CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. R2 2003-0078
NPDES PERMIT NO. CA0037834

WASTE DISCHARGE REQUIREMENTS FOR:

CITY OF PALO ALTO
REGIONAL WATER QUALITY CONTROL PLANT
SANTA CLARA COUNTY

8/20/03

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REISSUING WASTE DISCHARGE REQUIREMENTS FOR:
CITY OF PALO ALTO
PALO ALTO REGIONAL WATER QUALITY CONTROL PLANT
PALO ALTO, SANTA CLARA COUNTY

FINDINGS

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

1. *Discharger and Permit Application.* The City of Palo Alto (hereinafter called the Discharger) has applied to the Board for reissuance of waste discharge requirements and a permit to discharge treated wastewater to waters of the State and the United States under the National Pollutant Discharge Elimination System (NPDES).

Facility Description

2. *Location.* The Discharger owns and operates the Palo Alto Regional Water Quality Control Plant (the Plant), located at 2501 Embarcadero Way, Palo Alto. A location map of the facility is included as Attachment A of this Order.

3. *Service Area and Population.* The Plant provides tertiary treatment of wastewater from domestic, commercial and industrial sources from the cities of Los Altos, Los Altos Hills, Palo Alto, and Mountain View, the service area of the East Palo Alto Sanitary District, and the unincorporated area of the Stanford University Campus. The Discharger's service area has a present population of about 220,000.

4. The USEPA and the Board have classified this Discharger as a major discharger.

Purpose of Order

5. This NPDES permit regulates the discharge of treated wastewater to waters of the United States. This includes discharge of approximately 95% of the treated effluent is discharged to an unnamed, manmade channel which is tributary to lower South San Francisco Bay; both of which constitute marine environments. Approximately 5% of the treated effluent to the Renzel Marsh Pond which is tributary to Matedero Creek within the Palo Alto Flooding Basin, which constitutes a freshwater environment. Both of these discharges occur year-round, except that discharge to the Renzel Pond must be temporarily halted if high rainfall raises the level of the Palo Alto Flooding Basin. These discharges were governed by Waste Discharge Requirements specified in Order No. 98-054, as amended by Order 00-109.

Treatment Process Description

6. *Treatment Process.* The wastewater treatment process consists of, screening, primary sedimentation, fixed film roughing filters for CBOD reduction, activated sludge for nitrification, secondary clarification, filtration, disinfection, and dechlorination. A treatment process schematic diagram is included as Attachment B of this Order.

7. *Sludge Handling and Disposal.* Sludge is currently thickened, dewatered using belt presses, and incinerated in multiple hearth furnaces. The ash is hauled offsite and currently used for soil augmentation on farm and ranch lands in the Central Valley.

Storm Water Discharge Description

8. *Regulations.* Federal Regulations for storm water discharges were promulgated by the USEPA on November 19, 1990. The regulations [40 CFR Parts 122, 123, and 124] require specific categories of industrial activity (industrial storm water from Publicly Owned Treatment Works) to obtain a NPDES permit and to implement Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to control pollutants in industrial storm water discharges.

9. *Exemption from Coverage under Statewide Storm Water General Permit.* The State Board developed a statewide NPDES permit for storm water discharges associated with industrial activities (NPDES General Permit CAS000001) that was adopted November 19, 1991, amended September 17, 1992, and reissued April 17, 1997. Coverage under the General Permit, however, is not required because all storm water flows are directed to the wastewater treatment plant headworks and are treated along with the wastewater discharged to the plant. Because all storm water from the facility is treated at the facility, this permit regulates the discharge of storm water from the Plant.

Discharge Description

10. *Discharge Location.* Approximately 95% of the treated wastewater is discharged from the plant to an unnamed manmade channel (Latitude 37° 27' 30" and Longitude 122° 06' 37") tributary to Lower South San Francisco Bay through outfall E-001. Approximately 5% of the treated wastewater is discharged from the plant to the Renzel Marsh Pond (Latitude 37° 26' 30" and Longitude 122° 06' 45") which is tributary to Matedero Creek. Both locations constitute a discharge to waters of the United States. The discharge to the Renzel Marsh Pond is a reclamation project initiated by the City of Palo Alto to enhance a habitat area cut off from freshwater and saltwater inflow by a series of levees and roads built in the early and mid 1900s. The project created a 15-acre freshwater pond with treated effluent and enhances adjacent areas as well. A portion of the treated wastewater is not discharged to either discharge location (E-001 or E-002) and receives further treatment through reclamation and is reused on and off-site for irrigation and construction dust suppression. The further treatment consists of the addition of a flocculent, filtration and re-chlorination. In 2001, 22.9 million gallons (approximately 1% of the total wastewater flow) were treated and reused in this manner.

11. *Discharge Volume and Plant Capacity.* The Plant has an average dry weather flow design capacity of 39 million gallons per day (mgd) and can treat up to 80 mgd during wet weather. In 2002 the plant treated an annual average flow of 24.9 mgd. During wet weather flows, the plant is designed such that the fixed film reactors treat the first 40 mgd, with the excess flow blended with the treated flow and routed to the activated sludge units. Similarly, the Plant is designed such that the filters treat the

first 40 mgd, blending the excess flow with the treated flow from the filters. The quality of the effluent based on 1999-2002 monitoring data is presented in the Fact Sheet, Table A: Summary of Discharge Data.

South Bay Dischargers

12. NPDES permits have been issued to each of the three publicly owned treatment works (POTWs) discharging into the South San Francisco Bay, south of the Dumbarton Bridge (South Bay or Lower South Bay), namely the San Jose/Santa Clara Water Pollution Control Plant (CA 0037842), the Palo Alto Regional Water Quality Control Plant (CA 0037834), and the Sunnyvale Water Pollution Control Plant (CA 0037621). The previous NPDES Permits (the "1998 Permits") for the three South Bay POTWs were adopted by the Board in June 1998. The phrase "South Bay Dischargers" refers collectively to the San Jose/Santa Clara Water Pollution Control Plant, the Palo Alto Regional Water Quality Control Plant, and the Sunnyvale Water Pollution Control Plant.

Watershed Management Initiative

13. This Order was developed in cooperation with the Santa Clara Basin Watershed Management Initiative (WMI). The WMI, in which the Discharger is an active participant, is a stakeholder driven process that commenced in June 1996 as a pilot effort by the Regional Board. The WMI seeks to integrate regulatory and watershed programs in the South San Francisco Bay Region. This Order was developed through the Regulatory Work Group to coordinate permit reissuance process of the three South Bay POTWs. The Discharger is committed to encouraging stakeholder input with regard to permit requirements and programs. The Discharger has participated in the Bay Monitoring and Modeling Subgroup of the WMI to develop site-specific objectives (SSO's) for copper and nickel in the South San Francisco Bay. On May 15, 2002, the Board adopted Resolution R2-2002-0061 and on October 17, 2002, the State Board adopted Resolution 2002-0151, which established SSOs for copper and nickel for South San Francisco Bay.

14. The Discharger shall continue to participate with Board staff, other dischargers, representatives of the public, and concerned citizens in the WMI by reviewing and commenting upon technical and other proposals developed by the WMI and making technical information in its possession, available to stakeholder groups of the WMI as appropriate to develop its watershed management reports. The Discharger shall report to the Executive Officer annually describing its efforts in cooperating with the WMI.

Copper – Nickel Action Plans

15. *TMDL for Copper and Nickel*: Section 304(l) of the federal Clean Water Act (as amended in 1987) required States to develop lists of water bodies impaired by toxic pollutant discharges, identify point sources and pollutants causing toxic impacts, and develop individual control strategies (ICSs) for each point source identified. Section 303(d) of the Clean Water Act requires States every 2 years to list waterbodies that do not meet or are not expected to meet water quality objectives (WQOs) after existing controls are implemented. On March 9, 1998, the Regional Board submitted the Section 303(d) List of Impaired Water Bodies and Priorities for Total Maximum Daily Loads (TMDLs) for the San Francisco Bay Region to the State Water Resources Control Board. The list included a high priority ranking for copper and nickel in the South Bay. Municipal sources were listed as a source for these two pollutants and TMDLs for these pollutants were scheduled to begin in 1998. On November 28, 2001, the Board approved transmitting recommended revisions to the 1998 303(d) list to the SWRCB for inclusion in the state-wide 303(d) list, including delisting of copper

and nickel. The SWRCB adopted the revised California 303(d) list on February 4, 2003 with copper and nickel delisted and placed on the new Monitoring List. USEPA approved of the 2002 303(d) list on June 6, 2003. EPA deferred this approval because EPA is currently in the process of de-promulgating the CTR copper and nickel standards for South San Francisco Bay. EPA expects the promulgation to be complete Summer 2003.

16. In the *Impairment Assessment Report for Copper and Nickel in Lower South San Francisco Bay* (June 2000), the City of San Jose presented data and findings indicating that impairment of the Lower South Bay due to copper or nickel was unlikely. The report recommended that copper and nickel be removed from the 303(d) list of impaired water bodies. The report also recommended the establishment of acute and chronic SSOs for copper and nickel. In the report, the City provided several options for developing SSOs from the watershed-specific toxicity data developed by the Discharger. Depending on the option selected, fully protective chronic criteria could range from 5.5 to 11.6 µg/l for dissolved copper and from 11.9 to 24.4 µg/l for dissolved nickel.

17. The *Copper Action Plan.* As part of the adoption of SSOs, a Copper Action Plan was developed to comply with the State Anti-Degradation Policy. This plan includes monitoring to determine if ambient copper levels are increasing in the South Bay and triggers pollution prevention actions to control copper. A requirement to comply with the plan was previously incorporated into the Discharger's Order No. 98-054 NPDES permit through Order No. 00-109. This Order also requires the Discharger to comply with the Copper Action Plan, which is hereto incorporated into this Order by reference.

18. The Copper Action Plan requires dissolved copper be monitored in the Lower South Bay during the dry season. If the mean dissolved copper concentrations measured at stations specified in this Order increases from its current level of 3.2 µg/l to 4.0 µg/l or higher, Phase 1 actions would be triggered to further control copper discharges. If the mean dissolved copper concentration increases to 4.4 µg/l, Phase 2 actions would be triggered. Such incremental increases in mean dissolved copper concentrations shall be used solely for triggering the aforementioned actions. Where triggers are met the Discharger is required to submit the appropriate Phase 1 or Phase 2 implementation plan with a schedule to implement additional measures to limit the Discharger's relative cause or contribution to the exceedance.

19. The Copper Action Plan contains specific actions to be completed by various entities as appropriate. Those baseline actions applicable to the Dischargers include the following tasks (Appendix E contains other tasks and associated responsible parties):

    Baseline Actions: City of Palo Alto to continue and track corrosion control of copper pipes (CB-9); Track the three South Bay Discharger's pretreatment programs and loadings (CB-13); Track and encourage South Bay Discharger water recycling programs (CB-14); and Continue to promote industrial water efficiency efforts (CB-19). In addition, the Dischargers will work with other entities to accomplish other Baseline actions: Industrial runoff reduction (CB-3); Track and encourage investigations of uncertainties in the South San Francisco Bay impairment decision (CB-17); Track and encourage investigations on factors influencing copper fate and transport (CB-18); and Copper Conceptual Model update (CB-20).

    Phase I Actions include: Identify copper source increases (CI-3); Prepare and implement a Phase I plan for improved corrosion controls (CI-4); Expand water recycling (CI-7); Evaluate industrial water efficiency efforts and develop additional actions (CI-10); Develop Phase II plan for South Bay Discharger treatment optimization (CI-11); and Develop plan to re-evaluate actions (CI-12). In

addition, the South Bay Dischargers will work with other entities to accomplish other Phase I actions: Evaluate and investigate uncertainties in South San Francisco Bay impairment decision (CI-8); and Evaluate and investigate copper fate (CI-9).

Phase II Actions include: Reconsider managing storm water in the South Bay Discharger wastewater treatment plants (CII-1); Implement additional corrosion control measures (CII-3); Implement wastewater treatment plant process optimization (CII-6); and Expand water recycling programs (CII-7).

20. The *Nickel Action Plan:* As part of the adoption of SSOs, a Nickel Action Plan was also developed by the South Bay Dischargers and WMI stakeholders to comply with the State Anti-Degradation Policy. This plan includes monitoring to determine if ambient nickel levels are increasing in the South Bay and triggers pollution prevention actions to control nickel . A requirement to comply with the plan was previously incorporated into the Discharger's Order No. 98-052 NPDES permit through Order No. 00-109. This Order also requires the Discharger to comply with the Nickel Action Plan, which is hereto incorporated into this Order by reference.

21. The Nickel Action Plan requires that dissolved nickel be monitored in the Lower South Bay during the dry season. If the mean dissolved nickel concentrations measured at stations specified in this Order increases from its current level of 3.8 µg/l to 6.0 µg/l or higher, Phase 1 actions would be triggered to further control nickel discharges. If the mean dissolved nickel concentration increases to 8.0 µg/l, Phase 2 actions would be triggered. Such incremental increases in mean dissolved nickel concentrations shall be used solely for triggering the aforementioned actions. Where triggers are exceeded, the Discharger is required to submit the appropriate Phase 1 or Phase 2 implementation plan with a schedule to implement additional measures to limit the Discharger's relative cause or contribution to the exceedance.

22. *The Nickel Action Plan* contains specific actions to be completed by various entities as appropriate. Those actions applicable to the Dischargers include the following tasks:

Baseline Actions: Track the three South Bay Discharger's pretreatment programs and loadings (NB-13); Track and encourage South Bay Discharger water recycling programs (NB-4); Continue to promote industrial water efficiency efforts (NB-6); and Track and encourage a watershed model linked to a process oriented Bay model (NB-7).

Phase I Actions include: Expand water recycling (I-7); Evaluate industrial water efficiency efforts and develop additional actions (I-10); Develop Phase II plan for South Bay Discharger treatment optimization (I-11); and Develop Phase I Plan (NI-3).

Phase II Action includes: Implement actions developed during Phase I.

23. Some Phase 1 and Phase 2 actions in the Copper Action Plan and Nickel Action Plan may require the assistance of the Board to coordinate and assist in the efforts of the Dischargers and other entities to limit or reduce copper and nickel levels in the Lower South Bay. It is the intent of the Board that Board staff will, to the extent practicable, coordinate and assist Phase 1 and Phase 2 actions as identified in the Copper Action Plan and Nickel Action Plan.

Because the Water Quality Attainment Strategy (WQAS), of which the Copper and Nickel Action Plans are a part, is an adaptive management plan, modifications to the WQAS may be considered

provided that the Discharger continues reasonable treatment, source control, and pollution prevention measures to control discharges. If the dischargers can demonstrate that increases in either copper or nickel concentrations are due to factors beyond the control of the Dischargers, the Board will consider and determine reasonable control actions required under Phase 1 or Phase 2 of the Actions Plans.

Regional Monitoring Program

24. On April 15, 1992, the Board adopted Resolution No. 92-043 directing the Executive Officer to implement the Regional Monitoring Program (RMP) for the San Francisco Bay. Subsequent to a public hearing and various meetings, Board staff requested major permit holders in this region, under authority of Section 13267 of California Water Code, to report on the water quality of the estuary. These permit holders, including the Discharger, responded to this request by participating in a collaborative effort, through the San Francisco Estuary Institute. This effort has come to be known as the San Francisco Bay Regional Monitoring Program for Trace Substances. This Order specifies that the Discharger shall continue to participate in the RMP, which involves collection of data on pollutants and toxicity in water, sediment and biota of the estuary.

Basin Plan Discharge Prohibitions and Exceptions

25. The 1995 Basin Plan prohibits discharges south of the Dumbarton Bridge receiving less than 10:1 minimum initial dilution, discharges to dead-end sloughs, and discharge of any conservative toxic and deleterious substances above the levels that can be achieved by a program acceptable to the Board. Exceptions to the three Basin Plan prohibitions may be considered where the Discharger can show (1) a net environmental benefit as a result of the discharge, (2) that the project is part of a reclamation project, or (3) an inordinate burden would be placed on the Discharger relative to beneficial uses and an equivalent level of protection can be achieved by alternate means such as an alternative discharge site, a higher level of treatment, and/or improved treatment reliability.

26. The 1986 Basin Plan (at page III-5) did not include numeric water quality objectives for San Francisco Bay south of the Dumbarton Bridge; it suggests that criteria provided in Tables III-2B and III-2C should be used as guidance. The Basin Plan indicates that the South Bay has a unique hydrogeologic environment, and that site-specific water quality objectives are absolutely necessary for this water segment. The NPDES permit amendments issued to the Discharger on December 21, 1988 (Order 88-176) contained requirements for studies to assess impacts from metals on the water body, to investigate controls on metals levels discharged in effluent, and to develop water quality objectives based on cost/impact. Based on those studies, the Discharger was allowed to propose water quality objectives based on toxicity testing. In connection with the issuance of amendments to the Discharger's NPDES permit, on December 21, 1988 the Board granted a conditional exception to the discharge prohibitions based on net environmental benefit. The conditions to the granted exceptions related to unresolved concerns regarding the potential impacts of heavy metals on the South Bay.

27. **State Board Order WQ 90-5.** The State Board determined that a finding of equivalent level of protection for discharges South of Dumbarton Bridge could be made under several conditions. These include: (1) incorporating water-quality-based concentration limits for metals and revised mass loading limitations for metals into the Discharger's permit, and (2) implementation of a water conservation and reclamation program. WQ 90-5 found that water quality objectives were needed for the South Bay, and directed the Board to adopt objectives by March 1991, and to amend the permit to include water quality-based metals limits by April 1991. In addition, the Board was

required to modify the mass loading limits for metals in the permit. On April 17, 1991, Order 91-067 was adopted by the Board and included revised concentration and mass loading limits for metals. Order 91-067 amended Finding 13 in the December 21, 1988 permit so as to state that: "The requirements in this order support a finding of equivalent protection." The Board continued its granting of Basin Plan exceptions in the NPDES permits issued to the Discharger on July 21, 1993 and June 17, 1998.

28. *Concentration and Mass Limits for Metals.* As shown in Findings 62-83, the Board has conducted a reasonable potential analysis for metals based on the criteria contained in the CTR, and the requirements in the SIP. Based on the RPA, copper, mercury, and nickel show reasonable potential and effluent limits are included in this Order for these constituents. The previous permit established mass-based limits for metal constituents based on the requirements of State Board Order WQ 90-5, regardless of whether they exhibited reasonable potential. This permit does not automatically carry over the mass-based limits for metals. Instead, discharges of metals are addressed through the provisions of the State Implementation Policy as discussed in subsequent Findings. Effluent limits for copper and nickel, consistent with SSOs developed as a part of the Water Quality Attainment Strategy for the South San Francisco Bay, have been incorporated into this Order. It is the intent of the Board to review the need for copper and nickel limits for the next permit cycle.

29. Based on Findings 25-28, and consideration of existing information, the Board has retained the exception to the Basin Plan prohibitions based on a finding of an equivalent level of environmental protection consistent with the requirements specified in State Board Order WQ 90-5.

Applicable Plans, Policies and Regulations

Basin Plan

30. The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin on June 21, 1995 (Basin Plan). This updated and consolidated plan represents the Board's master water quality control planning document. The State Water Resources Control Board (SWRCB) and the Office of Administrative Law approved the revised Basin Plan on July 20 and November 13, respectively, of 1995. A summary of regulatory provisions is contained in Title 23 of the California Code of Regulations at Section 3912. The Basin Plan identifies beneficial uses for Waters of the State in the Region, including surface waters and groundwaters. The Basin Plan also identifies water quality objectives, discharge prohibitions and effluent limitations intended to protect beneficial uses. This Order implements the plans, policies and provisions of the Board's Basin Plan.

Beneficial Uses

31. Beneficial uses for the San Francisco Bay, South Bay (south of the Dumbarton Bridge) receiving waters, as identified in the Basin Plan, are:

a. Industrial Service Supply*
b. Navigation*
c. Water Contact Recreation
d. Non-contact Water Recreation
e. Ocean Commercial and Sport Fishing*
f. Wildlife Habitat
g. Preservation of Rare and Endangered Species*
h. Fish Migration
i. Fish Spawning (potential for San Francisco Bay)
j. Estuarine Habitat*

k. Shellfish Harvesting
*These Uses only apply to South San Francisco Bay and not to Matadero Creek

Beneficial uses specific to unnamed Channel tributary to the Bay and the Renzel Marsh Pond have not been assessed to determine which uses exist or potentially could exist. Board policy is to use the Tributary Rule to interpret which beneficial uses are currently or potentially supported where beneficial uses have not been specifically designated. The beneficial uses of South San Francisco Bay, are assumed to apply to the unnamed, man-made channel and the beneficial uses of Matadero Creek, are assumed to apply to the Renzel Marsh Pond.

California Toxics Rule (CTR)

32. On May 18, 2000, the USEPA published the *Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California* (Federal Register, Volume 65, Number 97, 18 May 2000). These standards are generally referred to as the CTR. The CTR specified water quality criteria (WQC) for numerous pollutants, of which all are applicable to the South Bay, except salt water quality criteria for copper and nickel.

State Implementation Policy (SIP)

33. The SWRCB adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (also known as the State Implementation Policy or SIP) on March 2, 2000 and the Office of Administrative Law (OAL) approved the SIP on April 28, 2000. The SIP applies to discharges of toxic pollutants in the inland surface waters, enclosed bays and estuaries of California subject to regulation under the State's Porter-Cologne Water Quality Control Act (Division 7 of the Water Code) and the federal Clean Water Act. The SIP establishes implementation provisions for priority pollutant criteria promulgated by the USEPA through the California Toxics Rule (CTR), the National Toxics Rule (NTR) and for priority pollutant objectives established by the Regional Water Quality Control Boards (RWQCBs) in their water quality control plans (basin plans). The SIP also establishes monitoring requirements for 2,3,7,8-TCDD equivalents, chronic toxicity control provisions, and Pollutant Minimization Programs.

34. In addition to the documents listed above, other USEPA guidance documents upon which BPJ was developed may include in part:
    - Region 9 Guidance For NPDES Permit Issuance, February 1994;
    - USEPA Technical Support Document for Water Quality-Based Toxics Control (March 1991) (TSD);
    - 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;
    - Draft Whole Effluent Toxicity (WET) Implementation Strategy, February 19, 1997.

Basis for Effluent Limitations

General Basis

35. *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.

36. *Water Quality Objectives (WQOs) and Effluent Limits.* WQOs/WQC and effluent limitations in this permit are based on the SIP; the plans, policies and WQOs and criteria of the Basin Plan; California Toxics Rule (Federal Register Volume 65, 97); *Quality Criteria for Water* (USEPA 440/5-86-001, 1986 and subsequent amendments, "USEPA Gold Book"); applicable Federal Regulations (40 CFR Parts 122 and 131); the National Toxics Rule (57 FR 60848, 22 December 1992 and 40 CFR Part 131.36(b), "NTR"); NTR Amendment (Federal Register Volume 60, Number 86, 4 May 1995, pages 22229-22237); USEPA December 27, 2002 "Revision of National Recommended Water Quality Criteria" compilation (Federal Register Vol. 67, No. 249, pp. 79091-79095); and Best Professional Judgment (BPJ) as defined in the Basin Plan. Where numeric effluent limitations have not been promulgated, 40 CFR 122.44(d) specifies that water quality-based effluent limitations (WQBELs) may be set based on USEPA criteria and supplemented where necessary by other relevant information to attain and maintain narrative WQOs/WQC to fully protect designated beneficial uses. Discussion of the specific bases and rationale for effluent limits are given in the associated Fact Sheet for this Permit, which is incorporated as part of this Order.

Applicable Water Quality Objectives/Criteria

37. The WQOs and WQC applicable to the receiving waters for this discharge are from the Basin Plan, the CTR, and the NTR.

    a. The Basin Plan specifies numeric WQOs for priority toxic pollutants, as well as narrative WQOs for toxicity and bioaccumulation in order to protect beneficial uses in waters within the region. However, the numeric WQOs for priority pollutants in the Basin Plan do not apply to the South Bay below Dumbarton Bridge. As discussed in Findings below, the Board adopted a Basin Plan Amendment that includes SSOs for copper and nickel that apply to the South Bay. The narrative toxicity objective states in part "[a]ll waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce other detrimental responses in aquatic organisms." The bioaccumulation objective states in part "[c]ontrollable water quality factors shall not cause a detrimental increase in concentrations of toxic substances found in bottom sediments or aquatic life. Effects on aquatic organisms, wildlife, and human health will be considered." Effluent limitations and provisions contained in this Order are designed to implement these objectives, based on current available information.

    b. The CTR specifies numeric aquatic life criteria for 23 priority toxic pollutants and numeric human health criteria for 57 priority toxic pollutants. These criteria apply to inland surface waters and enclosed bays and estuaries such as here, except that where the Basin Plan includes specific numeric objectives for certain of these priority toxic pollutants (i.e., only for copper and nickel in the South Bay south of the Dumbarton Bridge).

    c. The NTR established numeric aquatic life criteria for selenium, numeric aquatic life and human health criteria for cyanide, and numeric human health criteria for 34 toxic organic pollutants for waters of San Francisco Bay upstream to and including Suisun Bay and the Sacramento-San Joaquin Delta.

38. A Basin Plan Amendment adopted on May 22, 2002 (Board Resolution R2-2002-0061) and approved by the State Board on October 17, 2002 (State Board Resolution 2002-0151) contained SSOs and

translators for copper and nickel in the South San Francisco Bay. The amendment was transmitted to USEPA on January 9, 2003 for approval. After review, USEPA approved the SSOs on January 21, 2003. USEPA is currently in the process of depromulgating the CTR copper and nickel standards to reflect the new SSOs, and expects the promulgation to be complete during Summer 2003. The SSOs were derived through USEPA-approved methods and are fully protective of the most sensitive aquatic life beneficial uses in the South San Francisco Bay. The Amendment includes SSOs in the South San Francisco Bay of 6.9 µg/L for a 4-day average and 10.8 µg/L for a 1-hour average for dissolved copper and 11.9 µg/L for a 4-day average and 62.4 µg/L for a 1-hour average for dissolved nickel.

39. The SSOs are currently being achieved and must be maintained. Therefore, the SSOs are supported by the Water Quality Attainment Strategy (WQAS), which contains strong pollution prevention and source control actions designed to prevent water quality degradation and ensure ongoing attainment of SSOs. The WQAS and the associated Copper-Nickel Action Plans are discussed further in a Provision.

40. *Translators.* The Board also adopted metals translators specific to Lower South San Francisco Bay for copper and nickel. The translators for copper and nickel are 0.53 and 0.44, respectively. The translator development rationale and approach are discussed in the Staff Report to the May 22, 2002 SSO Basin Plan Amendment.

CTR Receiving Water Salinity Policy

41. The CTR states that the salinity characteristics (i.e., freshwater vs. saltwater) of the receiving water shall be considered in determining the applicable WQC. Freshwater criteria shall apply to discharges to waters with salinities equal to or less than one ppt at least 95 percent of the time. Saltwater criteria shall apply to discharges to waters with salinities equal to or greater than 10 ppt at least 95 percent of the time in a normal water year. For discharges to water with salinities in between these two categories, or tidally influenced freshwaters that support estuarine beneficial uses, the criteria shall be the lower of the salt or freshwater criteria, (the latter calculated based on ambient hardness), for each substance.

Receiving Water Salinity and Hardness

42. The receiving water for Outfall E-001 is an unnamed channel tributary to lower South San Francisco Bay. Salinity data from monitoring station SB10 at the old Palo Alto Yacht Club were used to determine the characteristics of this receiving water. The data from February 1997 through March 2002 show that the salinity exceeds 10 ppt more than 95% of the time and 5 ppt all of the time. Based on these data, the receiving water is considered salt water under the CTR definition. This is consistent with the findings in the previous Order. The remainder of the discharge from the Plant flows into the Renzel Pond (Outfall E-002) and subsequently Matadero Creek within the Palo Alto flooding basin. There is little salinity data for Matadero Creek, however, it is tidally influenced and subject to both inflows from the Bay and fresh water sources during wet weather conditions. Matadero Creek is, therefore, considered estuarine under the CTR definition. Because the Discharger has requested a single set of effluent limits to apply to both E-001 and E-002, the most stringent of the salt and fresh water quality criteria have been used in the reasonable potential analysis and for effluent limits development.

Receiving Water Hardness

43. Hardness monitoring has not been performed in Matadero Creek. The Discharger conducted four consecutive days of hardness testing upstream of Outfall E-002 in February 2003. The hardness values ranged from 184 to 631 mg/L. These data are consistent with eight hardness values measured

by the Discharger in San Francisquito Creek, the next urban creek to the north of Matadero Creek, between December 2001 and March 2003. The San Francisquito Creek data ranged from 153 to 316 mg/L. Hardness in Matadero Creek is expected to be similar to or higher than that in San Francisquito Creek because of the tidal influence on Matadero Creek in the vicinity of Outfall E-002. Due to the limited hardness data set available for Matadero Creek, a conservative value of 100 mg/L was used in the Reasonable Potential Analysis for Outfall E-002.

Technology-Based Effluent Limits

44. Effluent limits for conventional pollutants are generally technology-based. Limits in this permit are the same as those in the prior permit for the following constituents: Carbonaceous Biological Oxygen Demand (CBOD), total suspended solids (TSS), BOD and TSS removal efficiency, oil and grease, settleable matter, turbidity, and chlorine residual. Technology-based effluent limitations were included to ensure that full secondary and tertiary treatment is achieved by the wastewater treatment facility.

Water Quality-Based Effluent Limitations

45. Toxic substances are regulated by WQBELs derived from the Basin Plan SSOs for copper and nickel, the NTR, USEPA recommended criteria, CTR criteria, the SIP, and/or BPJ. WQBELs in this Order are revised and updated from the limits in the previous permit and their presence in this Order is based on evaluation of the Discharger's data as described below under Reasonable Potential Analysis (RPA). Numeric WQBELs are required for all constituents that have reasonable potential to cause or contribute to an excursion above any State WQO/WQC. Reasonable potential is determined and final WQBELs are developed using the methodology outlined in the SIP. If the Board determines that the final limits will be infeasible to meet, then interim limits are established, with a compliance schedule to achieve the final limitations. Further details about the effluent limitations are given in the associated Fact Sheet. In addition, water quality-based limits for ammonia-N are retained from the previous permit.

WQBELs are expressed as monthly average and daily maximum limits. The following is a justification for applying a daily maximum effluent limitation in lieu of a weekly average effluent limitation.

a. Maximum Daily Effluent Limitations (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. Although weekly averages are effective for monitoring the performance of biological wastewater treatment plants, the MDELs are necessary for preventing fish kills or mortality to aquatic organisms.
b. NPDES regulations, the SIP, and USEPA'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.)
c. The SIP (page 8, Section 1.4) requires WQBELs be expressed as maximum daily effluent limitations (MDELs) and average monthly effluent limitations (AMELs).
d. The TSD (page 96) states a maximum daily maximum limitation is appropriate for two reasons:

i. 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.
ii. 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 limitation would be toxicologically protective of potential acute toxicity impacts.

Receiving Water Ambient Background Data used in Calculating WQBELs

46. The receiving waters for the discharges are herein classified as estuarine and are subject to complex tidal conditions of the Lower South San Francisco Bay. Therefore, the most representative location of ambient background data in the Lower South San Francisco Bay for this facility is the Dumbarton Bridge RMP station. RMP data from 1993 through 2000 for the Dumbarton RMP station were used in the Reasonable Potential analysis. However, not all the constituents listed in the CTR were analyzed by the RMP during this time. By letter dated August 6, 2001, the Board's Executive Officer addressed this data gap by requiring the Discharger to conduct additional monitoring pursuant to section 13267 of the California Water Code.

Constituents Identified in the 303(d) List

47. On June 6, 2003, the USEPA 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. South San Francisco Bay is listed as an impaired waterbody. The pollutants identified as impairing South San Francisco Bay include chlordane, DDT, diazinon, dieldrin, dioxin compounds, exotic species, furan compounds, mercury, PCBs, dioxin-like PCBs, and selenium. Copper and nickel, which were previously identified as impairing South San Francisco Bay, were not included as impairing pollutants in the 2002 303(d) list and have been placed on the new Monitoring List.

Dilution and Assimilative Capacity

48. Ninety-five percent of the Discharger's effluent is discharged to a shallow-water unnamed channel. The dilution received by the discharge has been modeled by the Discharger (Dilution Analysis and Water Quality Impacts of the Palo Alto Regional Water Quality Control Plant on South San Francisco Bay, December 1997). Based on this study, the Discharger applied for a limited dilution credit in January 1998. The dilution credit application has not been considered by the Board. Due to the tidal nature of the Slough, and limited upstream freshwater flows, the discharge is classified by the Board as a shallow water discharge. Therefore, effluent limitations are calculated assuming no dilution (D=0).

TMDLs and Waste Load Allocations (WLAs)

49. Based on the 303(d) list of pollutants impairing South San Francisco Bay, the Board plans to adopt TMDLs for these pollutants no later than 2010, with the exception of dioxin and furan compounds. The Board defers development of the TMDL for dioxin and furan compounds to the USEPA. Future review of the 303(d) list for South San Francisco Bay may result in revision of the schedules and/or provide schedules for other pollutants.

50. The TMDLs will include WLAs and load allocations (LAs) for point sources and non-point sources, respectively, and are intended to result in the attainment of water quality standards in the water body.

The final effluent limitations for the 303(d)-listed pollutants will be based on WLAs that are derived from the TMDLs.

51. *Compliance Schedules.* Pursuant to Section 2.1.1 of the SIP, "the compliance schedule provisions for the development and adoption of a TMDL only apply when: (a) the Discharger requests and demonstrates that it is infeasible for the Discharger to achieve immediate compliance with a CTR criterion; and (b) the Discharger has made appropriate commitments to support and expedite the development of the TMDL. In determining appropriate commitments, the RWQCB should consider the Discharger's contribution to current loadings and the Discharger's ability to participate in TMDL development." The Board adopted Resolution No. 01-103, on September 19, 2001, which authorizes the Executive Officer of the Board to enter into a Memorandum of Understanding with Bay Area Clean Water Agencies (BACWA) and other parties to accelerate the development of Water Quality Attainment Strategies including TMDLs for the San Francisco Bay-Delta and its tributaries. The Discharger has made commitments to participate in TMDL development as a member of BACWA.

52. The following summarizes the Board's strategy to collect water quality data and to develop TMDLs:

    a. Data collection – The Board will require Dischargers to characterize the pollutant loads from their facilities into the water quality limited water bodies. The result will be used in the development of TMDLs, but may also be used to update/revise the 303(d) list and/or change the WQOs/WQC for the impaired water bodies including South San Francisco Bay.

    b. Funding mechanism – The Board has received and anticipated continuation to receive, resources from federal and state agencies for the development of TMDLs. To ensure timely development of TMDLs, the Board intends to supplement these resources with resources from Dischargers.

Interim Limits and Compliance Schedules

53. Until final WQBELs or WLAs are adopted, state and federal antibacksliding and antidegradation policies, and the SIP, require that the Regional Board include interim effluent limitations. The interim effluent limitations will be the lower of the following:
    - current performance; or
    - previous order's limits, unless anti-backsliding rules are met.

    This permit establishes interim concentration limits for Cyanide, Chlorodibromomethane, 4-4 DDE, Dieldrin, Benzo(b)Fluoranthene, Ideno(1,2,3-cd)Pyrene, and Heptachlor Epoxide and a performance-based concentration and mass limit for mercury. The mercury limitations will minimize the discharge of this 303(d)-listed bioaccumulative pollutant.

