns, the NPDES permit for wastewater discharge cannot require it.

c) Language Changes in Reference to Total Coliform as an Indicator Organism

1. Specific language changes need to be made to sentence 5 of Finding 18 in the tentative order, and sentence 3 of the Discussion in the SMP Section II. The following language is suggested as a replacement for the permit and SMP.

   "...monitoring under this permit will include all three indicators – total coliform, E-coli (as a surrogate for fecal coliform), and enterococcus for the first year of the permit cycle. One year of data collection using all three indicator organisms will provide a comparison of bacteriological conditions with previous permit data. After the first year, shoreline monitoring will include E-coli (as a surrogate for fecal coliform) and enterococcus as recommended by U. S. EPA guidance. Future research in this field may require changes to the indicator organisms measured to assess water contact recreation."
2. Sentence 3 of Finding 18 in the Tentative Order needs to indicate that beach postings will be removed when "the levels of all measured indicators drop below" the criteria.
3. Sentence 2 of Requirements in Section II. A. Routine Monitoring in the SMP should read:

   "Samples shall be collected in the surf and sampled for those indicators referenced in the previous discussion paragraph.".
4. References to the three indicator organisms in sentences 1, 5 and 7 of Requirements in Section II.,B. Monitoring in Response to a CSO in the SMP should read:

   Sentence 1: the Discharger "...shall conduct shoreline monitoring for those indicators referenced in the previous discussion paragraph of this section...";

   Sentence 5: "Samples shall be collected in the surf and sampled for those indicators referenced in the previous discussion paragraph.";

   Sentence 7: "Monitoring shall be conducted daily, and the beach shall remain posted until levels of all bacteria indicators measured drop below the following:"
5. Sentence 4 of paragraph 3 in Section XII in the Fact Sheet should be changed to read:

   "The Discharger will now analyze for E-coli (as a surrogate for fecal coliform) and enterococcus as recommended by U.S. EPA guidance. For the first year of the permit, the Discharger will also analyze for total coliform in order to compare previous permit bacteria data. Routine shoreline monitoring has been reduced in the new permit from 3

times/week to one time/week because monitoring over the past permit cycle has satisfactorily..."

d) Monitoring Efforts During a CSO Event – Misleading SMP, Section II.B.

The first sentence of this section indicates that shoreline monitoring will occur at a minimum of ten stations whenever a CSO occurs. Sentence 4 of this section indicates that monitoring will be conducted at those stations in closest proximity to the CSO discharge. For clarification and consistency the last portion of the first sentence should indicate that the Discharger

> "...shall conduct shoreline monitoring for those indicators referenced in the previous discussion paragraph of this section at those stations in closest proximity to the CSO discharge (see Station Descriptions below). Shoreline sampling following a CSO discharge will occur at up to ten stations located from Baker Beach along the shoreline perimeter to Fort Funston on Ocean Beach as soon as practicable with regard to safety."

This modification allows the removal of sentences 4 and 5 of the existing paragraph as they are repetitive.

Issue 5: Maximum Daily Effluent Limits (MDEL) – Finding 32

This finding goes into some length to support the application of daily maximum limits to POTWs. As noted in the Tentative Order, the federal regulations [40 CFR 122.45(d)(2)] specifically state that limitations for POTWs be specified only in terms of weekly and monthly averages *unless impracticable.* The permit cites U.S. EPA guidance in the Technical Support Document to provide the basis to establish MDELs, specifically in relation to water quality-based limits for toxicity. Although it appears that the Board and U.S. EPA interpret less than weekly or monthly averages would be *impractical* to protect against "acute toxicity impacts", that interpretation is unsubstantiated. Additionally, even if the arguments for daily limits for toxicity are accepted, there is no justification to apply daily maximum limits to technology-based limits for BOD and TSS, which are very clearly supposed to be limited on only a weekly and monthly basis. Consequently, the daily maximum and instantaneous maximum limitations are inappropriate and should be removed from the Dry Weather Effluent Limitations Tables B.1 and B.2 in the Tentative Order and in Section XI.B.1 and B.2 of the Fact Sheet.

Recent court decisions support the removal of Maximum Daily Effluent Limits in NPDES permits for POTWs. One of the appeal issues in the LA and Burbank POTW permits was the presence of less than weekly limits. LA and Burbank brought suit against the State Water Resources Control Board and the Los Angeles Regional Water Quality Control Board. The trial court determined that the Boards were in error.

From the decision of the Appeals Court (J. Kitchen): *"The trial court also sustained the petitions on the grounds that the Regional Board failed to adequately show how numerical permit effluent limitations were derived from the narrative criteria; the effluent limitations are not supported by adequate findings and evidence in the administrative record; the permits improperly impose daily maximum limits rather than average weekly and average monthly limits; and the permits improperly specify the manner of compliance. Water Boards do not challenge this latter group of rulings on*

appeal and acknowledge that they must issue new permits in compliance with these rulings." (2002 WL 31867863 (Cal.App. 2 Dist.)) [emphasis added]

Issue 6: Receiving Water Ambient Background Data Used in the RPA – Finding 42 of the Tentative Order

As already noted in above comments, the California Ocean Plan is not applicable to the SWOO discharge, as the discharge occurs in Federal waters. Although the Board and U.S. EPA are ensuring that the discharge meets State water quality standards by requiring compliance in this permit with numbers borrowed from the Ocean Plan, those numbers are inappropriate to use when more recent environmental data are more relevant, and actions to use more recent data are precedent. The copper value (2.0 ug/L) ambient background concentration is not accurate. In a Tentative Decision Document[1] issued on February 8, 2002 by U.S. EPA, Region IX in conjunction with the Ocean Outfall Permit for San Diego (NPDES CA0107409), the U.S. EPA stated, "The assumption in the COP [Ocean Plan] may be overly conservative. Flegal, *et al.*, (1991) reported that background copper concentrations in California coastal water were around 0.1 ug/L" (TDD, page 17).

Consequently, the RPA for the Oceanside permit should use 0.1 ug/L rather than 2.0 ug/L as the background copper concentration, and this should be reflected in Finding 42.

Issue 7: REPORTING AND SUBMITTAL DATES

Reporting dates need to be consistent throughout the Tentative Order, SMP, Fact Sheet and Attachments

a) SMP, Section V. Reporting Requirements, A.: In order to accommodate for less than 30 days in the month of February, change the Self-Monitoring Report monthly 'received' date to be 'no later than the last day of the following month'.
b) SMP, Section V. Reporting Requirements, B.: In order to make reporting dates consistent throughout permits, change the annual report covering effluent sampling from January 30 to February 28; and change the annual summary of wet weather activities and receiving water results from July 31 to August 30. This will make reporting consistent with other sections of this NPDES permit and with the other San Francisco NPDES permits.
c) SMP, Section V. Reporting Requirements, D.: To make all reporting submittal dates consistent and easier to track, change the annual report of the offshore monitoring data from July 30 to August 30.
d) Attachment E, Pre-treatment, Items 5 & 6: To make all reporting submittal dates consistent with other sections of this NPDES permit and with the other San Francisco NPDES permits and easier to track, change the semi-annual report due date from July 31 to August 31 and from January 31 to February 28; change the annual report due date from January 31 to February 28.

[1] The EPA 301(h) *Tentative Decision Document* is posted on the internet at: http://www.swrcb.ca.gov/rwqcb9/Programs/Outfall_Permit/301_h_TDD.pdf

Issue 8: Document Clarifications

1) Tentative Order, Finding 29, paragraph 1, sentence 1: The location of the SWOO discharge should be described as "0.3 to 1.5 miles beyond State waters" as is indicated in the Fact Sheet.
2) Fact Sheet (page 33 of 33), Whole Effluent Toxicity Testing: The last sentence I Paragraph 1 of this item indicates that acute toxicity testing has been decreased from monthly to quarterly. The SMP, Section B.1.b. indicates that acute testing will be conducted monthly for the first year and then if no toxicity is observed, annually thereafter. The information in these two documents must be made consistent.

Combined Sewer Overflows

Issue 1: REGIONAL AND STATE BOARD HISTORICAL EXCEPTION ORDERS
Inaccurate interpretation of historical orders that allow an exception to the California Ocean Plan, and address the long term average number of overflows (State Board Order No. 79-16 and Regional Board Order No. 79-12).

a) The discussion and references to Orders 79-12 and 79-16 in Finding 15 of the Tentative Order are unclearly stated and somewhat misleading. The sequence of events began with the San Francisco Bay Regional Water Quality Control Board adopting Order 79-12 which allowed an average of eight overflows per year, and based on evidence presented at a public hearing, determined that an exception to the Ocean Plan was warranted. The Regional Board requested that the State Board review and approve the exception to the Ocean Plan as recommended in Order 79-12. Following an additional public hearing, the State Board adopted Order 79-16 which supported the Regional Board assessment that a long term average of eight overflows per year would provide protection of beneficial uses and approved the exception to the Ocean Plan. Order 79-16 specifically states "...the proposed wet weather discharges by the City and County of San Francisco from the eight diversion structures in the Richmond Sunset Sewerage Zone are excepted from the requirements of the Ocean Plan."

The third sentence of Finding 15 of the Permit should be deleted as it is unclear and misleading. Sentences 1 and 2 should be combined to read:

> "In 1979, the San Francisco Bay Regional Water Quality Control Board "Board" issue Order No. 79-12 (See Attachment I) and the State Water Resources Control Board "State Board" issued Order 79-16 (See Attachment H) for the wet weather facilities; State Board Order No. 79-16 and Regional Board Order No. 79-12 found that a long term average of 8 overflows per year would provide adequate overall protection of beneficial uses."

The following sentence should be added just prior to the last sentence in paragraph 1 of Finding 15:

> "The State Board Order No. 79-16 defined an overflow...from the combined sewer collection system. When an overflow occurs, there may be discharges from multiple structures simultaneously. To be considered a discrete overflow event, ..."

b) The reference to State Board Order No. 79-16 in Finding 30 of the Tentative Order, Applicable Water Quality Objectives – State Waters implies that Order No. 79-16

granted an exception to only bacterial water contact and shellfish harvesting standards in the California Ocean Plan to shoreline CSOs. State Board Order No. 79-16 in fact granted an exception to standards contained in Chapters II through V of the California Ocean Plan to the City's CSO discharges. The Order states under "Section III. Exception Subject to Conditions: Subject to the following conditions, this Order excepts the proposed by-passes from the terms of the Ocean Plan." The conditions include performance of a self-monitoring plan; posting of beaches following a CSO event; warning signs where shellfish may be harvested following a CSO event; to the greatest extent practical, design, construction and operation of facilities that conform with standards in Chapters II and III of the Ocean Plan; containment of all storm water excepting an average of eight overflows per year; implementation of a pretreatment and pollution prevention program. The City has complied with all conditions of the exception order.

Issue 2: COMBINED SEWER OVERFLOW POLICY

Post Construction Monitoring Program

The last sentence in Finding 20 of the Tentative Order requires the Discharger "to continue the implementation of the nine minimum controls, properly operate and maintain the completed CSO controls in accordance with the operational plan, and implement the post-construction monitoring program." The City completed construction of CSO controls in January 1997 and to date has completed six years of post-construction monitoring. The last phrase of this sentence should be changed to read: "...to continue the implementation of the nine minimum controls, properly operate and maintain the completed CSO controls in accordance with the operational plan, and continue to implement the post-construction monitoring program, *e.g.*, CSO monitoring.

Issue 3: DISCHARGE PROHIBITIONS

Definition of Nuisance Conditions – Tentative Order, Section A. Discharge Prohibition 7

This prohibition states that "The discharge of waste shall not create a condition of pollution or nuisance as defined in the California Water Code." The City requests that this prohibition be limited to dry weather conditions. Combined sewer overflow discharges during wet weather periods may be perceived by the general public as the creation of nuisance conditions. Such discharges are a result of the system capacity exceeded by the volume of storm water flow. The City has no control over the volume of storm water that enters the system and has already implemented engineering strategies that comply with the Federal CSO Policy to control the release of floatable materials during a CSO event, *e.g.*, baffles.

Issue 4: SPECIAL STUDIES - SOFT

Tentative Order, Screening of Feasible Technologies (SOFT) Report, Section F. Provision 3.b.

There is no legally justifiable basis for requiring the City to address the SOFT report under the Oceanside NPDES Permit process. As written, this provision requires the City to develop a new master plan that incorporates priorities determined by the input of "interested stakeholders", regardless of their expertise on the issues. The City is responsible to all citizens of San Francisco, whether or not they consider themselves

interested stakeholders. Because the City is in the process of developing a comprehensive wastewater master plan, any reference to this program should ensure that no single entity is the controlling factor in the outcome. The following language can be used to replace Provision 3.b.

> "The Discharger is currently in the process of developing a new comprehensive wastewater master plan. The "Screening of Feasible Technologies" (SOFT), 2000 draft report should be finalized for use in the master plan process. The Discharger is encouraged to continue to work with interested stakeholders in the development of the master plan."

Fact Sheet, Section IV, Reassessment of Treated Overflows, 2nd paragraph (page 12 of 33), reference to SOFT report

The last sentence of the paragraph integrates the SOFT report into the City's pollution prevention program, which is incorrect. The sentence should read:

> "The City is currently initiating the development of a comprehensive wastewater master plan, and within that process will continue to evaluate the feasibility of implementing such options as those described in the SOFT report."

Issue 5: Tentative Order, Update Website Address

The San Francisco PUC website has been updated with a direct link to the shoreline bacteria page, Beaches and Bay Water Quality. Change the website address (http://www.sfwater.org) in the very last line of Section F. Provisions, Item 4. CSO Requirements, h. Notify the Public of Overflows to http://beaches.sfwater.org. (Note there is no www. included in this address.)

Issue 6: Tentative Order, CSO Study Section F.4.i.

Some of the language in this section is unclear. The City understands that one of the purposes of the CSO study is to evaluate historical CSO monitoring data as well as CSO monitoring data collected under this permit cycle to establish trends and better characterize CSO discharges, as discussed in Task B, items 1 and 2. The action discussed in Task B, item 3 is written circuitously and should be deleted after the parenthetical.

An additional component to the CSO study is to include monitoring to address recreational use observations. The second sentence in Task A is unnecessarily prescriptive and indicates that recreational use monitoring "will serve to track changes in uses over time". The general patterns of recreational use or changes in the general patterns of recreational use over time do not provide pertinent information on CSO impacts and should not be included as a task of this permit. Recreational use observations during or following a CSO event will provide information on the number of recreational users exposed to CSO discharges. The second sentence should be written:

> "The study shall propose monitoring, including follow-up monitoring to the Recreational Use Survey, to aid in the evaluation of CSO controls."

Issue 7: Document Clarifications

1) Tentative Order, Provision 7.c. – Ongoing Programs, Pretreatment Program: Change Attachment F to Attachment E, Appendix A.
2) Fact Sheet, Section III (page 5 of 33), paragraph 1, last sentence: For clarification, add "and discharged directly to the SWOO" after the word 'periods'

– "Flows receiving less than secondary treatment during wet weather periods and discharged directly to the SWOO are considered CSOs, but are not..."

3) Fact Sheet (page 15 of 33), Table 4, 2000: Delete bullet #4 "Permanent program for curbside pickup of used motor oil and latex paint." This item was incorrectly added to the year 2000 and is already correctly listed under the year 2001.

Other

Issue 1: Biosolid Management Practices – Tentative Order, Section E, Item 1.

The City currently re-uses all biosolids generated from the Oceanside wastewater treatment plant. Although the difference in definition between dispose and re-use may be subtle, that difference is important and distinct, and the City should be recognized for participating in a program that encourages recycling and re-use. The first sentence of Item 1, page 28 of 39 should be changed to read:

> "The Discharger presently re-uses all stabilized, dewatered sewage sludge (biosolids) from the Discharger's wastewater treatment plant beneficially at permitted sites."

Issue 2: Section F. Provisions. 10. Operation Plan Submittal

The Tentative Order currently reads on page 37 of 39:

> "The Discharger shall submit the Operation Plan by July 1, 2003, for approval by the Executive Officer."

Since the new Oceanside NPDES Permit will not be adopted until sometime after July 1, 2003, the designated date is incorrect. The Oceanside wastewater treatment plant Operations staff is currently using an approved Operations Plan that was submitted to the Board during the permit re-issuance process. Changes to the existing Operations Plan are submitted to the Board and Executive Officer at the time they are implemented. A complete Operations Plan is submitted prior to permit renewal for evaluation for the next permit cycle. In following with that process, this section should indicate the Operation Plan should be submitted by July 1, 2007, one year prior to permit expiration (assuming approval in July 2003).

Issue 3: Document Clarifications

1) Fact Sheet, List of Tables: Table 4 should be listed as "Pollution Prevention Program Highlights"; Table 5 is Effluent Quality. The Page Numbers for the Tables are as follows: Table 1 – Page 7; Table 2 – Page 8; Table 3 – Page 11; Table 4 – Page 13; Table 5 – Page 20.

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Comments on Dilution Modeling for the San Francisco Southwest Ocean Outfall

Prepared for:
City and County of San Francisco

June 12, 2003

1. INTRODUCTION

Dilutions for the San Francisco Southwest Ocean Outfall have recently been computed by mathematical models in support of the NPDES permit application. The computed dilutions are considerably higher than used in previous permits. The purpose of this report is to comment on the predictions and methods and procedures used in *Dilution Modeling for the San Francisco Southwest Ocean Outfall,* June 5, 2003, subsequently referred to as DM.

The outfall is governed by federal water quality regulations as set forth in *Ocean Discharge Criteria at 40 CFR 125.121(c).* These regulations specify a mixing zone, which is a limited area where initial dilution takes place and where numeric water quality criteria can be exceeded but acutely toxic conditions are prevented. The dilution factor must be met at the edge of the mixing zone, and depends on the dimensions of the mixing zone. The *Ocean Discharge Criteria at 40 CFR 125.121(c)* defines the mixing zone for federal waters as:

> The zone extending from the sea's surface to seabed and extending laterally to a distance of 100 meters in all directions from the discharge point(s) or to the boundary of the zone of initial dilution as calculated by a plume model approved by the director, whichever is greater...

It is assumed that the Criteria Continuous Concentration (CCC) water quality criteria are appropriate to protect the ecosystem from chronic effects and also to protect human health. Protection from chronic effects implies protection from average concentration levels of toxic materials, as opposed to transient levels, which may be much higher.

The federal regulations do not specify how the dilution calculations are to be done, so considerable judgment is necessary to decide which oceanographic conditions, density stratification, flow rates, and averaging times are used. It also does not define how dilution is defined. Finally, different mathematical models produce different results for similar input conditions.

Therefore, the major issues are how the regulations are interpreted, and the appropriateness of the mathematical models used. These issues are discussed below.

2. PREVIOUS WORK

In the previous NPDES permit, in 1990, the dilution factor was computed to be 76:1. This is a flux-averaged value based on simulations with the mathematical model UDKHDEN assuming zero current speed, a worst-case density profile, a flow of 25.6 mgd, and that only 12 risers were functioning. This value is lower even than predictions by the model ULINE, which is usually conservative. Since 1990 considerable advances have been made in understanding the mixing and dynamics of buoyant outfall plumes, and these earlier predictions are now archaic. In particular, considerable mixing and dilution occurs in the spreading layer after the plume reaches its terminal rise height. This mixing is not included in UDKHDEN (nor in the UM3 module of *Visual Plumes* used in DM), resulting

in considerable underestimation of dilution, particularly at low current speeds. The mixing in the spreading layer is included in ULINE, although this model has now been superseded by RSB (which was also used in DM).

There is other work available that would make the dilution calculations more credible, particularly the discussion of the dye tests and physical modeling of the outfall (Roberts and Wilson, 1990). Dilutions measured in the field dye study ranged from 182 to greater than 1000:1. In addition, physical modeling of the plumes was done in a large stratified towing tank to provide additional insight into the mixing processes. These tests were done as part of the physical modeling for the design of the Boston outfall. Recent field measurements on the Boston outfall (Roberts, et al., 2002) have provided strong confirmation of the validity of this physical modeling. The physical model study for the San Francisco outfall showed dilution increasing from about 200 to 985 as the current speed increased from zero to 25 cm/s. The dilution at 15 cm/s (the assumed speed for dilution calculations in DM) was 625. Good predictions of the dilutions were given by RSB.

Clearly, the dilution value of 76:1 used in the previous permit is unrealistically low. As pointed out in DM, the dilution depends strongly on current speed and stratification. Computation of a more realistic value depends on how the regulations are interpreted.

In DM, it was assumed that the average current speed can be used to compute dilution. The currents in the vicinity of the diffuser are strongly tidal. A typical frequency distribution of current speeds, obtained from a moored current meter in May 1987 is given in Table 1. The median speed is close to the average speed of 15 cm/s assumed in DM.

Table 1. Frequency Distribution of Currents Near Diffuser

Percentile	Speed (cm/s)
10	4.8
25	9.8
50	17.2
75	28.2
90	38.3

Some simulations were made using the model RSB. The effect of current speed on dilution is shown in Table 2. Conditions are similar to those assumed in DM, i.e. flow is 18 mgd, 12 risers operating. The worst-case density stratification profile (21 January 1976) was used. The dilution and the length of the near field increases considerably with current speed.

Table 2. Effect of Current Speed.

Current speed (cm/s)	Near-field dilution	Length of near field (m)
0.0	129	9.5
4.8	142	21.2
15.0	402	87.8

The use of the average current speed in computing dilution does not appear to be justified. On p. 12 of DM it is stated that:

> However, the current is never actually zero when it is slowest. Instead it moves in elliptical wave motion, so the average current of 15 cm/s is more realistic and also more appropriate for assessing chronic and long-term exposure.