54. Compliance schedules are established based on Section 2.2 of the SIP for limits derived from CTR WQC. If an existing Discharger cannot immediately comply with a new and more stringent effluent limitation, the SIP and the Basin Plan authorize a compliance schedule in the permit. To qualify for a compliance schedule, both the SIP and the Basin Plan require that the Discharger demonstrate that it is infeasible to achieve immediate compliance with the new limit. The SIP and Basin Plan require that the following information be submitted to the Board to support a finding of infeasibility:
    i. documentation that diligent efforts have been made to quantify pollutant levels in the discharge and sources of the pollutant in the waste stream, including the results of those efforts;
    ii. documentation of source control and/or pollution minimization efforts currently under way or completed;

iii. a proposed schedule for additional or future source control measures, pollutant minimization or waste treatment; and
iv. a demonstration that the proposed schedule is as short as practicable.

Antidegradation and Antibacksliding

55. The limitations in this Order are in compliance with the Clean Water Act Section 402(o) prohibition against establishment of less stringent WQBELs for the following reasons:

(1) For impairing pollutants, the revised final limitations will be in accordance with TMDLs and WLAs once they are established;
(2) For non-impairing pollutants, the final limitations are/will be consistent with current State WQOs/WQC.
(3) Anti-backsliding does not apply to the interim limitations established under previous Orders;
(4) If anti-backsliding policies apply to interim limitations under 402(o)(2)(c), a less stringent limitation is necessary because of events over which the Discharger has no control and for which there is no reasonable available remedy, and/or new information is available that was not available during previous permit issuance.

The interim limitations in this permit are in compliance with anti-degradation and meet the requirements of the SIP because the interim limitations hold the Discharger to performance levels that will not cause or contribute to water quality impairment or further degradation. Pollutant-specific discussions regarding the applicability of anti-degradation and anti-backsliding policies are provided in findings below.

Specific Basis

Reasonable Potential Analysis

56. As specified in 40 CFR 122.44(d) (1) (i), permits are required to include WQBELs 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." Using the method prescribed in Section 1.3 of the SIP, Board staff has analyzed the effluent data to determine if the discharge from Outfalls E-001/E-002 has a reasonable potential to cause or contribute to an excursion above a State water quality standard ("Reasonable Potential Analysis" or "RPA"). For all parameters that have reasonable potential, numeric WQBELs are required. The RPA compares the effluent data with SSOs and narrative WQOs in the Basin Plan and numeric WQC from the USEPA Gold Book, the NTR, and the CTR.

57. *RPA Methodology.* The method for determining RPA involves identifying the observed maximum pollutant concentration in the effluent (MEC) for each constituent, based on effluent concentration data. The RPA for all constituents is based on zero dilution, according to Section 1.3 of the SIP. There are three triggers in determining reasonable potential.

a. The first trigger is activated when the MEC is greater than the lowest applicable WQO/WQC, which has been adjusted for pH, hardness (400 mg/L), and translator data, if appropriate. An MEC that is greater than the (adjusted) WQO/WQC means that there is reasonable potential for that constituent to cause or contribute to an excursion above the WQO/WQC and a WQBEL is required. (Is the MEC>WQO/WQC?)
b. The second trigger is activated if the observed maximum ambient background concentration (B) is greater than the adjusted WQO/WQC, and the MEC is less than the adjusted WQO/WQC. If B is greater than the adjusted WQO/WQC, then a WQBEL is required. (Is B>WQO/WQC?)

c. The third trigger is activated after a review of other information determines that a WQBEL is required even though both MEC and B are less than the WQO/WQC. A limit is only required under certain circumstances required to protect beneficial uses.

58. *Summary of RPA Data and Results.* The RPA was based on effluent monitoring data of the past three years. Based on the RPA methodology described above and in the SIP, the following constituents have been found to have reasonable potential to cause or contribute to an excursion above WQOs/WQC: copper, mercury, nickel, cyanide, chlorodibromomethane, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, 4, 4'-DDE, dieldrin, heptachlor epoxide and dioxin TEQ. Based on the RPA, numeric WQBELs are required to be included in the permit for these constituents.

59. *RPA Determinations.* The maximum effluent concentrations (MEC), WQOs, bases for the WQOs, background concentrations used and reasonable potential conclusions from the RPA are listed in the following table for all constituents analyzed. The RPA results for some of the constituents in the CTR were not able to be determined because of the lack of background data, an objective/criteria, or effluent data. (Further details on the RPA can be found in the Fact Sheet.)

Constituent[1]	SSO/ WQC (µg/L)	Basis[2]	MEC outfalls 001/002 (µg/L)	Maximum Ambient Background Conc. (µg/L)	Reasonable Potential
Arsenic	36	CTR, sw	1.2	4.59	No
Cadmium	7.3	CTR, fw, H=100	0.3	0.1707	No
Chromium(VI)	200	CTR, fw, H=100 T= 0.8, 0.03	2	14.74	No
Copper	13.02	SSO T=0.53[3]	17	7.19	Yes
Lead	50	CTR, sw	0.9	3.78	No
Mercury*	0.051	CTR (#8)	0.019	0.0682	Yes[4]
Nickel	27.05	SSO T=0.44[3]	6	13.03	Yes[5]
Selenium*	5.0	NTR	1.2	0.63	No
Silver	2.24	CTR, sw	0.2	0.1193	No
Zinc	119.82	CTR, fw, H=100 T=0.53, 0.20	72	14.85	No
Cyanide	1	NTR (#14)	4.2	Not Available (NA)	Yes
Chlorodibromomethane	34	CTR (#23)	56	NA	Yes
Dieldrin*	0.00014	CTR (#111)	< 0.02	0.000292	Yes[4]
4,4-DDE*	0.00059	CTR (#109)	< 0.04	0.000678	Yes[4]
Dioxin TEQ*	$1.4x10^{-8}$	CTR (#16)	$< 4.3x10^{-7}$	NA	Yes[6]
Benzo(b)Fluoranthene	0.049	CTR (#62)	< 5	0.0572	Yes[4]
Indeno(1,2,3-cd)Pyrene	0.049	CTR (#92)	< 5	0.078	Yes[4]
Heptachlor Epoxide	0.00011	CTR (#118)	< 0.025	0.000174	Yes[4]
Tributyl tin	0.01	BP, narrative	0.003	NA	No
CTR #s 1, 3, 5a, 12, 15, 17-126 except, 34, 62,	Various or NA	CTR	Non-detect, less than WQC, or NA	Less than WQC or NA	No or Undetermined[7]

Constituent[1]	SSO/ WQC (µg/L)	Basis[2]	MEC outfalls 001/002 (µg/L)	Maximum Ambient Background Conc. (µg/L)	Reasonable Potential
92, 109, 111, and 118					

1. * = Constituents on 303(d) list, applies WHO 1998 to Toxicity Equivalent Factors (TEQ) of 2,3,7,8-TCDD.
2. RPA based on the following: Hardness (H) is based on CTR, 100 in mg/L as $CaCO_3$; BP = Basin Plan; CTR = California Toxics Rule; NTR=National Toxics Rule; SSO=Site-Specific Objective; fw = freshwater; sw = saltwater; T = translator to convert dissolved to total metals.
3. Copper and nickel SSOs and translators are based on the Basin Plan Amendment, Resolution R2-2002-0061 (dated May 15, 2002).
4. Mercury, benzo(b)fluoranthene, indeno (1,2,3-cd)pyrene, 4, 4'-DDE, dieldrin, and heptachlor epoxide: RPA = Yes, based on B > WQO/WQC.
5. Reasonable potential for nickel has been determined based on the third trigger.
6. Trigger 3 was used to determine RPA, however there was not enough data available to calculate an interim limit. The Discharger will continue to monitor for this pollutant as per the Self Monitoring Program.

60. *RPA Results for Impairing Pollutants.* While TMDLs and WLAs are being developed, effluent concentration limits are established in this permit for 303(d)-listed pollutants that have reasonable potential to cause or contribute to an excursion above the water quality standard. In addition, mass limits are calculated for bioaccumulative 303(d)–listed pollutants that can be reliably detected. Constituents on the 303(d) list for which the RPA determined a need for effluent limitations are mercury, dioxin TEQ, 4,4'-DDE, and Dieldrin.

Interim Limits with Compliance Schedules

61. The Discharger has demonstrated and the Board confirmed infeasibility to meet the WQBELs calculated according to Section 1.4 of the SIP for Cyanide, Chlorodibromomethane, 4-4 DDE, dioxin TEQ, Dieldrin, Benzo(b)Fluoranthene, Ideno(1,2,3-cd)Pyrene, and Heptachlor Epoxide. The basis for the compliance schedules is further described in the Fact Sheet.

Specific Pollutants

62. *Copper.* This Order contains copper WQBELs because, Board staff compared the SSO for copper (13.02ug/L) with the Discharger's effluent data (17 ug/L) and determined there is reasonable potential for exceedance of the SSO for copper (SIP trigger 1).

63. Nickel. The SIP (Section 1.3, Step 7) allows the Board to consider additional available information to determine if a water quality-based effluent limitation is required, notwithstanding Steps 1 through 6, to protect beneficial uses. The Board has considered the following additional information in determining that WQBELs are necessary for nickel:

Concern over copper and nickel in the Lower South San Francisco Bay watershed led to an impairment assessment, which indicated that impairment to beneficial uses of San Francisco Bay south of the Dumbarton Bridge due to ambient copper and nickel concentrations is unlikely. This conclusion, however, is not without uncertainty with respect to copper's toxicity to phytoplankton, copper and nickel cycling in Lower South San Francisco Bay, sediment toxicity and loading estimates. Given the results of the impairment study the Regional Board recently approved a Basin

Plan Amendment (Board Resolution No. R2-2002-0061) adopting SSOs for copper and nickel, specific translators to compute effluent limits during permit reissuance for the three municipal wastewater treatment plants discharging into Lower South San Francisco Bay, and the WQAS. Given the uncertainties associated with the impairment study and the need to meet antidegradation policies, the WQAS were developed to ensure that ambient levels of copper and nickel do not increase due to POTW discharges in the San Francisco Bay south of the Dumbarton Bridge.

Effluent limits are included in this permit due to remaining uncertainties identified in the Copper and Nickel Impairment Assessment. New data will be available as part of the implementation of the Copper and Nickel Action Plans and the impairment assessment for copper and nickel in North San Francisco Bay. It is the intent of the Regional Board to review the need for copper and nickel limits for the next permit cycle.

To ensure that ambient levels of copper and nickel do not increase as a result of POTW discharge, the Discharger will continue to maintain plant performance and ongoing pollution prevention measures for copper and nickel.

Based on the foregoing, as permitted by the SIP, Section 1.3, Step 7, numeric WQBELs are included for nickel, in this permit cycle, to protect beneficial uses.

64. *Chromium and Zinc.* For all metals except copper and nickel, which utilize translators adopted in the May 22, 2002 Basin Plan Amendment, Board staff initially assessed reasonable potential using the conversion factors (Cfs)/translators included in the CTR. These conversion factors/translators are generally considered very conservative because they are intended to be applied to a wide range of waterbody conditions. Board staff, with support from the WMI, evaluated whether site-specific translators could be developed based on RMP data from the Dumbarton Bridge Station. Board staff have determined that the RMP data are representative of season and spatial variability in waterbody conditions; were collected and evaluated according to rigorous quality assurance and control requirements; and meet USEPA's recommended guidelines for translator development. Based on these conclusions, Board staff followed the procedures in Section 1.4.1 of the SIP to establish chromium VI and zinc translators. Acute translators are based on the 90th percentile of the dissolved to total concentration ratios, while chronic translators are based on the median ratio. The acute and chronic translators for chromium VI are 0.08 and 0.03, respectively. The acute and chronic translators for zinc are 0.53 and 0.2, respectively. Additional information on translator development is presented in the Fact Sheet for this Order.

65. *Dioxin TEQ.* The CTR establishes a numeric human health WQC of 0.014 picograms per liter (pg/l) for 2,3,7,8-tetrachlorinated dibenzo-p-dioxin (2,3,7,8-TCDD) based on consumption of aquatic organisms. The preamble of the CTR states that California NPDES permits should use toxicity equivalents (TEQs) where dioxin-like compounds have reasonable potential with respect to narrative criteria. In USEPA's National Recommended Water Quality Criteria, December 2002, USEPA published the 1998 World Health Organization Toxicity Equivalence Factor (TEF)[1] scheme. Additionally, the CTR preamble states USEPA's intent to adopt revised WQC guidance subsequent to their health reassessment for dioxin-like compounds. The SIP applies to all toxic pollutants, including dioxins and furans. The SIP requires a limitation for 2,3,7,8-TCDD, if a limitation is

[1] The 1998 WHO scheme includes TEFs for dioxin-like PCBs. Since dioxin-like PCBs are already included within "Total PCBs", for which the CTR has established a specific standard, dioxin-like PCBs are not included in this Order's version of the TEF scheme.

necessary, and requires monitoring for a minimum of 3 years by all major NPDES dischargers for the other sixteen dioxin and furan compounds.

66. Basin Plan contains a narrative WQO for bio-accumulative substances:
"Many pollutants can accumulate on particulates, in sediments, or bio-accumulate in fish and other aquatic organisms. Controllable water quality factors shall not cause a detrimental increase in concentrations of toxic substances found in bottom sediments or aquatic life. Effects on aquatic organisms, wildlife, and human health will be considered."
This narrative WQO applies to dioxin and furan compounds, based in part on the scientific community's consensus that these compounds associate with particulates, accumulate in sediments, and bio-accumulate in the fatty tissue of fish and other organisms.

67. The USEPA's 303(d) listing determined that the narrative objective for bio-accumulative pollutants was not met because of the levels of dioxins and furans in fish tissue.

68. Routine semi-annual dioxin TEQ monitoring show no detected values in the effluent, but the levels of detection are above the CTR criterion. The South Bay dischargers undertook a low-level monitoring program to characterize organics, including dioxins, in their effluent. The results of this study have not been used in developing this Order because of questions about data quality and reliability. The data, however, suggest elevated levels of dioxin in the effluents. On May 15, 2003, a group of several San Francisco Bay Region dischargers (known as the Bay Area Clean Water Agencies, or BACWA) submitted a collaborative receiving water study, entitled the *San Francisco Bay Ambient Water Monitoring Interim Report*. This report addresses monitoring results from sampling events in 2002 and 2003 for the remaining priority pollutants not monitored by the RMP. While these "interim" data have not been used to evaluate RP using trigger 2, they also show elevated dioxin levels at the Dumbarton Bridge RMP station. Based on these data and the inclusion of dioxins and furans on the 303(d) list for San Francisco Bay, the Board has determined that there is reasonable potential for dioxin using RPA trigger 3.

69. *4,4'-DDE, Benzo(b)fluoranthene, Indeno (1,2,3-cd)pyrene, Dieldrin, and Heptachlor Epoxide* have not been detected in the effluent, although all of the detection limits are higher than the lowest WQC. Board staff compared the WQC with RMP ambient background concentration data for each constituent. Since the background concentrations are above the WQC, the RPA, trigger 2 indicates that these pollutants have reasonable potential and numeric WQBELs are required.

70. The current 303(d) list includes the Lower South San Francisco Bay as impaired for dieldrin and DDT. 4,4'-DDE is chemically linked to the presence of DDT. The Board intends to develop TMDLs that will lead towards overall reduction of dieldrin and DDT (and thus 4,4'-DDE). The WQBELs specified in this Order may be changed to reflect the WLAs from this TMDL.

71. *Tributyltin.* The criterion for tributyltin is based on best professional judgment to translate the narrative WQO in the Basin Plan to numerical WQO of 0.01ug/L, based on the EPA chronic water quality criteria for the protection of marine water aquatic life. Based on the RPA results, the effluent limitation for tributyltin in the previous permit is excluded in this Order as this pollutant does not pose reasonable potential to cause, or contribute to an excursion above any numeric or narrative water quality objectives.

72. *Other organics.* The Discharger has performed sampling and analysis for the organic constituents listed in the CTR. This data set was used to perform the RPA. The full RPA is presented as an attachment in the Fact Sheet. In some cases, reasonable potential cannot be determined because

detection limits are higher that the lowest WQC, and/or ambient background concentrations are not available. The Discharger will continue to monitor for these constituents in the effluent and the receiving water using analytical methods that provide the best feasible detection limits. When additional data become available, a further RPA will be conducted to determine whether to add WQBELs to the Order or to continue monitoring.

73. Provision 9 in Order 98-052 required the Discharger and the other lower South Bay Dischargers to jointly conduct low-level monitoring with ultra-clean procedures. On March 28, 2001, the *South Bay/Fairfield Trace Organic Contaminants in Effluent Study* was submitted to the Board to fulfill this requirement. The purpose of this study was to provide measurements for pollutants present in POTW effluents at extremely low concentrations, and to evaluate the reliability of the methods by which these low concentrations can be measured. Board staff has reviewed the study results and data and find the results to be generally of an "experimental nature." Specifically, there was significant variability in the results from split samples analyzed by different laboratories. In addition, the specific method detection limits were not determined and there are other QA/QC questions about the study. The Board, therefore, has not used the results/data from the study in the RPA.

74. *Continued Effluent Monitoring.* This Order does not include effluent limitations for constituents that do not show reasonable potential, but continued monitoring for these pollutants is required as described in the August 6, 2001 letter, which is further described in a later finding. If concentrations of these constituents increase significantly, the Discharger will be required to investigate the source of the increases and establish remedial measures, if the increases result in reasonable potential to cause or contribute to an excursion above the applicable WQC.

75. *Permit Reopener.* The Order includes a reopener provision to allow numeric effluent limitations to be added or deleted in the future for any constituent that exhibits or does not exhibit, respectively, reasonable potential. The Board will make this determination based on monitoring results.

Development of Effluent Limitations

Copper

76. *Copper Water Quality Objectives.* The SSOs for dissolved copper are 6.9 µg/L for a 4-day average and 10.8 µg/L for a one-hour average. Included in the Basin Plan Amendment are translator values to convert the dissolved criteria to total criteria. Using the site-specific translator (0.53), translated criteria of 13.02 µg/L for a 4-day average and 20.38 µg/L for a one-hour average were used to calculate effluent limitations.

77. *Copper Effluent Limitations.* Consistent with the Basin Plan Amendment, the Board has determined that WQBELs are required for copper to ensure that copper concentrations in the effluent are maintained at current levels and the SSOs are not exceeded in the South Bay. Furthermore, based on the maximum effluent concentration, the RPA determined that there is reasonable potential for exceedances of the SSO for copper. Therefore, WQBELs are required. The calculated final WQBELs for copper are: AMEL of 11.8 µg/L and MDEL of 17.4 µg/L. Board staff has determined that with continued aggressive pollution prevention programs, the Discharger can comply with the final limitations and interim limitations are not necessary.

78. *Anti-backsliding/Anti-degradation.* The previous copper effluent limitation (in Order 98-054) was a daily average limitation of 12.0 µg/L based on plant performance. This copper effluent limitation was a performance-based interim limit. Anti-backsliding provisions, therefore, do not apply. Anti-degradation is addressed through the development and implementation of the SSOs and the WQAS.

Mercury

79. *Mercury Water Quality Criteria.* The CTR specifies a long-term average criterion for protection of human health of 0.051 µg/L.

80. *Mercury TMDL.* The current 303(d) list includes the receiving waters as impaired by mercury, due to high mercury concentrations in the tissue of fish from the Bay. Methyl mercury is a persistent bioaccumulative pollutant. The Board intends to establish a TMDL that will lead towards overall reduction of mercury mass loadings into the San Francisco Bay watershed. The final mercury limitation will be based on the Discharger's WLA in the TMDL, and the permit will be revised, as necessary, to include the final water quality-based effluent limit as an enforceable limitation.

81. *Mercury Control Strategy.* Board staff is developing a TMDL to control mercury levels in San Francisco Bay. The Board, together with other stakeholders, will cooperatively develop water quality attainment strategies as part of TMDL development. The current strategy is applying interim limitations to maintain point source mercury loadings while focusing mass reduction efforts on other more significant and controllable sources. While the TMDL is being developed, the Discharger will cooperate in maintaining ambient receiving water conditions by complying with the performance-based concentration and mass limitations, by conducting studies to initiate aggressive pollution prevention measures, and as appropriate, by identifying and implementing additional mercury source controls.

82. *Concentration-Based Mercury Effluent Limitations.* Pending completion of a TMDL, this Order establishes an interim performance-based limitation of 23ng/L that the Board determined from pooled ultra-clean mercury data throughout the Region using advanced secondary treatment *(Staff Report: Statistical Analysis of Pooled Data from Region-wide Ultraclean Sampling, 2001)*. This limitation is more stringent than the previous permit limit of 0.025ug/L.

83. *Mass-Based Mercury Effluent Limitations*. In addition to the concentration-based interim mercury effluent limitation, this Order establishes an interim mercury mass-based effluent limitation of 0.103 kg/month. This limitation is calculated based on the concentration-based effluent limitation (23 ng/L) and the dry weather design capacity of the treatment plant (39 mgd). This interim mass limitation only applies during the dry weather season (May through October). The final mass-based effluent limitation will be based on the WLA derived from the mercury TMDL.

84. *Additional Mercury Studies and Controls*. In other Orders, the Board has established interim mercury mass-based effluent limitations based on actual treatment plant performance to maintain current loadings until a TMDL is established. The Board has determined that the mass-based limitation calculated as described in Finding 83 is appropriate for this Discharger for the following reasons: (1) recent monitoring data show very low levels of mercury in the discharge, well below the applicable water quality criteria, (2) the interim concentration limitations, which are more stringent than the previous permit limits, will ensure that mercury levels remain low in the discharge, (3) the Discharger will continue to identify and, to the extent feasible, address mercury sources under its pollution prevention program, and (4) the interim mass limitation based on the design flow will preclude any significant increases in mass loadings from the plant. Overall, the Discharger already has minimized mercury influent loadings to the treatment plant and provided for a high level of mercury removal in the treatment process. The Board anticipates that is unlikely that the TMDL will require additional reductions in mercury loadings beyond current treatment levels. Further, to complement the dry weather interim mercury mass limitations, the South Bay dischargers have

proposed to complete scientific studies designed to further the Board's understanding of mercury fate and transport in the South Bay and identify specific sources and potential advanced control opportunities. As part of this effort, a provision is included in this Order requiring the Discharger to implement an aggressive Advanced Mercury Source Control Program throughout its service area. This study, along with the work of the other South Bay dischargers, is expected to yield valuable data to support completion of the mercury TMDL, and yield further reductions in mercury loadings in the South Bay.

85. *Anti-backsliding/Anti-degradation.* The interim concentration mercury limitation of 0.023ug/L is lower than the previous concentration mercury limit of 2.1 ug/L as a maximum daily, and 0.025ug/L as a monthly average. The interim mass mercury limitation of 0.103 kg/month is lower than the previous mass mercury limitation of 0.61 kg/month. Anti-backsliding and anti-degradation provisions, therefore, do not apply.

Nickel

86. *Nickel Water Quality Objectives.* The SSOs for dissolved nickel are 11.9 µg/L for a 4-day average and 62.4 µg/L for a one-hour average. Included in the Basin Plan Amendment are translator values to convert the dissolved criteria to total criteria. Using the site-specific translator (0.44), translated criteria of 27.05 µg/L for a 4-day average and 141.82 µg/L for a one-hour average were used to calculate effluent limitations.

87. *Nickel Effluent Limitations.* The calculated final WQBELs for nickel are: AMEL of 25.6 µg/L and MDEL of 32.2 µg/L. Self-monitoring data from April 1999 through March 2002 indicate that effluent nickel concentrations ranged from 3 µg/L to 6 µg/L, which are well below the final WQBELs. Therefore, the Discharger can comply with the final WQBELs, and interim limits with a compliance schedule are not needed.

88. *Anti-backsliding/Anti-degradation.* The previous nickel effluent limitation (in Order 98-054) was a 4-day average limitation of 8.3 µg/L. The final limitations were developed based on the applicable SIP procedures and the revised SSOs for nickel that are considered protective of South San Francisco Bay. Under Clean Water Sections 402(0)(1) and 303(d)(4) there is an exception to Anti-backsliding for that pollutant as long as relaxation complies with Anti-degradation requirements. In addition, in the 2002 303(d) list, nickel is no longer identified as impairing South San Francisco Bay. Therefore, incorporation of the new, higher limits is allowable under anti-backsliding provisions. Anti-degradation was addressed through the development and implementation of the SSOs and the WQAS.

Cyanide

89. *Cyanide Water Quality Objectives.* The CTR specifies that the salt water Criterion Chronic Concentration (CCC) of 1 ug/l for cyanide is applicable to South San Francisco Bay. This CCC value is below the presently achievable reporting limit (ranges from approximately 3 to 5 ug/l). Reasonable potential was determined for cyanide because there were 5 out of 38 detectable effluent concentration values above the water quality objective.

90. *Cyanide Final Effluent Limitation.* Based on the RPA, there is reasonable potential for exceedances of the WQC for cyanide. Interim effluent limitations are necessary for cyanide since the Discharger has demonstrated and the Board verified that it is infeasible to immediately comply with the final WQBELs (AMEL of 0.5 µg/L and MDEL of 1.0 µg/L), included in the Fact Sheet as a point of reference, and that an interim limitation is necessary.

91. *Cyanide Interim Effluent Limitation.* The interim limitation was calculated using a "pooled data" approach, which was based on the performance of Bay Area POTWs with similar treatment processes (advanced secondary treatment). Due to the large number of samples with results below detection limits, the interim limitation was computed using the "log-Probit method" for estimating interim performance-based limitations, and provides unbiased estimates of distribution parameters and percentiles. The interim limitation was computed using the 99.87th percentile (or three standard deviations above the mean) of the pooled effluent data, resulting in a value of 32 µg/L, expressed as a daily maximum limitation. The Board may re-evaluate the interim limit during the next permit renewal.

92. *Antibacksliding/Antidegradation.* This interim limitation is higher than the existing interim permit limitation of 7.7 µg/L. Antibacksliding does not apply to interim limitations as the final WQBELs based on the WQC have not changed from the existing permit to this one. Antidegradation is satisfied because Lower San Francisco Bay is in attainment for cyanide. The new limit will not result in significant lowered water quality and the proposed action does not involve significant or substantial increase in pollutant loading. Furthermore, there is evidence to suggest that, to some degree, cyanide measured in effluents may be an artifact of the analytical method used or the result of analytical interferences. In addition, it is not known whether the form(s) of cyanide that are measured in POTW effluents exhibit toxicity in the environment.

93. WERF has initiated a $500,000 study to reassess cyanide criteria for the protection of aquatic life and wildlife. It will critique data to assure it meets current best scientific standards and new U.S. EPA guidelines, recommend testing strategies, and develop a data set to meet guidelines for ambient water quality development. It is expected that results from that study will provide information useful to devising alternative cyanide compliance strategies for shallow water dischargers in San Francisco Bay.

94. This Order contains two requirements to satisfy while the interim limitation is in effect. The first requirement, a compliance schedule, requires the Discharger to track and participate in relevant WERF studies, as described in the previous finding. Results from these studies should enable the Board to determine compliance with final WQBELS during the next permit reissuance. The second requirement, an SSO Study, requires the Discharger to actively participate in the development of an SSO for cyanide for San Francisco Bay.

95. *Cyanide SSO.* A regional discharger-funded study is underway for development of a cyanide SSO. The cyanide study plan was submitted on October 29, 2001. The final report was submitted to the Board by June 26, 2003. The WQBELs will be recalculated, as appropriate, based on the cyanide SSO, if adopted.

Chlorodibromomethane

96. *Chlorodibromomethane Water Quality Criteria.* The CTR specifies a long-term average criterion for protection of human health of 34 µg/L.

97. *Interim Chlorodibromomethane Effluent Limitation.* Based on maximum effluent concentration, the RPA determined that there is reasonable potential for exceedances of the water quality criterion for dibromochloromethane. Four of the six effluent concentrations measured from 1999-2002 exceeded the water quality criterion. The calculated final WQBELs for chlorodibromomethane are: AMEL of 34 µg/L and MDEL of 68.2 µg/L. The Discharger submitted an Infeasibility Analysis that demonstrated that the Discharger can not currently comply with the final WQBELs. Therefore, an

interim limit is necessary. The SIP allows for the interim limit to be based on the lower of existing permit limitations or facility performance. As there is no existing permit limit for chlorodibromomethane, this Order establishes a performance-based limit of 86 µg/L. The performance-based limit represents the 99.87th percentile of current Plant performance, and was calculated using 15 data points from 1996-2003. Although only data from 1999-2002 were used in conducting the RPA, data from previous years provided a more robust data set to perform the statistical analysis (calculation of 99.87 percentile). The Board may re-evaluate the interim limit during the next permit renewal.

98. *Chlorodibromomethane Source Control.* This Order requires the Discharger to prepare and implement a workplan to address generation of chlorodibromomethane in the disinfection process.

99. *4,4'-DDE, Dieldrin, and Heptachlor Epoxide*
Water Quality Criteria. In the CTR, the lowest criteria for 4,4'-DDE, dieldrin, and heptachlor epoxide are the human health values of 0.00059 µg/L, 0.00014 µg/L, and 0.00011 µg/L, respectively. These criteria are well below the Minimum Levels (MLs) of 0.05 µg/L, 0.01 µg/L, and 0.01 µg/L, respectively, identified in Appendix 4 of the SIP.

100. *4,4'-DDE, Dieldrin, and Heptachlor Epoxide Effluent Limitations.* Based on the RPA, there is reasonable potential for exceedances of the WQC for 4,4'-DDE, dieldrin, and heptachlor epoxide. The Board intends to establish a TMDL that will lead towards overall reduction of 4,4'-DDE and dieldrin mass loadings into Lower South San Francisco Bay. If the Discharger is found to be contributing to 4,4'-DDE and dieldrin impairment in Lower South San Francisco Bay, effluent limitations will be revised based on the Discharger's WLA in the TMDL Discharger demonstrated that it is infeasible to determine compliance at this time as the minimum levels are higher than the final calculated WQBELs. Therefore, interim limits are established at the respective minimum levels. The interim limits are as follows; DDE is 0.05 µg/L, Dieldrin is 0.01 µg/L, and heptachlor epoxide is 0.01µg/L.

PAHs

101. *Water Quality Criteria.* The CTR contains numeric water quality criteria for a number of individual PAHs of 0.049 µg/L, including benzo(b)fluoranthene and indeno(1,2,3-cd)pyrene.

102. *PAH Effluent Limitations.* There is reasonable potential for benzo(b)fluoranthene and indeno(1,2,3-cd)pyrene, because the background concentration for each parameter exceeded the WQC. The final effluent limitations for each of these parameters are: AMEL of 0.049 µg/L and MDEL of 0.098 µg/L. The Discharger demonstrated that it is infeasible to determine compliance with the final WQBELs at this time as the minimum levels are higher than the final calculated WQBELs. Therefore interim limits are established at the respective minimum levels. The interim limits are as follows; benzo(b)fluoranthene is 10.0 ug/L, indeno(1,2,3-cd) pyrene is 0.05ug/L. Self-monitoring data from 1999-2002 indicate that PAHs have never been detected in the effluent.

103. *Impairing Status for PAHs.* Interim limits for PAHs are supported by recent evidence that suggests high molecular PAHs are bioaccumulative with impairing status under further review. The Board staff report entitled Proposed Revisions to Section 303(d) List and Priorities for Development of Total Maximum Daily Loads, dated December 19, 2001, states:

"PAHs are known carcinogens that accumulate in shellfish tissue, but do not accumulate in fish tissue. The weight of evidence from the Regional Monitoring Program (RMP) indicates that although water quality criteria are almost never exceeded at RMP stations (between 0 and 1% of

RMP water samples individual PAHs exceeded the EPA and CRT criterion) there is evidence that PAHS may be accumulating at higher levels over time (Hoenicke, Hardin, et al., in prep.; Thompson et al., 1999)."

The Board staff Report Proposed Revisions to Section 303(d) List and Priorities for Development of Total Maximum Daily Loads also states:

"PAH water quality objectives from the California Toxics Rule (CTR) are human health-based and are therefore incomplete with respect to potential impacts to aquatic life described above. PAHs are elevated in sediments of about half the toxic hotspot sites identified in the Bay Protection Program exhibiting a correlative (not causative) but potentially synergistic effect on aquatic life along with other chemicals, as evidenced by sediment toxicity tests and degraded benthic communities (BPTCP, 1998). Occasional exceedances of the human health criteria in ambient samples, evidence of increasing shellfish concentrations, and preponderance of PAHs at toxic sites warrant increased assessment activities for PAHs by dischargers and cities around the region."
PAH's are included in the State's 2002 Monitoring List for South San Francisco Bay to provide additional data to allow future evaluation of impairment status.

104. *Dioxin Water Quality Criteria.* The CTR establishes a numeric human health WQO of 0.014 picograms per liter (pg/L) for 2,3,7,8-tetrachlorinated dibenzo-p-dioxin (2,3,7,8-TCDD) based on consumption of aquatic organisms. Finding 65 discusses the use of TEQ's for other dioxin-like compounds, the RPA procedures, and SIP requirements. Staff used TEQs to translate the narrative WQOs to numeric WQOs for the other 16 congeners.

105. *Dioxin Monitoring.* The final limitations for dioxin TEQ will be based on the waste load allocated to the Discharger from the TMDL. The detection limits historically used by the Discharger are insufficient to determine the concentrations of the dioxin congeners in the discharge. The SIP does not specify an ML for dioxin analysis. This Order requires additional dioxin monitoring to complement a special dioxin project being conducted by the CEP. The special dioxin project will consist of an impairment assessment and a conceptual model for dioxin loading into the Bay by mid 2004. This permit, as specified in the Self-Monitoring Program, requires additional monitoring using increased sample volumes to attempt to achieve the lowest detection limit, to the greatest extent practicable.

Whole Effluent Acute Toxicity

106. This Order includes effluent limits for whole effluent acute toxicity. Compliance evaluation is based on 96-hour flow through or static bioassays. USEPA promulgated updated test methods for acute and chronic toxicity bioassays in December 2002 in 40 CFR Part 136. Dischargers have identified several practical and technical issues that need to be resolved before implementing the new procedures, referred to as the 4th and 5th Edition. The primary unresolved issue is the use of younger, possibly more sensitive fish, which may necessitate a reevaluation of permit limits. SWRCB staff recommended to the Boards that new or renewed permit holders be allowed a time period in which laboratories can become proficient in conducting the new tests. A provision is included in this Order granting the Discharger 1 year to implement the new test method. In the interim, the Discharger may continue using the current test protocols. The previous Order included acute toxicity testing requirements and limits. The limits remain unchanged in this Order.

Whole Effluent Chronic Toxicity

107. ***History:*** An Effluent Characterization Study evaluating chronic toxicity in the Discharger's effluent was conducted in 1991, and triggered the Discharger's TRE/TIE program. The Discharger completed its TRE/TIE in 1992 concluding that zinc in the effluent was contributing to Selenastrum toxicity. During the 1998 permit cycle, the discharger continued implementation of a TRE, including source control and waste minimization, aimed at controlling zinc concentrations in effluent from the Plant. At the time of this permit adoption, the Discharger is no longer in TIE/TRE mode. The limited chronic toxicity data from 2000-2002 shows the discharger remained below the TUc trigger levels.

108. *Discharge Monitoring.* On December 20, 2002 the discharger submitted the results of the 2002 chronic toxicity screening as required by the previous NPDES permit. The discharger proposed to conduct chronic toxicity under the new permit utilizing Macrocystis pyrifera. Selenatrum was the previous test organism and nominally appeared to be the most sensitive of the five species screened in 2002. However, Selenastrum was not selected because it is a freshwater species and the Palo Alto effluent is slightly saline. In addition, future Selenastrum testing will require using EDTA (USEPA Final Rule, December 3, 2002) which may mask the toxicity of metals. Therefore, Macrocystis pyrifera was selected as the test organism for this permit cycle.

109. *Permit Requirements.* In accordance with the SIP, and BPJ, this permit includes requirements for chronic toxicity monitoring based on the Basin Plan narrative toxicity objective. This permit includes the Basin Plan narrative toxicity objective as the applicable effluent limit, implemented via monitoring with numeric values as "triggers" to initiate accelerated monitoring and to initiate a chronic toxicity reduction evaluation (TRE). The permit requirements for chronic toxicity are also consistent with the CTR and SIP requirements.