While it is probably true that the current is never actually zero, the statement about waves is irrelevant as they are unrelated to currents. This does not justify use of the average speed. Also, the dilution averaged over all possible current speeds is not the same as the dilution computed at the average current speed. If the intent is to compute average concentrations of toxics, use of the *harmonic* dilution average would be more appropriate, i.e.

$$\bar{S} = \frac{1}{\frac{1}{n}\sum_{i=1}^{n}\frac{1}{S}} \qquad (1)$$

where S is the dilution at current speed u_n. Another possibility is to use dilution calculated at the 10-percentile current speed, as this value is allowed in the 301(h) regulations.

The flux-average dilution is used in DM. This apparently follows from the wording in the California Ocean Plan which specifies "...the lowest average initial dilution..." which is usually assumed to be a flux-averaged value. The flux average is difficult to measure in the field or laboratory, however, and the value computed in mathematical models such as UM3 depends on the assumptions made on the shapes of the velocity and concentration profiles. A more defensible and measurable value is the minimum dilution (similar to centerline dilution). The earlier models discussed above were conservative in not including additional mixing, and the minimum dilution predicted with newer models is often close to the flux-average dilution predicted with older models.

The regulations and DM also refer to a *Zone of Initial Dilution*. This is defined as the region where dilution is due to combined affects of the discharge buoyancy and momentum. Better terminology is to call this the near field. This is the region where dilution is due to turbulence and other processes associated with the discharge, as opposed

to the far field where dilution is due to ambient (oceanic) turbulence. The near field is also sometimes called the hydrodynamic mixing zone, as opposed to a regulatory mixing zone. The near field is exactly the output that is given by RSB.

Conclusions and Recommendations

The value of 76:1 used in the previous NPDES permit in 1990 is clearly unrealistically low. Which value to replace this with, however, depends on how the permit requirements are interpreted. It is essential that the final numbers be technically defensible with the assumptions clearly stated. The federal regulations allow sufficient flexibility in interpretation that a good case can be made for a higher dilution value. In particular:

- There does not seem to be any justification for using the average current speed to determine dilution;
- Use of the "worst-case" density profile is overly restrictive and gives an overly pessimistic prediction of dilution under typical conditions;
- A better approach would be to run the dilution model with time series of measured currents and stratifications to get good statistical pictures of dilution at the 100 m distance (Roberts, 1999). Then compute (harmonic) average dilutions and use the lowest value at the 100 m boundary as "the" dilution value;
- I would recommend using minimum dilution values rather than flux-average. Minimum dilutions are more easily measured in the laboratory and field and therefor ultimately more defensible;
- If the differences between the predictions of the various mathematical models becomes an important issue and better dilution predictions are required, physical modeling using modern methods with Laser-Induced Fluorescence could be used (Roberts, et al., 2002).

References

Roberts, P.J.W., and Wilson, D. (1990). "Field and Model Studies of Ocean Outfalls." *National Conference on Hydraulic Engineering*, San Diego, California, July 30-August 3.

Roberts, P. J. W., Hunt, C. D., and Mickelson, M. J. (2002). "Field and Model Studies of the Boston Outfall." *Second International Conference on Marine Waste Water Discharges, MWWD2002*, Istanbul, Turkey, September 16-20, 2002.

Roberts, P. J. W. (1999). "Modeling the Mamala Bay Plumes. I: Near Field." *J. Hydr. Eng., ASCE*, 125(6), 564-573.

Dilution Modeling for the San Francisco Southwest Ocean Outfall

Submitted by

City and County of San Francisco
Public Utilities Commission
Planning Bureau

Submitted to

U.S. Environmental Protection Agency
San Francisco

San Francisco Bay Regional Water Quality Control Board
Oakland

June 5, 2003

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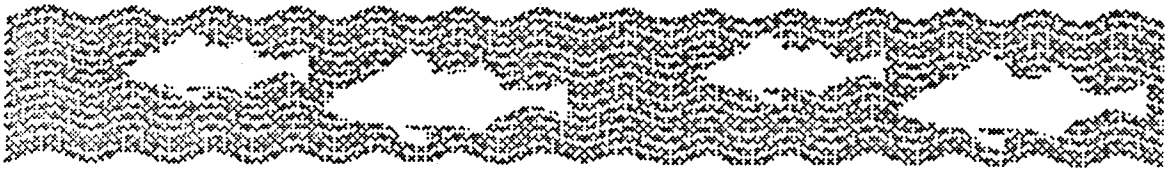

DRAFT

Dilution Modeling for the San Francisco Southwest Ocean Outfall

Summary

This report provides the results of the modeling program *Visual Plumes* used to determine the dilution characteristics of wastewater discharged through the Southwest Ocean Outfall (SWOO). The purpose is to identify a dilution factor to be used in the NPDES permit that regulates this discharge (NPDES No. CA 0037681). In federal waters, the regulatory dilution factor is defined as the dilution at the edge of a mixing zone extending laterally to a distance of 100 meters in all directions from the discharge point or the modeled zone of initial dilution, whichever is greater (see *40 CFR 125.121(c)*).

This effort uses an EPA program named *Visual Plumes*[1], specifically the *UM3* model within the program. Input to the model includes outfall and receiving water data. Although 21 risers are open on SWOO, visual inspection during dry weather indicates that only 12 are discharging effluent. Using the *UM3* model and average flow, the estimated dilution factors depending on various assumptions are the following:

Number of risers:	*12*	*21*
Option A – single port	**465:1**	**741:1**
Option B – double port	**870:1**	**896:1**

SWOO risers each have eight separate ports; however, the model can only address a single port per riser. Therefore, two simplified alternatives were modeled. Option A assumes a single theoretical port with a cross-sectional area adjusted to be the equivalent of the eight actual ports. Option B assumes two separated risers (in place of a single riser) spaced equidistant, each with one theoretical port equivalent to 4 actual ports. Both of these options likely underestimate the actual dilution provided by the eight separate ports per riser.

The discharge was also modeled using EPA's *NRField* model,[2] which yielded similar results.

We propose the factor of **465:1** [12 ports, option A] for regulatory purposes in assessing compliance with effluent limits and in completing the Reasonable Potential Analysis. In particular, the results will be used to evaluate compliance with the human health criteria which are based on long-term exposure, and therefore average discharge conditions. This factor would also be appropriate for evaluation of the criteria established for the protection from chronic effects. A separate factor, not addressed in this modeling effort, may be necessary for the evaluation of acute criteria.

The dilution factors calculated during this modeling effort appear to be similar or possibly conservative when compared with the actual dilution measured during a dye study. The measured

1 EPA's Visual Plumes, Experimental PVD Version by Walter Frick, Philip Roberts, Lorin Davis, Donald Baumgarter, Jennifer Keyes, and Kenwyn George.

2 *NRField* model is based on RSB and is contained within Visual Plumes.

dilution, averaged across all of the stations in the 100 m radius and not including non-detects, was **694:1**.

The following material describes in more detail the assumptions used in the modeling and related issues. *Attachment A – Model Results for Other Outfalls,* includes information on models completed for other large scale marine wastewater discharges in California and elsewhere.

Background

Southwest Ocean Outfall - The Southwest Ocean Outfall (SWOO) is 4.5 miles long. It carries the treated wastewater out to a diffuser system beginning approximately 3.75 miles from shore and at a depth of 78 feet (23.77 m). (See Figure 8 , page 16.) The end of the outfall consists of a diffuser section approximately 965 meters in length, with varying diameter (3.65, 3.05, 2.44m), with risers located every 11 meters. Twenty-one out of 85 risers are currently in operation to maintain port velocity because the present peak wet-weather flow through the outfall is only 38% of capacity[3]. Every other riser located along the outer 439 meters of the diffuser section is active. Each riser is constructed with eight discharge ports of diameter 0.1095 meters.[4]

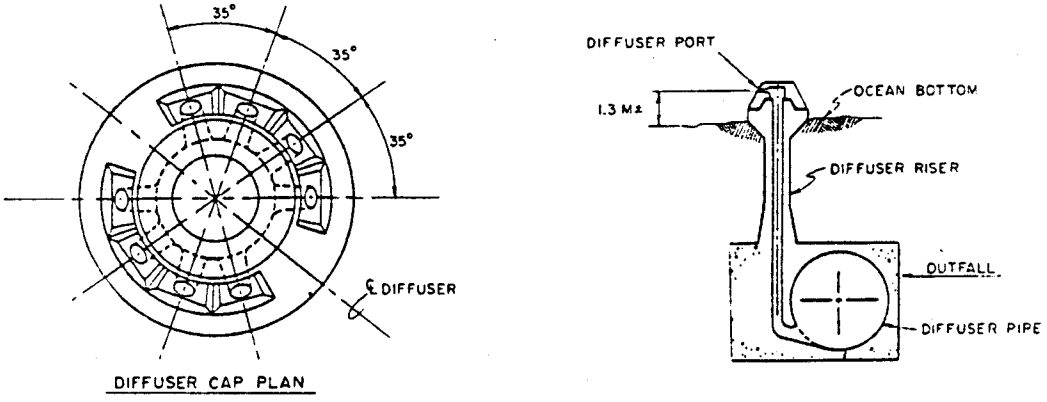

Figure 1 - Design drawing of outfall riser and diffuser port

San Francisco completed construction of the SWOO in 1986 and began discharging Richmond-Sunset plant effluent to federal waters via the new outfall in September 1986. After completion of the Oceanside Water Pollution Control Plant (WPCP) in 1993, the Richmond-Sunset plant was abandoned and eventually razed. The flow through the SWOO varies from the dry weather average of 18 MGD to a maximum wet weather rate of approximately 120 MGD[5].

The discharge location is in federal waters since it is beyond the three-mile limit of the state's territorial sea.

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3 Assuming maximum wet weather flow of 175 MGD and capacity of 465 MGD. The average dry weather flow is 18 MGD (4% of capacity).

4 The diffuser port dimensions are 3.60", 3.82", 4.04" and 4.31" for diffuser riser numbers D1-D15, D16-D28, D29-D50, and D51-D85, respectively. The odd number risers from D45 to D81 are open. For practical purposes, we can use 4.31" which is 0.1095 meter.

5 The maximum design capacity of the SWOO is approximately 465 MGD (or less depending on tide elevation). It was designed with this overall capacity to accept all dry and wet weather flows from the entire city.

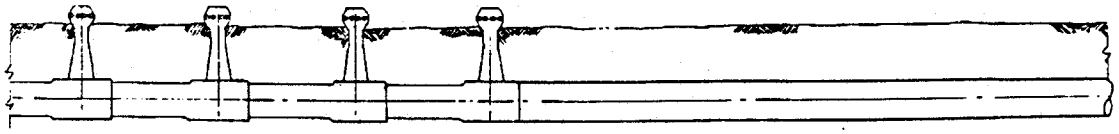

Figure 2 - Outfall schematic

Regulatory Mixing Zone for the SWOO Discharge

A *mixing zone* is a limited area where initial dilution of a discharge takes place and where numeric water quality criteria can be exceeded but acutely toxic conditions are prevented. A *regulatory mixing zone* is the specific mixing zone identified in state water quality standards or, in this case, by federal regulations. The dilution factor is dependent on the characteristics of the mixing zone.

The *Ocean Discharge Criteria* at *40 CFR 125.121(c)*[6] define a mixing zone for discharges to federal waters:

> The zone extending from the sea's surface to seabed and extending laterally to a distance of 100 meters in all directions from the discharge point(s) or to the boundary of the zone of initial dilution as calculated by a plume model approved by the director, whichever is greater...

For this effort, we determined the dilution levels at the edge of the Zone of Initial Dilution (ZID) and at the edge of the mixing zone, set at 100m.

If the ZID is determined by the model to be of a smaller radius than 100m, then the dilution at 100m will be composed of the initial dilution plus some additional "far-field" dilution. Far-field dilution is the mixing that takes place due to currents and wave action after momentum and buoyancy-induced mixing has ceased (neutral buoyancy).

The *Technical Support Document for Water Quality-based Toxics Control*[7] identifies three possible mixing zones and notes that independently established mixing zone specifications may apply to each. The smallest would be the acute mixing zone where the EPA Criteria Maximum Concentration (CMC) would apply at the boundary and the goal is to prevent lethality to passing organisms. A larger zone would apply the Criteria Continuous Concentration (CCC) with the goal of protecting the ecology of the waterbody as a whole. A third zone, using long-term average conditions, would apply to the human health criteria.

For this discharge the federal regulations only specify the 100m mixing zone (or greater if based on model). We have assumed that the dilution factor at 100 m would be applied to both the chronic (CCC[8]) and human health criteria. This follows EPA Region IX's approach in the draft permit for the Offshore Oil Platforms. For the SWOO discharge, the plume attains its maximum initial dilution within a few minutes and acute toxicity to passing organisms appears to not be an issue.

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6 Posted at http://www.epa.gov/owow/oceans/regulatory/criteriasubptm.html

7 EPA/505/2-90-001, March 1991.

8 Criterion Continuous Concentration (CCC) – Protective of chronic effects.

Mixing Zones Used for Other Discharges
Discharges into state ocean waters in California are governed by the provisions of the California Ocean Plan (COP). This plan specifies that the mixing zone is defined by the area of initial mixing and also assumes no current. For some California discharges into federal waters, the permitting agencies (EPA and the local Regional Board), have applied the COP mixing zone because these discharges operate with 301(h) waivers from the secondary treatment requirements of the Clean Water Act.[9]

Zone of Initial Dilution
The Zone of Initial Dilution is that area of a plume where dilution is achieved due to the combined effects of the effluent's momentum and buoyancy. The momentum is the result of the pressure in the outfall pipe and the shape of the port orifice. The buoyancy results from the temperature and density differential. The effluent is warmer than seawater and is essentially freshwater and therefore more buoyant than seawater. The ZID is defined differently for purposes of permits issued under section 301(h) of the Clean Water Act. Section 301(h) allows waivers from the standard requirement to provide secondary-level treatment for wastewater discharged from publicly owned treatment works (POTWs). For discharges with 301(h) waivers, the ZID is defined as a lateral distance around the outfall equal in length to the depth of the outfall.[10]

The Oceanside WPCP provides secondary treatment and the SWOO discharge does not operate under a 301(h) variance. For this reason, the ZID for SWOO is defined by the limits of the initial mixing induced by buoyancy and momentum. In our case, it will be defined by the distance from the diffuser at which the plume surfaces or ceases upward movement.

Other Regulatory Issues
Virtually all of San Francisco is served by a combined sewer system. To regulate the treatment plant's operation during wet weather, the NPDES discharge permit applies requirements from EPA's *Combined Sewer Overflow Control Policy*. One goal of the policy is to the maximum possible amount of this flow is directed to the treatment plant. Consequently, numerical effluent limits do not apply during wet weather, so this modeling effort uses dry weather average flows.

Model Assumptions

The following material describes the model that was used to determine the dilution factors and the assumptions that were used in the model. The model is used to determine both the zone of initial dilution (ZID), which is defined as the limit of dilution resulting from momentum and buoyancy, and the dilution expected at the 100m radius around the diffuser.

The Discussion makes reference to the document *Wastefield Transport and Bacteriological Compliance Studies of the San Francisco Ocean Outfall*, CH2M-Hill (1989). These references are identified in parentheses.

Selected Model
In order to predict the various levels of dilution of effluent released by the San Francisco Southwest Ocean Outfall, we used the Windows-based program *Visual Plumes*, Version 1.0,

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9 In order to receive a 301(h) waiver, the discharge must have applicable water quality standards and therefore the state standards have been "extended" into federal waters for these discharges since no federal standards have been promulgated for these waters.

10 See the EPA Office of Water *Amended Section 301(h) Technical Support Document*, III.A.2., http://www.epa.gov/OWOW/oceans/regs/sec301tech/3a.html

released in August 2001.[11] Within this program, we used the *UM3* model that is capable of modeling single as well as multiport systems. As a check on the *UM3* results, we also modeled the discharge using EPA's *NRField* model (also part of VP).

Outfall characteristics

The SWOO diffuser has 85 risers spaced at 10.97m intervals, but 64 of them have been capped leaving every other riser of the last 41 risers open (*Wastefield* 1-22). However, during dry weather, inspections indicate that only 12 of the risers are operational, the first 11 and the last one in the series (*Wastefield* 5-10). The depth of the ocean floor at the diffuser section is 23.77m (*Wastefield* 1-22). The eight ports on each riser have a diameter 0.1095 meters.

Diffuser Conditions

The port elevation is 1.3m (*Wastefield* 1-21). The ports are set at a vertical angle of 0° from the *x*-axis while we will set the horizontal angle or the direction in which it is pointing to 90°, which in *Visual Plumes*, indicates north (*Wastefield* 5-13) for the purposes of our modeling. In an effort to simplify the problem for modeling, we will assume that the 12 functioning risers are all equally spaced in a horizontal line 21.95 m apart. This will result in slightly lower dilution results than are actually present, and so the model is conservative.

Port Modeling Options

Each of the risers contains eight ports oriented around the risers in a circular fashion (see diagram on page 2). The *Wastefield Transport* report identifies four alternative options for modeling the diffuser section. However, we will only make use of two of them. In both our cases, we underestimate the total dilution factor:

Option A: We assume that all eight ports on each riser behave as one large port: 12 single ports spaced 21.95 m apart. In an effort to conserve the area of the ports, we multiply the original port diameter (0.1095 m) by a factor of 2.828 = sq rt 8. We then set the combined port diameter to 0.3097m (*Wastefield* 5-15).[12]

Option B: We divide the eight ports into groups of four (acting as a single port) that are oriented in opposite directions, and imagine that each set of four consolidated ports is on a separate riser. In this case, we would have 24 ports (rather than 12), spaced 10.98m apart with a port diameter of 0.219m (*Wastefield* 5-19).

Effluent Conditions

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11 This can be found on the EPA's website at: http://www.epa.gov/ceampubl/swater/vpulme/

12 *Wastefield* does not elaborate on how the equivalent port diameter was obtained. However, if we set the port areas equal and solve, we arrive at the following manner for determining combined port size that agrees with the *Wastefield* figures.

D_a = actual port diameter D_{eq} = combined port diameter P = # of ports combined
Area of actual ports = $\pi(D_a/2)^2$ Area of combined port = $\pi(D_{eq}/2)^2$
Therefore we set $P\pi(D_a/2)^2 = \pi(D_{eq}/2)^2 \Rightarrow PD_a^2 = D_{eq}^2 \Rightarrow D_{eq} = P^{1/2} D_a$

Therefore, we have $Diameter_{equiv} = Diameter_{actual} \times \#Ports^{1/2}$

Dave Jones (Technical Memo, 4/13/90) presents the equation as $Diameter_{equiv} = Diameter_{actual} \times \#Ports^{0.4}$. This approach decreases the combined port diameter, but increases the port velocity. The increase in port velocity causes the plume to surface further away with a somewhat higher dilution level, but at any given distance from the diffuser before the plume surfaces, offers a lower dilution level than an exponent of ½.

The depth of the ports is 22.80m (taking into account the height of the riser - *Wastefield Table* 5-3). We will also assume an average dry weather flow of 18 MGD.[13]

The effluent prior to discharge has a salinity of 0.2 ppt and an average temperature of 15°C (*Wastefield* Table 5-3). Since we are calculating the dilution of the effluent, we will set the pre-discharge effluent concentration at 100%.

Ambient (Receiving Water) Conditions.
The ambient conditions around the diffuser vary by tide and season.

Current: The ambient conditions around the diffuser vary depending on tide and season. Although the current speed can reach up to 40 cm/s in either direction, the average current speed is 15 cm/s perpendicular to the diffuser (*Wastefield* 1-13). The current direction will be 90° degrees, the program's method of indicating north. This is a more conservative estimate than south because we have oriented the port north as well (Option A) due to the simplicity of the model, although it technically points in eight different directions.

Salinity, Temperature, and Density Profile: Based on charts of the salinity during September and May (*Wastefield* figures 4-22, 23) the approximate salinity appears to be 32.5 ppt while ranging from 31.5 to 33.5 ppt. In addition, the approximate temperature of the seawater is 12° C (*Wastefield* figures 4-22, 23). We will also run this model in a linear mode since the ambient conditions are not near freezing nor exceptionally briny (*Visual Plumes Help Draft 2001*, pg 46). The model uses this information to calculate the density profile which should represent average conditions. This is appropriate since we are primarily interested in obtaining an average/long-term dilution factor for use with the human health criteria.

Other input: The background concentration and pollutant decay rate will be set at zero. The background concentration is not zero for a few constituents; however, the background value is taken into account in the equations used to calculate effluent limits or Reasonable Potential.

We will also take the Far-Field current speed and direction to be the same as the Near-Field current speed and direction.

We also use a conservative *Far-Field diffusion coefficient* as recommended by *Visual Plumes* of $0.0003 m^{0.67}/s^2$ (*Visual Plumes Help Draft,* 2001, pg 39). (The Offshore Oil Permit No.CAG280000 requires $0.000462 m^{0.67}/s^2$ although this difference is too small to significantly alter the calculated dilution factor.) The *Measurement* depths are set to 0m and 25m, a distance greater than the surface, which *Plumes* uses to extrapolate for every depth although the exact number is not very relevant.