Bacteriological Limits

110. From January 1, 2002 to March 30, 2003 the discharger conducted a Bacteriological Study (total coliform, fecal coliform, and enterococci) of levels in the Plant effluent and in lower South San Francisco Bay with varying doses of Chlorine. The study plan was submitted on September 12, 2001 and approved by the Board on December 4, 2001. The purpose of the study was to determine whether the effluent limit in the Plant's NPDES permit could be changed from total coliform to fecal coliform or to enterococci without adversely impacting bacteria levels in the Lower San Francisco Bay. Through this study, the discharger demonstrated that as the chlorine dosage decreased and as bacteria counts increased in the effluent, there was not a statistically significant corresponding rise in bacteria levels in the Lower San Francisco Bay. This lack of correlation was demonstrated for all three bacteriological tests conducted. Since enterococci is the better indicator of human waste, enterococci is selected as the bacteriological parameter for the effluent limit for this permit. It replaces total coliform which had been the bacteriological effluent limit in previous permits. The enterococci effluent limits reflect the Basin Plan limitations for saltwater, lightly used areas. (Note: This limitation is dictated by the E-001 saltwater location because the E-002 discharge location has no contact recreation uses.)

Pretreatment Program

111. 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 J. "Pretreatment Requirements".

Pollutant Prevention and Pollutant Minimization

112. The Discharger has established a Pollution Prevention Program under the requirements specified by the Board.
    a. Section 2.4.5 of the SIP specifies under what situations and for which priority pollutant(s) (i.e., reportable priority pollutants) the Discharger shall be required to conduct a Pollutant Minimization Program in accordance with Section 2.4.5.1.
    b. There may be some redundancy required between the Pollution Prevention Program and the Pollutant Minimization Program.
    c. Where the two programs' requirements overlap, the Discharger is allowed to continue/modify/expand its existing Pollution Prevention Program to satisfy the Pollutant Minimization Program requirements.

113. For cyanide, mercury, Benzo(b)fluoranthene, Indeno(1,2,3,-cd)pyrene, 4.4'-DDE, dieldrin, heptachlor epoxide the Discharger will conduct any additional source control measures described in the Discharger's infeasibility report submitted March 27, 2003 in accordance with California Water Code 13263.3 and Section 2.1 of the SIP. Section 13263.3(d)(1)(C) establishes a separate process outside of the NPDES permit process for preparation, review, approval, and implementation of pollution minimization measures.

114. 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 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

Requirement for Monitoring of Pollutants in Effluent and Receiving Water to Implement New Statewide Regulations and Policy

115. *Insufficient Effluent and Ambient Background Data.* The Board's review of the effluent and ambient background monitoring data found that there were insufficient data to determine reasonable potential and calculate numeric WQBELs, where appropriate, for some of the pollutants listed in the SIP.

116. *SIP- Required Dioxin study.* The SIP states that each Board shall require major and minor POTWs and industrial dischargers in its region to conduct effluent monitoring for the 2,3,7,8-TCDD congeners whether or not an effluent limit is required for 2,3,7,8-TCDD. The monitoring is intended to assess the presence and amounts of the congeners being discharged to inland surface waters, enclosed bays, and estuaries. The State Board will use these monitoring data to establish strategies for a future multi-media approach to control these chemicals.

117. On August 6, 2001, the Board sent a letter to all the permitted dischargers pursuant to Section 13267 of the California Water Code requiring the submittal of effluent and receiving water data on priority pollutants. This formal request for technical information addresses the insufficient effluent and ambient background data, and the dioxin study. The letter (described above) is referenced throughout the permit as the "August 6, 2001 Letter".

118. Pursuant to the August 6, 2001 Letter from Board Staff, the Discharger has submitted workplans for characterizing the levels of selected constituents in the effluent and ambient receiving water. The Workplans have been approved November 13, 2001, and monitoring is underway.

119. *Monitoring Requirements (Self-Monitoring Program).* The SMP includes monitoring at the outfall for conventional, non-conventional, and toxic pollutants, and acute and chronic toxicity. The monitoring frequency for turbidity has been increased from weekly to five times per week. Board staff has determined that five times per week monitoring is appropriate to measure treatment performance for tertiary treatment plants. The Discharger has indicated that the incremental cost from weekly to 5 times weekly is insignificant. Additionally, the Discharger reports that daily (7 times/week) sampling is infeasible due to the current practices for sampling and reporting turbidity. Turbidity samples for compliance determination are sent to the lab (analyzed using Standard Method 2130(B)). Although an on-line probe is used to monitor turbidity for process control, the discharger reports daily compliance sampling is not possible due to both the lab closure on weekends and the recommended 24-hour sampling hold-time.

    Monitoring for other conventional and non-conventional pollutants is generally the same as the previous Order This Order requires monthly monitoring for copper, mercury, and nickel to demonstrate compliance with final effluent limitations. Because they were not detected in the effluent during 1999-2002, this Order requires twice yearly monitoring for benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene 4,4'-DDE, dieldrin and heptachlor epoxide to demonstrate compliance. For dioxins and furans, due to considerable costs, this Order also requires twice yearly monitoring, which is consistent with SIP provisions. The SMP contains all of the influent and effluent monitoring requirements necessary for the Discharger to demonstrate compliance with effluent limits set forth in this Order. The SMP monitoring requirements also fulfill the pretreatment program sampling requirements and the requirements of the Regional Board's August 2001 13267 letter.

120. *Optional Mass Offset.* This Order contains requirements to prevent further degradation of the impaired waterbody. Such requirements include the adoption of interim mass limits that are based on treatment plant performance, provisions for aggressive source control, feasibility studies for wastewater reclamation, and treatment plant optimization. After implementing these efforts, the Discharger may find that further net reductions of the total mass loadings of the 303(d)-listed pollutants to the receiving water can only be achieved through a mass offset program. This Order includes an optional provision for a mass offset program.

121. Clean Bay Strategy/Water Quality Attainment Strategy In establishing the SSOs for Lower South San Francisco Bay, the Board determined that copper and nickel are not causing impairment. At the same time, the May 22, 2002 Regional Board Basin Plan Amendment and October 17, 2002 State Board Resolutions approving the Basin Plan Amendment, also required implementation of the WQAS by Dischargers, including the City of Palo Alto. This Order requires the Discharger to comply with the requirements of the WQAS and the associated Copper and Nickel Action Plans.

Other Discharge Characteristics and Permit Conditions

122. *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.

123. *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. Board staff prepared a Fact Sheet and Response to Comments, which are hereby incorporated by reference as part of this Order.

124. *Public Hearing.* The Board, 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, regulations, and plans and policies adopted thereunder, and to the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, that the Discharger shall comply with the following:

A. DISCHARGE PROHIBITIONS

1. Discharge of treated wastewater at a location or in a manner different from that described in this Order is prohibited.

2. Discharge of process wastewater at any point where it does not receive an initial dilution of at least 10:1 is prohibited.

3. Discharge of waste to dead-end sloughs or confined waterways is prohibited.

4. Discharge of waste to waters of San Francisco Bay south of the Dumbarton Bridge or tributaries is prohibited.

5. The bypass of untreated or partially treated process wastewater to waters of the State, either at the treatment plant or from the collection system is prohibited. Bypassing of individual treatment processes during periods of high wet weather flow or maintenance activities in the form of blending, is allowable under conditions stated in 40CFR Part 122.41(m)(4) and in Standard Provisions A.13 provided that the combined discharge of fully treated and partially treated wastewater complies with the effluent and receiving water limitations in this Order.

6. Discharges of water, materials, or wastes other than storm water, which are not otherwise authorized by this NPDES permit, to a storm drain system or waters of the State are prohibited.

7. The average dry weather flow (ADWEF) shall not exceed 39 MGD, determined by the average during the months of June through October. This flow includes 1 MGD of groundwater cleanup flows and 38 MGD of industrial and domestic flows. Groundwater clean-up flows should not occur during wet weather periods and should be consistent with local pretreatment limits and other requirements.

8. By complying with the metals limitations in B.6 and continuing to conduct the reclamation program as described in Findings 10 and 11 (Discharge Description) and Findings 25-28 (Basin Plan Prohibitions and Exceptions) and Provision E.11, the Discharger is granted an exception to discharge prohibitions 2 through 4.

B. EFFLUENT LIMITATIONS FOR E-001 AND E-002

Conventional Pollutants

1. The discharge containing constituents in excess of any of the following limits, is prohibited:

Constituent	Unit	Monthly	Daily	Instantaneous

			Average	Maximum	Maximum
a.	CBOD	mg/L	10	20	-
b.	Ammonia-N	mg/L	3	8	-
c.	Suspended Solids	mg/L	10	20	-
d.	Oil and Grease	mg/L	5	10	-
e.	Settleable Matter	mg/L-hr	0.1	0.2	-
f.	Turbidity	NTU	-	-	10
g.	Chlorine Residual	mg/L	-	-	0.0[A]

A. Requirement defined as below the limit of detection in standard test methods defined in the latest U.S. EPA approved edition of *Standard Methods for the Examination of Water and Wastewater*. The Discharger may elect to use a continuous on-line monitoring system(s) for measuring flows, chlorine and sodium bisulfite dosage (including a safety factor) and concentration to prove that chlorine residual exceedances are false positives. If convincing evidence is provided, Board staff will conclude that these false positive chlorine residual exceedances are not violations of this permit limit.

2. The discharge shall not have pH of less than 6.5 nor greater than 8.5. If the Discharger monitors pH continuously, the Discharger shall be in compliance with the pH limitation provided that both of the following conditions are satisfied: (i) The total time during which the pH values are outside the required range of pH values shall not exceed 7 hours and 26 minutes in any calendar month; and (ii) No individual excursion from the range of pH values shall exceed 60 minutes.

3. The arithmetic mean of the biochemical oxygen demand (BOD_5 20°C) and total suspended solids (TSS) values, for effluent samples collected in each 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, i.e., at least 85 percent removal.

Toxic Pollutants

4. **Whole Effluent Acute Toxicity**
Representative samples of the discharge shall meet the following limits for acute toxicity. Bioassays shall be conducted in compliance with Provision E.8.

   a. The survival of bioassay test organisms in 96-hour bioassays of undiluted effluent shall be:
      (1) An eleven (11)-sample median value of not less than 90 percent survival; and
      (2) An eleven (11)-sample 90th percentile value of not less than 70 percent survival.

   b. These acute toxicity limits are further defined as follows:
      (1) 11-sample median limit:
      Any bioassay test showing survival of 90 percent or greater is not a violation of this limit. A bioassay test showing survival of less than 90 percent represents a violation of this effluent limit, if five or more of the past ten or fewer bioassay tests also show less than 90 percent survival.
      (2) 90th percentile limit:
      Any bioassay test showing survival of 70 percent or greater is not a violation of this limit. A bioassay test showing survival of less than 70 percent represents a violation of this effluent limit, if one or more of the past ten or fewer bioassay tests also show less than 70 percent survival.
   c. Bioassays shall be performed using sensitive species as specified in writing by the Executive Officer based on the most recent screening test results, the "Methods for Measuring The Acute Toxicity of Effluents and Receiving Water To Freshwater and Marine Organisms", 5th Edition,

with exceptions granted the Discharger by the Executive Officer and the Environmental Laboratory Accreditation Program (ELAP).

5. **Chronic Toxicity**
   a. Representative samples of the effluent shall meet the following requirements for chronic toxicity. Compliance with the Basin Plan narrative chronic toxicity objective shall be demonstrated according to the following tiered requirements based on results from representative samples of the treated final effluent meeting test acceptability criteria:
      (1) Routine monitoring;
      (2) Accelerated monitoring after exceeding a three sample median value of 1 chronic toxicity unit[2] (TUc) or a single sample maximum of 2 TUc or greater. Accelerated monitoring shall consist of monitoring at frequency intervals of one half the interval given for routine monitoring in the SMP of this Order;
      (3) Return to routine monitoring if accelerated monitoring does not exceed either "trigger" in "2", above;
      (4) Initiate approved toxicity identification evaluation/toxicity reduction evaluation (TIE/TRE) work plan if accelerated monitoring confirms consistent toxicity above either "trigger" in "2", above;

      Return to routine monitoring after appropriate elements of TRE work plan are implemented and either the toxicity drops below "trigger" level in "2", above or, based on the results of the TRE, the Executive Officer authorizes a return to routine monitoring

   b. Test Species and Methods: The Discharger shall conduct routine monitoring with the *Macrocystis pyrifera.* Bioassays shall be conducted in compliance with The Self-Monitoring Program **(Attachment c).**

6. **Toxic Substances**: The discharge at Outfalls E-001/E-002 shall not exceed the following limits:

Constituent	Daily Max	Monthly Average	Interim Daily Maximum	Interim Monthly Average	Units	Notes
Copper	17.4	11.8			µg/L	(1)(4)
Mercury				0.023	µg/L	(1)(2)(3)(4)(5)
Nickel	32.2	25.6			µg/L	(1)(4)
Cyanide			32		µg/L	(1)(3)(4)
Chlorodibromomethane			86		µg/L	(1)(3)(4)
4.4'-DDE			0.05		µg/L	(1)(3)(4)
Dieldrin			0.01		µg/L	(1)(3)(4)
Heptachlor Epoxide			0.01		µg/L	(1)(3)(4)
Benzo(b)Fluoranthene			10.0		µg/L	(1)(3) (4)
Indeno(1,2,3-cd)Pyrene			0.05		µg/L	(1)(3) (4)

[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. Failure to conduct the required toxicity tests or a TRE within a designated period shall result in the establishment of effluent limitations for chronic toxicity.

Footnotes:

(1) (a) All analyses shall be performed using current USEPA methods, or equivalent methods approved in writing by the Executive Officer.

(b) Limits apply to the average concentration of all samples collected during the averaging period (Daily = 24-hour period; Monthly = calendar month).

(2) Mercury: Effluent mercury monitoring shall be performed by using ultraclean sampling and analysis techniques to the maximum extent practicable, with a minimum level of 0.002 µg/l, or lower.

(3) The discharger shall comply with these interim limits until October 31, 2008, or until the Regional Board amends the limit based on additional data, site-specific objectives, or the waste load allocation in respective TMDLs. However, during the next permit reissuance the Regional Board may re-evaluate the interim limits. If the permit expiration date is extended by the Regional Board, the interim limits shall remain in effect until the permit is renewed or a permit amendment addressing these limits is adopted, whichever occurs sooner.

(4) A daily maximum, 4-day average, or monthly average value for a given constituent shall be considered non-compliant with the effluent limits only if it exceeds the effluent limitation and the reported ML for that constituent. Table 2 of the SMP indicates the highest minimum level that the Discharger's laboratory must achieve for calibration purposes.

(5) The mercury TMDL and WLA will supersede this concentration limitation upon their completion. The Clean Water Act's anti-backsliding rule, Section 402(o), indicates that this Order may be modified to include a less stringent requirement following completion of the TMDL and WLA, if the requirements for an exception to the rule are met.

7. Dry Weather Interim Mass Emission Limitation for Mercury

a. During dry weather months (May through October), the total mercury mass load shall not exceed the mercury mass emission limitation of 0.103 kilograms per month (kg/month), as computed in b, below.

$$Monthly\ Total\ Mass\ Load, kg/month = Q * C * 0.1151$$

where

Q = monthly average WWTP dry weather effluent flow (May-Oct), MGD, as reported

C = effluent concentration, µg/L, corresponding to each month's flow.

If more than one concentration measurement is obtained in a calendar month, the average of these measurements is used as the monthly concentration value for that month. If test results are less than the method detection limit used, the concentration value shall be assumed to be equal to the method detection limit.

0.1151 = unit conversion factor to obtain kg/month.

b. The mercury TMDL and WLA will supersede this mass emission limitation upon their completion. The Clean Water Act's anti-backsliding rule, Section 402(o), indicates that this Order may be modified to include a less stringent requirement following completion of the TMDL and WLA, if the requirements for an exception to the rule are met.

8. Bacteria Limits (Enterococci)

The treated wastewater, at some point in the treatment process prior to discharge, shall meet the following limits of bacteriological quality:

a. The 30-day geometric mean shall not exceed 35 enterococci (MPN) per 100 ml, **and**
b. Any single sample shall not exceed 276 enterococci (MPN) per 100 ml as verified by a follow-up sample taken within 24 hours.

C. RECEIVING WATER LIMITATIONS

1. The discharges shall not cause the following conditions to exist in waters of the State at any place:

   a. Floating, suspended, or deposited macroscopic particulate matter or foam;

   b. Bottom deposits or aquatic growths to the extent that such deposits or growths cause nuisance or adversely affect beneficial uses;

   c. Alteration of temperature, turbidity, or apparent color beyond present natural background levels;

   d. Visible, floating, suspended, or deposited oil or other products of petroleum origin; and

   e. Toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on wildlife, waterfowl, or other aquatic biota, or which render any of these unfit for human consumption, either at levels created in the receiving waters or as a result of biological concentration.

2. The discharge of waste shall not cause nuisance, or adversely affect the beneficial uses of the receiving water.

3. The discharges shall not cause the following limits to be exceeded in waters of the State at any one place within one foot of the water surface:

   a. Dissolved Oxygen: 5.0 mg/L, minimum

      The median dissolved oxygen concentration for any three consecutive months shall not be less than 80% of the dissolved oxygen content at saturation. When natural factors cause concentrations less than that specified above, then the discharge shall not cause further reduction in ambient dissolved oxygen concentrations.

   b. Dissolved Sulfide: 0.1 mg/L, maximum

   c. pH: The pH shall not be depressed below 6.5 nor raised above 8.5, nor caused to vary from normal ambient pH by more than 0.5 pH units.

   d. Un-ionized Ammonia: 0.025 mg/L as N, annual median; and
      0.4 mg/L as N, maximum.

e. Nutrients: Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.

4. The discharges shall not cause a violation of any particular water quality standard for receiving waters adopted by the Board or the State Board as required by the Clean Water Act and regulations adopted thereunder. 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 will revise and modify this Order in accordance with such more stringent standards.

D. BIOSOLIDS/SLUDGE REQUIREMENTS

1. For biosolids management, the Discharger shall comply with all requirements of 40 CFR Part 503.

2. The Discharger of biosolids shall not allow waste material to be deposited in the waters of the State.

3. The Discharger shall submit an annual report to the USEPA and the Regional Board containing reuse information and other information requirements as specified by 40 CFR Part 503.

E. PROVISIONS

1. Permit Compliance and Rescission of Previous Waste Discharge Requirements

The Discharger shall comply with all sections of this Order beginning on November 1, 2003. Requirements prescribed by this Order supersede the requirements prescribed by Order No. 98-054, Order No. 00-109 and Order No. 01-059. Order Nos. 98-054 and 00-109 are hereby rescinded upon the effective date of this permit.

2. Chlorodibromomethane Compliance Schedule

Under this Permit, the Discharger will be operating under enterococcus bacteriological effluent limitations. This will allow the Discharger to reduce chlorine dosages and potentially the generation of disinfection byproducts.

The Discharger shall comply with the following tasks and deadlines:

Task	Deadline
a. The Discharger shall submit a work plan that will include tasks intended to define the correlation between WPCP chlorine dosages and formation of chlorodibromomethane, such as conducting monitoring throughout the treatment process and analyzing chlorine dosage histories.	Within 90 days after permit adoption
b. Upon approval by the Executive Officer, the Discharger shall implement the work plan within 90 days. Annual reports shall be submitted documenting the progress of the studies by February 28 of each year or by the date specified in the approved proposal. The Discharger will submit to the Board a final report detailing all monitoring activities, potential cost-effective control measures, and recommended actions to comply with the final effluent limitations by the date specified in the approved proposal.	Annual Reports, the first report is due on February 28, 2004
c. Evaluate compliance attainability with appropriate final limitations.	Within 2 years of permit adoption

3. Cyanide Compliance Schedule and Cyanide SSO Study

The Discharger shall comply with the following tasks and deadlines:

Task	Deadline
a. Compliance Schedule. The Discharger shall track and participate in relevant WERF studies, as described in findings above. Results from these studies shall enable the Board to determine compliance with final WQBELS during the next permit reissuance	Annual progress reports, the first report is due on January 31, 2004
b. SSO Study. The Discharger shall actively participate in the development of SSOs for cyanide for San Francisco Bay.	Annual progress reports, the first report is due on January 31, 2004
c. Evaluate compliance attainability with appropriate final limitations.	Within 2 years of permit adoption

4. Mercury Special Study - Advanced Mercury Source Control Study

a. The Discharger's study "Advanced Mercury Source Control Program" shall consist of the following tasks:

i. Advanced Dental Office Source Control

Having implemented a voluntary Best Management Practice (BMP) program for dental offices in its service area, Palo Alto is now required to achieve further reductions by developing and implementing a program for the installation of amalgam separators at dental offices. The program shall be developed in cooperation with the Mid-Peninsula Dental Society and other stakeholders according to the time schedule developed pursuant to the Workplan described in Provision 4.b. Careful coordination with the City of San Francisco and any other Bay Area local governments implementing similar programs shall be ensured. Periodic updates and a final report shall be made to the Bay Area Pollution Prevention Group, the Regional Board, the Mid-Peninsula Dental Society and other stakeholders. A key feature of such reporting shall include effectiveness measures including mercury reductions achieved and lessons learned. The program shall consist of the following:

a) The installation of amalgam separators (or the equivalent) at dental offices
b) Appropriate sewer line cleaning at selected dental offices to ensure cost-effective and accurate load reduction estimates
c) "Before" and "After" monitoring at selected dental offices.

ii. POTW Mercury Use Investigation

The discharger shall conduct a thorough investigation of the uses of mercury at the Palo Alto Regional Water Quality Control Plant according to the time schedule developed pursuant to the Workplan described in Provision 4.b. The investigation shall include the following:

i) An inventory of the mercury used at the Plant, focusing on switches and reagents, but including all uses.
ii) A listing of available non-mercury alternative products.
iii) Recommendations and a time schedule for action by Palo Alto where appropriate.

b. Schedule

Task	Deadline
a. Workplan. The Discharger shall submit a schedule and detailed workplan for the Advanced Mercury Source Control Program elements described above in (a). Implementation of the workplan will begin within 30 days of the Executive Officer's approval of the workplan.	Within 90 days after permit adoption
b. Final Report. The Discharger shall submit a final report presenting the results of the Advanced Mercury Source Control Program.	December 15, 2007
c. Progress Reports	Annually, the first report is due on February 28, 2004

5. 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 J. "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 U.S. EPA, the State Board and the Board, as described in Attachment J., "Pretreatment Requirements;". The Discharger may submit the annual pre-treatment report with the semi-annual pretreatment report (for July through December reporting period).

d. Pretreatment Program Flexibility: The Discharger may implement a non-substantial modification to the pretreatment program if the Executive Officer does not disapprove it within 45 days of being notified of the change.

6. Effluent Characterization for Selected Constituents

The Discharger shall monitor and evaluate the discharge from Outfall E-001 for the constituents listed in Enclosure A of the Board's August 6, 2001 Letter. Compliance with this requirement shall be achieved in accordance with the specifications stated in the Board's August 6, 2001 Letter under Effluent Monitoring for major Dischargers. A final report presenting all data shall be submitted to the Board no later than 180 days prior to the permit expiration date.

7. Pollutant Prevention and Minimization Program (PMP)

a. The Discharger shall continue to conduct and 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 shall submit an annual report, acceptable to the Executive Officer, no later than February 28th of each year. Annual reports shall cover January through December of the preceding year. Annual reports 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 shall 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. The Discharger may implement 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) *Outreach to employees.* The Discharger shall inform employees about the pollutants of concerns, potential sources, and how they might be able to help reduce the discharge of pollutants of concern into the treatment plant. The Discharger may provide a forum for employees to provide input to the Program. 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.

(vi) *Continuation of a public outreach program.* The Discharger shall continue its 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, conducting 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 shall 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.* The 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.

c. According to Section 2.4.5 of the SIP, when there is evidence that a priority pollutant is present in the effluent above an effluent limitation and either:

(i) A sample result is reported as detected, but not quantified (less than the Minimum Level) and the effluent limitation is less than the reported Minimum Level; or

(ii) A sample result is reported as not detected (less than the Method Detection Limit) and the effluent limitation is less than the Method Detection Limit,

(iii) If the effluent monitoring for Dioxin TEQ, exceeds the WQO of 0.014 pg/L;

the Discharger shall expand its existing Pollution Prevention Program to include the reportable priority pollutant. A priority pollutant becomes a reportable priority pollutant when (1) there is evidence that it is present in the effluent above an effluent limitation and either c.(i), c.(ii), or c.(iii) is triggered or (2) if the concentration of the priority pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the reported Minimum Level.

d. If triggered by the reasons in Provision E.7.c. and notified by the Executive Officer, the Discharger's Pollution Prevention Program shall, within 6 months, also include:
   (i) An annual review and semi-annual monitoring of potential sources of the reportable priority pollutant(s), which may include fish tissue monitoring and other bio-uptake sampling, or alternative measures approved by the Executive Officer when it is demonstrated that source monitoring is unlikely to produce useful analytical data;
   (ii) Quarterly monitoring for the reportable priority pollutant(s) in the influent to the wastewater treatment system, or alternative measures approved by the Executive Officer when it is demonstrated that influent monitoring is unlikely to produce useful analytical data;
   (iii) Submittal of a control strategy designed to proceed toward the goal of maintaining concentrations of the reportable priority pollutant(s) in the effluent at or below the effluent limitation;
   (iv) Development of appropriate cost-effective control measures for the reportable priority pollutant(s), consistent with the control strategy; and
   (v) An annual status report that shall be sent to the RWQCB including:
      1. All Pollution Prevention monitoring results for the previous year;
      2. A list of potential sources of the reportable priority pollutant(s);
      3. A summary of all actions undertaken pursuant to the control strategy; and
      4. A description of actions to be taken in the following year.

e. 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.

f. 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).

8. Acute Toxicity

Compliance with acute toxicity requirements of this Order shall be achieved in accordance with the following:

a. <u>From permit adoption date up to August 31, 2004:</u>
   (1) Compliance with the acute toxicity effluent limits of this Order shall be evaluated by measuring survival of test organisms exposed to 96-hour flow through renewal bioassays.
   (2) Test organisms shall be stickleback unless specified otherwise in writing by the Executive Officer.
   (3) All bioassays may be performed according to the "Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms," 3rd, 4th and

5th, Edition. Upon the Discharger's request with justification, exceptions may be granted to the Discharger by the Executive Officer and the Environmental Laboratory Accreditation Program (ELAP).

b. No Later Than September 1, 2004:
   (1) Compliance with the acute toxicity effluent limits of this Order shall be evaluated by measuring survival of test organisms exposed to 96-hour flow through bioassays, or static renewal bioassays. If the Discharger will use static renewal tests, they must submit a technical report by April 30, 2004, identifying the reasons why flow-through bioassay is not feasible using the approved USEPA protocol in 40 CFR 136 (currently 5th edition).
   (2) Test organisms shall be rainbow trout unless specified otherwise in writing by the Executive Officer.
   (3) All bioassays shall be performed according to the "Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms,"5th Edition. Upon the Discharger's request with justification, exceptions may be granted to the Discharger by the Executive Officer and the Environmental Laboratory Accreditation Program (ELAP).

9. Copper – Nickel Action Plans

Baseline Actions to control copper and nickel, as described in the Copper and Nickel Action Plans, shall be implemented immediately. The Discharger shall submit annual reports to the Bay Monitoring and Modeling Subgroup of the Santa Clara Basin Watershed Management Initiative and the Board, either included in, or at the same time as, the annual pretreatment report, on the status of these actions. The reports shall be acceptable to the Executive Officer, who will consider comments from the Bay Monitoring and Modeling Subgroup and other interested parties.

Ten stations described in the Copper Action Plan shall be monitored monthly during the dry season (May through October) for dissolved copper and nickel. The results of this monitoring shall be reported in the monthly Self Monitoring Reports and in the annual Self Monitoring Report to the Board and to the Bay Monitoring and Modeling Subgroup of the Santa Clara Basin Watershed Management Initiative. A Discharger may reference the monthly or annual Self-Monitoring Report of another Lower South Bay Discharger to comply with this Provision.

Phase I Triggers:

If the results of the required monitoring for Stations SB03, SB04, SB05, SB07, SB08, and SB09 show that mean dissolved copper concentrations have risen to 4.0 µg/l, the Dischargers shall implement Phase 1 actions as described in the Copper Action Plan and this Order (Findings 21-23, Attachment E). Within 90 days after the determination of Phase I trigger exceedances, the Discharger shall submit, for Executive Officer concurrence, its proposed Phase I plans with implementation schedules to implement additional measures to limit its relative cause or contribution to the exceedances. This submittal should, at a minimum include evaluation of the Phase I actions and development of a Phase II plan.

If the results of the required monitoring for Stations SB03, SB06, SB07, SB08, SB09, and SB10 show that mean dissolved nickel concentrations have risen to 6.0 µg/l, the Dischargers shall implement Phase 1 actions described in the Nickel Action Plan and this Order (Findings 24-26, Appendix E). Within 90 days after the determination of Phase I trigger exceedances, the Discharger

shall submit, for Executive Officer concurrence, its proposed Phase I plans with implementation schedules to implement additional measures to limit its relative cause or contribution to the exceedances. This submittal should, at a minimum include evaluation of the Phase I actions and development of a Phase II plan.

Phase II Triggers:

If the results of the monitoring required for Stations SB03, SB04, SB05, SB07, SB08, and SB09 show that mean dissolved copper concentrations have risen to 4.4 µg/L, the Dischargers shall implement Phase 2 actions described in the Copper Action Plan and this Order (Findings 21-23, Appendix E). Within 90 days after the determination of Phase II trigger exceedances, the Discharger shall submit, for Executive Officer concurrence, its proposed Phase II plans with implementation schedules to implement additional measures to limit its relative cause or contribution to the exceedance.

If the results of the monitoring required for Stations SB03, SB06, SB07, SB08, SB09, and SB10 show that mean dissolved nickel concentrations have risen to 8.0 µg/L, the Discharger shall implement Phase 2 actions described in the Nickel Action Plan and this Order (Findings 24-26, Appendix E). Within 90 days after the determination of Phase II trigger exceedances, the Discharger shall submit, for Executive Officer concurrence, its proposed Phase II plans with implementation schedules to implement additional measures to limit its relative cause or contribution to the exceedance.

If the required submittals are not received within 90 days of the determination of a Phase I or Phase II trigger exceedance or required actions are not being implemented in accordance with the Discharger's implementation schedule following the Executive Officer's concurrence, the Regional Board may consider enforcement action to enforce the terms of the Discharger's permit.

Because the WQAS is an adaptive management plan, modifications to the WQAS may be considered provided that the Discharger continues reasonable treatment, source control, and pollution prevention measures to control discharges. Therefore, to respond to changed conditions and to incorporate more effective approaches to pollutant control, requests for changes may be initiated by the Executive Officer or by the Discharger. Minor changes may be made with the Executive Officer's approval and will be brought to the Regional Board as information items and the Discharger and interested parties will be notified accordingly. If proposed changes imply a major revision of the Program, the Executive Officer shall bring such changes before the Regional Board as permit amendments and notify the Discharger and interested parties accordingly.

10. Santa Clara Basin Watershed Management Initiative

The Discharger shall continue to participate in the Santa Clara Basin Watershed Management Initiative (WMI).

11. Reclamation Programs

The Discharger shall continue to implement the reclamation programs described in Finding 10 (Discharge Description).

12. Regional Monitoring Program

The Discharger has committed to continue participating in the Regional Monitoring Program (RMP) for trace substances in San Francisco Bay in lieu of more extensive effluent and receiving water self-monitoring requirements that may be imposed.

13. Optional Mass Offset

The Discharger may submit to the Board for approval a mass offset plan to reduce 303(d)-listed pollutants to the same watershed or drainage basin. The Regional Board may modify this Order to allow an approved mass offset program.

14. Operations & Maintenance Manual/Operating Procedures (O&M Manual)

a. The Discharger shall maintain an O & M Manual 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.

b. 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.

c. Annually, 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. This report shall be submitted by June 30th of each year.

15. Contingency Plan Update

a. The Discharger shall maintain a Contingency Plan as required by Board Resolution 74-10 (attached), and as prudent in accordance with current industrial 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. By June 30 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.

16. Reliability Report Updates

Regional Board Order No. 98-054 concluded that: "The Discharger completed a plant reliability analysis in 1988 that demonstrated a high level of reliability. No significant changes have occurred at the plant, which would warrant an update of the 1988 reliability analysis." This situation is still the case as of the issuance date of this permit. Should significant changes in plant operations occur, the Discharger shall submit to the Board an updated version of the Reliability Report. The Regional

Board would then review the Reliability Report as to insure that the exception granted to the Basin Plan Discharge Prohibitions (See Finding 20 – Basin Plan Discharge Prohibitions and Exceptions) remains appropriate.

17. 303(d)-listed Pollutants Site-Specific Objective and TMDL Status Review

The Discharger shall participate in the development of a TMDL or site-specific objective for mercury, selenium, 4,4'-DDE, dieldrin, dioxin, and PCBs. By the last day of January of each year, the Discharger shall submit an update to the Board to document efforts made in participation in the development of TMDLs and/or site-specific objectives. Board staff shall review the status of TMDL development. This Order may be reopened in the future to reflect any changes required by TMDL development.

18. Self-Monitoring Program

The Discharger shall comply with the Self-Monitoring Program (SMP) for this Order as adopted by the Board. The SMP may be amended by the Executive Officer pursuant to USEPA regulations 40 CFR 122.63.

19. 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 (attached), 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.

20. 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.

21. Permit Reopener

The Board may modify or reopen this Order and Permit prior to its expiration date in any of the following circumstances:

(1) If present or future investigations demonstrate that the discharge(s) governed by this Order and Permit will or have a reasonable potential to cause or contribute to adverse impacts on water quality and/or beneficial uses of the receiving waters;

(2) New or revised WQOs come into effect for the San Francisco Bay estuary and contiguous water bodies (whether statewide, regional, or site-specific). In such cases, effluent limitations in this permit will be modified as necessary to reflect updated WQOs. Adoption of effluent limitations contained in this Order and Permit is not intended to restrict in any way future modifications based on legally adopted WQOs or as otherwise permitted under Federal regulations governing NPDES permit modifications;

(3) If translator or other water quality studies provide a basis for determining that a permit condition(s) should be modified. The Discharger may request permit modification on this basis. The Discharger shall include in any such request an antidegradation and antibacksliding analysis.

22. 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 November 1, 2003, provided the USEPA Regional Administrator has no objection. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.

23. 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.