Table 1: *Visual Plume* Modeling Input for San Francisco Ocean Outfall

Diffuser Inputs	***Port Diameter***	***Port Elevation***	***Vertical angle***	***Horizont. angle***	***Number of Ports***	***Port spacing***	
	0.3097 m	1.3 m	0°	90°	12	21.95 m	
Flow and Mixing Zone Inputs	***Acute mix zone***	***Chronic mix zone***	***Port depth***	***Effluent flow***	***Effluent salinity***	***Effluent temp***	***Effluent conc.***
	25 m (arbitrary)	100 m	22.80 m	18 MGD	0.2 psu	15°C	100%

13 Average quarterly flow was specified by EPA for the draft NPDES Permit No. CAG280000 for offshore oil platforms in federal waters.

Ambient Inputs	Near-Field current speed	Near-Field current direction	Ambient salinity	Ambient tempera-ture	Back-ground concentrat.	Pollut. decay rate	Far-field diffusion coeff.
	15 cm/s	90°	32.5 psu	12°C	0	0	0.0003

Special Settings
The Far-Field increment was set to 20m to ensure detailed output. This setting does not affect the dilution results, just the presentation. The contraction coefficient was set at 1.0, which is the default value for ports that narrow in the direction of the water flow, although a commonly accepted value of 0.61 for simple cylindrical holes in a pipe does not significantly change the results.

Effect of the Assumptions
The variety of assumptions that we have made are designed to result in conservative estimates of the average effluent dilution. The first key assumption was to imagine the ports are pointed with the flow of the current instead of against, the latter of which would increase mixing. Secondly, and perhaps more significant, we have tried to model the multiport risers as single ports in order to use *Visual Plumes*. The parameters in *Options A* and *B* are chosen to be as accurate as possible without overestimating the resulting mixing.

In addition, using the average current speed is a significant assumption. Using a lower speed means a much smaller zone of initial dilution because the plume surfaces much closer to the diffuser, while a greater speed results in significantly higher values for both since the plume surfaces much further away. Nonetheless, we presume that all of our assumptions together err on the side of caution and somewhat underestimate the actual average dilution levels.

Model Results and Dilution Graphs

After running the *Visual Plumes* model *UM3* it was determined that if we model the discharge of 18 MGD through 12 risers under *Option A*, the dilution at the edge of the ZID will be 464:1, while the dilution at 100m will be 465:1. The plumes will not merge, but reach a diameter of 15.2 m at the edge of the ZID. If we use the second *Option B*, the dilution at the edge of the ZID will be 869:1 while the dilution at 100m will be 870:1 and the plumes do merge with a diameter at the edge of the ZID of 16.8 m. Using the *NRField* model, similar results were found. The *NRField* model predicts a dilution of 497: 1 and 543:1 for *Options A* and *B* respectively at 100m.

Now if we were to assume that all 21 of the risers were functioning then with *Option A*, we have 21 ports with diameter 0.3097m, spaced 10.97 m apart, which results in a ZID dilution of 740:1, a 100m dilution of 741:1, and a plume diameter of 16.8 m. *Option B* results in 42 ports of diameter 0.219m separated by 5.49m. This results in a ZID dilution of 895:1, a 100m dilution of 896:1, and a plume diameter of 19.0 m. The plumes merge in both of the modeling options. The *NRField* model predicts a dilution of 452: 1 and 570:1 for *Options A* and *B* respectively at 100m, which is significantly lower.

On the other hand, if we assume a 22MGD effluent flow instead we end up with slightly lower dilution factors. The resulting ZID dilution was 377:1 while the 100m dilution was 378:1 with *Option A*, but 713:1 and 714:1 respectively using modeling *Option B*. And, like our 18 MGD flow, the plumes of diameter 14.9 m from the *Option A* model do not merge while those of diameter 17.1 m from the *Option B* model do. The *NRField* model predicts a dilution of 414: 1 and 452:1 for *Options A* and *B* respectively at 100m, similar to the *UM3* results.

Table 2:

Dilution Summary	18 MGD 12 Risers		18 MGD 21 Risers		22 MGD 12 Risers	
	ZID	***100 m***	***ZID***	***100 m***	***ZID***	***100 m***
Option A	464:1 at 24.15m	465:1	740:1 at 28.19m	741:1	377:1 at 23.3m	378:1
Option B	869:1 at 31.56m	870:1	895:1 at 32.17 m	896:1	713:1 at 29.74 m	714:1

It is important to "note that the far-field algorithm causes very little additional dilution between the end of the initial dilution distance and the 100m mixing zone" – Walter Frick, EPA, (Personal Communication).

The model also provides the time of travel from the point of discharge to the edge of the zone of initial dilution for edge of the 100m mixing zone. Using the *Option A* model (18 MGD of effluent discharged from 12 risers), we have an zone of initial dilution of 24.15 m. The time of travel to the edge of the zone of initial dilution (24.15 m) is two minutes and 40 seconds.

The following graphs show the results of the model for differing assumptions.

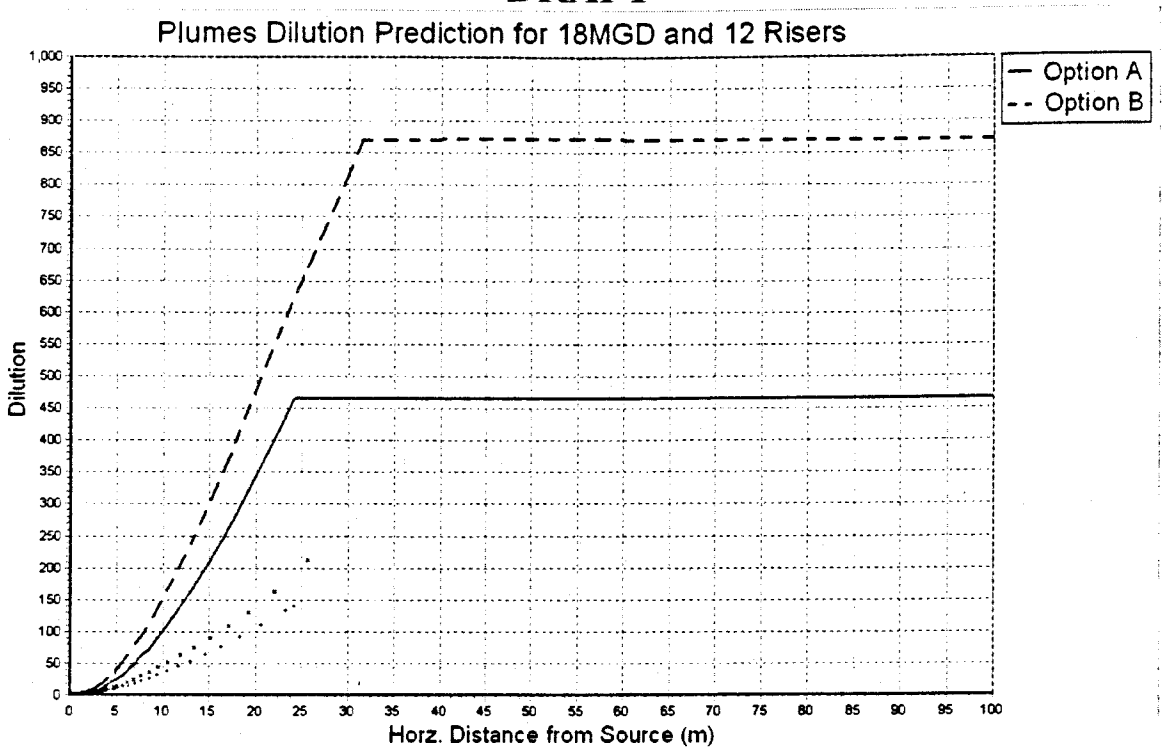

Figure 3: This is a prediction of dilution as a function of distance for 18 MGD effluent flow using *UM3*. *Option A*, combining eight ports per riser into one port resulting in 12 ports, is represented by the red line. *Option B*, combining only four ports together resulting in 24 ports, is represented by the blue dotted line.

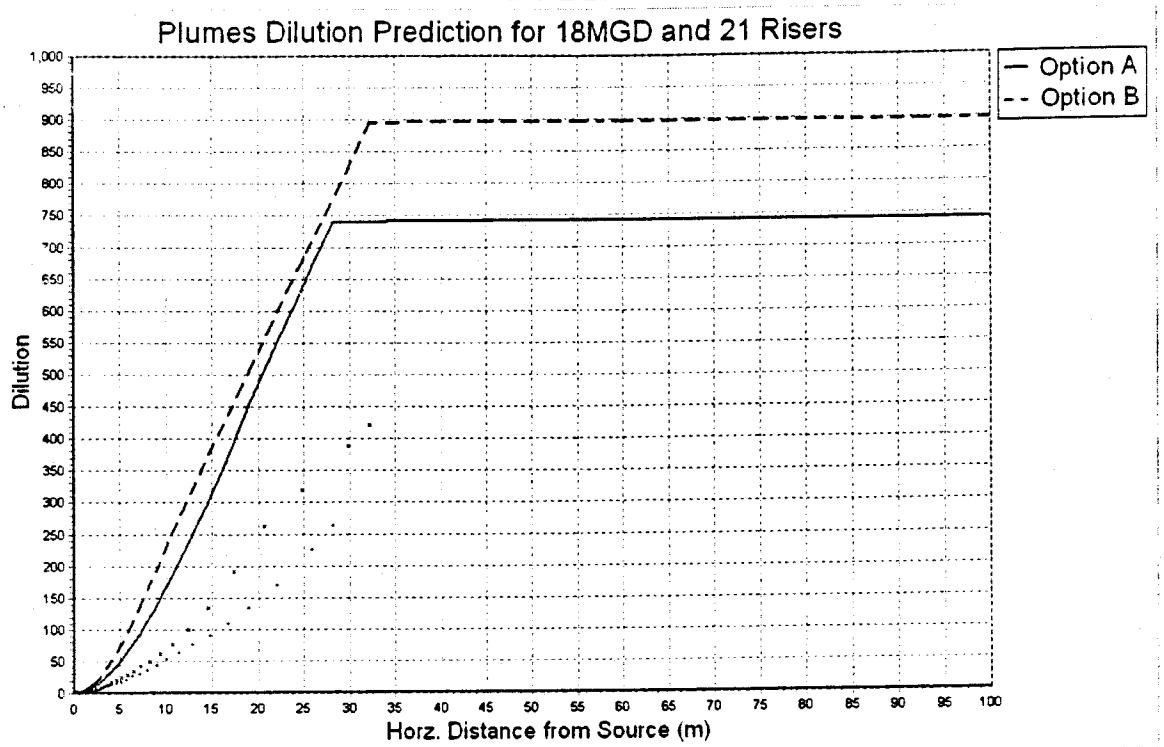

Figure 4: This is a prediction of dilution as a function of distance for 18MGD effluent flow, but with 21 open risers using *UM3*. *Option A*, combining the eight ports per riser into one port resulting in 21 ports, is represented by the red line. *Option B*, combining only four ports together resulting in 42 ports, is represented by the blue dotted line.

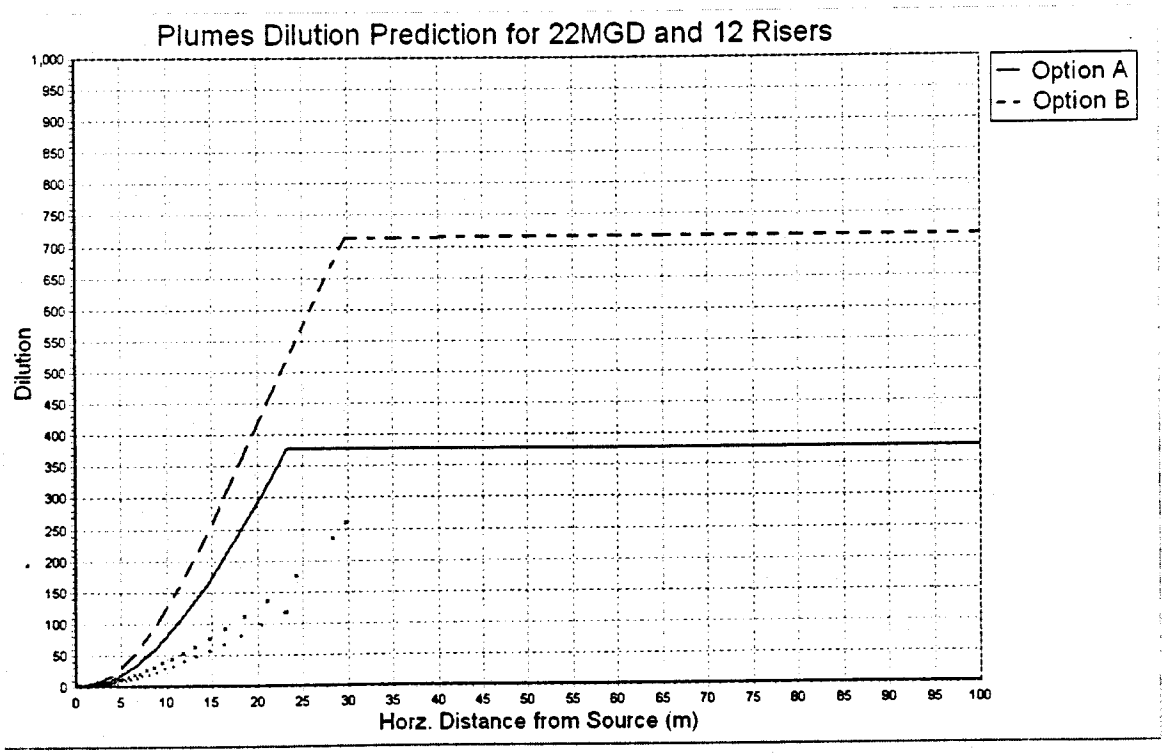

Figure 5: This is a prediction of dilution as a function of distance for 22 MGD effluent flow using *UM3*. *Option A*, combining eight ports per riser into one port resulting in 12 ports, is represented by the red line. *Option B*, combining only four ports together resulting in 24 ports, is represented by the blue dotted line.

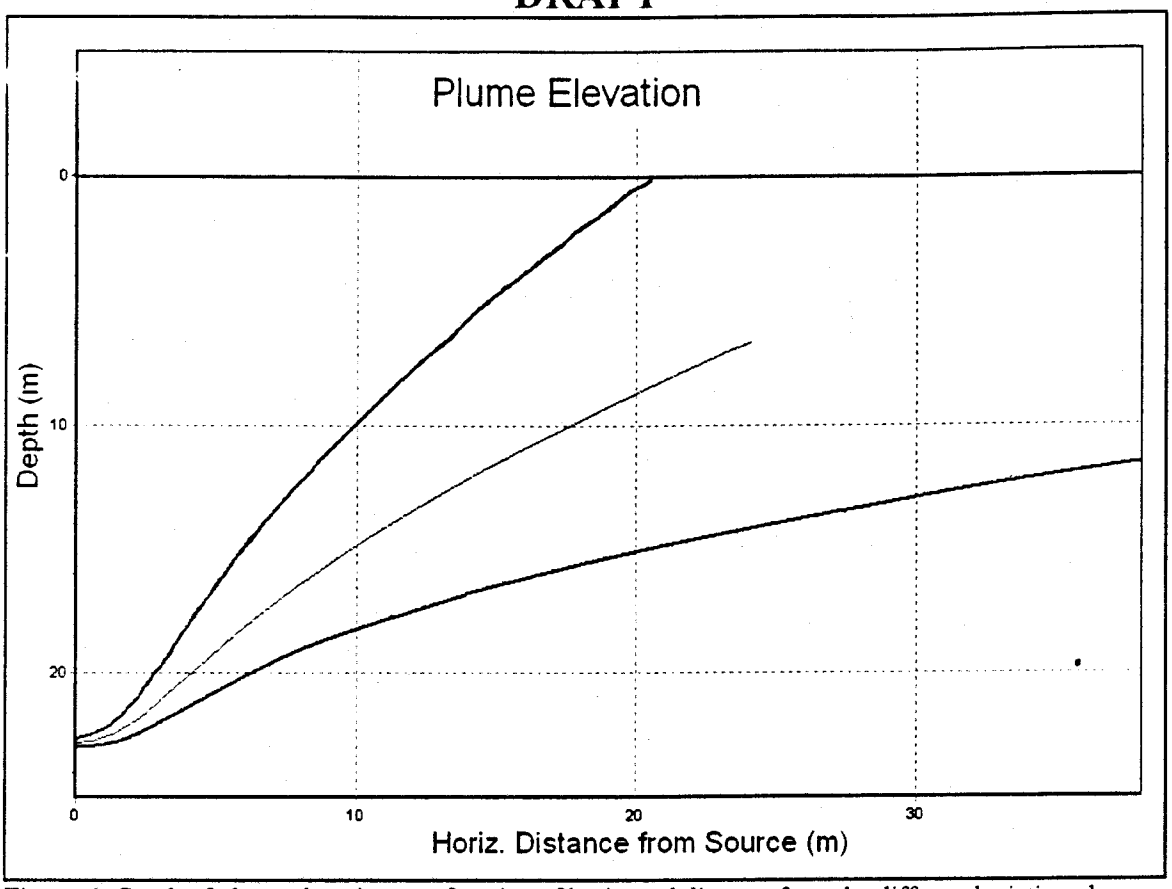

Figure 6: Graph of plume elevation as a function of horizontal distance from the diffuser depicting plume centerline as well as boundaries for an 18 MGD discharge from 12 risers.

Discussion

It would appear that the model results for *Option A* are more reliable and we have greater agreement between the *UM3* and *NRField* for that option as well. Therefore, the ratio of **465:1** for the SWOO average dilution level seems reasonable for use with the human health and chronic criteria.

At first, these dilution levels seem high since other coastal modeling efforts yielded lower estimates. One cause of this difference is the speed of the current. At this location current conditions regularly range from zero to 40 cm/s. If we were to run our models at zero current, then we would get the much lower dilution level of **98:1** assuming 18 MGD flowing through 12 risers. As we would expect, a current of 40 cm/s yields a dilution of **1573:1** since the plume does not surface for 101m. This range corresponds well with the dye studies whose results ranged from 100:1 to undetectable levels in the zone of initial dilution.

It is also important to note that the Southwest Ocean Outfall has a very low average flow of 18 MGD during dry weather, even though it has a 200MGD capacity (465 with all risers open). In comparison, San Diego's Outfall handles 205 MGD and has lower average current speeds. This is somewhat offset by the greater depth of 61-67 m of their diffuser and greater number of ports. These factors in combination result in an initial dilution level of **204:1**[14] (this may be based on a no-current assumption). The Orange County Sanitation District Outfall has similar conditions to San Diego in that it too has a depth of 60 m, a flow rate of 395 MGD, and a greater number of ports.[15] The resulting mean initial dilution is **341:1**, but the range of **119:1** to **2411:1** is similar to San Francisco's current-dependant range. (*Note*: Both San Diego and Orange County received 301(h) waivers from secondary treatment and were therefore required to apply state standards, including the Ocean Plan's no-current assumption for minimum dilution.)

The mixing zone approach assumes that chronic (or long-term criteria) will be attained at the edge of the calculated or measured mixing zone. It is also important that the concentrations *within* the mixing zone not create a condition to toxicity. The EPA's acute criteria (CMC) are based on the assumption of a brief exposure and are higher than the chronic criteria. Working from the *Option A* model (18 MGD of effluent discharged from 12 risers), we have a zone of initial dilution of 24.15 m. Fish will generally avoid the plume because it is freshwater. However, diatoms and other free-floating organisms may become entrained within the plume. Assuming the average current speed of 15 m/s, a marine organism floating in the plume at its greatest length would be in a zone that has less than the regulatory dilution factor (**465:1**) for two minutes and 40 seconds. This is a very brief exposure period.

Comparison with Dye Studies

Dye studies of the effluent conducted in 1988 indicated that the minimum dilution is at least 100:1 and generally exceeds 200:1 within 100m of the diffuser. However, that low value was measured only two meters south of the diffuser at a depth of 16.7 m – clearly very close to the diffuser – and at a relatively slow current speed of 9 m/s. Nevertheless, in many cases researchers were unable to detect any dye above background levels at their stations. According to the *Wastefield* report, dilutions generally ranged from 250 to 500 during the two dye studies

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14 Fact Sheet for the NPDES Permit for the E.W. Blom Point Loma Metropolitan Wastewater Treatment Plant Discharge to the Pacific Ocean through the Point Loma Ocean Outfall, San Diego County

15 NPDES Permit Application, Orange County Sanitation District, December 2, 2002, Appendix M – Initial Dilution.

conducted in Oct. '87 and Jun. '88.[16] The minimum dilution measured, averaged across all of the stations in the 100 m radius and not including non-detects, was **694:1**. It is also important to note that these are minimum dilutions, and are therefore conservative. Our modeled dilution levels for *Option A* fit nicely with this range. We also note that emphasis was placed on determining the minimum dilution at each station rather than on average dilution so the dye studies yielded conservative estimates in that regard.[17] It is very difficult to measure the concentration of tracer material over the cross section of the plume since it varies widely.[18]

The following figure summarizes the results of the dye studies for the zone of initial dilution and the 150m zone from the diffuser.

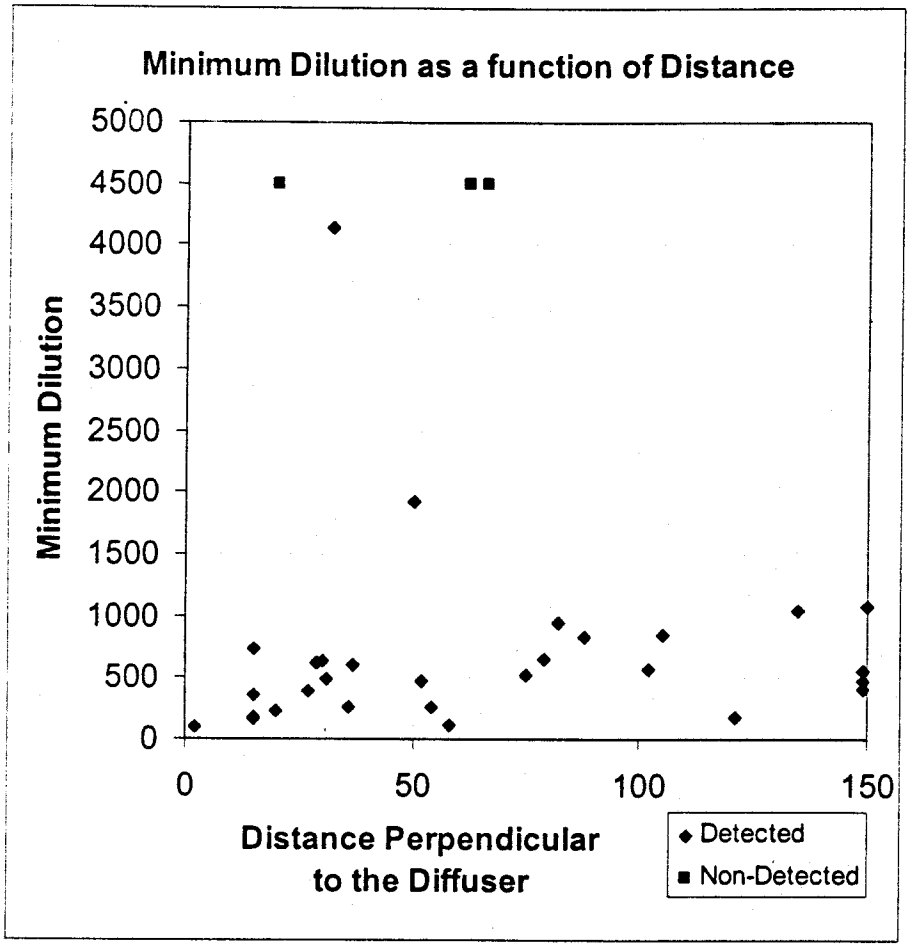

Figure 7: This figure demonstrates the Minimum Dilution as a function of Distance Perpendicular to the Diffuser in both the Oct. 1987 and Jun. 1988. Dye studies in the immediate area of the SWOO.

Previous San Francisco Modeling

In 1990, San Francisco applied the UDKHDEN model to the discharge. Assuming no current, the model result was **76:1** for initial dilution. In addition, the effluent flow level was set at 25.6 MGD instead of 18 MGD. Both of these assumptions have great effect on the resulting dilution

16 *Wastefield* 5-4

17 *Wastefield* 5-37

18 *Wastefield* 5-38

level. Running the *UM3* model from the more recently developed *Visual Plumes* results in a **83:1** dilution at the edge of the zone of initial dilution using these same restrictive assumptions (i.e., 25.6 MGD, no current). This is very close to the **76:1** determined with UDKHDEN. However, the current is never actually zero when it is slowest. Instead it moves in elliptical wave motion, so the average current of 15cm/s is more realistic and also more appropriate for assessing chronic and long-term exposure.

San Francisco originally applied for a 301(h) waiver and therefore may have been using the more restrictive mixing zone assumptions required for 301(h) permits. In addition, the UDKHDEN may have problems addressing buoyancy. EPA noted in the Fact Sheet for the Offshore OCS dischargers:[19]

> The Southern California OCS discharges are mostly buoyant for several reasons. It is a combination of temperature and salinity differences that produce large density differences, or buoyancy. However, the low Froude numbers also reflect discharges that combine large diameter discharge pipes with low flow rates. All these parameters are well-modeled by PLUMES-UM, as has been demonstrated in numerous verification studies. In contrast, some models are unable to predict these discharges for various reasons, including numerical limitations. For example, the UDKHDEN model has a numerical scheme that fails to converge at low Froude numbers. This non-convergence is a mathematical artifact that limits neither nature nor PLUMES-UM. This is an important reason to use PLUMES-UM. Other reasons include a combination of factors such as the depth of the discharges compared to the ocean depth, the complex water temperature stratifications, and a higher level of ambient ocean turbulence.

Orange County Comparison – Dilution factors

As an assessment of whether the effort to model the SWOO discharge is being approached in a similar manner to that used for other coastal dischargers, we modeled the Orange County discharge. This discharge was chosen because a significant portion of the relevant input documentation was readily available.

Table 3: Visual Plume Modeling Input for Orange County

Diffuser Inputs	**Port Diameter**	**Port Elevation**	**Vertical angle**	**Hor angle**	**Num of Ports**	**Port spacing**	
	0.09 m	0.1 m	0°	7 surv-deg	503	3.64 m	
Flow and Mixing Zone Inputs	**Acute mix zone**	**Chronic mix zone**	**Port depth**	**Effluent flow**	**Effluent density**	**Effluent temp.**	**Effluent conc.**
	25 m	100 m	54.6 m	**17.3 m^3/s**	997.2 kg/m^3	26.9°C	100%
Ambient Inputs	**Near-field current speed**	**Near-field current dir.**	**Ambient density**	**Ambient temp.**	**Back-ground concentra-tion**	**Pollutant decay rate**	**Far-field diffusion coeff.**
	7 cm/s	**7°**	1025.8 kg/m^3	**11.3°C**	0	0	**0.0003**

Table 3 Note: The numbers in bold were are unclear from the permit application and had to be estimated

19 Fact Sheet, Page 27, posted at: http://www.epa.gov/region9/water/npdes/factsheet1.pdf

By reviewing the NPDES Permit Application, Orange County Sanitation District, December 2, 2002. *Appendix M – Initial Dilution*, we were able to collect most of the relevant data to run our own simulation. However, several estimates had to be made. Orange Co. ran *Visual Plumes* for many different conditions of measured flow, current, and temperature. Since those individual measurements were not presented, we could only make estimate the general conditions. After evaluating the figures presented for current speed and averaging the temperatures presented over 12 months we assumed a current speed of 7 cm/s and an ambient temperature of 11.3°C. The Far-Field diffusion coefficient was left the same and the current was set in the same direction as the ports. The effluent flow was set at 17.3 m^3/s although several figures were presented. Using the *RSB* model, we calculated a dilution of **361:1** at 100 m. This is very close to the dilution that Orange Co. arrived at of **341:1**. This difference can be attributed to our rough estimate of the ambient conditions. However, the similarity between the figures indicates that the SWOO dilution levels were calculated in a similar manner to that used by Orange Co.

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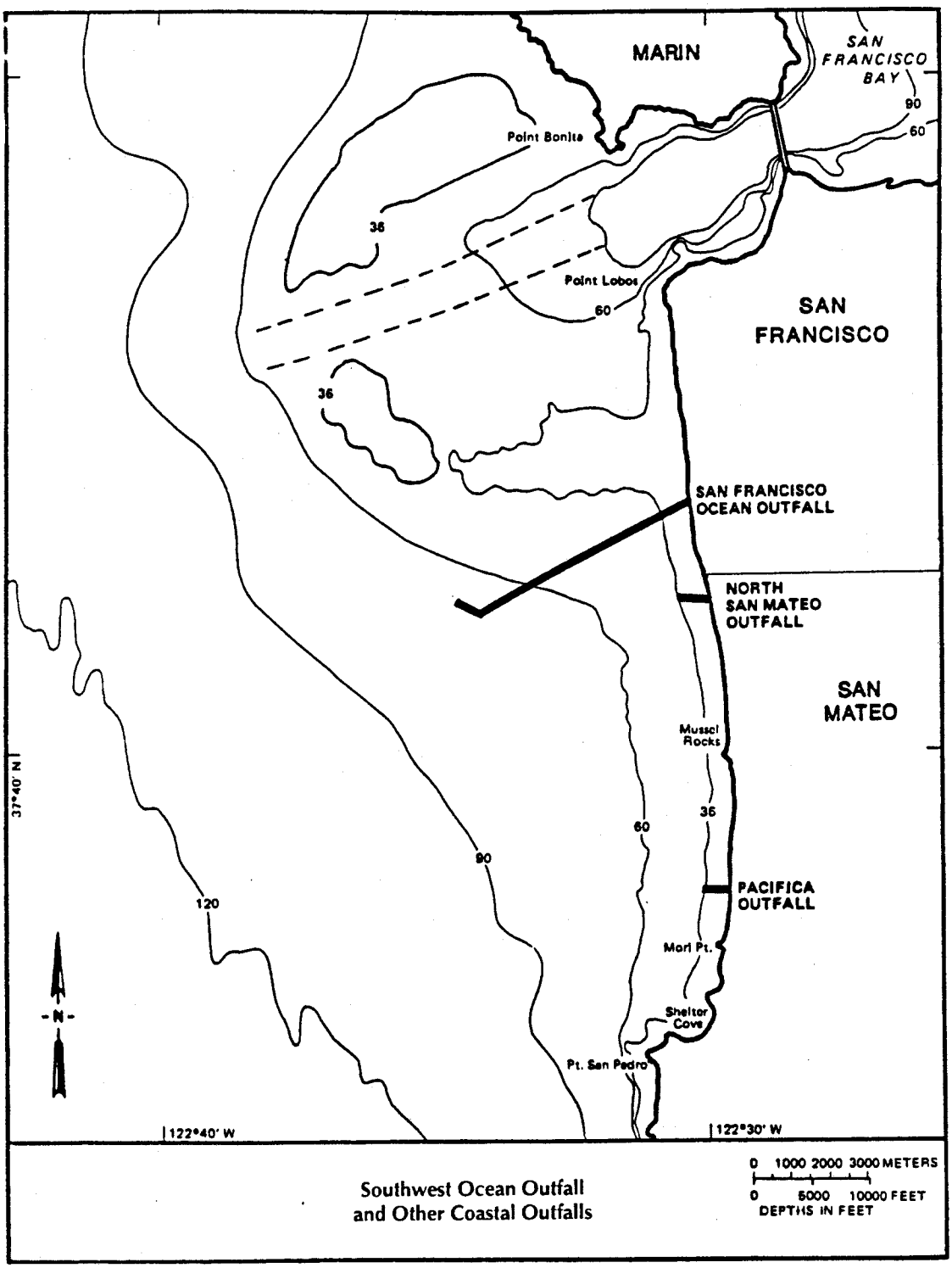
Map of San Francisco Southwest Ocean Outfall – *Fig. 8*



Southwest Ocean Outfall
and Other Coastal Outfalls

Attachment 1

Determination of Technology-Based Requirements

DETERMINATION OF TECHNOLOGY-BASED REQUIREMENTS FOR NPDES PERMIT NO. CA0037681: WESTSIDE WET-WEATHER FACILITIES AND SOUTHWEST OCEAN OUTFALL, CITY AND COUNTY OF SAN FRANCISCO.

The Clean Water Act (CWA) established the National Pollutant Discharge Elimination System (NPDES) permit program to regulate all point source discharges to the nation's waters. All dischargers must comply with two sets of requirements: (1) technology-based minimum requirements that apply to all dischargers of a specified class or (2) more stringent effluent limits, if necessary, to meet local water quality standards (WQSs). (CWA, Section 301(b)). Thus, effluent discharge permit limitations are either technology-based or water quality based. The technology-based requirements for non-POTW discharges (such as Combined Sewer Overflows[1] (CSOs)) must reflect:

1. *Best Practicable Control Technology Currently Available (BPT)*: The basic control level that all discharges (other than POTWs) must attain. BPT was the initial technology-based control level required by the CWA and usually reflected the average of the best existing performance in a category. This treatment level is determined first and then used in calculating the following two control levels, which may be more stringent.

2. *Best Conventional Pollutant Control Technology (BCT)*: Treatment that may be applied in addition to BPT for removal of conventional pollutants such as suspended solids, biochemical oxygen demand, oil and grease, pH, and coliform bacteria.

3. *Best Available Technology Economically Achievable (BAT)*: Treatment that may be applied in addition to BPT for removal of toxic pollutants and other non-toxic, non-conventional pollutants such as floatables.

EPA establishes some technology-based requirements by issuing industry-wide effluent guidelines. For CSOs, no effluent guidelines have been promulgated for BPT, BCT, or BAT. The permit writer must therefore use Best Professional Judgement (BPJ) to determine the level of treatment that BPT, BCT and BAT represent and must establish limits to ensure these levels of treatment.

The San Francisco CSO control and treatment program includes a combination of containment and treatment facilities in addition to non-structural controls. (See fact sheet for Westside permit and Section II.A.ii of this permit for a detailed description of San Francisco's Westside CSO facilities). There are also a number of discharge locations. The technology-based controls (BPT, BCT, BAT) are applicable to the following elements of San Francisco's Westside Combined Sewer System as follows:

Oceanside Water Pollution Control Plant
The Oceanside Water Pollution Control Plant (Oceanside WPCP) is a Publicly Owned Treatment Works (POTW) recently brought on-line to replace an outmoded secondary treatment facility. All flows directed to this POTW must receive treatment to the secondary standards identified in the regulations (40 CFR 133) (except for flows which meet the definition of an authorized "bypass" as discussed in Section I.4 below). The BPT/BCT/BAT analysis is therefore not applicable to the discharge from the Oceanside WPCP since the secondary standards establish the technology-based treatment requirements.

Flow-through Treatment in the Storage/Transports with Discharge to the Southwest Ocean Outfall ("Decant")
The wastewater from the storage/transports discharged directly (after flow-through treatment) to the Southwest Ocean Outfall (SWOO) does not enter the Oceanside Water Pollution Control Plant, and,

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[1] CSO is defined under Section I.A. of EPA's 1994 CSO Control Policy as " the discharge from a combined sewer system (CSS) at a point prior to the Publicly Owned Treatment Works (POTW) treatment plant." A CSS is defined as "A wastewater collection system owned by a State or municipality which conveys sanitary wastewater (domestic, commercial, and industrial wastewater) and storm water through a single pipe system to a POTW treatment plant."

therefore, is not subject to secondary treatment requirements. See In the Matter of City & County of San Francisco, NPDES Appeal No. 91-18. Instead, this discharge must meet BPT/BAT/BCT-based limits established using BPJ. This discharge is defined as a Combined Sewer Overflow (CSO).

Flow-through Treatment in the Storage/Transports with Discharge to the Shoreline
This wastewater discharged from the storage/transports (after flow-through treatment) to the shoreline also does not enter the Oceanside Treatment Plant, and, therefore, is not subject to secondary treatment requirements. Instead, this discharge must meet BPT/BCT/BAT-based limits established using BPJ. This discharge is also defined as a CSO.

Summary of Analysis:
In Section I of this document, the U.S. Environmental Protection Agency (EPA) Region IX examines the nine minimum controls established in the 1994 CSO Policy. EPA concludes that these measures are a cost-effective means for achieving effluent reductions of both conventional and non-conventional pollutants. EPA also concludes that implementation of these measures is consistent with the treatment processes and engineering systems employed by San Francisco and would result in no deleterious non-water quality environmental impacts. Therefore, these measures pass the BPT/BCT/BAT cost test. The NPDES permit for CSO discharges from the Southwest Ocean Outfall therefore establish the nine minimum controls as technology-based requirements and will contain provisions to ensure compliance with these controls.

In Section II of this document, EPA performs a BPJ analysis for the City of San Francisco's Combined Sewer System discharge from the Southwest Ocean Outfall and concludes:

a. The system currently in place provides effluent reduction at a cost in excess of that which would be required by BPT/BCT/BAT; and

b. No additional treatment facilities can be justified on a BPT/BCT/BAT cost basis.

The NPDES permit for Westside CSO discharges to be issued jointly by EPA and the Regional Water Quality Control Board (the Board or RWQCB) will include requirements to ensure proper operation of the existing CSO facilities. This will provide treatment in excess of that which would be required based on BPT/BCT/BAT requirements. This analysis also provides EPA Region IX's reconsideration of whether effluent limitations based on increased storage of wet weather flows can be justified on a BAT or BCT basis. EPA Region IX proposed to carry out this analysis when it withdrew portions of the previous NPDES permit.

In conclusion, by including requirements in the draft NPDES permit to ensure the continued implementation of the nine measures outlined in the CSO Policy and to require proper operation of the existing CSO facilities, EPA has established the technology-based requirements mandated by the Clean Water Act.

I. Establishment of the Nine Minimum Controls as Minimum BCT/BAT Requirements:

EPA adopted a CSO Policy which provides guidance to the permit writer. 59 Fed. Reg. 18688 (April 19, 1994). This CSO Policy was developed with extensive input from key stakeholders including representatives from States, environmental groups, and municipal organizations. The policy establishes a consistent approach for controlling discharges from CSOs to the Nation's waters through the NPDES program. The nine minimum controls outlined in the CSO Policy were developed after extensive review of existing CSO control systems, the cost of the controls and the effectiveness of the technologies. Though the CSO Policy has not been promulgated as a federal regulation, the nine minimum controls are often established as BAT/BCT requirements. This approach is consistent

with EPA's 1994 CSO Policy, which states (Section IV. Expectations for Permitting Authorities):

> *All permits for CSO discharges should require the nine minimum controls as a minimum best available technology economically achievable and best conventional technology (BAT/BCT) established on a best professional judgment (BPJ) basis by the permitting authority (40 CFR Section 125.3).*

These nine measurements are as follows:
1. Proper operation and regular maintenance
2. Maximum use of the collection system for storage
3. Review and modification of pretreatment programs
4. Maximization of flow to the POTW for treatment
5. Prohibition of dry weather overflows
6. Control of solid and floatable materials in CSO discharges
7. Pollution prevention programs
8. Public notification
9. Monitoring

Thus, pursuant to the Policy, these nine minimum controls will constitute the *minimum* technology as required by Section 301(b)(2) of the Clean Water Act. The EPA and Board staff, based on their best professional judgment, have determined that these controls can be appropriately applied to the discharger. Furthermore, an evaluation of the City's consistency with the nine minimum control technologies shows that the City has met or exceeded each technology.

The following text describes how San Francisco has implemented each of the nine control technologies and describes the permit conditions that ensure future consistency with these objectives. Finally, each control is identified as a BCT control (for the removal of conventional pollutants) and/or at BAT control (for the removal of toxic and/or non-conventionals including floatables. (See Part II for a more detailed discussion of BPT, BCT, and BAT).

1. *Proper Operation and Regular Maintenance:* Proper operation and maintenance of Combined Sewer Systems (CSSs) decreases pollutant loadings that occur during wet-weather events. Solids can settle out of the sewage and collect in the large combined sewers during dry-weather periods; these solids can become remobilized and flushed from the combined system by the first storm, or the so-called "first flush" phenomenon. San Francisco's hilly topography minimizes the amount of sewage solids that settle out of the wastewater. Sewer system inspection and maintenance ensures that breaks and blockages do not occur when the system is fully charged, as it is during storm events. Operation and maintenance of the City's CSS fall within the purview of three bureaus within the City's Department of Public Works: the Bureau of Street and Sewer Repair, the Bureau of Water Pollution Control, and the Bureau of Engineering. The City has an aggressive program of sewer system maintenance, including cleaning sewer pipes and catch basins, repairing main and side sewers, relieving flooded catch basins and plugged main sewers, and investigating public requests. The City also has a program whereby television cameras are routed through sewer lines to visually inspect lines for breaks, illegal connections, etc.

   Operation and maintenance procedures for the City's Westside Facilities are described in the City's Westside Operation Plan[1]. The system allows for combined flows to be routed first to the Oceanside Water Pollution Control Plant or stored in the Westside Transport for later treatment; decanted discharge can also be pumped to the Southwest Ocean Outfall for ocean disposal. Only after these steps have been taken are overflows of decanted combined effluent discharged to the near-shore waters. Procedures described in the Operation Plan ensure that the system operates as it was designed and constructed.

The draft NPDES permit requires that the City review and update its Operations and Maintenance Manual annually. This manual is subject to the review and approval of EPA. This requirement represents both a BCT and BAT control because it results in the removal of conventional, toxic and non-conventional pollutants.

2. *Maximum Use of the Collection System for Storage:* This requirement refers to the use of existing sewers to hold a portion of surplus flows during storm events. To the extent allowed by existing facilities, this has always been San Francisco's policy. The City's hilly terrain, however, previously limited the ability of the sewer system to store flows. The storage/transport construction program has increased the citywide storage capacity of existing sewers to an estimated 23 MG[2].

   The Westside facilities provide for the temporary storage of about 70 MG of combined flows that exceed the treatment plant capacity[3]. This amount of storage is sufficient to hold all runoff from a rainfall event of approximately 0.52 inches. Stored wastewater is treated after the storm flow subsides. Only after the storage facilities are filled to capacity and the treatment plants are operating at full capacity does an overflow to the beach occur. The storage in both the sewers themselves and the system as a whole is therefore maximized before an overflow event occurs. However, it should be noted that the storage/transport facilities were constructed as necessary components of the Master Plan to meet water quality standards. The increased storage of 23 MGD in the existing sewers is an incidental benefit. Minimum technology #2 refers to sewer system storage rather than the large volume storage provided by the storage/transports.

   Since the maximization of collection system for storage is inherent in the design of these facilities, no NPDES permit condition is necessary to ensure future consistency with this provision other than the standard NPDES permit conditions requiring proper operation and maintenance and prohibiting unnecessary bypass of treatment facilities. The maximization of the collection system for storage represents both a BCT and BAT control because it results in the removal of conventional, toxic and non-conventional pollutants.