LORETTA K. BARSAMIAN
Executive Officer

Attachments:
A. Discharge Facility Location Map
B. Discharge Facility Treatment Process Diagram
C. South Bay RMP and Monitoring Stations Diagram
D. Self-Monitoring Program, Part B
E. Nickel and Copper: Tables of Baseline Control Actions, Phase I, and Phase II
F. Fact Sheet
G. Self-Monitoring Program, Part A (Available on-line)
Standard Provisions and Reporting Requirements, August 1993
(http://www.swrcb.ca.gov/~rwqcb2/Agneda/04-17-02/res74-10standprov.doc)

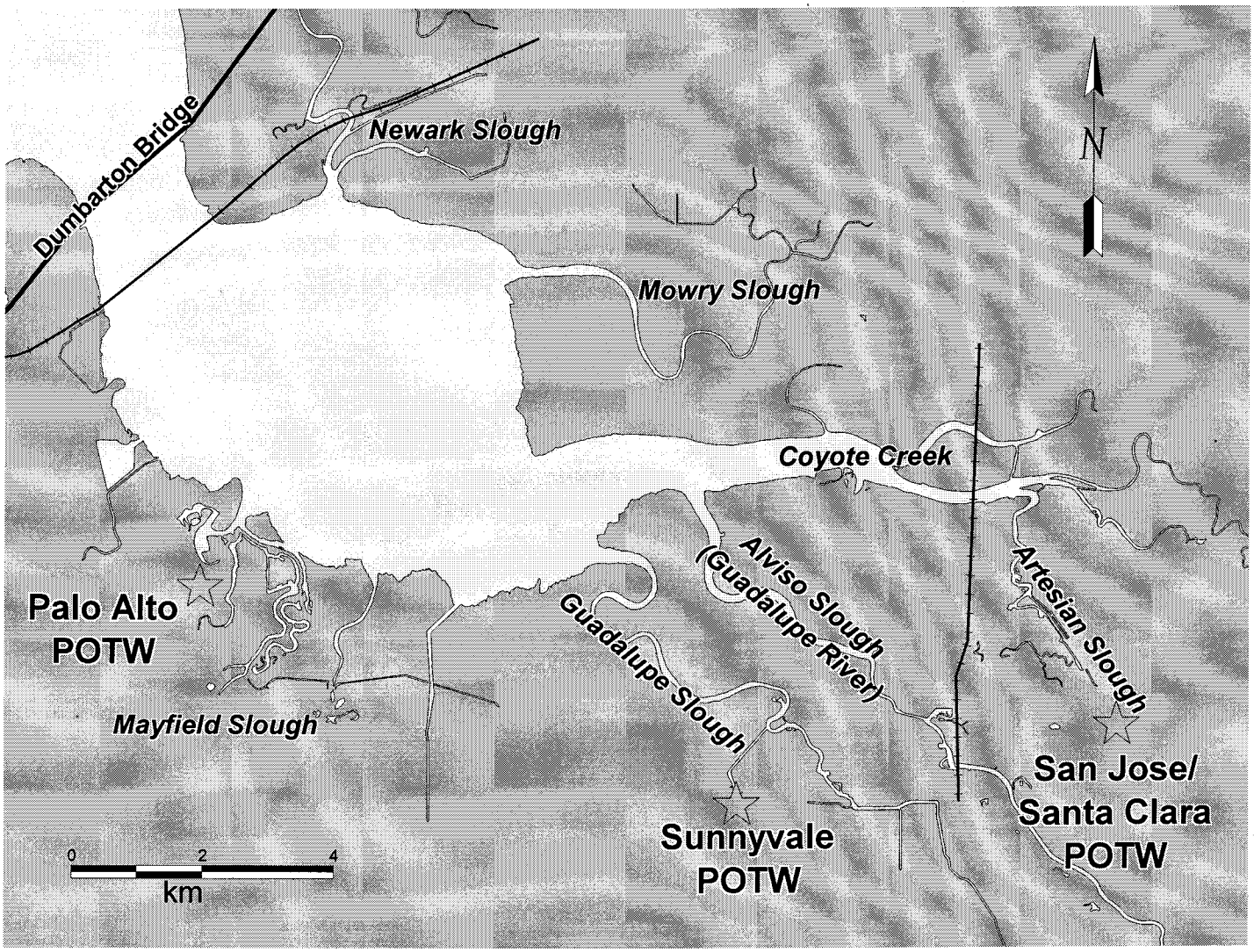
H. Board Resolution No. 74-10
[See (http://www.swrcb.ca.gov/~rwqcb2/Agenda/04-17-02/res74-10.doc]

I. Mercury Staff Report [See [http://www.swrcb.ca.gov/rwqcb2/sfbaymercurytmdl.htm]
click on the link for "Project Report."

J . Pretreatment Requirements
K. Infeasibility Analysis (Cyanide Limit- method and results)
L. Response to Comments

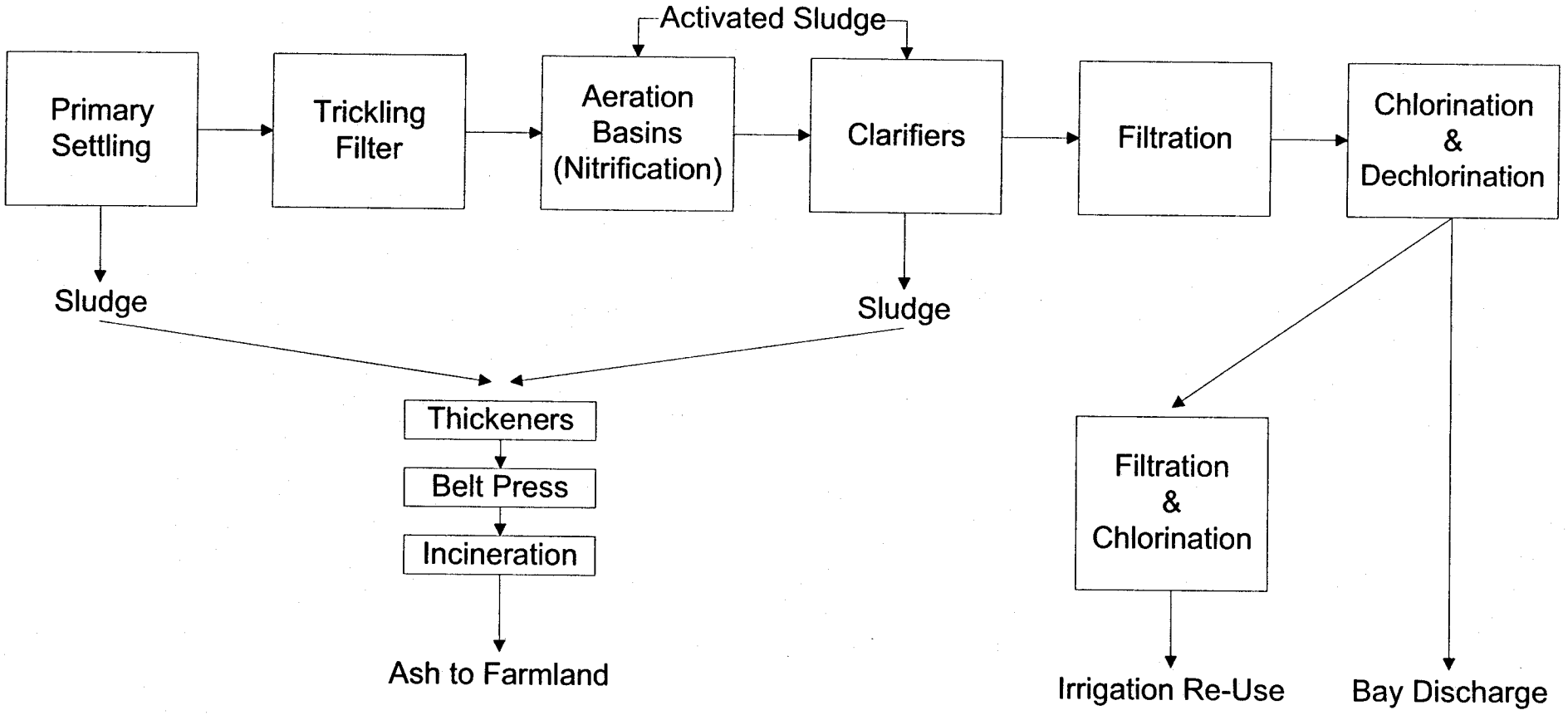
Attachments

Attachment A: Discharge Facility Location Map



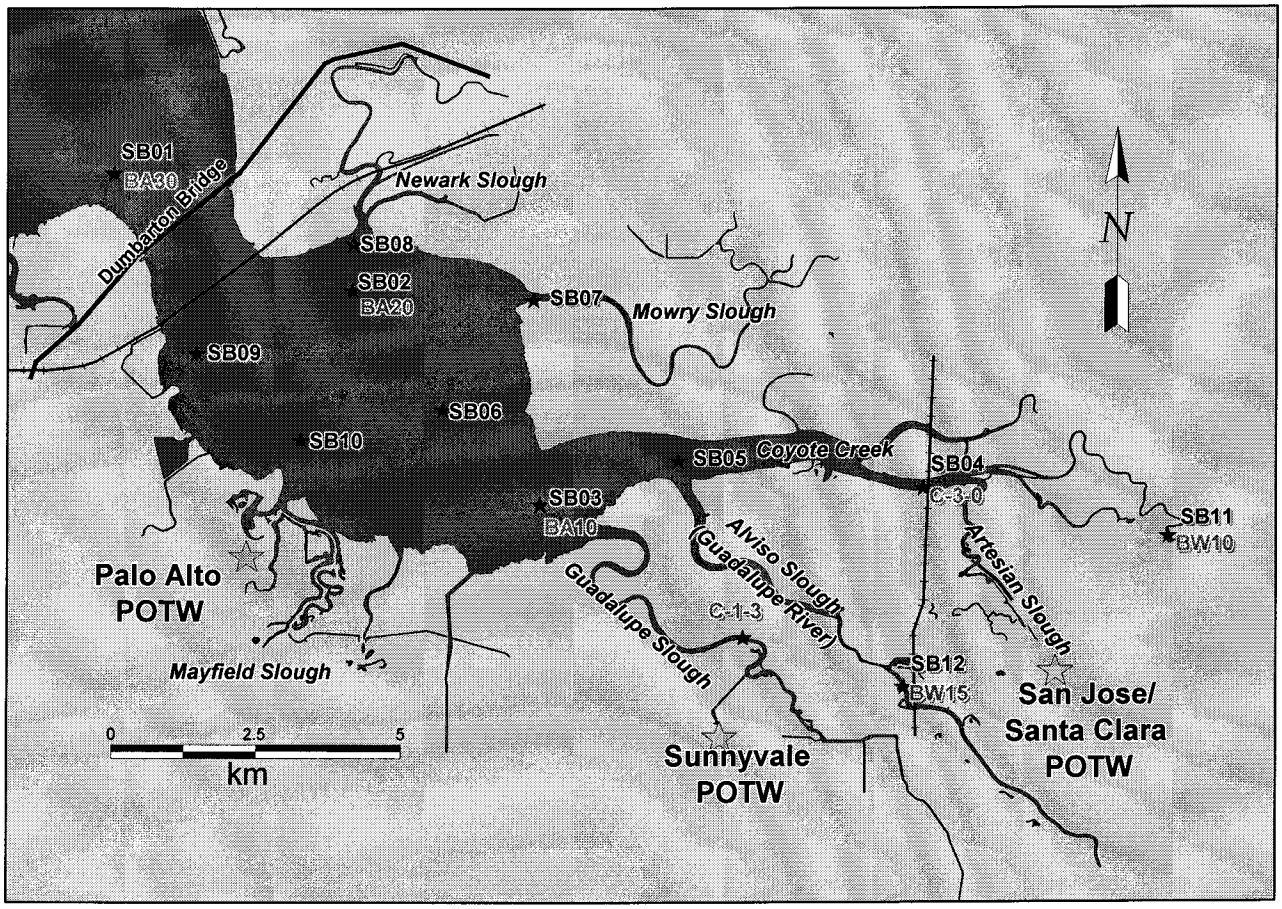
Attachment B: Discharge Facility Treatment Process Diagram

Palo Alto RWQCP Schematic



Attachment C: South Bay RMP Stations Diagram

South Bay Sampling Stations
(San Jose and RMP)



Attachment D: Self-Monitoring Program, Part B

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM

FOR

PALO ALTO REGIONAL WATER QUALITY CONTROL PLANT

PALO ALTO
SANTA CLARA COUNTY

NPDES PERMIT NO. CA0037834

ORDER NO. R2 2003 - 0078

Consists of:
Part A (not attached)
Adopted August 1993

And

Part B (Attached)
Adopted:

CONTENTS:

PART B

I. DESCRIPTION OF SAMPLING AND OBSERVATION STATIONS

NOTE: A sketch showing the locations of all sampling and observation stations shall be included in the Annual Report, and in the monthly report if stations change.

Station	Description
A. INFLUENT	
A-001	At any point in the treatment facilities' headworks at which all waste tributary to the treatment system is present, and preceding any phase of treatment, and exclusive of any return flows or process side streams that would significantly impact the quantity or quality of the influent.
B. EFFLUENT	
E-001/002	At any point in the outfall from the treatment facilities between the point of discharge and the point at which all waste tributary to these outfalls are present.
E-001/002-D	At any point in the disinfection facilities for outfalls 001 and 002 at which point adequate contact with the disinfectant is assured.
C. OVERFLOWS and BYPASSES	
OV-1 thru OV-'n'	Bypass or overflows from manholes, pump stations, portions of the collection system under the Discharger's control. NOTE: A map and description of each known or observed overflow or bypass location shall accompany each monthly report. A summary of these occurrences and their location shall be included with the Annual Report for each calendar year.

II. SCHEDULE OF SAMPLING, ANALYSES AND OBSERVATIONS OF INFLUENT AND EFFLUENT

The schedule of sampling, analysis and observation shall be that given in Table 1 below.

TABLE 1. SCHEDULE of SAMPLING, ANALYSES and OBSERVATIONS [1]

Sampling Station:			A-001	E-001/002			All OV Stations	E-001/002-D
			Influent	E-001/002				
Type of Sample:			C-24	G [2]	C-24	Cont		
Parameter	Units	**Notes**	[1]					
Flow Rate	MGD	[3]				Cont		
$BOD_5$20°C	mg/L & kg/day	[4]	W		W			
TSS	mg/L & kg/day	[4]	W		W			
Oil & Grease	mg/L & kg/day	[5]		M				
Settleable Matter	ml/l-hr			Q				
Enterococci	MPN/100 ml	[14]						5/W
Chlorine Residual and Dosage	mg/L & kg/day	[6]				Cont/H		
Ammonia Nitrogen & Unionized Ammonia	mg/L & kg/day				M			
pH	pH units	[7]		D				
Temperature	°C	[7]]		D				
Dissolved Oxygen	mg/L and %Saturation	[7]		D				
Acute Toxicity	% Survival	[8]			M			
Chronic Toxicity		[9]			M			
Copper	µg/L				M			
Mercury	µg/L & kg/mo	[10]			M			
Nickel	µg/L				M			
Benzo(b)Fluoranthene	µg/L	[13]			2/Y			
Indeno(1,2,3-cd)Pyrene	µg/L	[13]			2/Y			
4,4'-DDE	µg/L	[13]			2/Y			
Heptachlor Epoxide	µg/L	[13]			2/Y			
Dieldrin	µg/L	[13]			2/Y			
2,3,7,8-TCDD and Congeners	pg/L	[11, 13]			2/Y			
All Applicable Standard Observations				W			E	
Pretreatment Requirements (Table 2)	µg/L or ppb	[12]						
Turbidity (Neph.)	NTU	[16]		5/W				
Cyanide	µg/L	[15]	M		M			
Chlorodibromomethane	µg/L	[13]			2/Y			
Chlorinated Pesticides & PCBs (608)	µg/L	[13]			2/Y			

Sampling Station:			A-001	E-001/002			All OV Stations	E-001/002-D
			Influent	E-001/002				
Type of Sample:			C-24	G [2]	C-24	Cont		
Organophosphate Pesticides (614)	µg/L	[13]			2/Y			
Tributyltin	µg/L	[13]			2/Y			

LEGEND FOR TABLE 1

Sampling Stations:

A = treatment facility influent
E = treatment facility effluent
OV = overflow and bypass points
P = treatment facility perimeter points

Types of Samples:

C-24= composite sample, 24 hours (includes continuous sampling, such as for flows)
C-X = composite sample, X hours
G= grab sample
O= observation

Frequency of Sampling:

Cont. = continuous
Cont/H = continuous monitoring & hourly reporting
D = once each day
E = each occurrence
H = once each hour (at hourly intervals)
M = once each month
W = once each week
Y = once each calendar year
2/Y = twice each calendar year (at about 6 months intervals)
3/W = three times each calendar week (on separate days)
5/W = five times each calendar week (on separate days)
Q = once each calendar quarter

Parameter and Unit Abbreviations:

BOD_5 20°C = Biochemical Oxygen Demand, 5-day, at 20°C
D.O.= Dissolved Oxygen
PAHs = Polynuclear Aromatic Hydrocarbons
TSS = Total Suspended Solids
Est V = Estimated Volume (gallons)
mgd = million gallons per day
mg/L = milligrams per liter
ml/L-hr = milliliters per liter, per hour
µg/L= micrograms per liter
kg/d = kilograms per day
kg/mo = kilograms per month
MPN/100 ml = Most Probable Number per 100 milliliters

FOOTNOTES FOR TABLE 1

[1] Additional details regarding sampling, analyses and observations are given in Section VI of this SMP, *Specifications for Sampling, Analyses and Observations* (SMP Section IV).

[2] Grab samples shall be taken to coincide with day(s) of composite sampling.

[3] Flow Monitoring.
Flow monitoring indicated as continuous monitoring in Table 1 shall be conducted by continuous measurement of flows, and reporting of the following measurements:

Influent (A-001), and Effluent (E-001/002):

a. Daily: (1) Average Daily Flow (mgd)
(2) Maximum Flow Rate (mgd)
(3) Minimum Flow Rate (mgd).

b. Monthly: The same values as given in a. above, for the calendar month, except that "(2)" is the "Maximum Daily Flow" and "(3)" is the "Minimum Daily Flow.

[4] The percent removal for BOD and TSS shall be reported for each calendar month, in accordance with Effluent Limitation B.3

[5] Oil & Grease Monitoring.
Each glass container used for sample collection or mixing shall be thoroughly rinsed with solvent rinsing as soon as possible after use, and the solvent rinsing shall be added to the sample for extraction and analysis.

[6] Disinfection Process Monitoring.
During all times when chlorination is used for disinfection of the effluent, effluent chlorine residual concentrations shall be monitored continuously for process control. For compliance reporting, the discharger shall take an instantaneous reading once every hour on the hour, reporting a total of 24 residual chlorine readings a day. Chlorine residual concentrations shall be monitored and reported for sampling points both prior to and following dechlorination. Total chlorine dosage (kg/day) shall be recorded on a daily basis.

[7] Dissolved oxygen, temperature, and pH shall also be analyzed on the same sample(s) used for the bioassay(s) prior to starting the flow-through bioassay(s) and at intervals of 24, 48, 72, and 96 hours after starting the flow-through bioassay(s).

[8] Acute Toxicity Monitoring.
The following parameters shall be monitored on the sample stream used for the acute toxicity bioassays, at the start of the bioassay test and daily for the duration of the bioassay test, and the results reported: flow rate, water hardness, alkalinity, pH, temperature, and dissolved oxygen. If the fish survival rate in the effluent is less than 70% or the control fish survival rate is less than 90%, bioassay test shall be restarted with new batches of fish and continue back to back until compliance is demonstrated.

[9] Chronic Toxicity Monitoring: See also Attachment A of this SMP.

1. *Chronic Toxicity Monitoring Requirements*

a. Sampling. The Discharger shall collect 24-hour composite samples of treatment plant effluent at Sampling Station E-001, for critical life stage toxicity testing as indicated below. For toxicity tests requiring renewals, 24-hour composite samples collected on consecutive days are required.

b. Test Species: Chronic toxicity shall be monitored by using critical life stage test(s) and the most sensitive test specie(s) identified by screening phase testing under the ETCP. Based on studies required from Order 98-054 and submitted by cover letter dated 12/20/02, the approved species is Macrocystis pyrifera.

c. Frequency:
(1) Routine Monitoring: Monthly

(2) Accelerated Monitoring: Twice per Month, or as otherwise specified by the Executive Officer.

d. Conditions for Accelerated Monitoring: The Discharger shall conduct accelerated monitoring when either of the following conditions are exceeded:
(1) Three sample median value of 1 TUc, or
(2) Single sample maximum value of 2 TUc.

e. Methodology: Sample collection, handling and preservation shall be in accordance with USEPA protocols. The test methodology used shall be in accordance with the references cited in this Permit, or as approved by the Executive Officer. A concurrent reference toxicant test shall be performed for each test.

f. Dilution Series: The Discharger shall conduct tests with a control and five effluent concentrations (including 100% effluent) and using a dilution factor ≥ 0.5.

2. *Chronic Toxicity Reporting Requirements*

a. Routine Reporting: Toxicity test results for the current reporting period shall include, at a minimum, for each test:

1. Sample date(s)
2. Test initiation date
3. Test species
4. End point values for each dilution (e.g. number of young, growth rate, percent survival)
5. NOEC value(s) in percent effluent
6. IC_{15}, IC_{25}, IC_{40}, and IC_{50} values (or EC_{15}, EC_{25} ... etc.) in percent effluent
7. TUc values (100/NOEC, $100/IC_{25}$, or $100/EC_{25}$)
8. Mean percent mortality (±s.d.) after 96 hours in 100% effluent (if applicable)
9. NOEC and LOEC values for reference toxicant test(s)
10. IC_{50} or EC_{50} value(s) for reference toxicant test(s)
11. Available water quality measurements for each test (e.g., pH, D.O., temperature, conductivity, hardness, salinity, ammonia)

b. Compliance Summary: The results of the chronic toxicity testing shall be provided in the most recent self-monitoring report and shall include a summary table of chronic toxicity data from at least eleven of the most recent samples. The information in the table shall include the items listed above.

[10] In a letter dated November 15, 2001 from the Regional Board to the Discharger, the Discharger was provided an option of using composite sampling instead of grab sampling as long as ultra clean sampling procedures are followed to the maximum extent practicable. Use ultra-clean sampling (EPA 1669) to the maximum extent practicable, and ultra-clean analytical methods (EPA 1631) for mercury monitoring. The Discharger may use alternative methods of analysis (such as USEPA 245), if that alternate method has a Minimum Level of 2 ng/L or less.

[11] Chlorinated Dibenzodioxins and Chlorinated Dibenzofurans shall be analyzed using the latest version of USEPA Method 1613; the method shall be capable of achieving one half of the U.S. EPA Minimum Levels, and 4-liter sample volumes shall be used to lower the detection limit to the maximum extent practicable. At a minimum, the Discharger is required to monitor the dry

season and once during the wet season for the life of the permit. Alternative methods of analysis must be approved by the Executive Officer.

[12] Additional Pretreatment Program Requirements:

TABLE 2. PRETREATMENT MONITORING REQUIREMENTS

Constituents / USEPA Method	Influent	Effluent	Ash
VOC / 624 [1, 2]	2/Y	2/Y	
BNA / 625 [1, 2]	2/Y	2/Y	
Metals [3]	M	M	2/Y

LEGEND FOR TABLE 2

M = once each calendar 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

FOOTNOTES FOR TABLE 2

[1] VOC and BNA samples shall be 24 hour composite samples. Individual grab samples shall be collected every three hours during the 24 hour sampling event, and the grab samples shall be composited in the lab just prior to analysis.

[2] USEPA approved methods. See Appendix K: Pretreatment Requirements.

[3] Same USEPA method used to determine compliance with the respective NPDES permit. The parameters are arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, zinc, selenium and cyanide.

[13] Composite samples for organic compounds shall consist of grab samples taken every three hours for a 24 hour period. Each grab sample shall be collected in an individual bottle and immediately iced or refrigerated at 4° C until the time of extraction. The flow at the time each sample is collected shall be recorded. Prior to extraction and analysis, the lab shall composite the individual samples into a flow proportional composite sample.

[14] The Idexx-Enterolert method is approved for use by the Discharger for the Enterococci determination. If the Discharger is in compliance for 12 months continuously, the Discharger may submit a request to the Executive Officer for a reduction in sampling frequency from 5 to 3 samples per week.

[15] Cyanide composite samples shall consist of grab samples taken every six hours for a 24 hour period. Each grab sample shall be collected in an individual 1000 mL bottle, and the flow at the time each sample is collected shall be recorded. Prior to analysis, the lab shall composite the individual samples into a flow proportional composite sample.

[16] In addition to the turbidity sampling required in Table 1, the Discharger conducts online turbidity monitoring on a daily basis for process control purposes.

TABLE 3
Sampling Schedule for ITT (Renzel) Marsh (see Figure 3)

Sampling Station (Figure A)	1-B	2-B	E-1			Matadero Creek
Type of Sample	Grab	Grab	Cont	Grab	C-24	Grab
Flow Rate (mgd)			D			
Enterococcus (MPN/100ml)				M		
Dissolved Oxygen (Mg/L % % saturation)	W(2)	W(2)		W		
Dissolved Sulfides (mg/L if DO<5.0 mg/L)				W		
PH (units)	W(1,2)	W(1,2)		W		
Temperature (C)	W(1,2)	W(1,2)		W		
Ammonia Nitrogen (mg/L)	W (1)	W(1)				
Nitrate Nitrogen (mg/L)						
Nitrite Nitrogen (mg/L)						
Total Organic Nitrogen (mg/L)						
Total Phosphate (mg/L)						
Specific Conductance				W		
Turbidity, Nephelometric (NTU)				W		
Arsenic (µg/L) (3)					M	M
Cadmium (µg/L) (3)					M	M
Chromium (µg/L) (3)					M	M
Copper (µg/L) (3)					M	M
Cyanide (µg/L) (3)					M	M
Lead (µg/L) (3)					M	M
Mercury (µg/L) (3)					M	M
Nickel (µg/L) (3)					M	M
Selenium (µg/L) (3)					M	M
Silver (µg/L) (3)					M	M
Zinc (µg/L) (3)					M	M
PAHs (µg/L)					Y	
All applicable standard observations (4)				W		
Organic Priority Pollutants (µg/L)					2Y	

Types of Samples-Table 3

C-24 = 24 hr. Composite Sample
Cont. = Continuous Sampling
M = Once each month

Sampling Frequency

D = Once each day
W = Once each week

Y = Once each year
2Y = Once very two years

Footnotes Table3:

(1) Measures should be made in the afternoon, when PH and ammonia toxicity are at their maximum.

(2) Measures should be made within an hour of dawn, when DO values are at their lowest levels.

(3) Method detection limits for marsh samples shall be no greater than those used for effluent testing.

(4) All applicable observations, including rainfall.

III. MONITORING METHODS AND MINIMUM DETECTION LEVELS

For compliance monitoring, analysis shall be conducted using the lowest commercially available and reasonably achievable detection levels, as detailed in Table 3. The intent is to provide quantification of constituents sufficient to allow evaluation of observed concentrations with respect to the minimum levels given below.

The Discharger may use the methods listed in the Table 3 below or alternate test procedures that have been approved by the U.S. EPA Regional Administrator pursuant to 40 CFR 136.4 and 40 CFR 136.5 (revised as of May 14, 1999).

TABLE 4. SELECTED CONSTITUENTS MONITORING – MINIMUM LEVELS FOR TOXIC POLLUTANTS

CTR #	Constituent (a)	Minimum Level (µg/L) (b)											
		GC	GCMS	LC	Color	FAA	GFAA	ICP	ICP MS	SPGFAA	HYD RIDE	CVAA	DCP
6.	Copper (c)					25	5	10	0.5	2			1000
8.	Mercury (d)												
9.	Nickel					50	5	20	1	5			1000
23.	Chlorodibromomethane	0.05											
62.	Benzo(b)Fluoranthene [e]		10	10									
92.	Indeno(1,2,3-cd)Pyrene		10	0.05									
109.	4,4'-DDE	0.05											
111.	Dieldrin	0.01											
118.	Heptachlor Epoxide	0.01											

Table 4 Notes:

a.) According to the SIP, method-specific factors (MSFs) can be applied. In such cases, this additional factor must be applied in the computation of the reporting limit. Application of such factors will alter the reported ML (as described in section 2.4.1) Dischargers are to instruct laboratories to establish calibration standards so that the ML value is the lowest calibration standard. At no time is the discharger to use analytical data derived from the extrapolation beyond the lowest point of the calibration curve.

b.) Laboratory techniques are defined as follows: GC = Gas Chromatography; GCMS = Gas Chromatography/Mass Spectrometry; LC = High Pressure Liquid Chromatography; Color = Colorimetric; FAA = Flame Atomic Absorption; GFAA = Graphite Furnace Atomic Absorption; Hydride = Gaseous Hydride Atomic Absorption; CVAA = Cold Vapor Atomic Absorption; ICP = Inductively Coupled Plasma; ICPMS = Inductively Coupled Plasma/Mass Spectrometry; SPGFAA = Stabilized Platform Graphite Furnace Atomic Absorption (i.e. USEPA 200.9); DCP = Direct Current Plasma.

c.) For copper, the discharger may also use the following laboratory techniques with the relevant minimum level: GFAA with a minimum level of 5 µg/L and SPGFAA with a minimum level of 2 µg/L.

d.) Use ultra-clean sampling and analytical methods, to the maximum extent practicable, for mercury monitoring per 13267 letter issued to Discharger. ML for mercury is 0.002 µg/L, or lower.
e.) The equivalent name of this constituent in the SIP is 3,4 Benzofluoranthene

IV. SPECIFICATIONS FOR SAMPLING, ANALYSES AND OBSERVATIONS

Sampling, analyses and observations, and recording and reporting of results shall be conducted in accordance with the schedule given in Table 1 of this SMP, and in accordance with the following specifications, as well as all other applicable requirements given in this SMP. All analyses shall be conducted using analytical methods that are commercially and reasonably available, and that provide quantification of sampling parameters and constituents sufficient to evaluate compliance with applicable effluent limits.

A. Influent Monitoring.

Influent monitoring identified in Table 1 of this SMP is the minimum required monitoring. Additional sampling and analyses may be required in accordance with Pretreatment Program or Pollution Prevention/Source Control Program requirements.

B. Effluent Monitoring.

Composite samples of effluent shall be collected on varying days selected at random coincident with influent composite sampling unless otherwise stipulated. The Executive Officer may approve an alternative sampling plan if it is demonstrated to the Executive Officer's satisfaction that expected operating conditions for the facility warrant a deviation from the standard sampling plan.

Grab samples of effluent shall be collected during periods of maximum peak flows and shall coincide with effluent composite sample days.

Fish bioassay samples shall be collected on days coincident with effluent composite sampling except if the fish bioassay must be restarted due to technical difficulties beyond Discharger control (i.e. mortality in controls).

Bioassay tests should be performed on effluent samples after chlorination-dechlorination.

Total ammonia nitrogen shall be analyzed and un-ionized ammonia calculated whenever fish bioassay test results fail to meet the specified percent survival.

If any maximum daily limit is exceeded, the sampling frequency shall be increased to daily until two samples collected on consecutive days show compliance with the maximum daily limit.

If the final or intermediate results of any single bioassay test indicate a threatened violation (i.e. the percentage of surviving test organisms is less than the required survival percentage), a new test will begin and the discharger shall investigate the cause of the mortalities and report the finding in the next self-monitoring report.

Chlorine residual analyzers shall be calibrated against grab samples as frequently as is necessary to maintain accurate control and reliable operation. For samples obtained hourly, in the advent of a detected effluent violation- grab samples shall be collected at least every 30 minutes until compliance is achieved.

V. REPORTING REQUIREMENTS

A. General Reporting Requirements are described in Section E of the Regional Board's "*Standard Provisions and Reporting Requirements for NPDES Surface Water Discharge Permits*", dated August 1993.

B. Modifications to Self-Monitoring Program, Part A:

1. If any discrepancies exist between Part A and Part B of the SMP, Part B prevails.

2. The following sections of Part A: D.4., and E.3, are exclusions to the Self- Monitoring Program.

3. Section C.2.a of Part A, shall be modified as follows:

   Composite samples of effluent as required in Table 1 of Part B shall be collected on days coincident with influent composite sampling as required in Table 1 of Part B unless otherwise stipulated. If additional influent or effluent sampling beyond that required in Table 1 of Part B is done voluntarily or to fulfill any requirements in this permit other than those specified in Table 1 or Part B, corresponding collection of effluent or influent samples is not required by this section. The Executive Officer may approve an alternative sampling plan if it is demonstrated to be representative of plant discharge flow and in compliance with all other requirements of this permit.

4. Section C.2.b of Part A shall be modified as follows:

   Grab samples of effluent shall be collected during periods of maximum peak flows at a frequency specified in Table 1 of Part B, shall coincide with effluent composite sample days, and shall be analyzed for the constituents specified in Table 1.

5. Section C.2.c of Part A shall be modified as:

   Effluent sampling will occur on at least one day of any multiple-day flow-through bioassay test required by Table 1 in Part B.

6. Section C.2.c(1) of Part A shall be modified as follows (C.2.c(2) is unchanged):

   Bioassay tests should be performed on effluent samples after chlorination-dechlorination. If biological growth in the dechlorinated effluent sample line is a potential problem, chlorinated effluent that is dechlorinated separately from the plant dechlorination process may be used for the bioassay test.

7. Section C.3 of Part A, insert the following:
   The requirements of this section only apply to facilities where storm water is not directed to the headworks during wet weather. At the Palo Alto Water Pollution Control Plant, all stormwater is directed to the headworks at all times so the requirements of this section do not apply

8. Section C.4 of Part A, insert the following:

   The requirements of this section only apply when receiving water sampling is required by Table 1 of Part B. Receiving water sampling is not specified in Table 1 of Part B of this permit.

Therefore, the requirements of this section do not apply. The requirements of Section C.4. are satisfied by participation in the Regional Monitoring Program and the South Bay Monitoring Program.

9. Section C.5 of Part A, insert the following:

The requirements of this section only apply when collection of bottom sediment samples is specified in Table 1 of Part B. Collection of bottom sediment samples is not specified in Table 1 of Part B of this permit so the requirements of this section do not apply.

10. Section D.1 of Part A, insert the following:

The requirements of this section only apply when receiving water standard observations are specified in Table 1 of Part B. Receiving water standard observations are not specified in Table 1 of Part B of this permit. Therefore, the requirements of this section do not apply.

11. Section D.3 of Part A, insert the following:

The requirements of this section only apply when beach and shoreline standard observations are specified in Table 1 of Part B. Beach and shoreline standard observations are not specified in Table 1 of Part B of this permit. Therefore, the requirements of this section do not apply.

12. Section D.5 of Part A, insert the following:

The requirements of this section only apply when facility periphery standard observations are specified in Table 1 of Part B. Facility periphery standard observations are not specified in Table 1 of Part B of this permit. Therefore, the requirements of this section do not apply.

13. Section D.5 of Part A, insert the following:

The requirements of this section only apply when facility periphery standard observations are specified in Table 1 of Part B. Facility periphery standard observations are not specified in Table 1 of Part B of this permit. Therefore, the requirements of this section do not apply.

14. Section G. of Part A, Definition of Terms, amend as follows:

a. *Grab Sample.* A grab sample is defined as an individual sample collected in a short period of time not exceeding fifteen minutes. A grab sample represents only the conditions that exist at the time the sample is collected. Grab samples are used primarily in determining compliance with daily and instantaneous maximum or minimum limits.

b. *Composite Sample.* A composite sample is defined as a sample composed of individual grab samples collected manually or by an autosampling device on the basis of time and/or flow as specified in Table 1 of Part B. For flow-based compositing, the proportion of each grab sample included in the composite sample shall be within plus or minus five percent from the representative flow rate of the waste stream being sampled measured at the time of grab sample collection. Alternately, equal volume grab samples may be individually analyzed and the flow-weighted average calculated by averaging flow-weighted ratios of each grab sample analytical result. Grab samples forming time-based composite samples shall be collected at intervals not greater than those specified in Table 1 of Part B. The quantity of each grab sample forming a

time-based composite sample shall be a set or flow proportional volume as specified in Table 1 of Part B. For Oil and Grease, a minimum of three grab samples, one every eight hours over a 24-hour period shall be used. If a particular time or flow-based composite sampling protocol is not specified in Table 1 of Part B, the discharger shall determine and implement the most representative sampling protocol for the given parameter subject to approval by the Executive Officer.

c. *Average.* Average values for daily and monthly values are obtained by taking the sum of all daily values divided by the number of all daily values measured during the specified period. In calculating the monthly average, when there is more than one value for a given day, all the values for that day shall be averaged and the average value used as the daily value for that day.

C. Monthly Self-Monitoring Report (SMR).

For each calendar month, a self-monitoring report (SMR) shall be submitted to the Regional Board in accordance with the requirements listed below. The purpose of the report is to document treatment performance, effluent quality and compliance with waste discharge requirements prescribed by this Order, as demonstrated by the monitoring program data and the discharger's operation practices. The report shall be submitted to the Regional Board no later than forty-five (45) days after the end of the reporting month.

1. Letter of Transmittal

Each report shall be submitted with a letter of transmittal. This letter shall include the following:

a. Identification of all violations of effluent limits or other discharge requirements found during the monitoring period;

b. Details of the violations: parameters, magnitude, test results, frequency, and dates;

i. The cause of the violations;

ii. Discussion of corrective actions taken or planned to resolve violations and prevent recurrence, and dates or time schedule of action implementation. If previous reports have been submitted that address corrective actions, reference to such reports is satisfactory.

c. The letter of transmittal shall be signed by the discharger's principal executive officer or ranking elected official, or duly authorized representative, and shall include the following certification statement:

" I certify under penalty of law that this document and all attachments have been prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

2. Compliance Evaluation Summary

Each report shall include a compliance evaluation summary. This summary shall include, for each parameter for which effluent limits are specified in the Permit, the number of samples taken during the monitoring period, and the number of samples in violation of applicable effluent limits.

3. Results of Analyses and Observations.

   i. Tabulations of all required analyses and observations, including parameter, sample date and time, sample station, and test result.

   ii. If any parameter is monitored more frequently than required by this permit and SMP, the results of this additional monitoring shall be included in the monitoring report, and the data shall be included in data calculations and compliance evaluations for the monitoring period.

   iii. Calculations for all effluent limits that require averaging of measurements shall utilize an arithmetic mean, unless specified otherwise in this permit or SMP.

4. Effluent Data Summary - USEPA NPDES Discharge Monitoring Reports.

   Summary tabulations of monitoring data including maximum, minimum and average values for subject monitoring period shall be reported in accordance with the format given by the USEPA NPDES Discharge Monitoring Report(s) (DMRs; USEPA Form 3320-1 or successor). Copies of these DMRs shall be provided to USEPA as required by USEPA.

5. Results of Analyses and Observations.

   a. Tabulations of all required analyses and observations, including parameter, sample date and time, sample station, and test result.

   b. If any parameter specified in Table 1 of Part B is monitored more frequently than required by this permit and SMP, the results of this additional monitoring shall be included in the monitoring report, and the data shall be included in data calculations and compliance evaluations for the monitoring period.

   c. Calculations for all effluent limits that require averaging of measurements shall utilize an arithmetic mean, unless specified otherwise in this permit or SMP.

6. Data Reporting for Results Not Yet Available.

   The discharger shall make all reasonable efforts to obtain analytical data for required parameter sampling in timely manner. The Regional Board recognizes that certain analyses require additional time in order to complete analytical processes and result reporting. For cases where required monitoring parameters require additional time to complete analytical processes and reporting, and results are not available in time to be included in the SMR for the subject monitoring period, such cases shall be described in the SMR. Data for these parameters, and relevant discussions of any observed violations, shall be included in the next following SMR.

7. Reporting Data in Electronic Format.

The discharger has the option to submit all monitoring results in an electronic reporting format approved by the Executive Officer. The discharger is currently submitting SMRs electronically in a format approved by the Executive Officer in a letter dated December 17, 1999, Official Implementation of Electronic Reporting System (ERS). The ERS format includes, but is not limited to, a transmittal letter, summary of violation details and corrective actions, and transmittal receipt. If there are any discrepancies between the ERS requirements and the "hard copy" requirements listed in the SMP, then the approved ERS requirements supercede.

D. Self-Monitoring Program Annual Report (Annual Report).

An Annual Report shall be submitted for each calendar year. The report shall be submitted to the Regional Board by the last day of February of the following year. This report need not be submitted if all data has previously been submitted electronically. This report shall include the following:

- Both tabular and graphical summaries of monitoring data collected during the calendar year that characterizes treatment plant performance and compliance with waste discharge requirements.

- A comprehensive discussion of treatment plant performance and compliance with waste discharge requirements. This discussion should include any corrective actions taken or planned such as changes to facility equipment or operation practices which may be needed to achieve compliance, and any other actions taken or planned that are intended to improve performance and reliability of the discharger's wastewater collection, treatment or disposal practices.

- A plan view drawing or map showing the dischargers' facility, flow routing and sampling and observation station locations.

E. Spill Reports.

A report shall be made of any spill of oil or other hazardous material.

The spill shall be reported by telephone as soon as possible and no later than 24 hours following occurrence or discharger's knowledge of occurrence. Spills shall be reported by telephone as follows:

During weekdays, during office hours of 8 am to 5 pm, to Inspector, Ray Balcom at the Regional Board:

Current telephone number: (510) 622 – 2312, (510) 622-2460 (FAX).

During non-office hours, to the State Office of Emergency Services:

Current telephone number: (800) 852 - 7550.

A written report shall be submitted to the Regional Board within five (5) working days following telephone notification, unless directed otherwise by Board staff. A report submitted by facsimile transmission is acceptable for this reporting. The written report shall include the following:

Date and time of spill, and duration if known.

Location of spill (street address or description of location).

Nature of material spilled.

Quantity of material involved.

Receiving water body affected.

Cause of spill.

Observed impacts to receiving waters (e.g., discoloration, oil sheen, fishkill).

Corrective actions that were taken to contain, minimize or cleanup the spill.

Future corrective actions planned to be taken in order to prevent recurrence, and time schedule of implementation.

Persons or agencies contacted.

F. Reports of Collection System Overflows.

Overflows of sewage from the discharger's collection system, other than overflows specifically addressed elsewhere in this Order and SMP, shall be reported to the Regional Board in accordance with the following:

1. *Overflows in excess of 1,000 gallons.*

   a. Overflows in excess of 1,000 gallons shall be reported by telephone and written report, as follows:

   b. Overflows shall be reported by telephone as soon as possible and no later than 24 hours following occurrence or discharger's knowledge of occurrence. Notification shall be made as follows:

   c. Notify the current Board staff inspector, or case handler, by phone call or message, or by facsimile:

      - [current staff inspector, Ray Balcom, phone number (510) 622 –2312]
      - [current staff case handler: Linda Rao, phone number (510) 622 – 2445]
      - [current Regional Board Fax number: (510) 622 – 2460];

   d. Notify the State Office of Emergency Services at phone number: (800) 852 - 7550.

   e. Submit a written report of the incident in follow-up to telephone notification. The written report shall be submitted along with the regular self-monitoring report for the reporting period of the incident, unless directed otherwise by Board staff, and shall include the following:

      - Estimated date and time of overflow start and end.

- Location of overflow (street address or description of location).
- Estimated volume of overflow.
- Final disposition of overflowed wastewater (to land, storm drain, surface water body).
- Include the name of any receiving water body affected.
- Cause of overflow.
- Observed impacts to receiving waters if any (e.g., discoloration, fish kill).
- Corrective actions that were taken to contain, minimize or cleanup the overflow.
- Future corrective actions planned to be taken to prevent recurrence and time schedule of implementation.
- Persons or agencies contacted.

2. Overflows less than 1,000 gallons.

   Overflows less than 1,000 gallons shall be reported by written report, as follows:

   a. The discharge shall prepare and retain records of such overflows, with records available for review by Board staff upon request.

   b. The records for these overflows shall include the information as listed in 1.e. above.

   c. A summary of these overflows shall be submitted to the Regional Board annually, as part of the Discharger's Self-Monitoring Program Annual Report.

G. Reports of Treatment Plant Process Bypass or Significant Non-Compliance.

The following requirements apply to all treatment plant bypasses and significant non-compliance occurrences, except for bypasses under the conditions contained in 40 CFR Part 122.41 (m)(4) as stated in Standard Provision A.13:

1. A report shall be made of any incident, other than wet weather discharges or bypasses addressed elsewhere in this permit and self-monitoring program, where the discharger:

   a. experiences or intends to experience a bypass of any treatment process, or

   b. experiences violation or threatened violation of any daily maximum effluent limit contained in this Permit or other incident of significant non-compliance, due to:

      i. maintenance work, power failures or breakdown of waste treatment equipment, or

      ii. accidents caused by human error or negligence, or

      iii. other causes such as acts of nature.

2. Such incidents shall be reported to the Regional Board in accordance with the following:

   a. Notify Regional Board staff by telephone:

      i. within 24 hours of the time the discharger becomes aware of the incident, for incidents that have occurred, and

      ii. as soon as possible in advance of incidents that have not yet occurred.

   b. Submit a written report of the incident in follow-up to telephone notification.

   c. The written report shall be submitted along with regular self-monitoring report for the reporting period of the incident, unless directed otherwise by Board staff.

   d. The written report for a treatment process bypass shall include the following:

      i. Identification of treatment process bypassed;

      ii. Date and time of bypass start and end;

      iii. Total duration time;

      iv. Estimated total volume;

      v. Description of, or reference to other report(s) describing, bypass event, cause, corrective actions taken, and any additional monitoring conducted.

   e. The written report for violations of daily maximum effluent limits or similar significant non-compliance shall include information as described in section VII.B. of this SMP.

3. During any treatment process bypass, the discharger shall conduct additional monitoring if required by the Regional Board. The results of such monitoring shall be included in the regular SMR for the reporting period of the bypass.

VI. RECORDING REQUIREMENTS - RECORDS TO BE MAINTAINED

Written reports, electronic records, strip charts, equipment calibration and maintenance records, and other records pertinent to demonstrating compliance with waste discharge requirements including self-monitoring program requirements, shall be maintained by the discharger in a manner and at a location (e.g., wastewater treatment plant or discharger offices) such that the records are accessible to Board staff. These records shall be retained by the discharger for a minimum of three years. The minimum period of retention shall be extended during the course of any unresolved litigation regarding the subject discharges, or when requested by the Regional Board or by the Regional Administrator of the USEPA, Region IX.

Records to be maintained shall include the following:

A. Parameter Sampling and Analyses, and Observations.

For each sample, analysis or observation conducted, records shall include the following:

1. Parameter

2. Identity of sampling or observation station, consistent with the station descriptions given in this SMP.

3. Date and time of sampling or observation.

4. Method of sampling (grab, composite, other method).

5. Date and time analysis started and completed, and name of personnel or contract laboratory performing the analysis.

6. Reference or description of procedure(s) used for sample preservation and handling, and analytical method(s) used.

7. Calculations of results.

8. Analytical method detection limits and related quantitation parameters.

9. Results of analyses or observations.

B. Flow Monitoring Data.

For all required flow monitoring (e.g., effluent flows), records shall include the following:

1. Total flow or volume, for each day.

2. Maximum, minimum and average daily flows for each calendar month.

C. Wastewater Treatment Process Solids.

1. For each treatment process unit which involves solid removal from the wastewater stream, records shall include the following:

   a. Total volume and/or mass quantification of solids removed from each unit (e.g., grit, skimmings, undigested sludge), for each calendar month; and

   b. Final disposition of such solids (e.g., landfill, other subsequent treatment unit).

2. For final dewatered sludge from the treatment plant as whole, records shall include the following:

   a. Total volume and/or mass quantification of dewatered sludge, for each calendar month;

   a. Solids content of the dewatered sludge; and

   b. Final disposition of dewatered sludge (point of disposal location and disposal method).

D. Disinfection Process.

For the disinfection process, records shall be maintained documenting process operation and performance, including the following:

1. For bacteriological analyses:

    a. Date and time of each sample collected;

    b. Wastewater flow rate at the time of sample collection;

    c. Results of sample analyses (coliform count);

    d. Required statistical parameters of cumulative coliform values (e.g., moving median or log mean for number of samples or sampling period identified in waste discharge requirements).

2. For chlorination process, at least daily average values for the following:

    a. Chlorine residual in contact basin (mg/L);

    b. Chlorine dosage (kg/day).

E. Treatment Process Bypasses.

A chronological log of all treatment process bypasses, other than wet weather bypasses addressed elsewhere in this permit and self-monitoring program, including the following:

1. Identification of treatment process bypassed;

2. Date and time of bypass start and end;

3. Total duration time;

4. Estimated total volume;

5. Description of, or reference to other report(s) describing, bypass event, cause, corrective actions taken, and any additional monitoring conducted.

F. Collection System Overflows

A chronological log of all collection system overflows, including the following:

1. Location of overflow;

2. Date and time of overflow start and end;

3. Total duration time;

4. Estimated total volume;

5. Description of, or reference to other report(s) describing, overflow event, cause, corrective actions taken, and any additional monitoring conducted.

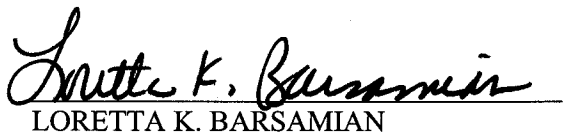
VII. SELF-MONITORING PROGRAM CERTIFICATION

I, Loretta K. Barsamian, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in this Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Board Order No. R2-2003-0078.

2. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the Discharger, and revisions will be ordered by the Executive Officer.

3. Is effective as of November 1, 2003.



LORETTA K. BARSAMIAN
Executive Officer

Attachment A: Chronic Toxicity – Definition of Terms and Screening Phase Requirements

ATTACHMENT A (pg. 1 of 4)

CHRONIC TOXICITY

DEFINITION OF TERMS & SCREENING PHASE REQUIREMENTS

I. Definition of Terms

A. No observed effect level (NOEL) for compliance determination is equal to IC_{25} or EC_{25}. If the IC_{25} or EC_{25} cannot be statistically determined, the NOEL shall be equal to the NOEC derived using hypothesis testing.

B. Effective concentration (EC) is a point estimate of the toxicant concentration that would cause an adverse effect on a quantal, "all or nothing," response (such as death, immobilization, or serious incapacitation) in a given percent of the test organisms. If the effect is death or immobility, the term lethal concentration (LC) may be used. EC values may be calculated using point estimation techniques such as probit, logit, and Spearman-Karber. EC_{25} is the concentration of toxicant (in percent effluent) that causes a response in 25% of the test organisms.

C. Inhibition Concentration (IC) is a point estimate of the toxicant concentration that would cause a given percent reduction in a non-lethal, non-quantal biological measurement, such as growth. For example, an IC_{25} is the estimated concentration of toxicant that would cause a 25% reduction in average young per female or growth. IC values may be calculated using a linear interpolation method such as USEPA's Bootstrap Procedure.

D. No observed effect concentration (NOEC) is the highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specific time of observation. It is determined using hypothesis testing.

II. Chronic Toxicity Screening Phase Requirements

A. The Discharger shall perform screening phase monitoring:

1. Subsequent to any significant change in the nature of the effluent discharged through changes in sources or treatment, except those changes resulting from reductions in pollutant concentrations attributable to source control efforts, or

2. Prior to Permit reissuance. Screening phase monitoring data shall be included in the NPDES Permit application for reissuance. The information shall be as recent as possible, but may be based on screening phase monitoring conducted within 5 years before the permit expiration date.

B. Design of the screening phase shall, at a minimum, consist of the following elements:

1. Use of test species specified in Tables 1 and 2 (attached), and use of the protocols referenced in those tables, or as approved by the Executive Officer;

2. Two stages:

a. Stage 1 shall consist of a minimum of one battery of tests conducted concurrently. Selection of the type of test species and minimum number of tests shall be based on Table 3 (attached); and

b. Stage 2 shall consist of a minimum of two test batteries conducted at a monthly frequency using the three most sensitive species based on the Stage 1 test results and as approved by the Executive Officer.

3. Appropriate controls; and

4. Concurrent reference toxicant tests.

C. The Discharger shall submit a screening phase proposal to the Executive Officer for approval. The proposal shall address each of the elements listed above.

TABLE C 1
CRITICAL LIFE STAGE TOXICITY TESTS FOR ESTUARINE WATERS

SPECIES	(Scientific name)	EFFECT	TEST DURATION	REFER-ENCE
alga	(Skeletonema costatum) (Thalassiosira pseudonana)	growth rate	4 days	1
red alga	(Champia parvula)	number of cystocarps	7-9 days	3
Giant kelp	(Macrocystis pyrifera)	percent germination; germ tube length	48 hours	2
abalone	(Haliotis rufescens)	abnormal shell development	48 hours	2
oyster mussel	(Crassostrea gigas) (Mytilus edulis)	{abnormal shell development; {percent survival	48 hours	2
Echinoderms (urchins -	Strongylocentrotus purpuratus, S. franciscanus); (sand dollar - Dendraster excentricus)	percent fertilization	1 hour	2
shrimp	(Mysidopsis bahia)	percent survival; growth	7 days	3
shrimp	(holmesimysis costata)	percent survival; growth	7 days	2
topsmelt	(Atherinops affinis)	percent survival; growth	7 days	2
silversides	(Menidia beryllina)	larval growth rate; percent survival	7 days	3

Toxicity Test References:

1. American Society for Testing Materials (ASTM). 1990. Standard Guide for conducting static 96-hour toxicity tests with microalgae. Procedure E 1218-90. ASTM Philadelphia, PA.

2. 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

3. Short-term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to Marine and Estuarine Organisms. EPA/600/4-90/003. July 1994

TABLE C 2
CRITICAL LIFE STAGE TOXICITY TESTS FOR FRESH WATERS

SPECIES	(Scientific name)	EFFECT	TEST DURATION	REFERENCE
fathead minnow	(Pimephales promelas)	survival; growth rate	7 days	4
water flea	(Ceriodaphnia dubia)	survival; number of young	7 days	4
alga	(Selenastrum capricornutum)	cell division rate	4 days	4

Toxicity Test Reference:

4. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Third edition. EPA/600/4-91/002. July 1994

TABLE C 3

TOXICITY TEST REQUIREMENTS FOR STAGE ONE SCREENING PHASE

REQUIREMENTS	RECEIVING WATER CHARACTERISTICS		
	Discharges to Coast	Discharges to San Francisco Bay ‡	
	Ocean	Marine/Estuarine	Freshwater
Taxonomic Diversity:	1 plant 1 invertebrate 1 fish	1 plant 1 invertebrate 1 fish	1 plant 1 invertebrate 1 fish
Number of tests of each salinity type: Freshwater (†):	0	1 or 2	3
Marine/Estuarine:	4	3 or 4	0
Total number of tests:	4	5	3

† The fresh water species may be substituted with marine species if:
1) The salinity of the effluent is above 1 part per thousand (ppt) greater than 95% of the time, or
2) The ionic strength (TDS or conductivity) of the effluent at the test concentration used to determine compliance is documented to be toxic to the test species.

‡ Marine/Estuarine refers to receiving water salinities greater than 1 ppt at least 95% of the time during a normal water year.
Fresh refers to receiving water with salinities less than 1 ppt at least 95% of the time during a normal water year.

Attachment E: CAP/NAP Plans-Tables of all Baseline, Phase I, and Phase II Actions of the Implementation Plan

Copper and Nickel Action Plans: Appendix E. extracted from "STAFF REPORT ON PROPOSED SITE-SPECIFIC WATER QUALITY OBJECTIVES AND WATER QUALITY ATTAINMENT STRATEGY FOR COPPER AND NICKEL FOR SAN FRANCISCO BAY SOUTH OF THE DUMBARTON BRIDGE." SF RWQCB Staff Report, May 15, 2002

Appendix E: Tables of all Baseline, Phase I, and Phase II Actions of the Implementation Plan

The columns of the following tables of actions are defined as follows:

Description of the Action to be Performed by the Lead Party	**This is a brief description of the action to be implemented.**
Lead Party	This is a list of the parties responsible for carrying out the action. See below for more information on various parties that are named as lead party. Where the lead party is a permitted entity (POTWs or SCVURPPP and Co-Permittees), the RWQCB can compel the actions through the permits. Where the lead party is not under a permit, the RWQCB cannot compel the action through a permit.
Implementation Time Frame	This column only applies to the baseline actions. This is an indication as to whether the action should be ongoing or is satisfied by the submittal of a single report or series of reports.
Implementation Mechanism	This column provides information on how the Regional Board will track the status of the action. This is often a report that is submitted by the Lead Party.

Term or Acronym	**Definition**
Annual Report (Urban Runoff Program)	Report submitted by the Urban Runoff Program each September. This report details the actions, including status, that took place the previous year. Status of all baseline actions should be reported either in the Annual Report or Annual Workplan. There should be sufficient detail in the description and status of actions to assess permit compliance.
Annual SMR (POTWs)	Annual Self-Monitoring Report submitted each year to provide data for compliance checking
Annual Workplan (Urban Runoff Program)	Report submitted by the Urban Runoff Program each March. This report details the actions that will be taken in the year following.
BASMAA	Bay Area Stormwater Management Agencies Association which includes the SCVURPPP and the other urban runoff programs in the San Francisco Bay region
BMP	Best Management Practice
Brake Pad Partnership (BPP)	A diverse stakeholder group addressing the connection of brake pad wear debris and environmental problems
CAP/NAP	Copper Action Plan/ Nickel Action Plan, June 2000
CMR	Conceptual Model Report, December 1999
Continuous Improvement Process	Continuous Improvement activities identified by the Urban Runoff

	Permit Re-issuance Work Group as part of the SCVURPPP permit re-issuance are contained in Table 3 "Urban Runoff Permit Re-issuance Work Group --Box 3: Summary of Continuous Improvement Items" (dated June 23, 2000).
Cu-L1, Cu-L2 complexes	Strong (L1) and weak (L2) copper complexes formed in the aquatic environment
CWC	California Water Code (Porter-Cologne)
IAR	Impairment Assessment Report by TetraTech, June 2000
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
POTW	Publicly-Owned Treatment Works. These are wastewater treatment plants.
RMP	Regional Monitoring Program for Trace Substances
SCBWMI (Core Group)	Santa Clara Basin Watershed Management Initiative (Core Group is the lead stakeholder body for this initiative, there are subgroups as well)
SCVURPPP & Co-permittees	Santa Clara Valley Urban Runoff Pollution Prevention Program. The Co-Permittees include the SCVWD, Santa Clara County and the 13 cities in the Santa Clara Valley
SCVWD	Santa Clara Valley Water District
SEIDP	The Stormwater Environmental Indicators Demonstration Project (SEIDP) is part of USEPA's Environmental Indicators/Measures of success project. The SEIDP is the third phase of EPA's program that focuses on local demonstration projects and the testing of indicators in the Walsh Ave. catchment, water quality indicators, programmatic indicators, social indicators, and site indicators are being evaluated to gauge Program implementation. Twenty different indicators are under review.
SFEI	San Francisco Estuary Institute
SWQTF	Storm Water Quality Task Force
URMP	Urban Runoff Management Plan, describes goals, program elements, including monitoring and watershed management measures, and model performance standards
USGS	United States Geological Survey
VMT	Vehicle Miles Traveled

Appendix E Baseline Copper Control Actions			
Baseline Number	**Description**	**Lead Party**	**Implementation Mechanism**
CB-1	*Measures to reduce copper discharges from vehicle washing operations.* These shall include outreach and education activities targeted towards residential car washing, washing of vehicles at commercial and industrial facilities; and vehicle washing by mobile cleaners; implementation of BMPs by mobile cleaners; and inspections or other mechanisms to evaluate effectiveness of these measures.	SCVURPPP & Co-permittees	Urban Runoff and Industrial Stormwater Permits Reporting conducted as part of SCVURPPP and Co-permittees Annual Reports
CB-3	*Measures to control copper in discharges of stormwater from targeted industrial sources.* These shall include identification and implementation of appropriate and cost-effective controls. The targeted industries include older printed circuit board manufacturers and metal plating facilities using copper. Clarify linkage with POTW Pretreatment Programs	SCVURPPP & Co-permittees & industry Possibly POTW permits (clarify need by March 2001 as part of SCVURPPP Work Plan)	Urban Runoff and Industrial Storm Water Permits Reporting conducted as part of SCVURPPP and Co-permittees Annual Report. Future Work Plans will contain description of additional tasks. Develop approach to implement Area-Wide as part of March 2001 Work Plan.
CB-10	*Measures associated with utilizing the Sediment Characteristics and Contamination Environmental Indicator.* These shall include utilizing results of SEIDP Indicator #5 (Sediment Characteristics and Contamination) to investigate development of an environmental indicator and investigate the linkage with SFEI sources and loading work effort.	SCVURPPP & Co-permittees	SCVURPPP & Co-permittees as part of Permit Annual Work Plan and Annual Report
CB-11	*Measures to improve street sweeping controls and storm water system operation and maintenance controls to reduce copper in stormwater discharges.* These shall include consideration of need for improvements to existing street sweeping controls and storm water system operation and maintenance controls and standard operating procedures for disposal of collected materials.	SCVURPPP	Consider need for improvements as part of SCVURPPP Continuous Improvement Process

Appendix E Baseline Copper Control Actions			
Baseline Number	**Description**	**Lead Party**	**Implementation Mechanism**
CB-12	*Measures to control copper discharges from pools and spas.* These shall include maintaining existing education and outreach programs for pools and spas.	SCVURPPP & Co-permittees	SCVURPPP & Co-permittees implementation via URMP Performance Standards and modification via Continuous Improvement Process
CB-15	*Measures to evaluate effectiveness of Performance Standards and identify cost-effective modifications to reduce discharges of copper.* These shall include utilizing results of SEIDP to evaluate effectiveness of related SCVURPPP Performance Standards and identify cost-effective modifications	SCVURPPP & Co-permittees	SCVURPPP & Co-permittees Continuous Improvement Process
CB-13	*Track POTW Pretreatment Program efforts and POTW Loadings*	POTWs	POTW NPDES Permits (reporting part of Annual SMR and Pretreatment Program reports)
CB-14	*Track and encourage water recycling efforts*	POTWs	Reporting through POTWs Annual Water Recycling report and/ or Annual SMR
CB-19	*Continue to promote industrial water use and reuse efficiency.* These programs may include workshops, outreach, incentives, or audits.	POTWs	POTW permits
CB-2	*Measures to track copper sulphate use by water suppliers.* The District shall continue to track and report use of copper sulphate by water suppliers in the Santa Clara Valley (includes State & Federal Water Project).	SCVWD	Urban Runoff Permit Report tracking results as part of SCVWD Co-permittee Annual Report
CB-9	*Continue current efforts and track corrosion control opportunities:* •Continue educational outreach, within the City of Palo Alto, to plumbers and designers to reduce corrosion of copper pipes via better design and installation •Track developments in (a) alternatives to copper piping (b) corrosion inhibitors, and (c) other methods of reducing copper corrosion	City of Palo Alto Environmental Compliance Unit (track and report developments to the SCBWMI)	POTW permit Reporting conducted as part of annual Pretreatment Program report.

Appendix E Baseline Copper Control Actions			
Baseline Number	**Description**	**Lead Party**	**Implementation Mechanism**
CB-4	*Measures to quantify copper control/pollution prevention measures and source loadings.* These shall include investigating and/or tracking agreed upon quantification studies concerning copper in vehicle brake pads and field investigations to monitor long-term trends to determine the possible linkage between copper from brake pads and copper concentrations in water. 1-Provide appropriate level of local support for agreed upon quantification studies 2 Investigate and/or track quantification studies for a wide range of existing copper control/pollution prevention measures and sources loadings 3-Collect data and prepare annual reports on the following potential indicators • Copper content in new auto brake pads • Total population in basin • Auto/truck vehicle traveled in basin • Copper sulfate (e.g. algaecide, pesticide, industrial; chemicals) sales in basin (aggregate basis-scaled to basin level estimate) • Copper content in macoma tissue at San Point (Palo Alto) • Reproductivity index for macoma at Sand Point • Benthic community assemblage at Sand Point 4-Prepare issue paper on feasibility of potential field investigation to monitor long-term trends between copper from brakepads and concentration in water.	SCBWMI/SCVURPPP (lead party may change depending on quantification study identified) City of Palo Alto RWQCB/SCVURPPP	SCVURPPP Continuous Improvement Process and Annual Work Plans and/or SCBWMI Core Group / Subgroup work plan task SCVURPPP Work Plan (include as part of Multi-Year Receiving Waters Monitoring Plan) POTW permit amendment
CB-6	*Measures to reduce traffic congestion* Review appropriateness of transportation control measures, prioritize reasonable measures and identify potential efforts for further development as part of Phase I and implementation as part of Phase II	SCBWMI (SCVURPPP take lead on preparing short-term issue paper as part of LUS (land use subcommittee of WMI) that begins to investigate the role of storm water management agencies in	CORE GROUP short-term issues (SCVURPPP to consider possible early measures as part of developing FY 01-02 Work Plan)

Appendix E Baseline Copper Control Actions			
Baseline Number	**Description**	**Lead Party**	**Implementation Mechanism**
		regional congestion management planning and implementation)	
CB-7	*Measures to reduce traffic congestion* Establish transportation/impervious surface "forum" • Consider results of VMT and imperviousness load estimates and control effectiveness evaluation; identify potential control efforts for further development as part of Phase I and implementation as part of Phase II	SCBWMI (incorporate as part of short-term issue paper on CB-6)	CORE GROUP short-term issue
CB-8	*Measures to classify and assess watersheds.* These shall include assisting the SCBWMI in its continuing efforts to implement watershed classification and assessment efforts and to improve institutional arrangements for watershed protection. These efforts shall include: • Ensuring that watershed protection is considered in all applicable elements of Dischargers' General Plans land use, circulation, open space, transportation, and conservation, and consistency requirements; and seek appropriate changes in State General Plan Guidelines; and • Ensuring that watershed protection is considered in the California Environmental Quality Act process. • Continue to implement watershed classification and assessment efforts of SCBWMI.	SCBWMI (with assistance from the SCVURPPP and Co-permittees)	SCVURPPP Continuous Improvement Process and Annual Work Plans and/or SCBWMI Core Group / Subgroup work plan task
CB-16	*Measures to establish an environmental clearinghouse.* These shall include assisting the SCBWMI in establishing an information clearinghouse and tracking and disseminating new scientific research on copper toxicity, loadings, fate and transport, and impairment of aquatic ecosystems	SCBWMI – CORE Group (assistance via SCVURPPP)	Implement through watershed measures element of SCVURPPP Permit and SCBWMI Long-term Data Management Plan (connected with resources for CB-5.3) Begin reporting as part of SCVURPPP Annual Report for FY 00-01
CB-5	*Measures to support Brake Pad*		

Appendix E Baseline Copper Control Actions			
Baseline Number	**Description**	**Lead Party**	**Implementation Mechanism**
	Partnership activities. These shall include providing appropriate level of local support for agreed upon BPP activities. 1-Review/assess/provide input on Brake Manufacturing Council (BMC)/BPP brakepad wear debris research & brakepad content data. *2-Ensure that other local state and federal players are involved appropriate on brakepads issue as it is a widespread urban concern.* 3-Assist in making research data that are in the public domain accessible	1-SCVURPPP currently tracking with funds designated in FY 00-01 Work Plans 2-BASMAA & SWQTF involvement on BPP may be needed as a Task of Regional Benefit 3- SCBWMI data management system	1-SCVURPPP Continuous Improvement Process and Annual Work Plans (will utilize conference results to lay out potential future direction/needs) BASMAA Task of Regional Benefit (TRB) (SCVURPPP recommend BASMAA consider funding TRB to support Regional involvement with BPP including investigation of fate and transport) 2- BASMAA Task of Regional Benefit (SCVURPPP recommend BASMAA & SWQTF consider funding to support State and Regional involvement with BPP including investigation of fate and transport) 3-SCVURPPP via data management efforts and in conjunction with WMI efforts incorporate BPP and other related and readily available into metadata database
CB-17	*Measures to reduce uncertainty associated with the Lower South San Francisco Bay Impairment Decision.* These shall include assisting the SCBWMI in tracking and encouraging the investigation of several important topics that influence uncertainty with Lower South San Francisco Bay Impairment Decision • Phytoplankton toxicity and movement (Impairment Assessment Report Section 5.3.1) • Sediment cycling • Loading uncertainty Encourage incorporation of appropriate bioassessment tools into ongoing monitoring programs to track presence of copper-sensitive taxa in Lower	SCBWMI – Core Group (assistance via POTW and SCVURPPP and Co-permittees)	Track and encourage RMP, NOAA, USGS, etc.