3. *Review and Modification of Pretreatment Requirements:* Pretreatment programs limit the amount of toxic pollutants discharged to the sewer system from industries and related sources. San Francisco has an approved and fully functioning Industrial Waste Pretreatment Program, including the establishment of Local Limits for several pollutants[4]. Although San Francisco has relatively few industrial sources (particularly on the Westside), the City has an ongoing effort to identify industrial and other pollutant sources and reduce the loading of toxic pollutants and other pollutants of concern. This program, administered by the City's Bureau of Environmental Regulation and Management (BERM), includes enforcement inspections, pretreatment monitoring, collection system monitoring, and permitting of Significant Industrial Users (SIUs).

   The main dischargers of toxic pollutants to the Westside system are hospitals and other medical facilities, with lesser amounts contributed by laundry, photographic, and car wash facilities[5]. Laboratory analysis indicates the presence of copper, lead, mercury, nickel, silver, zinc, and PAHs in wet-weather effluent from the Richmond-Sunset Water Pollution Control Plant (RSWPCP)[6]. Most of these pollutants are believed to originate from motor vehicles and would therefore be unaffected by pretreatment programs.

   The draft NPDES permit requires the implementation, review and modification of pretreatment requirements. This requirement represents a BAT control because it results primarily in the removal of toxic pollutants.

4. *Maximization of Flow to the POTW for Treatment:* This requirement refers to operating treatment plants at maximum capacity during storm events. This requirement has always been

San Francisco's policy. The City's system has been designed and constructed to maximize flows to the Oceanside Water Pollution Control Plant. The Oceanside WPCP recently replaced the RSWPCP, constructed in 1938, which provided a maximum of 45 million gallons per day (MGD) of primary treatment capacity[7]. The Oceanside WPCP provides up to 43 MGD of secondary treatment capacity (average dry-weather flow is about 24 MGD), and another 22 MGD of primary treatment capacity during wet-weather periods, for a total treatment capacity of 65 MGD during wet weather. Treated effluent is combined prior to discharge to the Pacific Ocean via the Southwest Ocean Outfall (SWOO). Flows to the Oceanside WPCP are maximized prior to any discharge of decant from the Westside Transport to either the SWOO or to the near-shore waters of the Pacific Ocean.

While the City can treat 65 MGD of flow to primary levels at the Oceanside WPCP, the plant can provide secondary treatment for only 43 MGD. Thus, when wet weather flow exceed 43 MGD, Oceanside WPCP is designed to allow excess flows (between 43 MGD and 65 MGD) to bypass the secondary treatment processes and discharge to the SWOO after receiving only primary treatment. The CSO Policy describes the circumstances where such bypassing may be explicitly authorized in a CSO permit. 59 Fed. Reg. 18693.

For such bypassing to be permitted, the permittee must justify the cut-off point at which the flow will be diverted from the secondary treatment portions of the treatment plant, and provide a benefit-cost analysis demonstrating that the conveyance of wet weather flow to the POTW for primary treatment is more beneficial than other CSO abatement alternatives such as storage and pump back for secondary treatment, sewer separation, or satellite treatment.

The City performed a benefit-cost on CSO abatement alternatives as part of its 1972 Master Plan. The system currently being implemented was determined to be significantly more beneficial than any of the other options analyzed. In particular, the Master Plan determined that sewer separation was extremely costly, highly disruptive, and undesirable in that it would not address stormwater pollution. In addition, the analysis performed as part of this permit demonstrates that providing either additional storage (to increase secondary treatment of stored wastewater) or additional secondary treatment capacity is both extraordinarily expensive and highly disruptive to the local community. EPA therefore concludes that no further wet-weather storage or treatment can be justified.

In addition, the permittee must demonstrate compliance with the requirements of 40 CFR 122.41(m)(4) for the bypass to be permitted. The bypass must be unavoidable to prevent loss of life, personal injury or severe property damage. For purposes of CSO permits, severe property damage includes situations where flows above a certain level wash out the POTW's secondary treatment system. See 59 Fed. Reg. 18694. Also, there must be no feasible alternatives to the bypass. For purposes of CSO permits, this provision is met if:

a. the secondary treatment system is properly operated and maintained;
b. the secondary system has been designed to meet secondary limits for flows greater than peak dry weather flow, plus an appropriate quantity of wet weather flow; and
c. it is either technically or financially infeasible to provide secondary treatment at the existing facilities for greater amount of wet weather flow.

Finally, the permittee must provide notice of the need for the bypass. This last provision is satisfied by the City's NPDES permit application describing the Oceanside WPCP facilities and its wet-weather operation plans.

The Oceanside WPCP can provide 43 MGD of secondary treatment nearly double the peak dry weather flow of 24 MGD. If the City attempts to provide secondary treatment to more than 43 MGD of flow during wet weather, the City risks washing out its biological treatment processes. This would result in serious property damage at the Oceanside WPCP. In addition, it would

degrade treatment performance significantly until the biological treatment process could be reestablished. The Master Plan for the City's Westside facilities documents the financial infeasibility of providing more secondary treatment capacity for wet weather flows at the OWPCP. This is confirmed by EPA's BPT/BCT/BAT Cost Analysis. (See Section I). In addition, the location of the Oceanside WPCP near the San Francisco Zoo is physically limited. Expansion of the treatment works on site is essentially impossible without severe disruption to zoo facilities.

The draft permit requires compliance with this objective. It requires the City to provide secondary treatment for all flows reaching the Oceanside WPCP up to 43 MGD. For flows up to 65 MGD, the City must provide primary treatment at the Oceanside WPCP for the flows in excess of 43 MGD. In addition, the City is required to use the storage capacity in the Westside Transport to maximize, to the extent feasible, storage of wet weather flows for later treatment during dry weather periods. This requirement represents both a BCT and BAT control because it results in the removal of conventional, toxic and non-conventional pollutants.

5. *Prohibition of Dry-Weather Overflows:* Previous wastewater permits issued to the City have prohibited dry-weather discharge of untreated wastewater from the CSS. Even prior to the Master Plan construction program, the system was designed to hold and treat all dry weather flow. The Westside Transport has enough storage capacity to provide for about three days of dry weather flow. After the 1989 Loma Prieta earthquake, the RSWPCP was without electrical power for more than one day. All wastewater generated in the Westside service area during the power outage was stored in the Westside Transport and subsequently treated.

   The draft NPDES permit prohibits dry-weather overflows. This requirement represents both a BCT and BAT control because it results in the removal of conventional, toxic and non-conventional pollutants.

6. *Control of Solid and Floatable Materials in CSO Discharges:* Control technologies assumed as part of the 1986 Strategy include, for example, baffles to control floatables and screening or swirl concentrators to control solids. These technologies remove aesthetically objectionable materials that would otherwise remain on beaches or float on water surfaces after a storm; they have little effect, however, on suspended solids or bacterial loading of the overflows. Rotary screening provides only about five percent total suspended solids (TSS) removal, and swirl concentrators provide about 15 percent removal.

   The City's storage/transport system provides a substantially higher level of control of solid and floatable materials in CSO decant discharged to the Bay, the SWOO, and to near-shore waters of the Pacific Ocean. Baffles control floatables, and the flow is passed over a weir to remove settleable solids. A study was conducted to determine the solids removal efficiency of the Westside Transport, which concluded that the performance of the Transport was not markedly different from that of a primary treatment plant, providing between 15 and 50 percent removal of TSS; the baffling system was shown to retain the majority of the macroscopic floatable material that entered the Transport[8]. Beach deposition of CSO floatables has therefore been largely eliminated.

   Because the design of the facilities ensures continual consistency with this objective, there is no need for any additional permit requirement other than the standard NPDES permit conditions requiring proper operation and maintenance and prohibiting unnecessary bypass of treatment facilities. The baffled storage/transport represents both a BCT and BAT control because it results in the removal of conventional, toxic and non-conventional pollutants.

7. *Pollution Prevention:* Pollution prevention is source reduction and other practices that reduce or eliminate pollutants through the increased efficiency in the use of resources or the protection of

resources by conservation. Two major source reduction efforts implemented by the City's BERM focus on reducing the pollutants released to the environment through the sewer system: (1) the development of an overall pollution prevention program and (2) the implementation of a wastewater waste minimization program as part of the pretreatment requirements. The City's proactive water pollution prevention and pretreatment programs, managed by BERM, minimize the introduction of toxic pollutants into the CSS. (The pretreatment program is discussed in greater detail under Item 3 above.)

The City undertook a study of Best Management Practices (BMPs) to determine which would provide the most cost-effective reduction in pollutant loadings into the CSS during both dry- and wet-weather periods[9]. The most important pollutants of concern during wet-weather periods include PAHs, copper, lead, and cyanide. The main sources of these pollutants are automobiles and automotive-related businesses; other sources include tar shingles, wood preservatives, paints, algicides, and manufacturing.

A key BMP is the City's street sweeping program, which directly reduces pollutants originating from street surfaces; all City streets are swept at least once per week with vacuum sweepers. Catch basins are also cleaned regularly to reduce the pollutant loading during storm events. Other BMPs selected for implementation include an education program and provision of alternative disposal methods for residential hazardous waste, regulatory measures to reduce the risk of toxic spills, and public agency measures to prevent contact of rainfall runoff with potential contaminants.

Table 1 illustrates the total estimated pollutant reduction that could occur from implementation of the City's source reduction strategies. Note that these are estimates, and reductions could increase if previously unknown pollutant sources are identified and targeted for source reduction strategies.

The draft NPDES permit requires the implementation and continual development of a Pollution Prevention Plan. This plan is subject to the review and approval of EPA. This requirement represents a BAT control because it primarily results in the removal of toxic pollutants.

Pollutant	Estimated Reductions	
	lbs/dy	mg/l
Copper (Cu)	14.7	0.0027
Mercury (Hg)	0.16	0.0003
Lead (Pb)	3.7	0.007
Nickel (Ni)	1.9	0.004
Silver (Ag)	2.2	0.004
Zinc (Zn)	24.2	0.045
Cyanide (Cn)	0.87	0.0015

(Source: City and County of San Francisco, 1994 NPDES Permit Program, Attachment #1, Appendix A, page 6)

8. *Public Notification:* The City has a long-term practice of posting notices along the shoreline for three days following any shoreline discharge. When a CSO event occurs, the City posts notices on beaches in the vicinity of the overflow warning the public that waters contain high levels of bacteria and may therefore be unsuitable for water contact recreation. Warning signs remain posted until monitoring indicates that bacteriological levels are within an acceptable range. Additionally, if a shoreline discharge occurs, or if routine monitoring indicates high bacteriological levels, the City notifies the surfing and windsurfing communities through a recorded hotline, warning that waters are unsafe and surfing is not recommended. When bacterial counts have returned to safe levels, this message is discontinued.

   Public notification is required under the draft permit. This requirement represents a BPT/BCT control for helps to prevent exposure to conventional pollutants (primarily bacteria).

9. *Monitoring to Effectively Characterize CSO Impacts and the Efficacy of CSO Controls:* The City has ongoing shoreline, Ocean, and Bay monitoring programs that include both routine long-term monitoring of overflow and receiving waters and special short-term studies undertaken to support development of CSO control strategies or characterize CSO impacts on beneficial uses. Shoreline samples are collected for bacteriological analysis three times per week along the San Francisco Bay and Pacific Ocean. Water and sediment sampling is routinely conducted both in the Bay and Ocean. Numerous special studies have been conducted since 1966, when the City first undertook an in-depth study of the CSO problem.

   Shoreline bacteriological levels have been monitored for the past 15 years at 45 locations around the City at a frequency of 8 to 12 times per month at each site; visual observations of overflow debris and recreational uses in the vicinity of the overflow structures are also reported. Monitoring results show that coliform levels are elevated at shoreline stations near CSO structures during and shortly after CSO events, but generally return to background levels within one or two tidal cycles following the cessation of the overflow.

Water quality monitoring of overflows has been routinely conducted since 1983, when the City's first CSO control facilities became operational. Flow-weighted, storm-composite samples are collected using automatic samplers and analyzed for constituents including BOD, TSS, oil and grease, phenols, and metals; in recent years, total PAHs have been added to the routine analysis. Full-priority pollutant scans are run on representative storm-composite samples of CSO one to two times per year. As new CSO control facilities come on-line, they will be added to monitoring program. A special monitoring program in the southeastern portion of the City documents benefits of CSO control on water contact recreation and shellfishing. Collected data are submitted annually to the The Board.

The draft NPDES permit requires continued receiving water monitoring. This requirement represents both a BCT and BAT control because it helps the City, the Regional Board, and EPA to evaluate the efficacy of the previous controls to remove conventional, toxic and non-conventional pollutants.

{tc \l 2 ""}II. BPJ Analysis of Treatment Beyond the Nine Minimum Controls

In Part I of this analysis, EPA has concluded that the nine minimum controls outlined in the Policy are appropriate as *minimum* BCT/BAT requirements. In Part II, EPA performs a BPJ analysis on the Westside CSO system in order to determine whether additional technology-based controls should be required in the NPDES permit. This analysis is also intended to reconsider the issue identified by the Regional Administrator in his Notice of Decision to Repropose Under 40 C.F.R. . 124.60(b), dated January 31, 1992:

> Whether BAT or BCT requires effluent limitations that reflect the additional amount of pollutant removal achievable through expansion of the [Westside] Transport's existing capacity to store combined flows for later treatment at the new Oceanside Plant, thus reducing the amount of decant discharged to the SWOO.

A. Determination of Best Practicable Control Technology Currently Available (BPT) for Combined Sewer Overflows

For many industrial categories, the BPT limitations (as well as BCT and BAT limitations) have been promulgated as regulations (effluent guidelines). EPA has not formally promulgated technology-based limitations for CSOs and therefore the permit writer must use best professional judgement (BPJ) on a case-by-case basis to develop the appropriate limitations. The regulations specify the factors to be used by the permit writer (40 CFR 125.3(d)(1)):

(I) The total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application;
(ii) The age of equipment and facilities involved;
(ii) The process employed;
(iv) The engineering aspects of the application of various types of control techniques;
(v) Process changes; and
(vi) Non-water quality environmental impact (including energy requirements).

The key factor here is item (I), the comparison of costs and performance. Senator Muskie, one of the authors of the legislation, noted:

> *The balancing test between total cost and effluent reduction benefits is intended to limit the application of technology only where the additional degree of effluent reduction is wholly out of proportion to the costs of achieving such marginal level of reduction for any class or category of sources.*[10]

In other words, Congress expected significant efforts toward pollutant control as a result of the BPT requirements. Costs for the construction of treatment facilities would be a limiting factor only if they were comparably much higher than experienced by similar industrial sources. However, very high costs for treatment characterize CSO controls. The costs of controlling CSOs are very expensive because CSOs are caused by large volumes of highly variable storm runoff which may occur at flow rates much greater than the flow rates of the dry weather sewage. Additionally, CSO control facilities are only used on an intermittent basis; they are idle most of the year. As a result of these two factors, costs per pound of pollutant removed for CSO facilities usually greatly exceed the comparable costs for other wastewater pollutant control measures. This is particularly true in San Francisco where rainfall generally occurs only during a six month period of the year at a rate of approximately 20.5 "/year.

The high costs for CSO control and treatment have resulted in a long-term EPA policy of equating BPT with limited controls not involving significant construction. Consequently, CSO treatment facilities have been built only when necessary to meet water quality needs.

Application of the Cost Factor to the Determination of BPT for San Francisco:

The determination of BPT requires an examination of the six factors above. Each of these factors is evaluated below:

(I) **The total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application**; (40 CFR 125.3(d)(1))
To determine if the benefits are reasonable compared with costs we can compare San Francisco Westside CSO treatment costs and benefits with sewage treatment plant costs and benefits. The dry weather pollutants entering sewage treatment plants and the pollutants discharged as CSOs are similar in nature and so a comparison can be made.

Table 2 includes the costs and effluent reductions (benefits) achieved in terms of dollars per pound of suspended solids removed from the wastewater. Table 2 includes cost data for two Bay area sewage treatment plants and for the San Francisco Westside combined sewer overflow control and treatment facilities. The two sewage treatment plants treat the wastewater to the secondary level which is the technology-based minimum required by the Clean Water Act.

Table 2

Facility	Suspended Solids (Unit cost for removal) ($/lb)
East Bay MUD*	$ 0.26
Central Contra Costa S.D.[11]	$ 0.51
S.F. Westside CSO control facilities[12]	$ 10.78

Cost Assumptions for S.F. Westside CSO facilities	
Tons per year of TSS Removed	676 tons
Required Storage	69 MG
Westside CSO Control Costs	$213,750,000
Expected CSO facility life	50 years
Assumed interest rate	6.5%
Capital Recovery factor	.0679139
Annual Costs	
Capital	$14,516,602
O&M (at 0.02 of Cap. Costs)	$42,750
Total	$14,559,352
Cost per pound of TSS removed	$10.78

As shown in the table, based on suspended solids removal, CSO control costs as implemented on San Francisco's Westside are wholly out of proportion to the benefits when compared with comparable costs and benefits at local POTWs. Consequently, CSO control facilities as built in San Francisco could not be justified based solely on BPT technology-based requirements. Instead the justification for constructing treatment facilities must be (and was) based on water quality needs.

There are additional methods of evaluating CSO performance. However, suspended solids removal is a practical and useful factor to compare since most pollutants of concern occur as suspended solids and suspended solids by themselves can have detrimental effects.

Though analysis of factor 1 is sufficient to show that the measures employed by San Francisco exceed BPT, this analysis will also examine the other BPT factors:

(ii) **The age of equipment and facilities involved; and (iii) The process employed;** San Francisco began planning for wastewater facilities improvement in 1972, with the preparation of the first Wastewater Master Plan. Implementation of the Master Plan will be complete in 1996. The Master Plan evaluated three basic options for wastewater control: (1) constructing high-capacity wastewater treatment plants, (2) storing excess flows for later treatment, and (3) separating sewers. The City selected a combination of increased treatment capacity and large volume storage as the most cost-effective means of controlling water quality. EPA concurred in San Francisco's analysis at the time the Master Plan was developed, and remains convinced that it represents the most cost-effective and environmentally protective strategy for addressing the City's CSO problems. Sewer separation was rejected because of high costs, the need to excavate every street in the City, and the failure to address pollution caused by stormwater runoff.

On the City's Westside, key facilities are the Oceanside Water Pollution Control Plant (Oceanside WPCP), the Southwest Ocean Outfall (SWOO), and the Westside

Storage/Transport facilities. The Oceanside WPCP came on-line in spring 1994, replacing the Richmond-Sunset treatment plant. The Oceanside WPCP provides both a higher level of treatment (full secondary treatment) and a larger treatment capacity (total of 65 MGD) than the former treatment facility. The Westside Storage/Transport facilities capture combined sewage and stormwater runoff and hold as much as possible for later treatment at the Oceanside WPCP. The SWOO was completed in 1986, and discharges treated wastewater effluent approximately 4.5 miles from shore, and provides effective initial dilution of the effluent. The Westside Storage/Transport, a 2.5□mile long, box-like structure located beneath the Great Highway, is one of the largest wastewater storage structures in the nation. Storm flows that cannot be stored pass over a weir and under a baffle into a second box, called the decant structure; settleable solids and floatables remain in the first box, and are flushed to the treatment plant after the storm subsides. Overflow from the decant box passes over another weir and under a baffle, and is routed to the SWOO. If SWOO's capacity is exceeded, effluent is discharged to the shoreline. Thus, any combined flows discharged from the storage/transport structures receive primary-equivalent treatment, which removes essentially all macroscopic floatables and most settleable solids. Once a storm subsides, stored flows are routed to the treatment plant. Storage/transport structures are subsequently drained to the treatment facilities.

All untreated combined sewage formerly discharged to the shoreline is captured and treated as a result of the Westside construction program. During rainy weather, approximately 50 percent of the flows are held for treatment at the Oceanside WPCP; the remaining 50 percent receive flow-through treatment within the storage/transport structures. On average, approximately 87 percent of the combined flows are discharged through the SWOO, and 13 percent are discharged to the shoreline. These percentages are long-term averages that may not reflect the system's performance for a particular year because of the dynamic nature of the interaction between the system and the characteristics and sequence of storm events. For example, the system might capture all flows during a relatively intense rainfall of short duration with no overflow, especially when the transport/storage structures are empty at the start of the storm; a storm event of similar intensity and duration, however, might result in an overflow if previous rainfall had partially filled the transports.

Parameter	Pre-Program	Master Plan	Percent Reduction
Average Number of Beach Overflows (Range)	114[a] (26□193)	8[b] (1□18)	93
Average Annual Volume of Wastewater Discharged, MG (Range)	2,870 (926□5,030)	449 (15□1,070)	84
Average Percentage of Sanitary Flow	12	6.5	46
Average Number of Days Recreational Uses Impaired (Range)	119 (67□147)	25 (6□51)	79
Average BOD, lbs/yr x 10^3 (Range)	1,220 (394□2,140)	191 (6□460)	84
Average TSS, lbs/yr x 10^3 (Range)	12,100 (3,890□21,200)	1,890 (63□4,550)	84

(Source: City and County of San Francisco, Revised Overflow Control Study, 1978, plate 8)

[a] Subsequent to the publication of the 1978 study, the SWRCB changed the definition of an overflow event. Under the current definition, the Westside facilities overflowed an average of 54 times per year.

[b] Using the present definition of overflow.

(iv) The engineering aspects of the application of various types of control techniques;

The range of available CSO control technologies is essentially limited to four core technologies: storage basins, deep tunnels, swirl concentrators, and screening facilities[13]. These four technologies fall into two groups. The first group of CSO control measures, storage basins and deep tunnels, are implemented where receiving water quality impacts are of the greatest concern, and required levels of CSO control are consequently high. These technologies rely on the storage of excess CSO, with subsequent treatment at existing water pollution control plants, to achieve high pollutant removal rates and effective disinfection levels. The second group of CSO controls, swirl concentrators and screening facilities, are implemented to reduce settleable solids and floatables. These technologies are typically applied where receiving water quality conditions do not warrant high BOD/TSS removal. Sewer separation, a third type of CSO control strategy, is typically used by municipalities that have only a relatively small area served by combined sewers.