Appendix E Baseline Copper Control Actions			
Baseline Number	**Description**	**Lead Party**	**Implementation Mechanism**
	South SF Bay.		
CB-18	*Measures to investigate important factors that influence copper fate and transport.* These shall include assisting the SCBWMI in tracking and encouraging the investigation of important factors that influence copper and fate and transport. • Investigate flushing time estimates for different wet weather conditions • Investigate location of northern boundary condition • Determine Cu-L1 and L2 complex concentrations • Investigate algal uptake/toxicity with competing metals	SCBWMI – Core Group (assistance via POTW and SCVURPPP and Co-permittees)	Track and encourage RMP, NOAA, USGS, etc.
CB-20	*Measures to revise the Copper Conceptual Model Report findings.* These shall include assisting the SCBWMI and the POTWs that discharge to Lower South SF Bay in revising the Copper Conceptual Model Report uncertainty table based on newly-available information and producing a status report. In particular, these activities will include revising the conceptual model uncertainty table based on newly-available information as part of the Dischargers' and POTWs' next NPDES permit applications.	SCBWMI (with assistance from POTWs and SCVURPPP & Co-permittees)	CORE GROUP short-term issue Update as part of NPDES Permit application process Possible linkage and assistance from North Bay effort as well as RMP and RWQCB TMDL efforts
CB-21	*Measures to discourage architectural use of copper.* These shall include assistance to the SCBWMI in the following areas: 1-SCVURPPP & Co-permittees evaluate feasibility of discouraging architectural use of copper & explore feasibility of related policy 2-Promote Green Building principles and identify measures to investigate as part of Phase I	Palo Alto (Lead) SCBWMI (with assistance from the SCVURPPP and Co-permittees)	CORE GROUP short-term issues (use SCVURPPP Continuous Improvement Process for agreed upon assistance) SCVURPPP & Co-permittees Continuous Improvement Process

Appendix E (continued)
Phase I Copper Control Actions

Phase I Number	Description	Lead Party	Implementation Mechanism
CI-5	*Evaluate street sweeping and other design, operation and maintenance practices to identify potential improvements.* Prepare an implementation plan reflecting the priorities and implement agreed upon Phase I control actions.	SCVURPPP & Co-permittees	SCVURPPP & Co-permittee Continuous Improvement Process
CI-6	*Follow-up on relevance of copper in diesel exhaust*	SCVURPPP & Co-permittees	SCVURPPP & Co-permittee Continuous Improvement Process
CI-7	*Develop Phase II Implementation Plan for POTW expansion of water Recycling*	POTWs	POTW permits
CI-10	*Evaluate results of tracking industrial virtual closed- loop wastewater efficiency measures and develop potential actions.* Prepare an implementation plan reflecting the priorities and implement agreed upon Phase I control actions.	POTWs	POTW permits
CI-11	*Develop Phase II Implementation Plan for POTW process optimization*	POTWs	POTW permits
CI-4	*Prepare and implement a Phase I plan for improved corrosion control based on evaluation of results of Baseline measures.*	POTWs/ SCVWD and other suppliers	POTW permits and other CWC regulatory Mechanisms
CI-9	*Evaluate and investigate important Factors that Influence Copper Fate* (Potential Reduction in Uncertainty is Moderate to High)[1] • Investigate flushing time estimates for different wet weather conditions • Investigate location of northern boundary condition • Determine Cu-L1 and L2 complex concentrations Investigate algal uptake/toxicity with competing metals	SCBWMI – Core Group (Assistance via POTW and / SCVURPPP and Co-permittees)	Encourage and identify resources (coordinate with other efforts/investigations such as those of SF Estuary Regional Monitoring Program, NOAA, USGS, etc)
CI-8	*Evaluate and investigate important topics that influence uncertainty with Lower South SF Bay Impairment Decision* • Phytoplankton toxicity and movement (IAR Section 5.3.1) • Sediment cycling • Loading uncertainty	SCBWMI – Core Group (Assistance via POTW and / SCVURPPP and Co-permittees)	Encourage and identify resources (coordinate with other efforts/investigations such as those of RMP, NOAA, USGS, etc)
CI-12	*Develop a Phase II Plan including a re-evaluation of Phase I actions*	RWQCB – convene powers that be	CWC regulatory mechanisms

Appendix E (continued)
Phase I Copper Control Actions

Phase I Number	Description	Lead Party	Implementation Mechanism
CI-1	*Update findings and recommendations of BPP efforts and implement agreed upon Phase I measures and develop Phase II Work Plan*	RWQCB – convene powers that be	NPDES permits and other CWC regulatory mechanisms
CI-2	*Update findings and recommendations of transportation/ impervious surface "forum" and implement agreed upon Phase I measures and develop Phase II Work Plan*	RWQCB – convene powers that be	NPDES permits and other CWC regulatory mechanisms
CI-3	*Update and re- evaluate source identification and prioritize sources based on effectiveness evaluation of future potential control actions.* Prepare an implementation plan reflecting the priorities and implement agreed upon Phase I control actions.	RWQCB – convene powers that be	NPDES permits and other CWC regulatory mechanisms

Appendix E (continued)
Phase II Copper Control Actions

Phase II Number	Description	Lead Party	Implementation Mechanism
CII-4	*Discourage use of copper-based pesticides*	SCVURPPP & Co-permittees	SCVURPPP & Co-permittee Continuous Improvement Process
CII-1	*Reconsider usefulness of managing storm water through POTWs*	POTWs (with assistance from SCVURPPP and Co-permittees)	CWC regulatory mechanisms
CII-3	*Implement plan for additional corrosion control measures*	POTWs/ SCVWD and other suppliers	POTW permits and other CWC regulatory mechanisms
CII-5	*Implement control actions identified for copper in diesel exhaust*	RWQCB – convene powers that be	Possible Regulatory and Legislative mechanisms
CII-6	*Implement Phase II POTW process optimization measures*	RWQCB – convene powers that be	POTW permits
CII-7	*Implement agreed upon Phase II expansion of water recycling programs*	RWQCB – convene powers that be	POTW permits
CII-8	*Re-evaluate Phase II Plan (developed as part of I-2) and finalize for implementation*	RWQCB – convene powers that be	CWC regulatory mechanisms
CII-2	*Implement agreed upon Phase II surface control measures (transportation/impervious/-brakepad)*	RWQCB – convene powers that be	CWC regulatory mechanisms and possibly other regulatory agency mechanisms

Appendix E (continued) Baseline Nickel Control Actions				
Baseline Number	**Description**	**Lead Party**	**Implementation Time-Frame**	**Implementation Mechanism**
NB-1	Co-permittees and SCVURPPP continue to implement Performance Standards Continue to implement URMP (Metals Control Measures Plan): EROSION-1 *Implement performance standards for construction inspection.* EROSION-2 *Participate in development of region-wide training and certification program for construction site inspectors.*	SCVURPPP & Co-permittees	Ongoing/Action Implemented Every Year Workshop for municipal staff on post-construction controls for new development and re-development. Support RWQCB's Annual Workshops for contractors and municipal staff on construction site management and erosion/sediment controls.	Urban Runoff Permit Reporting conducted as part of SCVURPPP and Co-permittees Annual Reports Improve Performance Standards and reporting via SCVURPPP Continuous Improvement process
NB-2	Utilize results of SEIDP Indicator #5 (Sediment Characteristics and Contamination) to investigate development of an environmental indicator and investigate the linkage with SFEI sources and loading work effort.	SCVURPPP & Co-permittees	SCVURPPP FY 01-02 Work Plan and multi-year receiving water monitoring plan	SCVURPPP & Co-permittees as part of Permit Annual Work Plan and Annual Report
NB-5	Utilize results of SEIDP to evaluate effectiveness of related SCVURPPP Performance Standards and identify cost-effective modifications	SCVURPPP & Co-permittees	SCVURPPP FY 01-02 Work Plan and multi-year receiving water monitoring plan	SCVURPPP & Co-permittees Continuous Improvement Process
NB-3	*Track POTW Pretreatment Program efforts and POTW loadings*	POTWs	Ongoing / Action implemented every year	POTW NPDES Permits (reporting part of Annual SMR and Pretreatment Program reports)
NB-4	*Track and encourage water recycling efforts*	POTWs	Ongoing / Action implemented every year	Reporting through POTWs Annual Water Recycling report and/ or Annual SMR
NB-6	*Continue to promote industrial water use and reuse efficiency.*	POTWs	Ongoing / Action implemented every year	POTW permits

Appendix E (continued) Baseline Nickel Control Actions				
Baseline Number	**Description**	**Lead Party**	**Implementation Time-Frame**	**Implementation Mechanism**
	These programs may include workshops, outreach, incentives, or audits.			
NB-7	*Track and encourage a watershed model linked to a process oriented Bay model*	POTWs/SCVURPPP	Ongoing/Action Implemented Every Year	POTW & SCVURPPP Permits

Appendix E (continued)
Phase I Nickel Control Actions

Attachment F: Fact Sheet

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
1515 CLAY STREET, SUITE 1400
OAKLAND, CA 94612
(510) 622 – 2300 Fax: (510) 622 - 2460

FACT SHEET

for

REISSUANCE OF
NPDES PERMIT and WASTE DISCHARGE REQUIREMENTS for

CITY OF PALO ALTO
REGIONAL WATER QUALITY CONTROL PLANT

PALO ALTO, SANTA CLARA COUNTY
NPDES Permit No. CA0037834
ORDER NO. R2-2003-0078

PUBLIC NOTICE:

Written Comments

- Interested persons are invited to submit written comments concerning this draft permit.
- Comments must be submitted to the Regional Board no later than 5:00 p.m. on August 1, 2003.
- Send comments to the Attention of Linda Rao.

Public Hearing

- The draft permit will be considered for adoption by the Board at a public hearing during the 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: August 20, 2003, starting at 9:00 am.

Additional Information

- For additional information about this matter, interested persons should contact Regional Board staff member: Ms. Linda Rao, Phone, email: lcr@rb2.swrcb.ca.gov, (510) 622-2445;

This Fact Sheet contains information regarding an amendment of waste discharge requirements and National Pollutant Discharge Elimination System (NPDES) permit for the City of Palo Alto for municipal wastewater discharges. The Fact Sheet describes the factual, legal, and methodological basis for the sections addressed in the Tentative Order and provides supporting documentation to explain the rationale and assumptions used in revising the effluent limitations.

I. INTRODUCTION

The Discharger applied to the Board for reissuance of waste discharge requirements and a permit to discharge municipal wastewater to waters of the State and the United States under the NPDES. The application and Report of Waste Discharge is dated December 18, 2002.

The Discharger owns and operates the Palo Alto Regional Water Quality Control Plant (the Plant), located at 2501 Embarcadero Way, Palo Alto. The Plant provides tertiary treatment of wastewater from domestic, commercial and industrial sources from the cities of Los Altos, Los Altos Hills, Palo

Alto, and Mountain View, the service area of the East Palo Alto Sanitary District, and the unincorporated area of the Stanford University Campus. The Discharger's service area has a present population of about 220,000. The wastewater treatment process consists of screening, primary sedimentation, fixed film roughing filters for CBOD reduction, activated sludge for nitrification, secondary clarification, filtration, disinfection, and dechlorination. In 2002, the plant treated an average flow of 24.9 million gallons per day (MGD). During wet weather flows, the plant is designed such that the fixed film reactors treat the first 40 mgd, with the excess flow blended with the treated flow and routed on to the activated sludge units. The treatment plant has an average dry weather flow design capacity of 39 MGD and can treat up to 80 MGD. The USEPA and the Board have classified this Discharger as a major discharger. Approximately 95% of the treated wastewater is discharged from the plant to an unnamed manmade channel (Latitude 37° 27' 30" and Longitude 122° 06' 37") tributary to Lower South San Francisco Bay. Approximately 5% of the treated wastewater is discharged to the Renzel Marsh Pond (Latitude 37° 26' 30" and Longitude 122° 06' 45"), which is tributary to Matedero Creek within the Palo Alto Flooding Basin. The beneficial uses for South San Francisco Bay and Matadero Creek, as identified in the Basin Plan and based on known uses of the receiving waters near the discharge, are:

a. Industrial Service Supply*
b. Navigation*
c. Water Contact Recreation
d. Non-contact Water Recreation
e. Ocean Commercial and Sport Fishing*
f. Wildlife Habitat
g. Preservation of Rare and Endangered Species*
h. Fish Migration
i. Fish Spawning (potential for San Francisco Bay)
j. Estuarine Habitat*
k. Shellfish Harvesting*
*These uses only apply to South Francisco Bay, not to Matadero Creek

Beneficial uses specific to the unnamed channel tributary to the Bay and the Renzel Marsh Pond have not been assessed to determine which uses exist or potentially could exist. Board policy is to use the tributary rule to interpret which beneficial uses are currently or potentially supported where beneficial uses have not been specifically designated. The beneficial uses of South San Francisco Bay, are assumed to apply to the unnamed channel and the beneficial uses of Matadero Creek, are assumed to apply to the Renzel Marsh Pond.

The unnamed channel and South San Francisco Bay near the discharge are considered marine receiving waters. Renzel Marsh Pond and Matadero Creek, however, are tidally influenced and estuarine in character. Therefore, the reasonable potential analysis (RPA) and effluent limitations specified in this Order for discharges to Renzel Marsh Pond and Lower South San Francisco Bay are based on lowest of the salt and fresh water CTR and NTR WQC.

II. DESCRIPTION OF EFFLUENT

The table below presents the quality of the discharge, as indicated in the Discharger's self-monitoring reports submitted for the period from January 1999 through March 2002. Average values represent the average of actual detected values only.

Table A. Summary of Discharge Data

Parameter	Average	Maximum
$CBOD_5$ (mg/L)*	1.65	7
$CBOD_5$ Removal (%)*	96.5 (min)	--
TSS (mg/L)*	1.59	6.4
TSS Removal (%)*	96.6 (min)	--
Total Settleable Solids (ml/l-hr)*	0.1	0.1
Residual Chlorine (mg/L)*	0	2
Turbidity (NTU)*	0.9	2.8
pH (s.u.)*	6.2 (min.)	7.7
Ammonia (as N) (mg/L)*	0.42	8.6
Nitrite (mg/L)	0.02	0.44
Nitrate (mg/L)	17.4	20.9
Organic Nitrogen (mg/L)	0.25	0.67
Phosphate (mg/L)	10.61	14
Total Coliform (mpn/100 ml)*	18.7	1,600
Arsenic (µg/L)	0.91	1.2
Cadmium (µg/L)	0.225	0.3
Chromium (µg/L)	0.89	2
Copper (µg/L)*	6.18	17
Lead (µg/L)	0.604	0.9
Mercury (µg/L)*	0.006	0.019
Nickel (µg/L)*	4.56	6
Selenium (µg/L)*	0.5	1.2
Silver (µg/L)	0.2	0.2
Zinc (µg/L)	53.14	72
Cyanide (µg/L)*	3.5	4.2
Tributyltin (µg/L)*	0.00275	0.003
Bromoform (µg/L)	17.74	28
Chlorodibromomethane (µg/L)	35.3	56
Chloroform (µg/L)	5.48	11
Dichlorobromomethane (µg/L)	18.24	31

* Current permit contains effluent concentration limitations for these constituents.
** Current permit contains effluent concentration goals for these constituents.

III. GENERAL RATIONALE

The following documents are the bases for the requirements contained in the proposed Order, and are referred to under the specific rationale section of this Fact Sheet.

- Federal Water Pollution Control Act, as amended (hereinafter the **CWA**).
- Federal Code of Regulations, Title 40 - Protection of Environment, Chapter 1, Environmental Protection Agency, Subchapter D, Water Programs, Parts 122-129 (hereinafter referred to as 40 CFR specific part number).
- Water Quality Control Plan, San Francisco Bay Basin, adopted by the Board on June 21, 1995 (hereinafter the **Basin Plan**). The California State Water Resources Control Board

(hereinafter the **State Board**) approved the Basin Plan on July 20, 1995 and by California State Office of Administrative Law approved it on November 13, 1995. The Basin Plan defines beneficial uses and contains WQOs for most waters of the State. However, the numeric WQOs for priority pollutants in the Basin Plan do not apply to the South Bay below Dumbarton Bridge. On May 22, 2002, the Board adopted and on October 17, 2002, the State Board approved a Basin Plan Amendment that includes site-specific objectives (SSOs) for copper and nickel that apply to the South Bay.

- California Toxics Rule, Federal Register, Vol. 65, No. 97, May 18, 2000 (hereinafter the **CTR**).

- National Toxics Rule, 57 FR 60848, December 22, 1992, as amended (hereinafter the **NTR**).

- State Board's Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California, May 1, 2000 (hereinafter the **State Implementation Policy**, or **SIP**).

- Ambient Water Quality Criteria for Bacteria – 1986, USEPA 440/5-84-002, January 1986.

- USEPA Technical Support Document for Water Quality-Based Toxics Control, EPA/505/2-90-001, March 1991 (hereinafter TSD).

IV. SPECIFIC RATIONALE

Several specific factors affecting the development of limitations and requirements in the proposed Order are discussed as follows:

1. Recent Plant Performance

Section 402(o) of CWA and 40 CFR § 122.44(l) require that water quality-based effluent limitations (**WQBELs**) in re-issued permits be at least as stringent as in the previous permit. The SIP specifies that interim effluent limitations, if required, must be based on current treatment facility performance or on existing permit limitations whichever is more stringent (unless anti-backsliding requirements are met). In determining what constitutes "recent plant performance", best professional judgment (**BPJ**) was used. Effluent monitoring data collected from 1999 to 2002 are considered representative of recent plant performance.

2. Impaired Water Bodies in 303(d) List

On June 6, 2003, the USEPA approved a revised list of impaired waterbodies prepared by the State. The list (hereinafter referred to as the 2003 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. South San Francisco Bay is listed as an impaired waterbody. The pollutants impairing South San Francisco Bay include chlordane, DDT, diazinon, dieldrin, dioxin compounds, exotic species, furan compounds, mercury, PCBs, dioxin-like PCBs, and selenium. Copper and nickel, which were previously identified as impairing South San Francisco Bay, were not included as impairing pollutants in the 2003 303(d) list and have been placed on the new Monitoring List.

The SIP requires final effluent limitations for all 303(d)-listed pollutants to be based on total maximum daily loads (**TMDLs**) and wasteload allocation (**WLA**) results. The SIP and federal

regulations also require that final concentration limitations be included for all pollutants with reasonable potential. The SIP requires that where the Discharger has demonstrated infeasibility to meet the final limitations, interim concentration limitations be established in the permit with a compliance schedule in effect until final effluent limitations are adopted. The SIP also requires the inclusion of appropriate provisions for waste minimization and source control.

3. Basis for Prohibitions

a). Prohibition A.1 (no discharges other than as described in the permit): This prohibition is based on the Basin Plan, previous Order, and BPJ.

b). Prohibitions A.2 (10:1 dilution), A.3 (dead end sloughs/confined waterbodies), and A.4 (no discharge to South San Francisco below Dumbarton Bridge or its tributaries): These prohibitions are based on the Basin Plan.

c). Prohibition A.5 (no bypass or overflow): This prohibition is based on the previous Order and BPJ.

d). Prohibition A.6 (no unauthorized discharge): This prohibition is based on the Basin Plan, the and the Clean Water Act, which prohibit unauthorized/unpermitted discharges.

e). Prohibition A.7 (flow limitation): This prohibition is based on the reliable treatment capacity of the plant. Exceedence of the treatment plant's average dry weather flow design capacity may result in lowering the reliability of compliance with water quality requirements, unless the Discharger demonstrates otherwise through an antidegradation study. This prohibition is based on 40 CFR 122.41(l).

f). Prohibition A.8 (discharge prohibition exception): As discussed in detail in the Order, the Board has continued the Discharger's exception from Prohibitions A.2-A.4 based on an equivalent level of environmental protection.

4. Basis for Effluent Limitations

a) Effluent Limitations B.1: These limitations are technology-based and other limitations representative of, and intended to ensure, adequate and reliable advanced secondary level wastewater treatment. They are at least as stringent as the Basin Plan requirements (Chapter 4, pg 4-8, and Table 4-2, at pg 4-69). The limitations are unchanged from the previous permit. Compliance has been demonstrated by existing plant performance.

b) Effluent Limitation B.2 (pH): This effluent limitation is unchanged from the existing permit. The limitation is based on the Basin Plan (Chapter 4, Table 4-2), which is derived from federal requirements (40 CFR 133.102). Compliance has been demonstrated by existing plant performance. The Discharger may elect to use continuous on-line monitoring system(s) for measuring pH. In this case, 40 CFR 401.17 (pH Effluent Limitations Under Continuous Monitoring) and BPJ are the basis for the compliance provisions for pH limitations. Excursions outside of the pH effluent limitations are permitted, provided that both of the following conditions are satisfied:

i. The total time during which the pH values are outside the required range of pH values shall not exceed 7 hours and 26 minutes in any calendar month; and

ii. No individual excursion from the range of pH values shall exceed 60 minutes.

c) Effluent Limitation B.3 (CBOD and TSS monthly average 85 percent removal): These are standard secondary treatment requirements and existing permit effluent limitations based on Basin Plan requirements (Table 4-2, pg. 4–69), derived from federal requirements (40 CFR 133.102; definition in 133.101). Compliance has been demonstrated by existing plant performance for ordinary flows (dry weather flows and most wet weather flows). During the past few years, the Discharger has consistently met these removal efficiency limitations.

d) Effluent Limitation B.4 (Whole Effluent Acute Toxicity): The Basin Plan specifies a narrative objective for toxicity, requiring that all waters shall be maintained free of toxic substances in concentrations that are lethal to or produce other detrimental response on aquatic organisms. Detrimental response includes but is not limited to decreased growth rate, decreased reproductive success of resident or indicator species, and/or significant alternations in population, community ecology, or receiving water biota. These effluent toxicity limitations are necessary to ensure that this objective is protected. The whole effluent acute toxicity limitations for a eleven-sample median and single sample maximum are consistent with the previous Order and are based on the Basin Plan (Table 4-4, pg. 4–70). The limitations remain unchanged in this Order. During 1999-2001, the eleven sample median survival was 100 percent. The 90th percentile survival was between 96-100 percent.

e) Effluent Limitation B.5 (Whole Effluent Chronic Toxicity): The chronic toxicity objective/limitation is based on the Basin Plan's narrative toxicity objective on page 3-4.

f) Effluent Limitations B.6 and B.7 (Toxic Substances):

1. Reasonable Potential Analysis (RPA):
40 CFR 122.44(d)(1)(i) specifies that permits are required to include WQBELs 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". Thus, the fundamental step in determining whether or not a WQBEL is required is to assess a pollutant's reasonable potential of excursion of its applicable WQO or WQC. The following section describes the reasonable potential analysis and the results of such an analysis for the pollutants identified in the Basin Plan and the CTR.

   i) *SSOs and WQC*: The RPA involves the comparison of effluent data with appropriate SSOs for copper and nickel adopted in the Basin Plan Amendment (adopted by the Regional Board on May 22, 2002 and the approved by the State Board on October 17, 2002), applicable WQC in the CTR/NTR, and USEPA's 1986 Quality Criteria for Water. The SSOs and CTR criteria are shown in Attachment 1 of this Fact Sheet.

   In the May 22, 2002 Basin Plan Amendments, the Board also adopted metals translators specific to Lower South San Francisco Bay for copper and nickel. The translators for copper and nickel are 0.53 and 0.44, respectively. The translator development rationale and approach are discussed in the Staff Report to the May 22, 2002 SSO Basin Plan Amendments.

ii) *Methodology*: The RPA is conducted using the method and procedures prescribed in Section 1.3 of the SIP. Board staff has analyzed the effluent and background data and the nature of facility operations to determine if the discharge has reasonable potential to cause or contribute to exceedances of applicable SSOs or WQC. Attachment 1 of this Fact Sheet shows the step-wise process described in Section 1.3 of the SIP.

iii) *Effluent and background data*: The receiving waters for the discharges are estuarine and subject to the complex tidal conditions of the Lower South San Francisco Bay. Therefore, the most representative location of ambient background data in the Lower South San Francisco Bay for this facility is the Dumbarton Bridge RMP station (B-A-30). The RPA was completed using RMP data from 1993 through 2000 for the Dumbarton Bridge RMP station.

iv) *RPA determination*: The RPA results are shown below in Table B and Attachment 1 of this Fact Sheet. The pollutants that exhibit RP are copper, nickel, mercury, cyanide, chlorodibromomethane, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, 4,4'-DDE, dieldrin, heptachlor epoxide, and 2,3,7,8-TCDD.

Table B. Summary of Reasonable Potential Results

# in CTR	PRIORITY POLLUTANTS	MEC or Minimum DL[1] (µg/L)	Governing WQO/WQC (µg/L)	Maximum Background (µg/L)	RPA Results[2]
2	Arsenic	**1.2**	36	4.59	N
4	Cadmium	**0.3**	2.46	0.1707	N
5b	Chromium (VI)	**2**	200	14.74	N[3]
6	Copper	**17**	13.02	7.19	**Y**
7	Lead	**0.9**	50	3.78	N[3]
8	Mercury	**0.019**	0.051	0.0682	**Y**
9	Nickel	**6**	27.05	13.03	**Y**[4]
10	Selenium	**1.2**	5	0.63	N
11	Silver	**0.2**	2.24	0.1193	N
13	Zinc	**72**	85.6	14.85	N
14	Cyanide	**4.2**	1	NA	**Y**
16	2,3,7,8-TCDD (Dioxin)	0.847	1.4E-08	NA	**Y**
17	Acrolein	1	780	NA	N
18	Acrylonitrile	1	0.66	NA	N
19	Benzene	1	71	NA	N
20	Bromoform	**28**	360	NA	N
21	Carbon Tetrachloride	1	4.4	NA	N
22	Chlorobenzene	1	21000	NA	N
23	Chlorodibromomethane	**56**	34	NA	**Y**
24	Chloroethane	1	NA	NA	Uo
25	2-Chloroethylvinyl Ether	2	NA	NA	Uo
26	Chloroform	**11**	NA	NA	Uo
27	Dichlorobromomethane	**31**	46	NA	N
28	1,1-Dichloroethane	1	NA	NA	Uo
29	1,2-Dichloroethane	1	99	NA	N
30	1,1-Dichloroethylene	1	3.2	NA	N
31	1,2-Dichloropropane	1	39	NA	N
32	1,3-Dichloropropylene	1	1700	NA	N

# in CTR	PRIORITY POLLUTANTS	MEC or Minimum DL[1] (µg/L)	Governing WQO/WQC (µg/L)	Maximum Background (µg/L)	RPA Results[2]
33	Ethylbenzene	1	29000	NA	N
34	Methyl Bromide	1	4000	NA	N
35	Methyl Chloride	1	NA	NA	Uo
36	Methylene Chloride	1	1600	NA	N
37	1,1,2,2-Tetrachloroethane	1	11	NA	N
38	Tetrachloroethylene	1	8.85	NA	N
39	Toluene	1	200000	NA	N
40	1,2-Trans-Dichloroethylene	1	140000	NA	N
41	1,1,1-Trichloroethane	1	NA	NA	Uo
42	1,1,2-Trichloroethane	1	42	NA	N
43	Trichloroethylene	1	81	NA	N
44	Vinyl Chloride	1	525	NA	N
45	Chlorophenol	5	400	NA	N
46	2,4-Dichlorophenol	5	790	NA	N
47	2,4-Dimethylphenol	5	2300	NA	N
48	2-Methyl-4,6-Dinitrophenol	5	765	NA	N
49	2,4-Dinitrophenol	5	14000	NA	N
50	2-Nitrophenol	5	NA	NA	Uo
51	4-Nitrophenol	5	NA	NA	Uo
52	3-Methyl-4-Chlorophenol	5	NA	NA	Uo
53	Pentachlorophenol	5	7.9	NA	N
54	Phenol	5	4600000	NA	N
55	2,4,6-Trichlorophenol	5	6.5	NA	N
56	Acenaphthene	5	2700	0.0026	N
57	Acenaphthylene	5	NA	0.00054	Uo
58	Anthracene	5	110000	0.0023	N
59	Benzidine	NA	0.00054	NA	Ud
60	Benzo(a)Anthracene	5	0.049	0.017	N
61	Benzo(a)Pyrene	5	0.049	0.045	N
62	Benzo(b)Fluoranthene	5	0.049	0.0572	Y
63	Benzo(ghi)Perylene	5	NA	0.015	Uo
64	Benzo(k)Fluoranthene	5	0.049	0.02105	N
65	Bis(2-Chloroethoxy)Methane	5	NA	NA	Uo
66	Bis(2-Chloroethyl)Ether	5	1.4	NA	N
67	Bis(2-Chloroisopropyl)Ether	5	170000	NA	N
68	Bis(2-Ethylhexyl)Phthalate	5	5.9	NA	N
69	4-Bromophenyl Phenyl Ether	5	NA	NA	Uo
70	Butylbenzyl Phthalate	5	5200	NA	N
71	2-Chloronaphthalene	5	4300	NA	N
72	4-Chlorophenyl Phenyl Ether	NA	NA	NA	Uo, Ud
73	Chrysene	5	0.049	0.02206	N
74	Dibenzo(a,h)Anthracene	5	0.049	0.0088	N
75	1,2 Dichlorobenzene	5	17000	NA	N
76	1,3 Dichlorobenzene	5	2600	NA	N
77	1,4 Dichlorobenzene	5	2600	NA	N
78	3,3-Dichlorobenzidine	10	0.077	NA	N
79	Diethyl Phthalate	5	120000	NA	N

# in CTR	PRIORITY POLLUTANTS	MEC or Minimum DL[1] (µg/L)	Governing WQO/WQC (µg/L)	Maximum Background (µg/L)	RPA Results[2]
80	Dimethyl Phthalate	5	2900000	NA	N
81	Di-n-Butyl Phthalate	NA	12000	NA	Ud
82	2,4-Dinitrotoluene	5	9.1	NA	N
83	2,6-Dinitrotoluene	5	NA	NA	Uo
84	Di-n-Octyl Phthalate	5	NA	NA	Uo
85	1,2-Diphenylhydrazine	5	0.54	NA	N
86	Fluoranthene	5	370	0.03896	N
87	Fluorene	5	14000	0.0055	N
88	Hexachlorobenzene	5	0.00077	0.000164	N
89	Hexachlorobutadiene	5	50	NA	N
90	Hexachlorocyclopentadiene	5	17000	NA	N
91	Hexachloroethane	5	8.9	NA	N
92	Indeno(1,2,3-cd) Pyrene	5	0.049	0.078	**Y**
93	Isophorone	5	600	NA	N
94	Naphthalene	5	NA	0.0024	Uo
95	Nitrobenzene	5	1900	NA	N
96	N-Nitrosodimethylamine	5	8.1	NA	N
97	N-Nitrosodi-n-Propylamine	5	1.4	NA	N
98	N-Nitrosodiphenylamine	5	16	NA	N
99	Phenanthrene	5	NA	0.0141	Uo
100	Pyrene	5	11000	0.05603	N
101	1,2,4-Trichlorobenzene	5	NA	NA	Uo
102	Aldrin	0.025	0.00014	NA	N
103	alpha-BHC	0.025	0.013	0.000662	N
104	beta-BHC	0.025	0.046	0.000607	N
105	gamma-BHC	0.025	0.063	0.0016667	N
106	delta-BHC	0.025	NA	0.000133	Uo
107	Chlordane	0.5	0.00059	0.000574	N
108	4,4'-DDT	0.1	0.00059	0.000202	N
109	4,4'-DDE	0.04	0.00059	0.000678	**Y**
110	4,4'-DDD	0.1	0.00084	0.00077	N
111	Dieldrin	0.02	0.00014	0.000292	**Y**
112	alpha-Endosulfan	0.05	0.0087	0.000027	N
113	beta-Endosulfan	0.04	0.0087	0.000046	N
114	Endosulfan Sulfate	0.1	240	0.000072	N
115	Endrin	0.05	0.0023	0.00012	N
116	Endrin Aldehyde	0.1	0.81	NA	N
117	Heptachlor	0.025	0.00021	0.000022	N
118	Heptachlor Epoxide	0.025	0.00011	0.000174	**Y**
119-125	PCBs	4	0.00017	NA	N
126	Toxaphene	1	0.0002	NA	N
	Tributyltin	**0.003**	0.005	NA	N

1) Maximum Effluent Concentration (MEC) in bold is the actual detected MEC, otherwise the MEC shown is the minimum detection level.
NA = Not Available (there is not monitoring data for this constituent).

2) RP =Yes, if (1) either MEC or Background > WQO/WQC.
RP = No, if both MEC or background < WQO/WQC or (2) all effluent concentrations non-detect and background <WQO/WQC or no background available.

RP = Ud (undetermined due to lack of effluent monitoring data).
RP = Uo (undetermined if no objective promulgated).

3) For all metals except copper and nickel-which utilize translators adopted in the May 22, 2002 Basin Plan Amendment, Board staff initially assessed reasonable potential using the conversion factors (Cfs)/translators included in the CTR. After this initial assessment, reasonable potential was suggested for chromium VI and lead. Board staff have determined that the RMP data are representative of season and spatial variability in water body conditions; were collected and evaluated according to rigorous quality assurance and control requirements; and meet USEPA's recommended guidelines for translator development. Based on these conclusions, Board staff followed the procedures in Section 1.4.1 of the SIP to chromium VI and lead translators. Complete documentation of the data and methodology used to determine the chromium VI and lead translators is provided in Attachment 3 to this Fact Sheet.
4) RP =Yes, based on third trigger, see the Order for detailed basis for this determination for nickel.
5) RP =Yes, based on third trigger. Although additional, reliable ambient and effluent data are required, the *San Francisco Bay Ambient Water Monitoring Interim Report* provides monitoring results from sampling events in 2002 and 2003 for the Dumbarton Bridge RMP station. While these "interim" data have not been used to evaluate RP using trigger 2, they show elevated dioxin levels at the Dumbarton Bridge RMP station. The Board has considered these data along with the listing on the 303(d) list to find RP for dioxin based on the third trigger.

v) *Constituents with limited data*: Reasonable potential could not be determined for some of organic priority pollutants due to (i) the absence of effluent data or (ii) the absence of applicable WQC. As required by the August 6, 2001 letter from Board staff to all permittees, the Discharger is required to initiate or continue to monitor for those pollutants in this category using analytical methods that provide the best detection limits reasonably feasible. These pollutants' RP will be reevaluated in the future to determine whether there is a need to add numeric effluent limitations to the permit or to continue monitoring.

vi) *Pollutants with no reasonable potential*: WQBELs are not included in the Order for constituents that do not have reasonable potential to cause or contribute to exceedance of applicable WQOs or WQC. However, monitoring for those pollutants is still required, under the provisions of the August 6, 2001 letter. If concentrations of these constituents are found to have increased significantly, the Discharger will be required to investigate the source(s) of the increase(s). Remedial measures are required if the increases pose a threat to water quality in the receiving water.

vii) *Permit reopener:* The permit includes a reopener provision to allow numeric effluent limitations to be added for any constituent that in the future exhibits reasonable potential to cause or contribute to exceedance of a WQO or WQC. This determination, based on monitoring results, will be made by the Board.

2. Final Water Quality-Based Effluent Limitations: The final WQBELs were developed for the toxic and priority pollutants that were determined to have reasonable potential to cause or contribute to exceedances of the SSOs or WQC. Final effluent limitations were calculated based on appropriate SSOs/WQC and the appropriate procedures specified in Section 1.4 of the SIP (See Attachment 2 of this Fact Sheet). For the purpose of the Proposed Order, final WQBELs refer to all non-interim effluent limitations. The SSO or WQC used for each pollutant with reasonable potential is indicated in Table C below as well as in Attachment 2.

Table C. Water Quality Objectives/Criteria for Pollutants with RP

Pollutant	Chronic WQC (µg/L)	Acute WQC (µg/L)	Human Health WQC (µg/L)	Basis of Lowest SSO/WQC Used in RP
Copper	13	20		SSO
Mercury	--	--	0.051	CTR
Nickel	27	142		SSO
Cyanide	1	1		NTR
Chlorodibromomethane	--	--	34	CTR
Benzo(b)fluoranthene	--	--	0.049	CTR
Indeno(1,2,3-cd)pyrene	--	--	0.049	CTR
4,4'-DDE	--	--	0.00059	CTR
Dieldrin	0.056	0.24	0.00014	CTR
Heptachlor Epoxide	--	--	0.00011	CTR
Dioxin TEQ	--	--	1.4E-08	CTR

3. Interim Limitations: Interim performance-based effluent limitations were derived for those constituents (cyanide and chlorodibromomethane) for which the Discharger has shown infeasibility of complying with the respective final limitations and has demonstrated that compliance schedules are justified based on the Discharger's source control and pollution minimization efforts in the past and continued efforts in the present and future. Interim concentration and dry weather mass effluent limitations were derived for mercury pending completion of the mercury TMDL for South San Francisco Bay. For benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, 4,4'-DDE, dieldrin, and heptachlor epoxide, compliance with the final WQBELs cannot be determined at this time as the MLs are higher than the final calculated WQBELs. Therefore, interim limitations are established at the respective MLs. The interim limitations are also discussed in more detail below.

4. The Discharger submitted infeasibility to comply reports on March 5, 2003 for cyanide and chlorodibromomethane. For both these pollutants, Board staff could not perform a statistical analysis of feasibility because of insufficient detected values in the effluent monitoring data. Board staff, therefore, compared the MECs to the WQBELs (both in µg/L) to determine if the Discharger can achieve immediate compliance with the final limitations (see Table E below).

Table E: Summary of Feasibility Analysis

Constituent	AMEL	MDEL	MEC	Is MEC ≥ AMEL	Feasible to Comply
Cyanide	0.5	1	4.2	Yes	No
Chlorodibromomethane	34	68	56	Yes	No

This permit establishes 5-year compliance schedules for both cyanide and chlorodibromomethane. As indicated in Section 2.1, 5 years is the maximum allowable compliance schedule duration for pollutant with final limitations derived from CTR/NTR WQC. These compliance schedule both exceed the length of the permit; therefore, the

calculated final limitations are intended for point of reference for the feasibility demonstration.

During the compliance schedules, interim limitations are included based on current treatment facility performance or on existing permit limitations, whichever is more stringent to maintain existing water quality. The Board may take appropriate enforcement actions if interim limitations and requirements are not met.

g) Mercury – Further Discussion and Rationale for Interim Effluent Limitation: An interim performance-based effluent limitation of 0.023 µg/L is established. This performance-based effluent limitation was calculated statistically using ultra-clean mercury concentration data and adequately characterizes advanced secondary POTW facility performance regarding mercury removal (*Staff Report: Statistical Analysis of Pooled Data from Region-wide Ultra-clean Sampling, 2000*). The previous Order included a monthly average limitation of 0.025 µg/L and a daily maximum limitation of 2.1 µg/L, which were determined based on BPJ.

In other Orders, the Board has established interim mercury mass-based effluent limitations based on actual treatment plant performance to maintain current loadings until a TMDL is established. This Order establishes an interim dry weather mercury mass-based effluent limitation of 0.103 kg/month. This limitation is calculated based on the average monthly concentration-based effluent limitation (23 ng/L) and the dry weather design capacity of the treatment plant (39 mgd). This interim mass limitation only applies during the dry weather season (May through October). The Board has determined that this approach to calculating a mass-based limitation for this Discharger is appropriate for the following reasons: (1) recent monitoring data show very low levels of mercury in the discharge, well below the applicable WQC, (2) the interim concentration limitations, which are more stringent than the WQBELs calculated according to the SIP methodology, will ensure that mercury levels remain low in the discharge, (3) the Discharger will continue to identify and, to the extent feasible, address mercury sources under its pollution prevention program, and (4) the interim mass limitation based on the design flow will be preclude any significant increases in mass loadings from the plant. Overall, the Discharger already has minimized mercury influent loadings to the treatment plant and provided for a high level of mercury removal in the treatment process. The Board anticipates that it is unlikely that the TMDL will require additional reductions in mercury loadings beyond current treatment levels. As part of this effort, a provision is included in this Order requiring the Discharger to implement an aggressive Advanced Mercury Source Control Program throughout its service area.

h) Cyanide – Further Discussion and Rationale for Interim Effluent Limitation: An interim performance-based concentration limitation of 32 µg/L was derived for cyanide using a "pooled data" approach, which was based on the performance of Bay Area POTWs with similar treatment processes (advanced secondary treatment). Due to the large number of samples with results below detection limits, the interim limitation was computed using the "log-Probit method" for estimating interim performance-based limitations, and provides unbiased estimates of distribution parameters and percentiles. The interim limitation was computed using the 99.87^{th} percentile (or three standard deviations above the mean) of the pooled effluent data, resulting in a value of 32 µg/L, expressed as a daily maximum limitation.

Recent data show that cyanide measured in the Discharger's effluent appears to be the result of processes wherein cyanide (or cyanide complexes) are formed during the disinfection process, rather than the result of "pass through" from the influent stream (i.e. influent cyanide values are

almost always at or below the detection limit). There is also evidence to suggest that, to some degree, cyanide measured in effluents may be an artifact of the analytical method used or the result of analytical interferences. In general, the chemistry of cyanide formation in POTW effluents is highly complex, involving both chemical and environmental factors, in ways that are still poorly understood, despite considerable research. In addition, it is not known whether the form(s) of cyanide that are measured in POTW effluents exhibit toxicity in the environment.

A recently completed 3-year $1.5 M investigation sponsored by the Water Environment Research Foundation (WERF)describes a number of possible mechanisms for cyanide formations, and shed new light on analytical issues. WERF has initiated a $0.5 M follow-up study to reassess cyanide criteria for the protection of aquatic life and wildlife. It will critique data to assure it meets current best scientific standards and new USEPA guidelines, recommend testing strategies, and develop a data set to meet guidelines for ambient water quality development. It is expected that results from that study will provide information useful to devising alternative cyanide compliance strategies for shallow water dischargers in San Francisco Bay. The Board has determined that antibacksliding does not apply to interim limitations. Furthermore, antidegradation is satisfied because Lower San Francisco Bay is in attainment for cyanide..

i) Chlorodibromomethane – Further Discussion and Rationale for Interim Effluent Limitation: This Order establishes a performance-based limitation of 86 µg/L. The performance-based limitation represents the 99.87th percentile of current Plant performance, and was calculated using 15 data points from 1996-2003. Although only data from 1999-2002 were used in conducting the RPA, data from previous years provided a more robust data set to perform the statistical analysis (calculation of 99.87 percentile). There is no existing permit limitation for chlorodibromomethane. The Discharger should be able to significantly reduce chlorine dosage and better control trihalomethane generation with the application of the revised bacteria limitations included in this Order.

j) Benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, 4,4'-DDE, dieldrin, and heptachlor epoxide – Further Discussion and Rationale for Interim Effluent Limitations: Interim effluent limitations are required for these pollutants because compliance with the final WQBELs cannot be determined at this time as the MLs are higher than the final calculated WQBELs as shown in Table D. Therefore, interim limitations are established at the respective minimum levels.

Table D. Final WQBELs and MLs

Pollutant	AMEL(µg/L)	MDEL (µg/L)	ML(µg/L)
Benzo(b)fluoranthene	0.049	0.098	10.0
Indeno(1,2,3-cd)pyrene	0.049	0.098	0.05
4,4'-DDE	0.00059	0.00118	0.05
Dieldrin	0.00014	0.00028	0.01
Heptachlor Epoxide	0.00011	0.00022	0.01

k) Effluent Limitation B.8 (Bacteria): The previous Order included total coliform limitations. EPA's draft implementation guidance for bacteriological water quality criteria (May, 2002) recommended either enterococcus or *E. coli*, or both together, as superior bacteriological indicators of human health pathogenic risk as compared to total or fecal coliform. This recommendation was based on the fact that coliforms originate from many sources, including humans, and research has shown that many of these forms are unrelated to human pathogens or risk potential. A growing number of studies (including the Santa Monica Bay study, Haile and

others, 1999) have indicated that enterococcus and/or *E. coli* counts are more significantly correlated with human health problems than coliform counts. Thus, enterococcus is recognized by EPA and others as a accurate indicator of human health risk potential from water contact.

In 2000, the Discharger submitted a work plan for a study to develop alternative bacteriological limitations. In March 2003, the Discharger submitted the *Palo Alto Bacteriological Study.* Palo Alto submitted supplemental information on access to and recreational use in the Renzel Marsh Pond and Matadero Creek on April 14, 2003. The study showed that the unnamed channel and South San Francisco Bay in the vicinity of the discharge support "lightly used" contact recreational use. Because of controlled access to the Renzel Marsh Pond, there is no recreational use in the immediate vicinity of the discharge into the marsh. Recreational access is limited and prohibited by signage in Matadero Creek, which is approximately one mile downstream from the pond. Based on this, the Discharger proposed and the Board has incorporated into this Order the following enterococcus limitations for salt water, which are consistent with EPA guidance and the Basin Plan:

a. 30-day geometric mean of less than 35 enterococcus colonies per 100mL; and,
b. No single effluent sample exceeding 276 colonies per 100mL, as verified by a follow-up sample taken within 24 hours.

Compliance with these limitations, which are protective of the designated use, will reduce the required level of chlorination.

5. Basis for Receiving Water Limitations

a) Receiving water limitations C.1, C.2, and C.3 (conditions to be avoided): These limitations are based on the previous Order and the narrative/numerical objectives contained in Chapter 3 of the Basin Plan, page 3-2 – 3-5.

b) Receiving water limitation C.4 (compliance with State Law): This requirement is in the previous permit, requires compliance with Federal and State law, and is self-explanatory.

6. Basis for Sludge Management Practices

These requirements are based on Table 4.1 of the Basin Plan and 40 CFR 503.

7. Basis for Self-Monitoring Requirements

The SMP includes monitoring at the outfall for conventional, non-conventional, and toxic pollutants, and acute and chronic toxicity. The monitoring frequency for turbidity has been increased from weekly to five times per week. Board staff has determined that five times per week monitoring is appropriate to measure treatment performance for tertiary treatment plants. The Discharger has indicated that the incremental cost from weekly to 5 times weekly is insignificant. Additionally, the Discharger reports that daily (7 times/week) sampling is infeasible due to the current practices for sampling and reporting turbidity. Turbidity samples for compliance determination are sent to the lab (analyzed using Standard Method 2130(B)). Although an on-line probe is used to monitor turbidity for process control, the discharger reports daily compliance sampling is not possible due to both the lab closure on weekends and the recommended 24-hour sampling hold-time.

Monitoring for other conventional and non-conventional pollutants is generally the same as the previous Order. Quarterly settleable matter monitoring is required to demonstrate compliance with the effluent limitations. The monitoring frequency for bacteria has been increased to five times per week. This will provide data for assessment of compliance with the new bacteria limitations, while the Discharger reduces chlorine usage at the plant. This Order requires monthly monitoring for copper, mercury, and nickel to demonstrate compliance with final effluent limitations. Because they were not detected in the effluent during 1999-2002, this Order requires twice yearly monitoring for benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene 4,4'-DDE, dieldrin and heptachlor epoxide to demonstrate compliance. For dioxins and furans, due to considerable costs, this Order also requires twice yearly monitoring, which is consistent with SIP provisions. The SMP contains all of the influent and effluent monitoring requirements necessary for the Discharger to demonstrate compliance with effluent limits set forth in this Order.

8. Basis for Provisions

a) Provisions E.1. (Permit Compliance and Rescission of Previous Permit): Time of compliance is based on 40 CFR 122. The basis of this Order superceding and rescinding the previous permit Order is 40 CFR 122.46.

b) Provisions E.2 and E.3 (Chlorodibromomethane and Cyanide Compliance Schedules): These provisions are required as the Discharger cannot currently comply with final WQBELs for chlorodibromomethane and cyanide. SIP 2.2.1 requires the establishment of interim requirements and dates for their achievement in the permit. The requirement to participate in development of a cyanide SSO is a continuation of the Discharger's previous work to better to determine appropriate WQC, analytical methods, and control options for cyanide.

c) Provision E.4 (Advanced Mercury Source Control Program): This provision, under which the Discharger is required to implement an Advanced Mercury Source Control Program, that includes a program to install amalgam separators in dental offices throughout its service area, sewer line cleaning and "before and after" monitoring, as well as an investigation of mercury uses within the Palo Alto Plant. These programs will complement the Discharger's interim, dry weather, and effluent mass limitation for mercury.

d) Provision E.5 (Pretreatment Program): The requirements to implement an approved pretreatment program are based on 40 CFR Part 403.

e) Provision E.6 (Effluent Monitoring): This provision, which requires the Discharger to conduct effluent water monitoring as provided for in the August 6, 2001 letter, is based on the Basin Plan and the SIP.

f) Provision E.7 (Pollutant Prevention and Minimization Program): This provision is based on the Basin Plan, page 4-25 – 4-28, and the SIP, Section 2.1.

g) Provision E.8 (Whole Effluent Acute Toxicity): This provision establishes conditions by which compliance with permit effluent limitations for acute toxicity will be demonstrated. Conditions initially include the use of 96-hour bioassays, the use of rainbow trout, and the use of approved test methods as specified. No later than November 1, 2004, the Discharger shall switch from the 3rd to the 5th Edition USEPA protocol with flow through bioassays. Static renewal bioassays may be allowed if the Discharger demonstrates that flow through tests are not feasible.

h) Provision E.9 (Copper and Nickel Action Plans and Water Quality Attainment Strategy): This provision incorporates the specific requirements of the May 22, 2002 Basin Plan Amendment, to implement the Water Quality Attainment Strategy, including the Copper and Nickel Action Plans. Order No. 00-109, which is superceded by this Order, previously required the Discharger to implement the Copper and Nickel Action Plans.

As documented in the Staff Report for the May 22, 2002 Basin Plan Amendment, the four elements of the WQAS are:

1. Current control measures/actions to minimize copper and nickel releases (from municipal wastewater treatment plants and urban runoff programs to Lower South SF Bay;
2. Statistically-based water quality "triggers" and a receiving water monitoring program that would initiate additional control measures/actions if the "triggers" are met;
3. A proactive framework for addressing increases to future copper and nickel concentrations in Lower South SF Bay, if they occur; and
4. Metal translators that will be used to compute copper and nickel effluent limitations for the municipal wastewater treatment plans discharging to Lower South SF Bay.

i) Provision E.10 (Santa Clara Basin Watershed Management Initiative): This provision is unchanged from the previous Order and is based on BPJ.

j) Provision E.11 (Reclamation Programs): This provision is unchanged from the previous Order and is based on BPJ.

k) Provision E.12 (Regional Monitoring Program): This provision, which requires the Discharger to continue to conduct receiving water monitoring through the RMP is based on the Basin Plan and the SIP

l) Provision E.13 (Optional Mass Offset): This option is provided to encourage the Discharger to further implement aggressive reduction of mass loads to South San Francisco Bay.

m) Provision E.14 (Operations and Maintenance Manual), E.15 (Contingency Plan Update), and E.16 (Reliability Report Updates): These provisions are based on the Basin Plan, the requirements of 40 CFR 122, and the previous permit. If significant changes occur at the Plant, a reliability report update is necessary to assist the Board in evaluating whether the Discharge prohibition exception should continue to be granted.

n) Provision E.17 (303(d)-listed Pollutants Site-Specific Objective and TMDL Status Review): Consistent with the SIP, the Discharger shall participate in the development of a TMDL or site-specific objective for mercury, selenium, 4,4'-DDE, dieldrin, dioxin, and PCBs. Active participation by the Discharger in the Clean Estuary Partnership (CEP) shall fulfill the requirements of this provision.

o) Provision E.18 (Self-Monitoring Program): The Discharger is required to conduct monitoring of the permitted discharges in order to evaluate compliance with permit conditions. Monitoring requirements are contained 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 issued by the Board, including this Order. It contains definitions of terms, specifies general sampling and analytical protocols, and sets out requirements for 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 facility. It defines the sampling stations and frequency, the pollutants to be monitored, and additional reporting requirements. Pollutants to be monitored include all parameters for which effluent limitations are specified. Monitoring for additional constituents, for which no effluent limitations are established, is also required to provide data for future completion of RPAs for them.

p) Provision E.19 (Standard Provisions and Reporting Requirements): The purpose of this provision is require compliance 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* (the Standard Provisions), or any amendments thereafter. That document is incorporated in the permit as an attachment to it. Where provisions or reporting requirements specified in the permit are different from equivalent or related provisions or reporting requirements given in the Standard Provisions, the permit specifications 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.

q) Provision E.20 (Change in Control or Ownership): This provision is based on 40 CFR 122.61.

r) Provision E.21 (Permit Reopener): This provision is based on 40 CFR 123

s) Provision E.22 (NPDES Permit /USEPA concurrence): This provision is based on 40 CFR 123.

t) Provision E.23 (Permit Expiration and Reapplication): This provision is based on 40 CFR 122.46(a).

V. WASTE DISCHARGE REQUIREMENT APPEALS

Any person may petition the State Water Resources Control Board to review the decision of the Board regarding the Waste Discharge Requirements. A petition must be made within 30 days of the Board public hearing.

VI. ATTACHMENTS

Attachment 1: RPA Results for Priority Pollutants
Attachment 2: Calculation of Final WQBELs
Attachment 3: Documentation of Chromium VI and Lead Translator Development

Attachment 1
Reasonable Potential Analysis Results for Priority Pollutants
City of Palo Alto

Beginning			Step 2	Step 3					Step 4	Step 5	Step 6	Steps 7 & 8	Final Result	
	Constituent name	C (µg/L) Lowest (most stringent) Criteria (Enter "No Criteria" for no criteria)	Effluent Data Available (Y/N)?	Are all data points non-detects (Y/N)?	If all data points ND Enter the min detection limit (MDL) (ug/L)	Enter the pollutant effluent detected max conc (ug/L)	If all data points are ND and MinDL>C, interim monitoring is required	Concentration from the effluent (MEC) (MEC= deteted max value; if all ND & MDL<C then MEC = MDL)	MEC vs. C 1. If MEC> or =C, effluent limitation is required; 2. If MEC<C, go to Step 5	B (µg/L) Enter the Maximum Background Conc	B vs. C If B>C, effluent limitation is required	7) Review other information in the SIP page 4. If information is unavailable or insufficient; 8) the RWQCB shall establish interim monitoring requirements.	RPA Result	Reason
1	Antimony	4,300	N				No effluent data			No RMP Data	No ambient data, to Step 7		UD	No effluent data & no B
2	Arsenic	36	Y	N		1.2		1.2	MEC<C, go to Step 5	4.59	B<C, Step 7		No	MEC<C & B<C
3	Beryllium	No Criteria	N				No Criteria	No Criteria	No Criteria	No RMP Data	No Criteria	No Criteria	Uo	No Criteria
4	Cadmium	2.46	Y	N		0.3		0.3	MEC<C, go to Step 5	0.1707	B<C, Step 7		No	MEC<C & B<C
5a	Chromium (III)	206.98	N				No effluent data			No RMP Data	No ambient data, to Step 7		UD	No effluent data & no B
5b	Chromium (VI)	200.00	Y	N		2		2	MEC<C, go to Step 5	14.74	B<C, Step 7		No	MEC<C & B<C
6	Copper (303d listed) [b]	13.02	Y	N		17		17	MEC>=C, Effluent Limits R	7.19	B<C, Step 7	Yes	Yes	MEC>C
7	Lead	50.00	Y	N		0.9		0.9	MEC<C, go to Step 5	3.78	B<C, Step 7		No	MEC<C & B<C
8	Mercury (303d listed)	0.051	Y	N		0.019		0.019	MEC<C, go to Step 5	0.0682	B>C, Effluent Limit Require		Yes	B>C
9	Nickel [c]	27.05	Y	N		6		6	MEC<C, go to Step 5	13.03	B<C, Step 7	Yes	Yes	RP based on Board BPJ
10	Selenium (303d listed)	5.00	Y	N		1.2		1.2	MEC<C, go to Step 5	0.63	B<C, Step 7		No	MEC<C & B<C
11	Silver	2.24	Y	N		0.2		0.2	MEC<C, go to Step 5	0.1193	B<C, Step 7		No	MEC<C & B<C
12	Thallium	6.30	N				No effluent data			No RMP Data	No ambient data, to Step 7		UD	No effluent data & no B
13	Zinc	119.82	Y	N		72		72	MEC<C, go to Step 5	14.85	B<C, Step 7		No	MEC<C & B<C
14	Cyanide	1.00	Y	N		4.2		4.2	MEC>=C, Effluent Limits R	No RMP Data	No ambient data, to Step 7		Yes	MEC>C
15	Asbestos	No Criteria	N				No Criteria	No Criteria	No Criteria	No RMP Data	No Criteria	No Criteria	Uo	No Criteria
16	2,3,7,8 TCDD (303d liste	0.000000014	Y	Y	0.847		ND, MinDL>C, Go to Step 5, &			No RMP Data	No ambient data, to Step 7		No	all ND & no B
17	Acrolein	780	Y	Y	1		All ND, MDL<C, MEC=MDL	1	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
18	Acrylonitrile	0.66	Y	Y	1		ND, MinDL>C, Go to Step 5, &			No RMP Data	No ambient data, to Step 7		No	all ND, MDL>C & no B
19	Benzene	71	Y	Y	1		All ND, MDL<C, MEC=MDL	1	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	MEC<C & no B
20	Bromoform	360	Y	N		28		28	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	MEC<C & no B
21	Carbon Tetrachloride	4.4	Y	Y	1		All ND, MDL<C, MEC=MDL	1	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
22	Chlorobenzene	21,000	Y	Y	1		All ND, MDL<C, MEC=MDL	1	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
23	Chlorodibromomethane	34	Y	N		56		56	MEC>=C, Effluent Limits R	No RMP Data	No ambient data, to Step 7		Yes	MEC>C
24	Chloroethane	No Criteria	Y	Y	1		No Criteria	No Criteria	No Criteria	No RMP Data	No Criteria	No Criteria	Uo	No Criteria
25	2-Chloroethylvinyl ether	No Criteria	Y	Y	2		No Criteria	No Criteria	No Criteria	No RMP Data	No Criteria	No Criteria	Uo	No Criteria
26	Chloroform	No Criteria	Y	N		11	No Criteria	No Criteria	No Criteria	No RMP Data	No Criteria	No Criteria	Uo	No Criteria
27	Dichlorobromomethane	46	Y	N		31		31	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	MEC<C
28	1,1-Dichloroethane	No Criteria	Y	Y	1		No Criteria	No Criteria	No Criteria	No RMP Data	No Criteria	No Criteria	Uo	No Criteria
29	1,2-Dichloroethane	99	Y	Y	1		All ND, MDL<C, MEC=MDL	1	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
30	1,1-Dichloroethylene	3.2	Y	Y	1		All ND, MDL<C, MEC=MDL	1	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
31	1,2-Dichloropropane	39	Y	Y	1		All ND, MDL<C, MEC=MDL	1	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
32	1,3-Dichloropropylene	1,700	Y	Y	1		All ND, MDL<C, MEC=MDL	1	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
33	Ethylbenzene	29,000	Y	Y	1		All ND, MDL<C, MEC=MDL	1	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
34	Methyl Bromide	4,000	Y	Y	1		All ND, MDL<C, MEC=MDL	1	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
35	Methyl Chloride	No Criteria	Y	Y	1		No Criteria	No Criteria	No Criteria	No RMP Data	No Criteria	No Criteria	Uo	No Criteria
36	Methylene Chloride	1,600	Y	Y	1		All ND, MDL<C, MEC=MDL	1	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
37	1,1,2,2-Tetrachloroethan	11	Y	Y	1		All ND, MDL<C, MEC=MDL	1	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
38	Tetrachloroethylene	8.85	Y	Y	1		All ND, MDL<C, MEC=MDL	1	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
39	Toluene	200,000	Y	Y	1		All ND, MDL<C, MEC=MDL	1	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
40	1,2-Trans-Dichloroethyle	140,000	Y	Y	1		All ND, MDL<C, MEC=MDL	1	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
41	1,1,1-Trichloroethane	No Criteria	Y	Y	1		No Criteria	No Criteria	No Criteria	No RMP Data	No Criteria	No Criteria	Uo	No Criteria
42	1,1,2-Trichloroethane	42	Y	Y	1		All ND, MDL<C, MEC=MDL	1	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
43	Trichloroethylene	81	Y	Y	1		All ND, MDL<C, MEC=MDL	1	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
44	Vinyl Chloride	525	Y	Y	1		All ND, MDL<C, MEC=MDL	1	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
45	2-Chlorophenol	400	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
46	2,4-Dichlorophenol	790	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
47	2,4-Dimethylphenol	2,300	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
48	2-Methyl- 4,6-Dinitrophe	765	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
49	2,4-Dinitrophenol	14,000	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
50	2-Nitrophenol	No Criteria	Y	Y	5		No Criteria	No Criteria	No Criteria	No RMP Data	No Criteria	No Criteria	Uo	No Criteria
51	4-Nitrophenol	No Criteria	Y	Y	5		No Criteria	No Criteria	No Criteria	No RMP Data	No Criteria	No Criteria	Uo	No Criteria
52	3-Methyl 4-Chlorophenol	No Criteria	Y	Y	5		No Criteria	No Criteria	No Criteria	No RMP Data	No Criteria	No Criteria	Uo	No Criteria
53	Pentachlorophenol	7.90	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
54	Phenol	4,600,000	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
55	2,4,6-Trichlorophenol	6.50	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
56	Acenaphthene	2,700	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	0.0026	B<C, Step 7		No	all ND & no B
57	Acenaphthylene	No Criteria	Y	Y	5		No Criteria	No Criteria	No Criteria	0.00054	No Criteria	No Criteria	Uo	No Criteria
58	Anthracene	110,000	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	0.0023	B<C, Step 7		No	MEC<C & B<C
59	Benzidine	0.00054	N				No effluent data			No RMP Data	No ambient data, to Step 7		UD	No effluent data & no B
60	Benzo(a)Anthracene	0.049	Y	Y	5		ND, MinDL>C, Go to Step 5, &			0.017	B<C, Step 7		No	all ND, MDL>C & B<C
61	Benzo(a)Pyrene	0.049	Y	Y	5		ND, MinDL>C, Go to Step 5, &			0.045	B<C, Step 7		No	all ND, MDL>C & B<C
62	Benzo(b)Fluoranthene	0.049	Y	Y	5		ND, MinDL>C, Go to Step 5, &			0.0572	B>C, Effluent Limit Require		Yes	B>C
63	Benzo(ghi)Perylene	No Criteria	Y	Y	5		No Criteria	No Criteria	No Criteria	0.015	No Criteria	No Criteria	Uo	No Criteria
64	Benzo(k)Fluoranthene	0.049	Y	Y	5		ND, MinDL>C, Go to Step 5, &			0.02105	B<C, Step 7		No	all ND, MDL>C & B<C
65	Bis(2-Chloroethoxy)Meth	No Criteria	Y	Y	5		No Criteria	No Criteria	No Criteria	No RMP Data	No Criteria	No Criteria	Uo	No Criteria
66	Bis(2-Chloroethyl)Ether	1.40	Y	Y	5		ND, MinDL>C, Go to Step 5, &			No RMP Data	No ambient data, to Step 7		No	all ND & no B
67	Bis(2-Chloroisopropyl)Et	170,000	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
68	Bis(2-Ethylhexyl)Phthala	5.90	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
69	4-Bromophenyl Phenyl E	No Criteria	Y	Y	5		No Criteria	No Criteria	No Criteria	No RMP Data	No Criteria	No Criteria	Uo	No Criteria
70	Butylbenzyl Phthalate	5,200	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B

Attachment 1
Reasonable Potential Analysis Results for Priority Pollutants
City of Palo Alto

Beginning			Step 2	Step 3					Step 4	Step 5	Step 6	Steps 7 & 8	Final Result	
	Constituent name	C (µg/L) Lowest (most stringent) Criteria (Enter "No Criteria" for no criteria)	Effluent Data Available (Y/N)?	Are all data points non-detects (Y/N)?	If all data points ND Enter the min detection limit (MDL) (ug/L)	Enter the pollutant effluent detected max conc (ug/L)	If all data points are ND and MinDL>C, interim monitoring is required	Concentration from the effluent (MEC) (MEC= deteted max value; if all ND & MDL<C then MEC = MDL)	MEC vs. C 1. If MEC> or =C, effluent limitation is required; 2. If MEC<C, go to Step 5	B (µg/L) Enter the Maximum Background Conc	B vs. C If B>C, effluent limitation is required	7) Review other information in the SIP page 4. If information is unavailable or insufficient: 8) the RWQCB shall establish interim monitoring requirements.	RPA Result	Reason
71	2-Chloronaphthalene	4,300	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
72	4-Chlorophenyl Phenyl E	No Criteria	N				No Criteria	No Criteria	No Criteria	No RMP Data	No Criteria	No Criteria	Uo	No Criteria
73	Chrysene	0.049	Y	Y	5		ND, MinDL>C, Go to Step 5, &			0.02206	B<C, Step 7		No	all ND, MDL>C & B<C
74	Dibenzo(a,h)Anthracene	0.049	Y	Y	5		ND, MinDL>C, Go to Step 5, &			0.0088	B<C, Step 7		No	all ND, MDL>C & B<C
75	1,2-Dichlorobenzene	17,000	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
76	1,3-Dichlorobenzene	2,600	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
77	1,4-Dichlorobenzene	2,600	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
78	3,3 Dichlorobenzidine	0.077	Y	Y	10		ND, MinDL>C, Go to Step 5, &			No RMP Data	No ambient data, to Step 7		No	all ND & no B
79	Diethyl Phthalate	120,000	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
80	Dimethyl Phthalate	2,900,000	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
81	Di-n-Butyl Phthalate	12,000	N				No effluent data			No RMP Data	No ambient data, to Step 7		UD	No effluent data & no B
82	2,4-Dinitrotoluene	9.10	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
83	2,6-Dinitrotoluene	No Criteria	Y	Y	5		No Criteria	No Criteria	No Criteria	No RMP Data	No Criteria	No Criteria	Uo	No Criteria
84	Di-n-Octyl Phthalate	No Criteria	Y	Y	5		No Criteria	No Criteria	No Criteria	No RMP Data	No Criteria	No Criteria	Uo	No Criteria
85	1,2-Diphenylhydrazine	0.54	Y	Y	5		ND, MinDL>C, Go to Step 5, &			No RMP Data	No ambient data, to Step 7		No	all ND & no B
86	Fluoranthene	370	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	0.03896	B<C, Step 7		No	MEC<C & B<C
87	Fluorene	14,000	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	0.0055	B<C, Step 7		No	MEC<C & B<C
88	Hexachlorobenzene	0.00077	Y	Y	5		ND, MinDL>C, Go to Step 5, &			0.000164	B<C, Step 7		No	all ND, MDL>C & B<C
89	Hexachlorobutadiene	50	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
90	Hexachlorocyclopentadie	17,000	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
91	Hexachloroethane	8.90	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
92	Indeno(1,2,3-cd)Pyrene	0.049	Y	Y	5		ND, MinDL>C, Go to Step 5, &			0.078	B>C, Effluent Limit Require		Yes	B>C
93	Isophorone	600	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
94	Naphthalene	No Criteria	Y	Y	5		No Criteria	No Criteria	No Criteria	0.0024	No Criteria	No Criteria	Uo	No Criteria
95	Nitrobenzene	1,900	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
96	N-Nitrosodimethylamine	8.10	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
97	N-Nitrosodi-n-Propylamir	1.40	Y	Y	5		ND, MinDL>C, Go to Step 5, &			No RMP Data	No ambient data, to Step 7		No	all ND & no B
98	N-Nitrosodiphenylamine	16	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
99	Phenanthrene	No Criteria	Y	Y	5		No Criteria	No Criteria	No Criteria	0.0141	No Criteria	No Criteria	Uo	No Criteria
100	Pyrene	11,000	Y	Y	5		All ND, MDL<C, MEC=MDL	5	MEC<C, go to Step 5	0.05603	B<C, Step 7		No	MEC<C & B<C
101	1,2,4-Trichlorobenzene	No Criteria	Y	Y	5		No Criteria	No Criteria	No Criteria	No RMP Data	No Criteria	No Criteria	Uo	No Criteria
102	Aldrin	0.00014	Y	Y	0.025		ND, MinDL>C, Go to Step 5, &			No RMP Data	No ambient data, to Step 7		No	all ND & no B
103	alpha-BHC	0.013	Y	Y	0.025		ND, MinDL>C, Go to Step 5, &			0.000662	B<C, Step 7		No	all ND & no B
104	beta-BHC	0.046	Y	Y	0.025		All ND, MDL<C, MEC=MDL	0.025	MEC<C, go to Step 5	0.000607	B<C, Step 7		No	all ND & no B
105	gamma-BHC	0.063	Y	Y	0.025		All ND, MDL<C, MEC=MDL	0.025	MEC<C, go to Step 5	0.0016667	B<C, Step 7		No	all ND & no B
106	delta-BHC	No Criteria	Y	Y	0.025		No Criteria	No Criteria	No Criteria	0.000133	No Criteria	No Criteria	Uo	No Criteria
107	Chlordane (303d listed)	0.00059	Y	Y	0.5		ND, MinDL>C, Go to Step 5, &			0.000574	B<C, Step 7		No	all ND, MDL>C & B<C
108	4,4'-DDT (303d listed)	0.00059	Y	Y	0.1		ND, MinDL>C, Go to Step 5, &			0.000202	B<C, Step 7		No	all ND, MDL>C & B<C
109	4,4'-DDE (linked to DDT)	0.00059	Y	Y	0.04		ND, MinDL>C, Go to Step 5, &			0.000678	B>C, Effluent Limit Require		Yes	B>C
110	4,4'-DDD	0.00084	Y	Y	0.1		ND, MinDL>C, Go to Step 5, &			0.00077	B<C, Step 7		No	all ND, MDL>C & B<C
111	Dieldrin (303d listed)	0.00014	Y	Y	0.02		ND, MinDL>C, Go to Step 5, &			0.000292	B>C, Effluent Limit Require		Yes	B>C
112	alpha-Endosulfan	0.0087	Y	Y	0.05		ND, MinDL>C, Go to Step 5, &			0.000027	B<C, Step 7		No	all ND, MDL>C & B<C
113	beta-Endosulfan	0.0087	Y	Y	0.04		ND, MinDL>C, Go to Step 5, &			0.000046	B<C, Step 7		No	all ND, MDL>C & B<C
114	Endosulfan Sulfate	240	Y	Y	0.1		All ND, MDL<C, MEC=MDL	0.1	MEC<C, go to Step 5	0.000072	B<C, Step 7		No	MEC<C & B<C
115	Endrin	0.0023	Y	Y	0.05		ND, MinDL>C, Go to Step 5, &			0.00012	B<C, Step 7		No	all ND, MDL>C & B<C
116	Endrin Aldehyde	0.81	Y	Y	0.1		All ND, MDL<C, MEC=MDL	0.1	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	all ND & no B
117	Heptachlor	0.00021	Y	Y	0.025		ND, MinDL>C, Go to Step 5, &			0.000022	B<C, Step 7		No	all ND, MDL>C & B<C
118	Heptachlor Epoxide	0.00011	Y	Y	0.025		ND, MinDL>C, Go to Step 5, &			0.000174	B>C, Effluent Limit Require		Yes	B>C
119-125	PCBs sum (2)	0.00017					ND, MinDL>C, Go to Step 5, &			No RMP Data	No ambient data, to Step 7		UD	MDL>C & no B
126	Toxaphene	0.0002	Y	Y	1		ND, MinDL>C, Go to Step 5, &			No RMP Data	No ambient data, to Step 7		No	all ND & no B
	Tributyltin	0.0100	Y	N		0.003		0.003	MEC<C, go to Step 5	No RMP Data	No ambient data, to Step 7		No	MEC<C

a. The most stringent of salt and fresh water criteria were selected for this analysis.

b. Criteria for copper is a Site-Specific Objective for the LSSFB of 6.9 (4-d) and 10.8 (1-hr) ug/L. The copper criteria in the table is adjusted by dividing a site-specific translator 0.53 to convert the dissovled to total metal concetration.

c. Criteria for nickel is a Site-Specific Objective for the LSSFB of 11.9 (4-d) and 62.4 (1-hr) ug/L. The nickel criteria in the table is adjusted by dividing a site-specific translator 0.44 to convert the dissovled to total metal concetration.
The freshwater criteria for Selenium are taken from NTR.

d. Acronyms in the "Final Result" column: UD: Undetermined: cannot determine reasonable potential due to the absence of effluent data
MDL: Minimum Detection limit

e. Criteria for Tributyltin based on EPA criteria.

Attachment 2
Calculation of Final Water Quality-Based Effluent Limitations
(Per Section 1.4 of the SIP)
City of Palo Alto

PRIORITY POLLUTANTS	Copper	Mercury	Nickel	CN	Chlorodibromomethane	Benzo(b)Fluoranthene	Indeno(1,2,3-cd)Pyrene	4,4'-DDE	Dieldrin	Heptachlor Epoxide
Basis and Criteria type	SSO	HH	SSO	CTR - SW	HH	HH	HH	HH	HH	HH
Lowest WQO	13.02	0.051	27.05	1.00	34	0.049	0.049	0.00059	0.00014	0.00011
Translators										
Dilution Factor (D) (if applicable)	0	0	0	0	0	0	0	0	0	0
No. of samples per month	4	4	4	4	4	4	4	4	4	4
Aquatic life criteria analysis required? (Y/N)	Y	N	Y	Y	N	N	N	N	Y	Y
HH criteria analysis required? (Y/N)	N	Y	N	Y	Y	Y	Y	Y	Y	Y
Applicable Acute WQO	20.38		141.82	1					0.71	0.053
Applicable Chronic WQO	13.02		27.05	1					0.0019	0.0036
Applicable HH criteria		0.051		220,000	34	0.049	0.049	0.00059	0.00014	0.00011
Background (max conc for Aq Life calc)	7.19		13.03						0.000292	0.000174
Background (avg conc for HH calc)		0.01935				0.01132	0.01135	0.000206	0.00009	0.00006
Is the pollutant Bioaccumulative(Y/N)? (e.g., Hg)	N	Y	N	N	N	Y	Y	Y	Y	Y
ECA acute	20.38		141.82	1					0.71	0.053
ECA chronic	13.02		27.05	1					0.0019	0.0036
ECA HH		0.051		220,000	34	0.049	0.049	0.00059	0.00014	0.00011
No. of data points <10 or atleast 80% of data reported non detect? (Y/N)	N	N	N	Y	Y	Y	Y	Y	Y	Y
avg of effluent data points	6.180	0.0057	4.556							
std dev of effluent data points	1.775	0.0036	0.735							
CV calculated	0.29	0.63	0.16	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CV (Selected) - Final	0.29	0.63	0.16	0.60	0.60	0.60	0.60	0.60	0.60	0.60
ECA acute mult99	0.54		0.70	0.32					0.32	0.32
ECA chronic mult99	0.72		0.83	0.53					0.53	0.53
LTA acute	11.02		98.96	0.32					0.23	0.02
LTA chronic	9.43		22.50	0.53					0.001	0.0019
minimum of LTAs	9.43		22.50	0.32					0.001	0.0019
AMEL mult95	1.25	1.58	1.14	1.55	1.55	1.55	1.55	1.55	1.55	1.55
MDEL mult99	1.85	3.24	1.43	3.11	3.11	3.11	3.11	3.11	3.11	3.11
AMEL (aq life)	11.81		25.61	0.50					0.00156	0.0029
MDEL(aq life)	17.45		32.25	1.00					0.00312	0.006
MDEL/AMEL Multiplier	1.48	2.05	1.26	2.01	2.01	2.01	2.01	2.01	2.01	2.01
AMEL (human hlth)		0.051		220,000	34	0.049	0.049	0.00059	0.00014	0.00011
MDEL (human hlth)		0.104		441,362	68.21	0.098	0.098	0.00118	0.00028	0.00022
minimum of AMEL for Aq. life vs HH	11.81	0.051	25.61	0.50	34	0	0	0.00059	0.00014	0.00011
minimum of MDEL for Aq. Life vs HH	17.45	0.104	32.25	1.00	68	0	0	0.00118	0.00028	0.00022
Current limit in permit (30-d avg)	N/A	0.025	8.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Current limits in permit (daily)	12	2.1	N/A	5	N/A	N/A	N/A	N/A	N/A	N/A
Final limit - AMEL	11.81	0.051	25.61	0.50	34.00	0.049	0.049	0.00059	0.00014	0.00011
Final limit - MDEL	17.45	0.104	32.25	1.00	68.21	0.098	0.098	0.00118	0.00028	0.00022
Max Effl Conc (MEC), 1999-2002	17	0.019	6.0	4.2	56	<5	<5	<0.04	<0.02	<0.025
Interim Limits for those where TMDL is final limit	N/A	N/A	N/A	32	86	N/A	N/A	N/A	N/A	N/A

Notes:

1. The interim effluent limitation for Cyanide is set at 32 ug/L. This interim limit is based on pooled cyanide effluent data from advanced secondary treatment plants in the San Francisco Bay Area.
2. The interim effluent limitation for Chlorodibromomethane is set at 86 ug/L, which is the 99.87th percentile of current Plant performance.
3. The interim effluent limitations for benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, 4,4'-DDE, dieldrin, and heptachlor epoxide are set at the Minimum Levels (MLs).