Storage BasinsStorage Basins{tc \l 3 "Storage Basins"}
Storage basins are typically concrete tanks located at overflow points or near treatment plants. This structurally intensive technology involves the capture and storage of CSOs, with subsequent treatment of captured flows. Combined flows that exceed the storage capacity of the basin may receive coarse screening, primary settling, floatable removal, and/or disinfection prior to discharge. Once flow capacity is available at the treatment plant, the stored volume is treated and discharged. This technology is very flexible because extremely variable CSO flows can be stored and treated, and high removal of BOD and TSS can be achieved[14].

Deep TunnelsDeep Tunnels{tc \l 3 "Deep Tunnels"}
Deep tunnels provide consolidated storage in underground tunnels, from which the CSO is pumped to an existing treatment plant when capacity becomes available. Pollutant removal effectiveness is limited by the volume of the tunnel; CSO discharges that exceed the storage capacity of the tunnel typically do not receive treatment. Thus, the CSO that is stored in tunnels can receive a high level of treatment prior to discharge, but flows in excess of the tunnel's capacity typically receive no treatment.

Swirl ConcentratorsSwirl Concentrators{tc \l 3 "Swirl Concentrators"}
The swirl concentrator is a specially configured gravity solids separator that retains floatables in the unit, passes concentrated solids to the sewer, and discharges the remaining flow to the receiving waterbody. The swirl concentrator can provide effective separation of floatables over a wide range of hydraulic loadings, while removing approximately 15 percent of suspended solids[15].

Screening FacilitiesScreening Facilities{tc \l 3 "Screening Facilities"}
Screening of CSOs can be effective in removing large solids and floatables and is typically used in conjunction with other storage and treatment systems. The effectiveness of this technology is directly related to the size of the screen openings, which can vary from bar racks to coarse and fine screens and microstrainers. Screened materials are generally removed mechanically. Screening, a physical treatment process for CSO discharges, is usually applied when a high level of BOD/TSS removal is not necessary.

ConclusionConclusion{tc \l 3 "Conclusion"}
Based on this brief review of available CSO control technologies, San Francisco's transport/storage facilities clearly provide the highest level of water quality protection available. Swirl concentrators and screening facilities can reduce floatables, but provide limited removal of BOD and suspended solids. Deep tunnels allow for a high level of treatment for combined flows that do not exceed its storage capacity, although combined flows in excess of tunnel capacity receive little or no treatment. In San Francisco's system, combined flows are either stored for later treatment when capacity becomes available at the treatment plant or are subjected to primary-equivalent treatment prior to discharge when transport/storage capacity is exceeded. This treatment provides the storage benefits of deep tunnels and storage basins, and a high rate of removal for BOD, TSS, floatables, and settleable solids that is not possible with deep tunnels, swirl concentrators, or screening facilities.

(v) **Process changes;**
This factor only applies to point source discharges from industrial plants, because industrial plants can consider alterations to processes that affect wastewater quality and quantity.

(vi) **Non-water quality environmental impact (including energy requirements).**
See BAT analysis

BPT Summary
The construction of CSO control and treatment facilities cannot be justified based on the application of the BPT cost/benefit criteria to San Francisco's Westside System. This conclusion is consistent with the long-term policy of both EPA, Region IX and the Regional Water Quality Control Board to base San Francisco's CSO permits (and resultant facility construction) on the need to achieve water quality standards. BPT does not require any additional measures beyond the six control measures outlined in the 1989 CSO Control Strategy. NPDES Permit CA0037681 contains effluent limitations that require proper operation of San Francisco's CSO facilities. Therefore, these effluent limitations ensure that San Francisco will provide treatment in excess of that mandated by BPT requirements.

B. The Determination of Best Conventional Pollutant Control Technology (BCT) for CSOs.

BCT applies to the following constituents of the combined sewer overflows: suspended solids, biochemical oxygen demand (BOD), oil & grease, pH, and coliform bacteria. BCT represents an incremental level of control beyond BPT for the specified pollutants. The first part of this analysis has shown that the current system surpasses BPT for CSOs. This portion of the analysis will determine whether the current system also meets BCT or whether additional treatment is necessary. In addition, EPA's CSO Policy recommends consideration of certain technologies as potential bases for setting BCT effluent limitations. These are discussed in Section II.

The regulations specify the factors to be used by the permit writer to determine BCT:

(I) The reasonableness of the relationship between the costs of attaining a reduction in effluent and the effluent reduction benefits derived;

(ii) The comparison of the cost and level of reduction of such 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.

(iii) The age of equipment and facilities involved;

(iv) The process employed;
(v) The engineering aspects of the application of various types of control techniques;
(vi) Process changes; and
(vii) Non-water quality environmental impact (including energy requirements).

The determination of BCT requires an examination of the seven factors above. Each of these factors is evaluated below:

(I) **The reasonableness of the relationship between the costs of attaining a reduction in effluent and the effluent reduction benefits derived;**
This portion of the analysis could simply compare the costs of the current treatment with the effluent reduction benefits derived as done in Table 1 above. However, since San Francisco built these facilities to meet water quality standards, the question has arisen as to whether any additional treatment could be justified by BCT. For example, would further conventional pollutant reductions brought about by increased storage (and therefore increased treatment) be incrementally cheap enough to pass the "reasonableness" test? This analysis therefore compares the most economical additional treatment necessary to further reduce conventionals (i.e. suspended solids) with the cost of the increased treatment:

Analysis of Increased Storage
To further reduce suspended solids, additional storage capacity would have to be added to the current facility. At a minimum the City estimates that it would cost $2.35 for each additional gallon of storage. If the portion of decanted wastewater discharged through the SWOO was to first receive treatment at the Oceanside Treatment facility (60% secondary, 40% primary), an additional 69.6 million gallons of storage capacity would be needed. This facility enhancement would only reduce suspended solids by additional 209 tons per year and would cost approximately $163.6 million or an amortized cost of $11.1 million per year. (Assuming a 50 year project life. 6.5% interest, and a 0.02% of capital costs O&M). This facility enhancement would thereby cost approximately $25/lb of TSS removed.[16] (See Table 4 below).

Analysis of Full Containment
Full containment of storm flow is not required under the CWA's BAT/BCT requirements or by the CSO Control Policy. In fact, "full containment" of CSOs is extremely difficult to achieve because of the nature of precipitation events and usually defined stochastically (e.g., long-term average of 1, 0.2, or 0.05 overflows to the shoreline per year). The following section analyzes the costs and environmental benefits of full containment of all Westside storm flows (defined as one overflow per year), which allow for secondary treatment of all combined flows. Two options that would meet the necessary combination of increased treatment and storage are examined.

Option 1 would provide a limited increase in treatment capacity and a major increase in storage. This option assumes that the lack of available land or difficulties of constructing satisfactory treatment methods prevent the City from building more than 20 MGD of additional secondary treatment. Assuming one allowable overflow per year, an additional 515 MG of storage would need to be constructed, over and above an existing 70 MG: a second storage/transport box under the Great Highway and additional storage/transports under Avenues 45 through 48. Thirty-foot diameter tunnels would be constructed under Avenues 41 through 44 and part of 40th Avenue; tunnels would be constructed, because the street grade is too high for open-cut construction. Estimated capital costs for these facilities would be $1.3 billion[17].

Option 2 assumes that constructing a new 65 MGD secondary treatment plant on the Westside would be possible to double the existing treatment capacity. In this case, an additional 220 MG of storage would be necessary to provide full secondary treatment to all combined flows, allowing one overflow per year. Estimated capital cost for this option, not including land acquisition costs for the treatment plant, would be $840 million.

Implementation of one of the above options would reduce TSS loading to the Pacific Ocean by an estimated 420 tons per year, at an incremental removal cost of approximately $68 per pound (Table 4). The capital cost per City resident would be at least $1,160.

Table 1 shows that the cost of pollutant reduction for San Francisco's present system is exorbitant. Table 4 shows incremental pollutant reductions which could be gained with increased storage and treatment is even more costly. Therefore, the costs of both the current facilities and any additional storage or treatment facilities could not be considered "reasonable" when compared to the effluent reduction benefits derived.

Stage	Annual Cost ($, millions)	Average TSS Discharged (tons/yr)	Average TSS Removed[a] (tons/yr)	Percent TSS Removal[a]	Increm. Cost of TSS Removal ($/lb)[b]
Pre-program Facilities[c]	□	3,800	□	□	□
Full Master Plan (1996)	46.5[d]	1,580	2,220	58	10.8
Increased Storage Option	11.1[d,g]	1,371	2, 429	64	24.8[f]
Full Secondary on Westside (1 overflow)	57.2[d,e,g]	1,160	2,640	69	68[f]

[a]Total reductions compared to Pre-Program facilities.

[b]Divides total annual cost by pounds of TSS removed; other measures of water pollutant loading (e.g., BOD and toxic pollutants) also improve.

[c]Pre-program facilities represent the baseline for comparison of TSS emissions.

[d]Assumes a 50-year life, 6.5% interest rate, and O&M of 0.02% of capital cost.

[e]Excludes land acquisition costs for a 65 MGD treatment plant.

[f] For comparison, secondary treatment of wastewater costs approximately $0.26 per pound of TSS removed for the East Bay Municipal Utilities District and approximately $0.51 per pound TSS removal for the Central Contra Costa Sanitation District.

[g]Costs are in addition to those incurred in construction and operation of full master plan.

(ii) The comparison of the cost and level of reduction of such 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.

The intent of this factor was summarized in *Chemical Manufacturer's Association v. EPA*:

> *Representative Roberts, the author of the conference report on the 1977 amendments, emphasized that the additional technology requirements of BCT were to be imposed only to remove additional "cheap pounds" of conventional pollutants beyond BPT.*[18]

Best conventional pollutant control technology (BCT) is intended as an incremental level of control beyond the best practicable control technology currently available (BPT). The intent of the requirement is to impose additional controls only if the additional removal of conventional pollutants is comparable to removal costs at POTWs. As shown in Table 2, however, the CSO control technology implemented by San Francisco is very expensive compared with POTW costs and therefore could not be justified under BCT. Other CSO treatment technologies, as listed in Table 5, are far more costly than POTWs, and therefore, also cannot be justified.

Control Technology		TSS Reduction (percent)	TSS Removal Cost ($/lb)
CSO Control[a]	Rotary Screening	5	46
	Swirl Concentrators	15	21
	High-Rate Filtration	20	17
	Sedimentation	33	6
Local POTWs[b]	East Bay Municipal Utilities District	85	0.26
	Central Contra Costa County Sanitation Dist.	85	0.51
San Francisco	Westside Facilities	60	10.5

(Source: RWQCB San Francisco Bay Region and the City of San Francisco)

a. The control technology costs in Table are taken from the California Regional Water Quality Control Board BCT/BAT analysis as developed for NPDES CA0037681 (7/26/1990 final permit). The costs were originally developed by East Bay Municipal Utility District. Note that with the exception of sedimentation, these costs for partial treatment are significantly higher than the costs for full-scale CSO control as implemented by San Francisco on the Westside.

   The TSS Reduction and the corresponding TSS Removal Cost for the CSO Control technologies are calculated assuming that the stormwater/wastewater influent has not undergone any prior treatment. The TSS percent reduction would be significantly lower and the TSS Removal Cost would be significantly higher if one of these CSO Controls were added to the existing system which already reduces TSS by at least 60%.

b. POTWs in general have significantly lower treatment costs since they do not treat stormwater.

(iii) The age of equipment and facilities involved;
See BPT analysis above.

(iv) The process employed;
See BPT analysis above.

(v) The engineering aspects of the application of various types of control techniques;
See BPT analysis above.

(vi) Process changes;
Not Applicable.

(vii) Non-water quality environmental impact (including energy requirements).
See BAT analysis below.

BCT Summary
Best Conventional Treatment applies to the removal of conventional pollutants (TSS, BOD, etc.). The viability of a potential BCT treatment is determined by comparing treatment costs with POTW treatment costs. The costs of the CSO facilities actually built by San Francisco, the costs of increased storage for later treatment, and the costs for other potential CSO treatment technologies all greatly exceed POTW treatment costs. Therefore no additional treatment can be justified based solely on BCT. NPDES Permit CA0037681 contains effluent limitations that require proper operation San Francisco's CSO facilities. Therefore, these effluent limitations ensure that San Francisco will provide treatment in excess of that mandated by EPA's BCT requirements.

C. The Determination of Best Available Technology Economically Achievable (BAT) for CSOs.

BAT requirements are requirements that go beyond BCT by specifying controls for two groups of pollutants: (1) toxic pollutants (e.g., copper, lead, zinc, polynuclear aromatic hydrocarbons [PAHs], pesticides, and other organics) and (2) non-toxic, non-conventional pollutants. For CSOs, floatables are the only non-toxic, non-conventional pollutant of concern. The following CWA regulations for BAT specify factors are used by the permit writer (40 CFR 125.3(d)(3)):

(I) The age of equipment and facilities involved;
(ii) The process employed;
(iii) The engineering aspects of the application of various types of control techniques;
(iv) Process changes;
(v) The cost of achieving such effluent reduction; and
(vi) Non-water quality environmental impacts (including energy requirements).

Since all wastewater receives at least primary treatment including baffling as it is decanted, San Francisco's system provides substantial treatment for floatables. EPA has not been able to identify any treatment process that would significantly improve floatables removal, and so finds that baffling constitutes BAT for floatables.

To determine BAT for toxic pollutants (beyond the nine minimum controls discussed in section I), EPA analyzed the existing San Francisco CSO containment and treatment system, and compared it to the regulatory requirements for BAT. In addition, the Clean Water Act requires EPA to promulgate effluent limitations requiring the elimination of discharges of all pollutants if EPA determines that such elimination is technically and economically achievable. CWA . 301(b)(2)(A). Therefore, EPA has analyzed the technical and economical achievability of effluent limitations that would effectively eliminate San Francisco's CSO discharge.

The determination of BAT requires an examination of the six factors above. Each of these factors is evaluated below:

(I) The age of equipment and facilities involved;
See BPT analysis.

(ii) The process employed;
See BPT analysis. The City and County has also implemented a Source Control program which will significantly help to reduce toxic pollutants discharged by the public and industry. (See discussion under Section I of this Fact Sheet Amendment, *Control # 7, Pollution Prevention.*)

(iii) The engineering aspects of the application of various types of control techniques;
See BPT analysis

(iv) **Process changes;**
Not applicable. See discussion in BPT analysis.

(v) **The cost of achieving such effluent reduction;**
This item is the key issue. The high cost of CSO control has prevented many U.S. cities from providing treatment, even when WQSs are being violated. The City's capital investment for water pollution control has been about $1,900 per person and would be substantially higher in current dollars. This level of investment represents one of the highest per capita investments for in the nation for a medium or large city. As noted earlier, this equates to approximately $10.8/lb of TSS removal. Roughly two thirds of this expense was dedicated to CSO control.
The application of the cost test in the BAT analysis is discussed by the court in NRDC v. EPA, 863 F.2d 1420 (9th Cir. 1988). The court concluded:

> *To demonstrate economic achievability, no formal balancing of costs and benefits is required; BAT should represent "a commitment of the maximum resources economically possible to the ultimate goal of eliminating all polluting discharges." EPA has considerable discretion in weighing the costs of BAT.... The Administrator should be bound by a test of reasonableness.* NRDC v. EPA, 863 F.2d at 1426 ,(citations omitted).

San Francisco has made an extraordinarily large investment in CSO control technology. This is consistent with BAT requirements to commit the maximum resources economically possible to the goal of eliminating pollutant discharges. However, without the associated water quality benefits that justified this investment, EPA would not conclude that this was a reasonable expense to require. Therefore, EPA concludes that the existing level of storage and treatment for CSOs exceeds BAT requirements for toxic pollutant removals.

This, however, does not conclude EPA's analysis of BAT. Given the existing treatment system, and the existing resource commitment, EPA has also examined possible mechanisms to improve reductions of toxic pollutants. This review is appropriate to determine whether it is reasonable to require additional steps to address toxic pollutants when considering the costs already incurred by the program as a whole and the incremental costs and benefits of potential improvements. Without such a review, cost-effective improvements to toxic pollutant removal could escape consideration simply because so much has been already spent. The toxic pollutant removal technology examined is increased primary and secondary treatment of all wastewater and stormwater, as well as toxic pollutant control strategies in EPA's CSO Policy (see Section I).

Analysis of toxic pollutant removal efficiencies through primary and secondary treatment (activated sludge).
For purpose of this cost analysis, additional primary and activated sludge treatment was selected as the most cost efficient toxic removal technology. This selection is based on a study of 40 POTWs. The study compares removal efficiencies through primary treatment, activated sludge (secondary), trickling filter, and tertiary treatment.[19] Copper, Lead, and Zinc were chosen for this analysis. Removal efficiencies for Copper, Lead, and Zinc are as follows:

	Primary	Primary and Secondary
Cu:	22%	86%
Pb:	57%	61%
Zn:	27%	79%

Decanting was conservatively estimated to have no effect on metals removal. (Since decanting does remove some suspended solids, it would likely have some effect on removing metals. However, no data exists to estimate the amount.)

Site-specific wet-weather influent data for 1994 and 1995 was used. The most cost efficient means to increase the amount of wastewater that receives primary and secondary treatment is to increase storage capacity (as opposed to increasing treatment facilities).

Analysis of Increased Storage
Under this scenario (similar scenario as discussed under BCT above), the 1,280 million gallons per year (MGY) that currently is decanted would receive a combination of primary and secondary (an additional 40 MGY would receive primary and 1,056 (MGY) would receive secondary). The remaining 184 MGY would be discharged to the shoreline. (See Table 6). By multiplying these flows by the removal efficiencies for primary and secondary above, the reductions in loadings were calculated. Assuming an amortized $11.1 million yearly cost for the additional treatment, the cost/lb of removal was estimated.[20]

Metal	% Reduction	$$/lb removed
Copper	26%	$300
Lead	12%	$1,400
Zinc	21%	$100

Analysis of Full Secondary
By increasing the storage capacity by another 108 Million Gallons, all stormwater/wastewater (except for the eight shoreline overflows) could receive secondary treatment (See Table 6). While this would further reduce the loadings of metals to the ocean, the cost, of course, would increase significantly. (This scenario is not the same as the "Full Containment" Options discussed under the BCT Analysis. The scenario is cheaper because is assumes eight overflows per year, and therefore does not require additional treatment facilities.) The reduction in metals discharged to the ocean was calculated. Assuming an amortized yearly cost of $28 million, the cost per pound removed was also calculated.[21]

Metal	% Reduction	$$/lb removed
Copper	37%	$500
Lead	12%	$3,700
Zinc	28%	$200

Both the Increased Storage and Full Secondary alternatives would achieve, at best, marginal reductions in toxic pollutant loadings (12% to 37%) at extremely high costs ($100 to $3,700/lb). These expenditures would be wholly unreasonable given their limited effectiveness.

Table 6: Flow Scenarios for BAT Analysis

Scenario	Storage Volume (MGY)	Capital Costs for Add. Stor.	Secondary & Primary (MGY)	Primary Only (MGY)	SWOO Decant (MGY)	Shore Decant (MGY)
Current	69.4		8816	664	1280	440

Option 1	139	$164 M	9872	704	0	624
Option 2	247	$417 M	10493	0	0	707

(vi) **Non-water quality environmental impacts (including energy requirements).** By 1996, the City will have constructed about 70 MG of storage on the Westside, consisting of 47.6 MG in the Westside Storage/Transport project, 19.7 MG in the Richmond and Lake Merced Storage/Transport project, and an additional 2.2 MG of storage in the sewer lines. The Westside Storage/Transport, one of the largest wastewater storage structures in the nation, is a 2.5-mile long, box-like structure located beneath the Great Highway. Approaching full containment of combined flows (assuming one overflow per year) would require the construction of either an additional 515 MG of storage or the construction of a 65 MGD wastewater treatment plant and an additional 220 MG of storage[22].

Constructing the required storage facilities would involve the excavation of many miles of City streets and would be extremely disruptive to local residents. Constructing an additional wastewater treatment plant in a densely populated city such as San Francisco would be extremely difficult, possibly involving the condemnation of private property. Neighborhood disruption resulting from construction on this scale would include street closure for up to one year, dust and noise nuisances, potential vibration damage from the excavation and pile-driving equipment, and traffic disruption from truck deliveries and workers commuting to and from construction sites. Although land and property values would probably be unaffected in the long term, properties in the vicinity of construction activities would likely take longer to sell during the construction period than they would normally.

The fact that these extensive construction activities would occur in a densely populated city and adjacent to environmentally sensitive coastal areas was a consideration for designing and constructing the City's current system to allow for an average of eight overflows per year, rather than one. In 1979, the SWRCB (with EPA concurrence) granted an exemption to the Ocean Plan that allowed up to eight overflows per year on the Westside, partially due to the fact that the Central Coast Regional Coastal Commission had denied the City a required development permit based on one overflow per year because of the size and location of the transport necessary for a one overflow system[23]. The major increase in facility size that would be needed was judged to be too disruptive to the coastal area. Other concerns voiced by the Coastal Commission include future beach erosion, sewer exposure, seismic disturbances, and groundwater problems.

BAT Summary

BAT applies to toxic and non-conventional pollutants. Based on the guidance provided by the CWA, the costs of increased storage, along with the non-water quality environmental impacts, are excessive compared to the benefits provided, and this expenditure would be wholly unwarranted under BAT. The current treatment facilities therefore exceed the cost of treatment facilities that would be required under BAT.

1. City and County of San Francisco. *Westside Operation Plan for the Oceanside Water Pollution Control Plant*, January 1990.

2. City and County of San Francisco, 1994 NPDES Permit Program, Attachment 1. Page 7.

3. City and County of San Francisco, Department of Public Works. September 1991. Op Cit.

4. San Francisco Public Works Code, Section 118, Article 4.1, Industrial Waste.

5. City and County of San Francisco, Department of Public Works. *Industrial Waste Pretreatment Program Annual Report*, June 1992.

6. Ibid.

7. San Francisco Clean Water Program. *Westside Water Pollution Control Facility Planning Report*, 1988. Page 5-5.

8. City and County of San Francisco, Department of Public Works. *Westside Transport Performance Evaluation Study, Final Report*, March 1991.

9. James M. Montgomery, Consulting Engineers, Inc. *City and County of San Francisco, Department of Public Works, Best Management Practices Study*, August 1992.

10. 1972 Leg.Hist. at 170, cited in *Chemical Manufacturer's Association v. USEPA*, 870 F.2d 177 (5th Cir. 1989)

11. Lam, Johnson, Area Engineer, to John Wolfenden, Section Leader, *Internal Memo, BOD and TSS Cost Removal Data or EBMUD and CCCSD,* Regional Water Quality Control Board, San Francisco Bay Region, May 19, 1993.

12. City and County of San Francisco, Department of Public Works, *Determination of BCT/BAT for Westside Permits,* September 17, 1993, Appendix A.

13. U.S. Environmental Protection Agency. *Cost Estimates for Select Combined Sewer Overflow Control Technologies*, 1992. Page 1.

14. Ibid. Page 8.

15. EPA Region IX and California Regional Water Quality Control Board. *Fact Sheet, NPDES No. CA 0037681.* Page 12.

16. City and County of San Francisco, Department of Public Works, *Memorandum from Michelle Pla, Planning and Control, to Shirin Tolle, Environmental Engineer, USEPA,* November 12, 1993, pp. 2-4.

17. City and County of San Francisco, September 1991, Op Cit., Page 37.

18. *Chemical Manufacturer's Association v. USEPA,* 870 F.2d 177 (5th Cir. 1989), p. 205 citing Rep. Roberts in 1977 Leg.Hist. at 330.

19. EPA Guidance Manual on the Development and Implementation of Local Discharge Limitations Under the Pretreatment Program, December 1987, pp.3-55 - 3-58.

20. EPA Region 9, Memo to files from Doug Liden, Engineer, "Calculations of Metals Removal Achievable Through Additional Storage," June 1, 1995.

21. Ibid.

22. City and County of San Francisco. *Control of Westside Storm Flows*, September 1991. Page 31.

23. California Water Resources Control Board. Order No. WQ 79-16. Page 15.

Attachment 3

Memorandum of Agreement

MEMORANDUM OF AGREEMENT

BETWEEN

THE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION,

THE
U.S. ENVIRONMENTAL PROTECTION AGENCY,

THE
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

THE
CALIFORNIA STATE WATER RESOURCES CONTROL BOARD,

THE
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD,
CENTRAL COAST REGION,

THE
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD,
SAN FRANCISCO BAY REGION,

THE
CALIFORNIA COASTAL COMMISSION,

AND THE
ASSOCIATION OF MONTEREY BAY AREA GOVERNMENTS

TABLE OF CONTENTS

I. PURPOSE OF MOA

The purpose of this Memorandum of Agreement (MOA) is to provide an ecosystem based water quality management process that integrates the mandates and expertise of existing coastal and ocean resource managers and protects the nationally significant resources, qualities and compatible uses of the Monterey Bay National Marine Sanctuary (Sanctuary or MBNMS).

II. AUTHORITY

A. NOAA

Title III of the Marine Protection, Research, and Sanctuaries Act of 1972, as amended, (MPRSA), 16 U.S.C. §§ 1431 et seq., National Program Regulations at 15 CFR Part 922 and the Monterey Bay National Marine Sanctuary regulations at 15 CFR Part 944 as administered by the National Oceanic and Atmospheric Administration (NOAA).

B. U.S. EPA

The Federal Water Pollution Control Act, as amended, (Federal Water Pollution Control Act or Clean Water Act (CWA)), 33 U.S.C. §§ 1251 et seq., gives the U.S. Environmental Protection Agency (U.S. EPA) authority to regulate both point and non-point (e.g., stormwater) sources of pollution. In addition, title I of the MPRSA (33 U.S.C. §§ 1401 et seq.) section 102 gives U.S. EPA authority to permit non-dredged material for the purpose of dumping into marine waters.

C. State and Regional Boards

The State Water Resources Control Board (State Board or SWRCB) and the California Regional Water Quality Control Boards (Regional Boards or RWQCBs) are established by the Porter-Cologne Water Quality Control Act, Division 7 (commencing with Section 13000) of the California Water Code. The State and Regional Boards are the state agencies with primary respônsibi-lity for water quality control in California. The Act provides a statewide program for water quality control administered regionally within a framework of statewide coordination and policy. The Act contains a complete regulatory framework for the regulation of waste discharges to both surface and ground waters. It also provides for the adoption of water quality control plans and implementation of these plans by adoption of water discharge requirements for the discharges of waste that could impact State waters. Extensive enforcement mechanisms are available to ensure that requirements are met.

The Water Code also provides the necessary authority for the State to operate the National Pollutant Discharge Elimination System (NPDES) permit program in California in lieu of U.S. EPA. The law is codified in Chapter 5.5, Division 7 of the Water Code. As a result, the issuance of a California NPDES permit under State law satisfies the requirements of the Federal Water Pollution Control Act.

The State Board's jurisdiction and responsibilities include but are not limited to: (a) overseeing Regional Board regulation of discharges into State waters under the California Porter-Cologne Water Quality Control Act; (b) developing water quality standards; (c) adopting and approving water quality control plans; (d) overseeing Regional Boards' issuance, compliance monitoring, and enforcement of all NPDES permits in California including NPDES general permits and permits for Federal facilities; (e) overseeing Regional Boards' implementation and enforcement of National Pretreatment Program requirements except for NPDES permits incorporating variances granted under Federal Water Pollution Control Act Sections 301(h) and 301(m) and permits to dischargers for which EPA has assumed direct responsibility; (f) designating "Areas of Special Biological Significance (ASBS):, under State Board Resolution No. 74-28, for the purposes of protecting areas of high biological productivity and ecological sensitivity; (g) adopting standards and regulations for waste disposal sites; (h) implementing Toxic Substances Monitoring (TSM) and State Mussel Watch Programs; (i) administering the State's Water Quality Planning Program pursuant to CWA Section 205(j); (j) issuing or denying Water Quality Certification for any Federally licensed or permitted project which may result in discharges to navigable State waters pursuant to CWA Section 401; (k) developing and implementing the State Nonpoint Source Management Program pursuant to CWA Section 319; and (1) working with the California Coastal Commission (CCC) and the San Francisco Bay Conservation and Development Commission (BCDC) in developing and implementing a Coastal Nonpoint Pollution Control Program pursuant to the Coastal Zone Act Reauthorization Amendments of 1990, Section 6217.

The jurisdictional boundaries of the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Board 2), are described in Water Code Section 13200(b). The jurisdictional boundaries of the California Regional Water Quality Control Board, Central Coast Region (Regional Board 3), are described in Water Code section 13200(c).

The Regional Boards have jurisdiction and are responsible for: (a) regulation of waste discharges into State waters; (b) adoption of water quality control plans for the watershed basins within each region; (c) issuance, monitoring, and enforcement of NPDES individual and general permits and other waste discharge requirement orders within each region;

(d) adoption and enforcement of pretreatment standards; (e) issuance, monitoring, and enforcement of requirements for waste disposals to land; and (f) taking all other planning and regulatory action necessary to assure protection of water quality within the regions.

D. California Coastal Commission

Pursuant to the California Coastal Act of 1976 and the Federal Coastal Zone Management Act (CZMA) of 1972, as amended, the California Coastal Commission (CCC) has jurisdiction and is responsible for: (a) administering the California Coastal Management Program (CCMP); (b) receiving grants from the Federal Government in support of the coastal management program; (c) implementing, through the CCMP's broad planning and regulatory framework, a comprehensive set of specific policies for the protection of coastal resources and the management of orderly development throughout the State's coastal zone; and (d) reviewing, for consistency with the CCMP, all activities within or outside of the coastal zone that affect land or water uses or natural resources of the coastal zone and that are conducted, permitted, or funded by the Federal government. In addition, pursuant to Section 6217 of the Coastal Zone Management Act Reauthorization Amendments of 1990, the CCC is responsible for developing, in conjunction with the SWRCB, a coastal Nonpoint Pollution Control Program for submission to the Administrator of U.S. EPA and the Secretary of Commerce for approval.

The Coastal Act grants the CCC authority to issue Coastal Development Permits (CDPs) for any development in the coastal zone until local governments adopt CCC-approved Local Coastal Programs (LCPs). The Commission works with local governments to design LCPs that reflect local coastal issues while meeting the statewide goals and policies of the Coastal Act. Upon certifying a LCP's compliance with Coastal Act requirements, the CCC delegates most permitting and related monitoring and enforcement responsibilities to the local jurisdiction. Several well-defined regulatory responsibilities delineated by the Coastal Act and the CZMA, however, permanently reside with the CCC. Included among these is the aforementioned "Federal consistency" review authority. Distinct sets of State and Federal standards and procedures for determining consistency with the CCMP apply to Federal agency activities, Federally funded activities, and non-Federal activities that require Federal licenses or permits, including oil and gas exploration, development, and production on the Outer Continental Shelf.

E. Association of Monterey Bay Area Governments

The Association of Monterey Bay Area Governments (AMBAG) is a Council of Governments, created as a voluntary agency established by agreement among its members pursuant to a joint

powers agreement, and established among its members as an area-wide planning and water quality management organization and is responsible for: (a) serving as the Metropolitan Regional Clearing House to review and comment on Federal grant applications and proposed Federal projects and other environmental documents and plans prepared pursuant to CEQA and NEPA, (b) creating a Non-Point Source Water Quality Management Plan pursuant to its designation by the State in 1975 under Section 208 of the Federal Water Pollution Control Act, (c) managing Federal transportation funds, general transportation, reviewing transportation projects or capital improvements in major urban areas and annually endorsing a Transportation Improvement Program and Regional Transportation Plan pursuant to its designation as a Metropolitan Planning Organization (MPO) by the State of California, (d) preparing an air quality plan to ensure consistency with Federal Clean Air Act, National Air Quality Standards, (e) preparing a regional hazardous waste management plan in accordance with Tanner Legislation (AB 2948, 1986), and (f) preparing a 5-year plan of housing needs for each city and county within its jurisdiction.

III. SCOPE

This agreement shall apply to the following permits, plans, research, and monitoring efforts within all California waters to achieve the purpose of this MOA:

A. National Pollutant Discharge Elimination System (NPDES) permits (which include stormwater associated with industrial activity and stormwater from urban areas) issued under Section 13377 of the California Water Code (Hereafter "NPDES permit"),

B. Waste Discharge Requirements (WDR) issued under Section 13263 of the California Water Code,

C. California Ocean Plan, Enclosed Bays and Estuaries Plan, Inland Surface Water Plan, relevant Basin Plans, and CWA 208 Plans,

D. Non-Point Source (Hereafter "NPS", when abbreviated) Pollution Planning and Control Measures including Management Plans prepared under Sections 319 and 208 of the CWA and under Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990, and

E. Research and monitoring toward the development of a Sanctuary Water Quality Protection Program, as outlined in Section VII of this MOA.

IV. POLICY FOR INTERAGENCY COORDINATION

A. NOAA Role:

- Provide its Sanctuary data and reports to the signatory agencies semiannually.

- Ensure holistic, uniform protection is provided to all Sanctuary resources and qualities.

- Provide comprehensive ecosystem perspective.

- Consider cumulative impacts from multitude of projects.

- Consider multiple use and conflict resolution between potentially competing user groups and other Sanctuary activities, e.g., research and education projects and other permitted activities.

- Provide experience and perspective from National System of sanctuaries, e.g., examples and models of approaches and methods to address similar issues from other sites.

- Build up data-base on what is going on in Sanctuary area via tracking and filing of existing permits to see if problems exist. Begin to address potential or perceived problems early on and then work cooperatively to address issues.

- Provide recommendations on conditions or objections to discharge permits based upon potential injury to Sanctuary resources and qualities and compliance with applicable criteria.

- Work with all signatory agencies of this MOA to integrate NOAA criteria, goals, and objectives into water quality plans, i.e., Basin Plans, California Ocean Plan, Enclosed Bays and Estuaries Plan, Inland Surface Water Plan, CWA 208 and 319 Plans, and CZMA NPS management measures.

- Provide comments on impacts on Sanctuary resources and qualities, impacts on compatible uses of the Sanctuary, and impacts on NOAA's management of the Sanctuary.

- Identify, in consultation with U.S. EPA, a specific threat of significant injury or significant injury to the Sanctuary resources or qualities. NOAA provides evidence and informs U.S. EPA, the RWQCB, the discharger (for existing permits), or the permit applicant.

- Work with U.S. EPA, the discharger or applicant, and RWQCB to address the threat of significant injury or significant injury to the Sanctuary.

- Utilize the "Process for Elevation" (see Section VIII of this MOA) when it deems appropriate.

- Provide certifications in accordance with this MOA.

B. U.S. EPA Role:

- Work with the State Board and the Regional Boards to assure that all Section 402 NPDES permits are issued in a timely manner, protective of water quality, and that full compliance is achieved with all the terms contained therein.

C. State Board Role:

- Provide expertise on water quality issues.

- Work with NOAA and Regional Boards to determine if it is necessary to develop criteria in addition to that already promulgated by the State and Regional Boards or to take other specific actions in order to protect Sanctuary resources and qualities.

- Work with NOAA and Regional Boards in developing criteria that are scientifically sound to ensure proposed criteria are acceptable for adoption by the State Board as water quality objectives or standards in the respective water quality control plans.

- Oversee all Regional Boards' NPDES permits and other waste discharge requirements.

- Review and provide responses to all petitions filed by NOAA and recommendations made by the Joint Review Board during the "Referral Process" (See Section VIII.B. of this MOA).

- Work with the California Coastal Commission (CCC) and the San Francisco Bay Conservation and Development Commission (BCDC) in developing and implementing a Coastal Non-Point Pollution Control Program pursuant to the Coastal Zone Act Reauthorization Amendments of 1990, Section 6217.

D. Regional Boards' Roles:

- Issue NPDES and Waste Discharge Requirements permits in accordance with applicable State and Federal laws.

- Coordinate procedure to comment on permits as outlined in Section V of this MOA and fulfill Regional board duties described in Sections V and VIII of this MOA.

- Work with NOAA and State Board to determine if it is necessary to develop criteria in addition to that already

promulgated by the State and Regional Boards in order to protect Sanctuary resources and qualities.

- Work with NOAA and State Board in developing criteria that are scientifically sound and to ensure proposed criteria are acceptable for adoption by the State Board as water quality objectives or standards in the respective water quality control plans.

- Provide expertise on water quality issues.

- Coordinate with NOAA and all other appropriate agencies on development and implementation of nonpoint source control activities.

- Provide NOAA with data and reports from Regional Board contracts or activities within the Sanctuary.

- Regional Board 3 work with CCC to provide to NOAA the final report on the Coastal Zone Management Act Morro Bay Nonpoint Source pilot program (including status, accomplishments, and potential applicability to the Sanctuary).

E. California Coastal Commission Role:

- Evaluate effects of proposed activities (including discharges) on coastal land and water uses and natural resources in the coastal zone to determine if the proposed activities are consistent with the CCMP. Such evaluations particularly will be guided by the policies set forth in the Coastal Act, an integral component of the CCMP. These policies include, but are not limited to, the following:

> Public Resources Code Section 30230 which provides that "[m]arine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance..." and that "[u]ses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes...;"
>
> Public Resources Code Section 30231 which directs that biological productivity and water quality shall be "maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment controlling runoff, preventing depletion of ground water supplies, and substantial interference with surface water flow,

encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams...;"

Public Resources Code Section 30233(a) which limits dredging and filling in coastal waters to situations where "there is no feasible less environmentally damaging alternative," and where feasible mitigation measures have been provided to minimize adverse environmental effects, and where it is related to specific listed purposes;

Public Resources Code Section 30233(b), which states that "Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable long shore current systems."

Public Resources Code Section 30240 which mandates the protection of environmentally sensitive habitat areas "against any significant disruption of habitat values" and against impacts from adjacent development which would "significantly degrade" the area; and,

Public Resources Code Section 30262 which sets forth specific policies applicable to the Commission's regulation of oil and gas development.

- Cooperate with NOAA, EPA, SWRCB, RWQCBs and other Federal, state, and local agencies to promote timely issuance of permits and plans relevant to the MBNMS.

- Provide coastal zone management experience from a statewide perspective on the development of regulatory, planning, educational, and other programs which will be included in the overall management of the MBNMS.

- Ensure that the goals and objectives for protection of the MBNMS's resources are appropriately incorporated in the Monterey Bay segment of the California Coastal Nonpoint Pollution Control Program to be submitted to NOAA and U.S. EPA for approval.

F. Association of Monterey Bay Area Governments Role:

- Consider publication of a Monterey Bay Sanctuary Newsletter that circulates summaries of, and provides review comments on, proposed activities and developments within the Regional Metropolitan Clearinghouse area of projects, studies, plans,

and permits which could impact directly or indirectly the Sanctuary.

- Ensure that the interests of local cities and counties are represented during the discharge permitting and planning review process.

- Ensure that any proposed projects or developments are reviewed, when applicable, for consistency with the 208 nonpoint source water quality management plan.

- Provide all parties to the MOA an opportunity to update the area's 208 plan (now 14 years old) in order to document what has been implemented since the late 1970's, and what nonpoint source water quality problems remain to be resolved particularly as they affect the Sanctuary.

- Participate with other agencies in nonpoint source water quality planning issues pertinent to the Sanctuary, including but not limited to 205(j) planning projects, such as the Elkhorn Slough Uplands Water Quality Management Plan, the Urban Runoff Water Quality Management Plan for the Monterey Bay Region, the Coastal Aquatic and Marine Projects Information Transfer System (CAMPTIS), and other non-point source planning efforts such as the Coastal Nonpoint Pollution Control Program under Section 6217 of the Federal Coastal Zone Act Reauthorization Amendments of 1990.

V. PROCEDURES AT THE INITIAL DECISION-MAKING LEVELS

A. General:

1. Parties agree to work together and review proposed permits and plans in parallel to avoid delays in issuance of the permit or plan.

2. NOAA agrees to provide a reasonable basis for objections or recommended terms and conditions based on evidence of a significant threat of injury to Sanctuary resources, qualities, compliance with applicable criteria, and effects on other compatible uses of the Sanctuary.

3. The Regional Board staff will make every effort to resolve conflicts between NOAA and the Regional Board during the scheduled comment period.

4. If conflicts are not resolved during the comment period, the Regional Board may take action on the permit or plan. The effective date of any new

permit that is not consistent with all of NOAA's comments will be no earlier than 45 days from the date the Regional Board adopts the permit. If NOAA has objections after Regional Board adoption of the permit or plan, NOAA may appeal the decision in accordance with the process for elevation outlined in Section VIII of this MOA.

B. Existing Permits (NPDES/WDR):

Copies of all current permits for discharges originating in:

* all of the counties of Monterey, Santa Cruz and San Benito,

* those portions of San Luis Obispo County which fall within the Salinas River drainage or which drain into the Pacific Ocean northerly of the southern boundary of the Sanctuary,

* those portions of San Mateo County which drain directly into the Pacific Ocean,

* those portions of the City and County of San Francisco which drain directly into the Pacific Ocean, and

* those portions of Marin County southerly of the northern boundary of the Sanctuary which drain into the Pacific Ocean

will be sent within 90 days of the effective date of Sanctuary designation, by the Regional Boards to NOAA with a listing of expiration/review dates, as well as the Regional Boards' schedule for mailing of draft permits for existing dischargers. NOAA will use information obtained pursuant to this paragraph in its efforts to implement a Sanctuary monitoring plan. Regional Boards will also provide copies or summaries of existing monitoring data for the last three years for each discharger.

Discharges outside the Sanctuary shall not be prohibited for failure to notify NOAA within 90 days of sanctuary designation.

NOAA will review existing permits and NOAA will report to the Regional Boards on any conflicts between Sanctuary protection and the quality of discharges as soon as a conflict is documented by NOAA.

NOAA may request a Regional Board review and commensurate hearing to consider permit revision or enforcement action by the Regional Board at any time data warrant such action. The Regional Boards will determine whether data warrant the reopening of a permit subsequent to a hearing. NOAA bears the burden of demonstrating threat of injury which would justify revision of permits by the Regional Boards before a regular five-year review. Such demonstration will be based on State or Federal laws, regulations, and standards. NOAA will make every attempt to minimize requests for "mid-permit life" revisions by evaluating all available data during the regularly scheduled five-year review intervals. Any revisions must be consistent with EPA regulations on reopening permits.

Provided the provisions of this Section V.B are adhered to by the Regional Boards, NOAA will certify within six months of receipt the existing valid permits it receives copies of.

C. Existing Plans

NOAA will review and provide comment on the California Ocean Plan, Enclosed Bays and Estuaries Plan, Inland Surface Water Plan and Regional Board Basin Plans during the regularly scheduled review period.

All parties agree to make every effort to build upon existing regional, local, and State water quality control plans.

D. Non-Point Source Pollution

All parties recognize the significance of nonpoint source (NPS) pollution to the health of the Monterey Bay ecosystem, and whereas there is currently a lack of data and information to adequately control NPS pollution all parties agree to:

Focus pertinent ongoing NPS pollution efforts such as CWA 205(j) studies, municipal and industrial stormwater permitting (Section 402, CWA), 208 plans, 319 programs, and NOAA water quality research efforts to develop adequate prevention and management measures for protection of the Sanctuary. Management of significant contributions to nonpoint source pollution to Monterey Bay shall be addressed through the ongoing development of the State's Coastal Non-Point Source Pollution Control Program under Section 6217, and the Bay Protection and Toxic Cleanup Program.

Work together to incorporate those controls and measures determined necessary to protect the Sanctuary into the California Ocean Plan, Enclosed Bays and Estuaries Plan, Inland Surface Water Plan and appropriate Basin Plans once adequate prevention controls and management measures have been determined.

E. New and Revised Permits

Regional Boards will require applicants for new and revised permits ("revised permits" include renewals) for discharges originating in the geographic areas described in Section V.B of this MOA to submit applications simultaneously to NOAA as well as the Regional Board. Further, if NOAA provides reasonable evidence of a significant threat of injury to Sanctuary resources or qualities from a proposed or on-going discharge originating outside those geographic areas but originating anywhere in San Luis Obispo County, the relevant Regional Board will require the applicant for that new or revised permit to submit an application to NOAA as well. Regional Boards will make every effort to ensure that applicants for revised permits submit applications at least six months before expiration of current permits.

No additional applications will be required by NOAA, however NOAA may seek, through the Board, additional information from the applicants in accordance with State law. Regional Boards will draft permits according to the schedule submitted to NOAA, incorporating all criteria which the Regional Board determines to be applicable (e.g., State Ocean Plan, Enclosed Bays and Estuaries Plan, Inland Surface Water Plan, Basin Plans, Federal regulations) as agreed upon in the 1989 National Pollutant Discharge Elimination System (NPDES) MOA between the U.S. EPA and the SWRCB. Regional Boards will mail draft permits to NOAA and all other concerned agencies for comment 90 days before scheduled adoption of the draft permit by the Regional Board. No permit may be renewed or otherwise issued allowing the discharge of primary-treated sewage within the Sanctuary. However, as the City of Watsonville is in the process of obtaining a CWA 301(h) waiver renewal as the Sanctuary designation is being finalized, the City of Watsonville may be allowed a one time renewal with a timeline for compliance with secondary standards requirements. This one time renewal allows the City of Watsonville until November 1, 1998 to achieve secondary treatment. The signatories of this MOA will cooperate with and where possible assist the City of Watsonville to achieve secondary treatment of sewage.

NOAA will review and comment on any draft new or revised permits and EIRs/EISs during the publicly noticed comment period. NOAA will review draft permits, monitoring summaries, and any other applicable data, and provide comments to the Regional Board no later than 30 days prior to the scheduled date of Regional Board adoption of the permit. Agendas are sent to Regional Board members two weeks before the meeting (one week for Regional Board 2). All comments should be based upon State or Federal laws, regulations, and standards which will be specified in the comments.

The Regional Board shall consider and address all comments and shall modify the proposed permit to incorporate those comments with which the Regional Board agrees and shall prepare a written response to each NOAA comment that is not accommodated. If the Regional Board adopts a revised permit which is not consistent with all of NOAA's comments, the permit will be effective upon expiration of the current permit. If the Regional Board adopts a new permit which is not consistent with all of NOAA's comments, the effective date of the permit will be no earlier than 45 days from the date the Regional Board adopts the permit. However, the permit could be affirmed, amended or overturned in accordance with Section VIII, the Procedures for Referral.

Valid permits that are consistent with all of NOAA's comments will be deemed by NOAA, through notification to the permittee, to have met paragraph (a) of 15 C.F.R. § 944.11. Valid revised permits that are not consistent with all of NOAA's comments will be deemed by NOAA to have met such paragraph (a) on an interim basis as of their effective date and will be deemed by NOAA to have met such paragraph (a) on a final basis upon NOAA notification to the permittee that Sections V.E and VIII of this MOA have been complied with. Valid new permits that are not consistent with all of NOAA's comments will be deemed by NOAA to have met such paragraph (a) upon NOAA notification to the permittee that Sections V.E and VIII of this MOA have been complied with. Such notification shall be sent by NOAA within 10 working days following NOAA receipt of written notice of the action by the RWQCB or SWRCB, as appropriate. If NOAA fails to act within this time period, the subject permit shall be deemed to have met such paragraph (a).

No permit may be issued allowing the disposal of dredge material within the Sanctuary other than at sites

designated as of the effective date of Sanctuary designation.

With regard to the combined sewer overflow component of the City and County of San Francisco's sewage treatment program, as approved by the San Francisco RWQCB and U.S. EPA: a buffer zone has been created encompassing the anticipated discharge plume in order to protect Sanctuary resources and qualities from the discharge. The parties to this MOA agree that the MPRSA and its implementing regulations do not apply to the buffer zone. The buffer zone extends from Point San Pedro (37° 35' 39.9577'' N latitude, 122° 31' 11.0433'' W longitude); to 37° 36' 59.4490'' N latitude, 122° 36' 56.2934'' W longitude; to 37° 46' 01.2422'' N latitude, 122° 38' 56.4737'' W longitude; to Point Bonita (37° 49' 05.9481'' N latitude, 122° 31' 42.3981'' W longitude). The shoreward boundary of the buffer zone extends from Point San Pedro north along the coast following the mean high tide line to Point Lobos and thence in a straight line to Point Bonita.

F. Consistency Review Procedures

California Coastal Commission shall conduct its consistency review in accordance with the NOAA-approved CCMP.

VI. INTEGRATION AND COORDINATION OF RESEARCH AND MONITORING EFFORTS

- All parties to this MOA agree that a higher degree of resource protection may be necessary for the Sanctuary.

- All parties to this MOA agree to conduct, coordinate, and integrate any joint research, monitoring, and permit review oversight. The results of these efforts will be used to develop a more specific water quality management plan and to provide a higher degree of resource protection for the Sanctuary.

VII. SANCTUARY WATER QUALITY PROTECTION PROGRAM AND DEVELOPMENT OF SANCTUARY CRITERIA

A. Sanctuary Criteria

- Criteria are proposed values which are intended to provide a nonregulatory, scientific evaluation of the ecological effects of pollutants. EPA has published numerical criteria for priority pollutants under CWA Section 304(a). The Section 304(a) criteria or other proposed values become water quality objectives after adoption by the State Board

pursuant to the provisions of the California Porter-Cologne Water Quality Control Act. These objectives, once they are combined with beneficial uses and approved by EPA, become water quality standards pursuant to the CWA.

- NOAA shall consult with the State Board and the Regional Boards to determine if it is necessary to develop criteria in addition to those already promulgated by the

  State Board and Regional Boards in order to protect Sanctuary resources and qualities and compatible uses.

- Any necessary specific criteria will be developed for the Sanctuary to implement the purposes of Title III of the MPRSA. These criteria will be developed in a Water Quality Protection Program process (see below under Part B of this Section).

B. Water Quality Protection Program

- All signatory agencies agree to work together to develop a comprehensive water quality protection program for the Sanctuary.

- The purposes of such water quality program shall be to--

  (A) recommend priority corrective actions and compliance schedules addressing point and nonpoint sources of pollution to restore and maintain the chemical, physical,and biological integrity of the Sanctuary, including restoration and maintenance of the resources, qualities and compatible uses of the Sanctuary; and
  (B) assign responsibilities for the implementation of the program among the Governor, the Secretary of Commerce, and the Administrator of U.S. EPA or designees in accordance with applicable Federal and State laws.

  The program shall under applicable Federal and State laws provide for measures to achieve the purposes described above including--

  (A) adoption or revision, under applicable Federal and State laws, by the State and the Administrator of applicable water quality standards for the Sanctuary, based on water quality criteria which may utilize biological monitoring or assessment methods, to assure protection and restoration of the resources and qualities of the Sanctuary;
  (B) adoption under applicable Federal and State laws of enforceable pollution control measures (including water quality-based effluent limitations and best management practices) and methods to eliminate or reduce pollution from point and nonpoint sources;

(C) establishment of a comprehensive water quality monitoring program to (i) determine the sources of pollution causing or contributing to existing or anticipated pollution problems in the Sanctuary, (ii) evaluate the effectiveness of efforts to reduce or eliminate those sources of pollution, and (iii) evaluate progress toward achieving and maintaining water quality standards and toward protecting and restoring any degraded areas and living marine resources of the Sanctuary;
(D) provision of adequate opportunity for public participation in all aspects of developing and implementing the program;
(E) identification of funding for implementation of the program, including appropriate Federal and State cost sharing arrangements; and
(F) provision to ensure compliance with the program consistent with applicable Federal and State laws.

In the development and implementation of the program appropriate State and local government officials shall be consulted either directly or via AMBAG.

VIII. PROCEDURES FOR REFERRAL

A. General:

1. In the vast majority of cases, the concerns of the different parties to this MOA will be addressed at the Initial Decision-making levels.

2. If concerns have not been resolved at the Initial Decision-making levels, the dispute could be referred to higher level officials within each agency for resolution.

3. If resolution is not reached at Initial Decision-making levels, the following process is available to NOAA.

B. Process for elevation:

1. If the RWQCB permit does not, in the opinion of NOAA, adequately act to relieve the threat of significant injury or significant injury to the Sanctuary, i.e., the threat of significant injury or significant injury is still occurring and there is not underway a NOAA-approved (in consultation with U.S. EPA) action plan to adequately reduce or eliminate the threat of significant injury or significant injury to the Sanctuary, NOAA may file an appeal with the SWRCB within 30 days of the RWQCB action (ref: Section 13320

of the California Water Code). The SWRCB shall act to confirm, amend or overturn the decision of the RWQCB within 45 days of the appeal being filed by NOAA.

2. If, after the SWRCB acts to confirm, amend or overturn the decision of the RWQCB, in the opinion of NOAA, the SWRCB has not adequately acted, i.e, the threat of significant injury or significant injury to the Sanctuary is still occurring and there is not underway a NOAA-approved (in consultation with U.S. EPA) action plan to adequately reduce or eliminate the threat of significant injury or significant injury to the Sanctuary, NOAA may file an appeal with the MBNMS Joint Review Board (JRB) within 30 days of the SWRCB's action. The JRB shall consist of the Administrator of NOAA (or designee) and the Secretary of California EPA (or designee).

3. After considering information received from NOAA, the SWRCB, the RWQCB, other public agencies and the public, the JRB shall recommend to the SWRCB the confirmation, amendment, or overturning of the decision of the SWRCB. The JRB shall make such recommendation within 30 days of receipt of the appeal to it.

4. The SWRCB shall act to confirm, amend or overturn its decision within 60 days of receipt of the JRB's recommendation.

IX. RIGHTS OF APPEAL OR PETITION UNDER FEDERAL OR CALIFORNIA STATUTE OR REGULATION

This MOA is not intended to limit any rights of appeal or petition of any signatory to this MOA existing under Federal or California statute or regulation.

X. MODIFICATION PROVISIONS

This MOA shall become effective upon signature by all parties hereto.

Any amendment to this MOA shall only be in writing and shall become effective only upon the signature of all signatory agencies. Any amendment to this MOA shall be published in the Federal Register.

An individual signatory agency may withdraw from this MOA only if the Procedures for Referral in Section VIII have been exhausted on at least one occasion and the resolution of the subject dispute is not acceptable to the withdrawing party. Upon notice that a party is considering withdrawing, NOAA shall publish a notice in the Federal Register stating the reasons for

ultimately decides to withdraw, it shall give the other parties at least 90 days notice of intent to withdraw, and NOAA shall publish a notice in the Federal Register announcing the withdrawal.

This MOA shall become invalid only if NOAA or the SWRCB withdraws in accordance with the above procedures.

Gertrude M. Coxe, Director
Office of Ocean and Coastal Resource Management
National Oceanic and Atmospheric Administration

Harry Seraydarian, Director
Office of Water, Region IX
U.S. Environmental Protection Agency

James Strock, Secretary
California Environmental Protection Agency

Walt Pettit, Executive Director
State Water Resources Control Board

Steven Ritchie, Executive Officer
San Francisco Regional Water Quality Control Board

William Leonard, Executive Officer
Central Coast Regional Water Quality Control Board

Peter Douglas, Executive Director
California Coastal Commission

Nicolas Papadakis, Executive Director
Association of Monterey Bay Area Governments

Appendix C

Comments

Advocates for Wild, Healthy Oceans

Pacific Regional Office
116 New Montgomery Street
Suite 810
San Francisco, CA 94105
415.979.0900 Telephone
415.979.0901 Facsimile
www.oceanconservancy.org

Formerly the Center for
Marine Conservation

April 17, 2003

Abigail Smith, NPDES Division
San Francisco Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

The Ocean Conservancy

VIA FACSIMILE AND U.S. MAIL

Re: Initial Comments on NPDES Permit No. CA0037681, Oceanside Water Pollution Control Plant and Southwest Ocean Outfall, City and County of San Francisco

Dear Ms. Smith:

The Ocean Conservancy (TOC) welcomes the opportunity to submit the following preliminary comments on NPDES Permit No. CA0037681 for the City and County of San Francisco's Oceanside Water Pollution Control Plan and Southwest Ocean Outfall (Permit). These comments are based on our initial review of documents you supplied to us, specifically the Permit itself, the Self-Monitoring Program, the Fact Sheet, the Memorandum of Agreement relating to the Monterey Bay National Marine Sanctuary, and a September 19, 2002 letter from NOAA regarding potential impacts on endangered species, essential fish habitat, and marine mammals. TOC has several comments on the Permit and the Self-Monitoring Program, which are outlined below.

1. **The Impact of the Removal of a Discharge Site Should Be More Fully Evaluated Prior to Issuing the Permit.**

The discharge system, as described under the old permit, had eight CSO discharge locations. Under the new permit there are seven, because one site was eliminated during construction of the Richmond Transport System. The permit states that the system was designed with a storage and flow capacity to accommodate the historical rainfall in the area. (Permit at 11.) The elimination of one of only a few discharge sites may be a significant change to the system design, but the impact of this change is not discussed. For example, it is impossible to tell whether this has resulted in increased flow of discharge from the remaining seven locations and if so, whether such increased flow results in locally increased concentrations of substances of concern. This change should be addressed in the Permit.

2 **Chronic Toxicity Screening Should Be Conducted Using a Variety of Species.**

Under the 1997 permit, the chronic toxicity bioassay appears to have been conducted on abalone only, based on a determination during screening that this organism was the most sensitive. The new self-monitoring program states that testing on echinoderm development was most sensitive, and that therefore the monthly toxicity assays should be conducted using urchins. The monitoring program documentation acknowledges that the relative sensitivity of species to the assay may vary, stating: "[e]very two years, the Discharger shall re-screen for the most sensitive species, for one month at different times from the prior year and continue to monitor using the most sensitive species." (Self-Monitoring Program at 5.) Given that this kind of variability exists, the Discharger should be required to monitor using a variety of species.

3. **The Effluent Limit for Mercury Should Not Be Removed from the Permit.**

The new permit removes the effluent limit for mercury, based on a determination that there was no reasonable potential that mercury discharge would cause an excursion over the state water quality standard. (Fact Sheet at 27.) However, it is possible that the levels of mercury in the discharges were kept low because of the incentive created by the effluent limit in the permit. In this case, removing the mercury limit would eliminate this incentive and possibly result in exceedances of the water quality standard. On the other hand, it is also possible that the Discharger is effortlessly meeting applicable mercury standards. Under these circumstances, it shouldn't be troublesome to the Discharger to keep the effluent limit in the permit.

4. **The Frequency of Monitoring for Bacteriological Contamination and Acute Toxicity Should Not Be Reduced.**

The new self-monitoring program decreases the frequency of several monitoring requirements. First, monitoring frequency for acute toxicity has been reduced to quarterly from monthly under the rationale that no acute toxicity was detected during the last permit cycle. Similarly, the frequency of shoreline bacteriological monitoring has been decreased to once per week from three times per week based on the rationale that "monitoring over the last permit cycle has satisfactorily characterized the area . . . where bacteriological contamination is routinely found in the absence of a CSO." (Fact Sheet at 34.) Frequent monitoring of both acute toxicity and harmful bacteria is important because of the potential dangers posed to marine life and human health. Reducing the frequency of monitoring for these dangers could vastly slow the response time should an exceedance be detected. Particularly in light of the elimination of the CSO discharge location, monitoring frequency should not be reduced.

Appendix D

Response to Comments

From: "alex lantsberg" <wideye@earthlink.net>
To: "Abigail Smith" <ahs@rb2.swrcb.ca.gov>
Date: 6/2/03 3:48PM
Subject: comments re: SF discharge permit

Hi Abigail.

Thanks for sending me that information and continuing to keep me in the loop on this matter. I expect a number of my colleagues, including Communities for a Better Environment, Surfrider Foundation, and Baykeeper to submit their own comments on the permit application, so I'd like to limit my comments specifically to combined sewage overflows and wet weather facilities.

The Alliance comes to this issue through its several years of work of advocating for the use of more environmentally just and sustainable treatment and management methods for the city's sewage and stromwater. Since persuading the PUC to exclude the Clean Water system from last November's Proposition A capital ilmprovement bond, the Alliance has worked closely with PUC General Manager Pat Martel and SF District 10 Supervisor Sophie Maxwell to craft a process for developing a new Clean Water master plan that can win public support. We'd like to make sure that the Regional Board's regulatory mandates support this effort.

The reform and modernization of the city's stormwater and wet weather management practices must be a fundamental element of this new master plan. The Alliance is particularly interested in comprehensive evaluations of how cutting edge "low impact development" or "soft path" alternatives can be applied within the City's system. This approach is already being used in two areas - the Port of San Francisco's Southern Waterfront and the redevelopment of Hunters Point Shipyard.

A number of the provisions included in the bayside and, i expect, the ocean side permit can help move the City in the right direction. Several of the provisions in the bayside permit call for the development of a number of CSO related studies by a "mutually agreed upon" third parties by various compliance dates. A number of these can and should be folded into the master planning process to ensure their integration with the policy decisions being made in the public planning process. Furthermore, the City's Clean Water Program Technical Review Committee of sewage and stormater management experts, which includes Blair Allen of the Regional Board, should participate in the development of these studies. To that end, the Alliance would like to participate in helping to lay out the scopes of work and consultant selection for these studies.

We would be glad to meet with you in person to discuss how this can occur. In the meantime, please keep us updated on other public participation activities regarding the City's discharge permits.

Sincerely for Alliance for a Clean Waterfront,

Alex Lantsberg

Alex Lantsberg
wideye@earthlink.net

5 **Consultations Required under the Endangered Species Act, the Magnuson-Stevens Fishery Conservation and Management Act, and the Marine Mammal Protection Act Should Be Completed Prior to Issuance of the Permit.**

The September 19, 2002 letter from Patrick Rutten of NOAA's Protected Resources Division lists a broad array of threatened or endangered species, essential fish habitats, and marine mammals that might be impacted by this action. It is unclear whether U.S. EPA has completed its Endangered Species Act Section 7 consultation responsibilities, although it appears that such consultation has been occurring. Neither the Fact Sheet nor the proposed permit discusses consultation with NOAA regarding essential fish habitat or marine mammals. This permit should not be issued until those responsibilities have been met.

* * *

Thank you for the opportunity to provide these preliminary comments. We look forward to working with you to finalize a Permit that effectively protects both human health and our ocean and coastal resources.

Sincerely,

Linda Sheehan
Director, Pacific Region Office

SFPUC

WATER
HETCH HETCHY
WATER & POWER
CLEAN WATER

SAN FRANCISCO PUBLIC UTILITIES COMMISSION

PLANNING BUREAU

1145 Market Street – Suite 401 - San Francisco, CA 94103• Tel. (415) 934-5700 • Fax (415) 934-5750

June 12, 2003

Abigail Smith
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Nancy Yoshikawa
U.S. Environmental Protection Agency, Region IX
75 Hawthorne Street, WTR-5
San Francisco, CA 94105

Dear Ms. Smith and Ms. Yoshikawa:

We appreciate the opportunity to review and comment on the final draft NPDES Permit No. CA0037681 and accompanying Fact Sheet and Self-Monitoring Program being issued for the Oceanside Treatment Plant Southwest Ocean Outfall (SWOO) and Westside Wet Weather Facilities. We were asked by the San Francisco Bay Regional Water Quality Control Board to submit comments on issues applicable to the SWOO discharge separate from comments on issues applicable to combined sewer overflows. Where comments do not fall into either category, they are listed separately at the end of the submittal. In preparing these comments, the City has attempted to provide clarification on issues that were not clear or were inaccurate in the documents. When possible, substitute language is also provided.

We hope the attached comments are useful as you prepare the final version of the documents. If you have any questions or would like to meet to discuss these issues please contact Arleen Navarret at (415) 242-2201.

Very truly yours,

Michael P. Carlin, Planning Bureau Manager

c.c. Patricia E. Martel, General Manager, SFPUC
William Keaney, Water Pollution Control Division Manager, SFPUC
Jim Salerno, Environmental Services Manager, SFPUC
Arleen Navarret, Supervising Biologist, SFPUC
John Roddy, Deputy City Attorney
Shin-Roei Lee, RWQCB (with attachments)
Lila Tang, RWQCB (with attachments)

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