ATTACMENT 3

DOCUMENTATION FOR CHROMIUM AND ZINC TRANSLATOR DEVELOPMENT

EOA, Inc.

DRAFT MEMORANDUM

TO: Lorrie Gervin/Dave Grabiec, City of Sunnyvale
Dan Bruinsma/Dave Tucker, City of San Jose

FROM: Kristin Kerr/ Tom Hall

DATE: January 14, 2003

SUBJECT: **DRAFT Additional Analysis of RMP Station BA30 Zinc Translator Information**

BACKGROUND

A Reasonable Potential Analysis (RPA) is required to be conducted during the permit renewal process to determine which effluent limits need to be included in the reissued permits. On behalf of the City of Sunnyvale and the City of San Jose, EOA prepared separate Draft RPAs memos during July 2002. These initial RPAs used Regional Monitoring Program Yerba Buena Island (Station BC10) data for receiving water background data and a hardness of 400 mg/L. RWQCB staff and their consultants prepared Draft RPAs for the three South Bay cities during July and August 2002 that differed in several ways from the approach used by EOA, primarily in the use of Dumbarton Bridge (Station BA30) data for background and the use of default metals conversion factors instead of site specific translators.

To facilitate subsequent discussion of these RPA approach differences and implications on effluent limit requirements, EOA prepared a follow-up memo titled *Draft Review of Key RPA Issues and Options* (09/24/02, revised 12/19/02 and 01/14/03). To simplify the comparisons, and since it made no difference on the outcome of the RPA results (when translators are used) a slightly modified RPA was included with the "Issues" memo that used a conservative default hardness of 100 mg/L instead of 400 mg/L. Tables were included that showed how the results would differ depending of whether BC10 or BA30 background data were used. There were very minor differences in BC10 vs BA30 calculated translator values. However, four additional constituents at BA30 vs at BC10 would have RP based solely on background concentrations exceeding the corresponding water quality objectives.

One key issue addressed in the "Issues" memo (pages 6-9 and intervening tables) was how to adjust California Toxics Rule (CTR) dissolved metals based water quality objectives (criteria) (WQO) and dissolved metals receiving water concentrations, to a total metals basis. This adjustment is required since Federal Regulations require that effluent limitations be expressed on a total metals basis and thus effluent data are collected and analyzed for total metals concentrations. Thus CTR WQOs need to be adjusted from dissolved to total concentration to allow comparison to the maximum effluent concentrations (MEC) in the EPA based RPA (the first RPA trigger). For consistency under the State Implementation Plan (SIP) RPA Section 1.3 Step 6 (the second RPA trigger), background receiving water dissolved metals concentrations need to be similarly adjusted to total metals to allow comparison to the adjusted CTR WQOs developed and used for the MEC comparison.

(Possible future revisions to the SIP may modify and improve the current RPA process. Both BACWA and RWQCB staff submitted comments to the SWRCB in mid-December 2002 on changes to the SIP regarding how translators should be applied. Another common comment was that background concentration exceedances of WQOs alone should not trigger RP).

CONVERSION FACTORS vs TRANSLATORS in RPAs

Four options for adjusting the WQOs and RMP Station BA30 (Dumbarton Bridge) background receiving water concentrations were presented in the "Issues" memo. Table A in the Attachments to this memo is an updated version of the table summarizing those options with a column added for Sunnyvale MEC values. The table shows (in bold) the four metals that could potentially be viewed as having RP depending on one's assumptions about use of conversion factors versus site specific translators.

Hexavalent Chromium and Lead Even when hexavalent chromium and lead WQOs are adjusted with the conservative default conversion factors (instead of RMP translators), the only instance when there could be RP is the case where the RMP directly measured total metals background concentrations would be compared to the CF adjusted WQOs (Option 2). As noted above and in more detail in the "Issues" memo, this would be an internally inconsistent way of conducting an RP contrary to the SIP. When the dissolved background concentrations are instead converted to total metals using the CFs (Option 3) there is no RP (and by a wide margin) for hexavalent chromium or lead.

Mercury Total mercury concentrations are used in the RPAs instead of dissolved given that mercury is bioaccumulative and therefore the total metal concentration present is of concern. Two total mercury BA30 concentrations were above the CTR WQO of 0.051 ug/L. All MECs were well below the WQO.

Zinc Zinc is the only effluent metal where the Sunnyvale and San Jose MECs (110 and 102 ug/L respectively) could show RP, and only if one were to use the default CFs to adjust the CTR WQOs instead of translators. As shown in Table 1 below, the lowest WQO adjusted with the EPA conversion factor (0.946) is 85.6 ug/L while the lowest WQO adjusted with RMP BA30 translators is 170 ug/L. It is somewhat unusual that the translated CMC resulted in a lower WQO than the translated CCC. This appears to be due at least in part to the fact that for most other metals the chronic (CCC) values are at least two times lower than the acute (CMC) values rather than only about 10% lower for zinc.

Table 1. RPAs for Zinc: MECs Compared to Differently Adjusted WQOs

	Default EPA Conversion Factor	**BA30 RMP Translator**
Saltwater CMC	90	90
CMC Translator	0.946	0.53
Acute WQO Adjusted	95	170
Saltwater CCC	81	81
CCC Translator	0.946	0.2
Chronic WQO Adjusted	85.6	405
Lowest WQO	85.6	170
Sunnyvale MEC	110	110
Sunnyvale Zinc RP?	**Yes**	**No**
San Jose MEC	102	102
San Jose Zinc RP?	**Yes**	**No**

The SIP Section 1.4.1 specifies the use of default EPA conversion factors (i.e. divide the dissolved WQO by the applicable conversion factor to calculate a total recoverable WQO) unless site specific translators have been developed. Permit Work Group (PWG) members have generally been supportive of the use of site specific metals translators based on Regional Monitoring Program data versus the use of default EPA conversion factors. However, in a November 16, 2002 email RWQCB staff requested additional supporting analysis of how these RMP based translators should be calculated.

The direct ratio approach has been used to date, based on the very similar results obtained previously in the Lower South Bay (LSB) for copper and nickel translators using more complex methods.

Given that zinc is the only constituent for which translators are potentially an issue (in the Sunnyvale and San Jose RPAs), this memo presents additional analysis of alternative approaches using available data to derive zinc translators. Until further information is available to more definitively identify the most hydrodynamically appropriate background station for the LSSFB, the RMP Dumbarton Bridge station (BA30) data are being used for background for these analyses.

INITIAL TRANSLATOR DETERMINATION APPROACH

EOA developed proposed site specific copper and nickel translators for the LSSFB as part of the prior (1998) permit reissuance process (*Case Study: Investigation of Metals Translators for the Sunnyvale WPCP, August 1997)*. That memorandum (see Attachment B) described in considerable detail the rationale for translators, and three alternative approaches for deriving translators based on the June 1996 EPA translator guidance document. Readers interested in more background information on translators are referred to Attachment B.

The EOA 1997 translator study looked at the relationship between TSS, TOC, DOC, DO, pH and translators and found that the only consistently statistically significant relationship was with the natural log of TSS. The study found that the direct ratio computation method and the regression with ln(TSS) method produced South Bay translator values that only varied by 0.03 (0.63 vs 0.66, respectively).

The SIP outlines two approaches for developing site specific translators. If existing data are not available from which to calculate translators, dischargers have up to two years from the date of permit issuance to develop a workplan (that must be approved by the RWQCB staff after consultation with the Department of Fish and Game), to collect the necessary data, and submit the results and proposed translators. Several translator studies have been conducted around the Bay (generally for copper and nickel) including work by Sonoma Valley County Sanitation District, Las Gallinas Valley Sanitary District, City of Petaluma, Union Sanitary District for Hayward Marsh, and the City of Sunnyvale.

As an alternate to conducting a new translator study after permit adoption, the SIP allows for the RWQCB to consider applying translators

> "based on a study completed prior to the adoption of this Policy if the RWQCB believes the translator adequately reflects existing conditions (including spatial and/or seasonal variability) in the areas of the water body affected by the discharger's effluent".

This was the approach used in the Sunnyvale RPA, namely to make use of the existing high quality RMP data to calculate translators for metals other than copper and nickel (which have already been developed and approved as part of the May 2002 site specific objective Basin Plan Amendment). The USEPA translator guidance document (June 1996) recommends using a minimum of 8 to 10 pairs of data points (dissolved and total metals) that are representative spatially and temporally (seasonally) of the receiving water to calculate a translator. There are generally 21 RMP data points available from 1993 – 1999 sampled at three different times during the year. Therefore by these criteria, the available RMP data should be adequate and sufficient to calculate translators for the remaining metals.

The Regional Board Response to EOA, Inc. Translator Analysis (November 16, 2002) supported the use of site specific data in developing site-specific metals translators for dissolved water quality objectives, and took no issue with the use of RMP data. However the staff recommended that

"methods to develop translators be consis tent both with EPA guidance, and with those used in the Lower South San Francisco Bay (LSSFB) to develop metals translators for copper and nickel ."

EOA, Inc. is very familiar with the methods used in the LSSFB SSO. EOA worked with Tetra Tech as part of the copper/nickel TMDL S SO workgroup in the developing of the transl ator methods and performing the analyses of the data that is documented in Appendix D (pp. 76-80) of the May 2002 SSO Basin Plan Amendment (BPA) staff report. The LSSFB SSO work developed tran slators using both the direct ratio method and the regr ession against TSS approach referenced in the 1986 EPA guidance document. Results from the two methods only varied by 0.03 (0.45 vs 0.42, r espectively). The LSSFB SSO work also used the C lassification and Regression Tree (CART) program to evaluate the potential effect of other variables on translator results. As in the EOA 1997 analysis, TSS was again found to be the only significant variable in predicting translators.

The July 2002 Sunnyv ale and San Jose D raft RPAs and the follow-up September 24, 2002 " Issues" memo used the direct ratio translator calculati on method in large part based on these prior experiences that showed very similar results with regression derived translators. Given that BA 30 is effectively part of the LSSFB, it was not expected that ancillary w ater quality constituent data would vary appreciably from that evaluated in 1997 or for the 2002 SS O be useful in explaining/deriving translators.

However, as requested, results from additional regression and CART analyses are presented below for zinc and ancillary water quality data from the RMP D umbarton Bridge BA30 station. It needs to be kept in mind that the purpose, and sc ope, of these additional anal yses is to document the potential range of technically defensible zinc translators bas ed on the approach used in the LSSFB in a manner appropriate to the available BA30 data. The bottom line is to then revisit the MEC RPA determination and verify that there is or is not RP for zinc based on the resultant translator(s).

It is beyond scope of this analysis to address the multitude of technical and policy issues that need to be resolved as part of developing a reasonable and practical region-wide approach for translator development and applic ation.

ADDITIONAL BA30 DATA AND TRANSLATOR ANALYSES

Raw Data and Bar Charts

RMP sampling at BA30 was conducted three times per year from 1993 – 1999, typically in February, April, and July (Winter, Spring, Summer) to capture the range of Delta outflows (from high to low flows). Attachment A includes a table of raw data and associated summary statistics for dissolved and total zinc, direct dissolved to total zinc ratio based translators, and available physicochemical data (TSS, DOC, DO, pH, silicate and temperature).

Bar charts showing total and di ssolved zinc, ratio based translators, and TSS are also included in Attachment A with the bars color coded by season. V isual inspection shows that total zinc and TSS concentrations track fairly closely but that there is not a c onsistent relationship between dissol ved zinc and TSS. There was also not consi stent relationship between total and diss olved zinc. Dissolved zinc concentrations w ere consistently higher in winter samples. The zinc translator with TSS overlay bar chart shows higher translators during w inter but no consistent relations hip to TSS. Some factor(s) other than or in addition to TSS appear to be affecti ng dissolved zinc concentrations.

Physiochemical Parameters as Potential Predictors of Translators

Regional Board staff recommended evaluating the RMP data to determine if a stati stically significant relationship exists between physicochemical data and individual total to dissolved ratios. This approach was suggested for any metal having a range of total to dissolv ed ratios where the maximum is at least three times the minimum (e.g., T:D ratios range between 2 and 6). It is ass umed that this suggestion is directed at eval uating the potential relationship between other constituents and particularly variable (and low) translators. It is not c lear why T:D terminology is being introduced instead of referring directly to translators. The suggested screening range is equiv alent to translators (D:T) in the range of 0.50 to 0.167. (T o minimize confusion, this memo will continue with translator terminology.)

With three exceptions (0.63, 0.53, and 0.53) all the zi nc data fall into the suggested range deserving investigation. Probability plots (Attachment A) of total and dis solved zinc using both arithmetic and log scales demonstrate the data to more closely fit a log-normal distribution (as often occurs wi th environmental data). Therefore the translator versus physiochemical data evaluations are presented in log-log X/Y scatter plots with regression lines (Attachment A).

None of the plots of direct ratio zinc translator versus TSS, DOC, DO, silicates, temperature, or chlorophyll a showed any significant relationships, nor did pl ots of total versus dissolved zinc. This is consistent with the prior two translator study results, exc ept that in this instance TSS was only weakly related to the translators. The RWQC B commentors also observed (based on Yerba Buena stati on data) little relationship between these variables and transl ators. The correlation coefficients for these plots are shown in Table 2 below.

Table 2. Correlation Coefficients for Scatter Plots

	Correlation Coefficient (r^2 value)
Zinc Translator versus TSS	0.21
Zinc Translator versus DOC	0.0005
Zinc Translator versus DO	0.10
Zinc Translator versus Silicates	0.04
Zinc Translator versus Temperature	0.28
Zinc Translator versus Chlorophyll a	0.13
Zinc Translator versus pH	0.09
Total Zinc versus Dissolved Zinc	0.05

Outlier Analysis

Regional Board staff recommended screening the data for statistical outliers. Graphical displays of the dissolved to total ratio against physicochemical parameters were suggested to help evaluate if one individual sampling event w ere driving a supposed relationship. V isual inspection of the X/Y scatter plots did not indicate the exi stence of readily obv ious outliers.

The log-log plot of the zinc translator vs TSS has a regression line with an r-square value of 0.21. One point with a value of 0.17 and TSS of 3 mg/L was evaluated as a possible outli er (4/16/97 sample). There is a corresponding point (2/02/95) with an almost identical TSS of 3.2 mg/L that has a value of 0.53, the third highest translator in t he dataset. The two events had simil ar DOC values of 2.8 and 3.3 mg/L, respectively. Silicates were lower at 2 vs 4.2 mg/L and chlorophyll a higher at 22.3 vs 14.5 mg/m3 in the 1997 vs 1995 events, perhaps indi cating the presence of a phytoplankton bl oom during the 4/16/97 event based on the l ower silica (used in diatom cell w alls) and higher chlorophyl l a present (an indicator of phytoplankt on biomass). Spring phytoplankton blooms are common in the LSS FB.

It not clear that there is a strong basis based on the anci llary data for calli ng the 0.17 value an outlier and the 0.53 value not an outlier. If the 0.17 value were to be remo ved from the data set the relationship of zinc translator to TSS does improve somewhat from an r-squar ed of 0.21 to 0.31 and the slope of the regression li ne increases in the manner expected (higher translators wi th lower TSS). If the 0.53 value is removed from the data set the relationship of zi nc translator to TSS worsens somewhat from an r-squared of 0.21 to 0.12 and the sl ope of the regression line decreases.

In the same respect, at the highest TS S values there are two data points that appear pe rhaps disproportionately di stant from the regression l ine. If the high zinc translator value, 0.33, at the high TSS value of 81 mg/L were to be r emoved from the dataset, the r elationship of zinc translator to TSS does improve somewhat from an r -squared of 0.21 to 0.31 and the slope of the regr ession line increases in the manner expected (lower translators wit h higher TSS). If the lower zi nc translator value, 0.07, at the high TSS value of 72.3 mg/L were to be is removed fr om the dataset, the relationship of zinc translator to TSS would worsen somewhat from an r-squared of 0.21 to 0.13 .

Given the current unre solved status of how and w hen it is appropriate to classify and censor a datapoint as an out lier, all of the data hav e been retained and used in these anal yses.

Multiple Parameter Influence on Translators

The RWQCB commentors noted that TSS alone may not be a useful predictor of translators and suggested that multipl e factors together be examined to attempt to account for multiple parameters or interactions betw een parameters. To add ress this same issue, the LS SFB SSO effort used the Classification and Regression Tree (CART) program. CART is a software implementation (Salford Systems) of a nonparametric multivariate analysi s technique known as Regional Sensitivity Analysis (Spear and Hornber ger, 1980; B reiman et al., 1984).

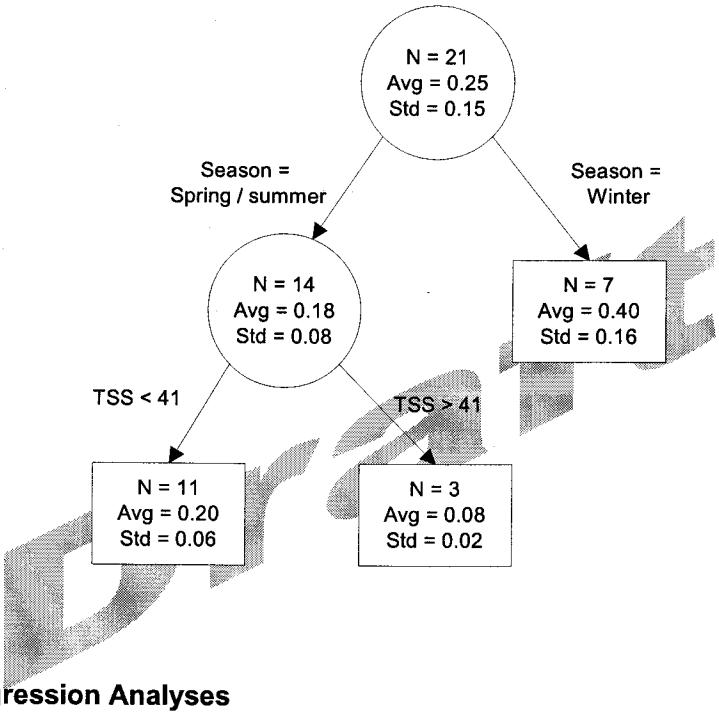
Multivariate analysis is motivated by the fact t hat various types of parameter interactions may be important with respect to the output variable (in this case the output variable is the translator for Zn at the BA30 station). CART analysis leads to classification rules based on inequality constraints applied to individual parameter values or to linear combinations of parameters. The analysis produces a tree structure in which a parametric division is made at each node by an inequality. Observations satisfying the condition are sent to the left node, otherwise they are sent to the right node. Splits in the data are chosen that minimize the classification error. When a split is chosen, the node is replaced by two daughter nodes. Splitting continues until a prespecified stopping rule is satisfied.

The LSSFB work used translators as the CART response variable and site, season (wet or dry), TSS, and tide as input variables. There were 12 stations and nearly 600 metals datapoints in the LSSFB work. The most important variable in predicting translators was TSS, with site slightly more important than season or tide. B ased in part on these results , two slough s ites were dropped from the translator calculations because they di d not appear to be representative of LS SFB conditions.

CART analysis conducted for the zinc translator inves tigation was carried out usi ng the RMP BA30 zinc translator data collec ted between Mar ch 1993 and J uly 1999 (21 sample events). Other par ameters used in the CA RT analysis were DO, DOC, pH, silicates, temperature, TSS and season (winter, spring, summer). Since data from only the one BA 30 station are being used in this analysis, station was not a relevant variable for CA RT analysis. Each variable i n the CART tree has an importance score based on how often and wi th what significance it served as primary or sur rogate splitter throughout the tree. Th e scores reflect t he contribution each variable makes in classifying or predicting the target variable, with the contribution stemming from the variable's role in primary spli ts. Season had a relativ e score of 100, TSS a relative score of 45 and DOC , pH, silica, and temperature all had relativ e scores of 0.

Results from the CART analysis are presented graphically below. The figure indicates the first splitting occurs on the parameter "Season". CART grouped spring and summer together and winter separately. The average translator value during the winter season (N=7) was 0.40, slightly higher than the average for the entire dataset of 0.25 (N=21). The average translator value for Spring/ Summer observations (N=14) is 0.18. CART found that these Spring/Summer observations could be further split into categories of observations with TSS values above and below 41 mg/L. As shown, spring/summer observations with TSS values greater than 41 mg/L (N=3) had an average translator value of 0.08, and those with TSS less than 41 mg/L (N=11) had an average TSS value of 0.20.

Further division of the spring/summer data is possible, however such splitting does not appreciably enhance the interpretation of the translator values and produces results of increasingly questionable relevance. CART did not suggest further splitting of the winter dataset, apparently indicating that none of the other input variables were significant in explaining the higher winter translator values.



TSS-Translator Regression Analyses

According to the EPA translator guidance document, if translators are found to be dependent on TSS, regression equations relating to TSS can be developed. The EOA 1997 study and the 2002 LSSFB SSO study developed translators based on regression equations with values that were nearly identical to those developed based on direct ratio calculations. Per EPA guidance, median TSS concentrations were inserted into the regression equations to derive the translators. For the LSSFB work upper and lower 95% confidence intervals and associated equations were also generated. RWQCB commentors recommended conducting a similar regression analysis to that performed in the LSSFB.

It should be noted that the results reported above show a relatively weak relationship between translators and TSS. In the case of the LSSFB work, there was a strong relationship as evidenced by the r-squared value of 0.72. Similar analysis of the complete BA30 data showed an r-squared value of

0.21. The regression line and 95% confidence intervals are shown graphically (Attachment A) and the resultant total dataset equations are as follows:

Linear Regression Line (All Data):
Log(translator) = -0.293 – 0.294 * Log(TSS)

95% confidence interval:
X+/- t(v,z) * (s/n^05)

Where x = mean, s = standard deviation, t(v,z) = t statistic for v=n-1 degrees of freedom and z=1.96

Based on the CART results showing seasonal differences between translators, additional regressions were developed for the winter and for the spring/summer translator/TSS datasets. The winter regression showed an r-squared value of 0.32. The spring/summer regression showed an r-squared value of 0.39. The plots and regression equations are in Attachment A. Translators resulting from use of each of these equations and various TSS concentrations are presented below.

TRANSLATOR CALCULATION OPTIONS

The most direct method of calculating a translator, as described above, is the dissolved to total ratio. The SIP recommends (Section 1.4.1) using a median of the data for translation of chronic criteria and a 90th percentile of data for translation of acute criteria. EPA guidance recommends using a geometric mean of the calculated translators as an estimate of the central tendency. A summary of the dissolved to total ratio based translator results are shown below.

Table 3. Direct Ratio Based Translator Options: All Data

	Arithmetic	Geometric
Min	0.07	
Max	0.63	
Mean	0.25	0.21
Standard deviation	0.15	1.82
90th percentile	**0.53**	**0.53**
Median	0.20	0.20

The CART analysis showed a difference in translator values between winter and summer/spring seasons. Therefore, a summary of the direct ratio translators divided into those two categories is shown below.

Table 4. Direct Ratio Based Translator Options: Seasonal

	Summer/Spring		Winter	
	Arithmetic	Geometric	Arithmetic	Geometric
Min	0.07		0.18	
Max	0.35		0.63	
Mean	0.18	0.16	0.40	0.37
Standard deviation	0.08	1.59	0.17	1.57
90th percentile	0.27	0.27	**0.58**	**0.58**

The TSS vs translator regression line can also be used to calculate a translator value by plugging in a TSS value in the regression line equations or associated 95th percentile confidence intervals (representing an upper bound). Options for TSS values to use would be the arithmetic or geometric means (representing the central tendency), or separate median TSS values for the summer/spring and winter seasons. The resultant options for translators based on the assumption of a linear relationship with TSS are shown below.

Table 5. TSS-Translator Regression Based Options: All Data

TSS Options for Regression Equation	TSS value	Translator calculated from Linear Regression Equation	Translator from graph upper 95% Conf. Interval
Arithmetic average	28.2	0.19	0.25
Geometric mean	20	0.21	0.3
Geo. Mean Spring/Summer	20.2	0.21	0.3
Geo. Mean Winter	19.8	0.21	0.3

Note: The translators from the graph 95% confidence interval were visually estimated, therefore, only one decimal place is shown in most cases.

The CART Analysis showed there was a difference in the translator values for the winter and spring/summer seasons. This can be seen in the difference between the geometric mean of the winter translator, 0.37, and the spring/summer translator, 0.16. However, there is little difference between the geometric mean of the TSS concentration in winter, 19.8 mg/L and in spring/summer, 20.2 mg/L. Using the linear regression equation to calculate the translator values for the different seasons yields the same translator value of 0.21.

Table 6. TSS-Translator Regression Based Options: Winter Season

TSS Options for Regression Equation	TSS value	Translator calculated from Linear Regression Equation	Translator from graph upper 95% Conf. Interval
Arithmetic average	30.3	0.33	0.5
Geometric mean	19.8	0.37	0.5

Note: The translators from the graph 95% confidence interval were visually estimated so only one decimal place is shown.

Table 7. TSS-Translator Regression Based Options: Spring/Summer Season

TSS Options for Regression Equation	TSS value	Translator calculated from Linear Regression Equation	Translator from graph upper 95% Conf. Interval
Arithmetic average	27.2	0.15	0.2
Geometric mean	20.2	0.16	0.2

TRANSLATOR SUMMARY AND REASONABLE POTENTIAL CONCLUSIONS

The CART analysis found there to be some difference in translators attributable to season (defined as winter, spring, and summer) and grouped the data into two categories: winter and spring/summer. However, there turned out to be relatively little difference in calculated 90th percentile (CMC) translators based on whether all data were used, seasonal data used, or TSS regressions used. Values ranged from 0.5 (upper 95th percentile of TSS regression), to 0.53 (original direct ratio value using all data), to 0.58 (90th percentile of the log transformed winter zinc translators). The maximum observed direct ratio value (3/2/93) was 0.63.

No RP

The CTR zinc saltwater CMC is 90 ug/L and the CCC is 81 ug/L. Using the most conservative 0.58 translator with either of these criteria would produce adjusted WQOs of 155 and 140 ug/L, respectively. Both WQOs are greater than the Sunnyvale and San Jose MECs of 110 and 102 ug/L. Therefore, there is no RP for zinc when this 0.58 translator or any other of the various RMP translator permutations investigated is used.

Limited MEC Values

The complete effluent zinc datasets for the Cities are included in Attachment A. Sunnyvale had only the one 110 ug/L value that would have triggered RP if the default conversion factor of 0.946 had been used to produce an adjusted WQO of 85.6. San Jose would have had either two or four exceedances (102, 91, 86, 86 ug/L) depending on significant figure rounding assumptions.

Potable Water Zinc Source

Santa Clara Valley Water District (SCVWD) adds zinc orthophosphate to its treated potable water for corrosion control in the distribution system. SCVWD potable water zinc concentrations measured at a Sunnyvale turnout receiving all SCVWD water averaged 383 ug/L during calendar years 1999-2001, with maximum values exceeding 600 ug/L. The Cities have no control over this significant source of zinc to their wastewater treatment plants.

ATTACHMENT A

RMP DATA AND GRAPHS

Table A. Sunnyvale MEC and Background Metals Reasonable Potential Analysis
Adjusted WQOs and Background Total Metals Concentrations (ug/L) Derivation Options Using
CTR Default Conversion Factors and RMP BA30 (Dumbarton Bridge) Translator Data (1/14/03 corrected version)

	Option 1			Option 2		Option 3			Option 4			
	Max. Effluent Conc. (MEC) (ug/L)	RMP Max (Dissolved) (ug/L)	Lowest CTR WQO (Not Adjusted) (ug/L)	RMP Max (Total) (ug/L)	Lowest CTR WQO (Adjusted by CF) (ug/L)	CTR Default Conv. Factor	RMP Dissolved Adjusted to Total by CF (ug/L)	Lowest CTR WQO (Adjusted by CF) (ug/L)	RMP Translator	RMP Dissolved (Adjusted by RMP Translator) (ug/L)	Lowest CTR WQO (Adjusted By RMP Translator) (ug/L)	Basis of Lowest WQO
Arsenic	3.1	4.05	36	4.59	36	1.000	4.05	36	0.91	4.45	38	Salt. CCC
Cadmium	0.2	0.22	2.2	0.17	2.4	0.909	0.24	2.4	0.95	0.23	2.3	Fresh. CCC
Chromium (VI)	7	0.49	11	**14.74**	11.4	0.962	0.51	11.4	0.08	6.1	200	Fresh. CMC
Copper	6.2	3.74	6.9 (SSO)	7.19	13	0.83	3.70	13	0.53	7.06	13	SSO
Lead	1.8	0.10	2.5	**3.78**	3.3	0.791	0.13	2.5	0.05	2.00	50	Fresh. CCC
Mercury	0.009	NA	0.051	**0.0680**	0.051	1	**0.0680**	0.051	1	**0.068**	0.051	Org.Cnsp.
Nickel	4.6	3.42	11.9 (SSO)	13.03	27	0.99	3.45	27	0.44	7.77	27	SSO
Selenium	2.7	0.53	5	0.63	5	1	0.53	5	1	0.63	5.0	Fresh. CCC
Silver	1	0.01	1.9	0.12	2.2	0.85	0.01	2.2	0.54	0.02	3.5	Salt.CMC
Zinc	110	3.2	***81*** [3]	14.85	***85.6*** [3]	0.946	3.38	***85.6*** [3]	0.53 [1]	6.00	170 [1]	Salt. CMC [1]
Zinc	110								0.58 [6]	5.5	140	Salt. CMC

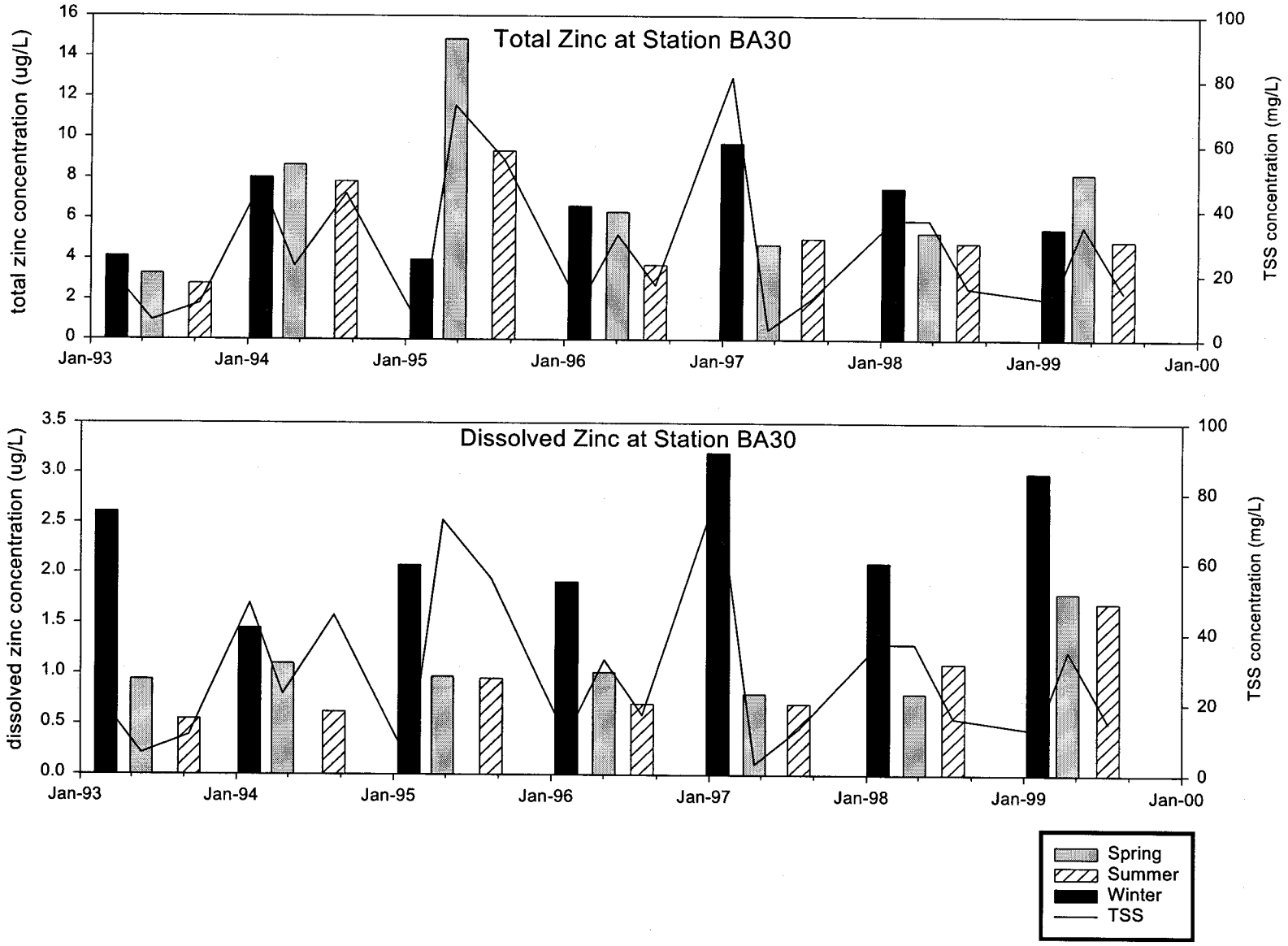
Notes:

1. Option 4 for zinc uses the saltwater CMC of 90 ug/L and corresponding BA30 acute translator, 0.53, since this yields a lower adjusted WQO of 170 ug/L vs using the saltwater CCC of 81 ug/L, and the chronic translator, 0.20, that yields an adjusted WQO of 405 ug/L.
2. **Background concentrations with reasonable potential shown in bold next to corresponding WQO**
3. ***WQO option resulting in MEC RP shown in bold italics (I.e. only unadjusted and CF adjusted zinc WQOs)***
4. The CF used (freshwater CMC, freshwater CCC, saltwater CMC, or saltwater CCC) and the translator used was dependent on which criteria was the lowest.
5. Per SIP guidance, median (of all BA30 based) translators used for adjusting CCC based WQOs, 90th percentiles for CMCs.
6. For zinc, alternate translator of 0.58 based on 90th percentile of log transformed winter season BA30 data produces adjusted WQO of 140 ug/L.
7. For simplicity and conservatism, a background hardness of 100 mg/L is assumed (RP conclusions not impacted by this variable).
8. If maximum CTR allowable 400 mg/L hardness is used, the hardness dependent conversion factors for cadmium and lead are less conservative at 0.851 and 0.589, respectively.
9. RMP maximum total values used for bioaccumaltive mercury and selenium.

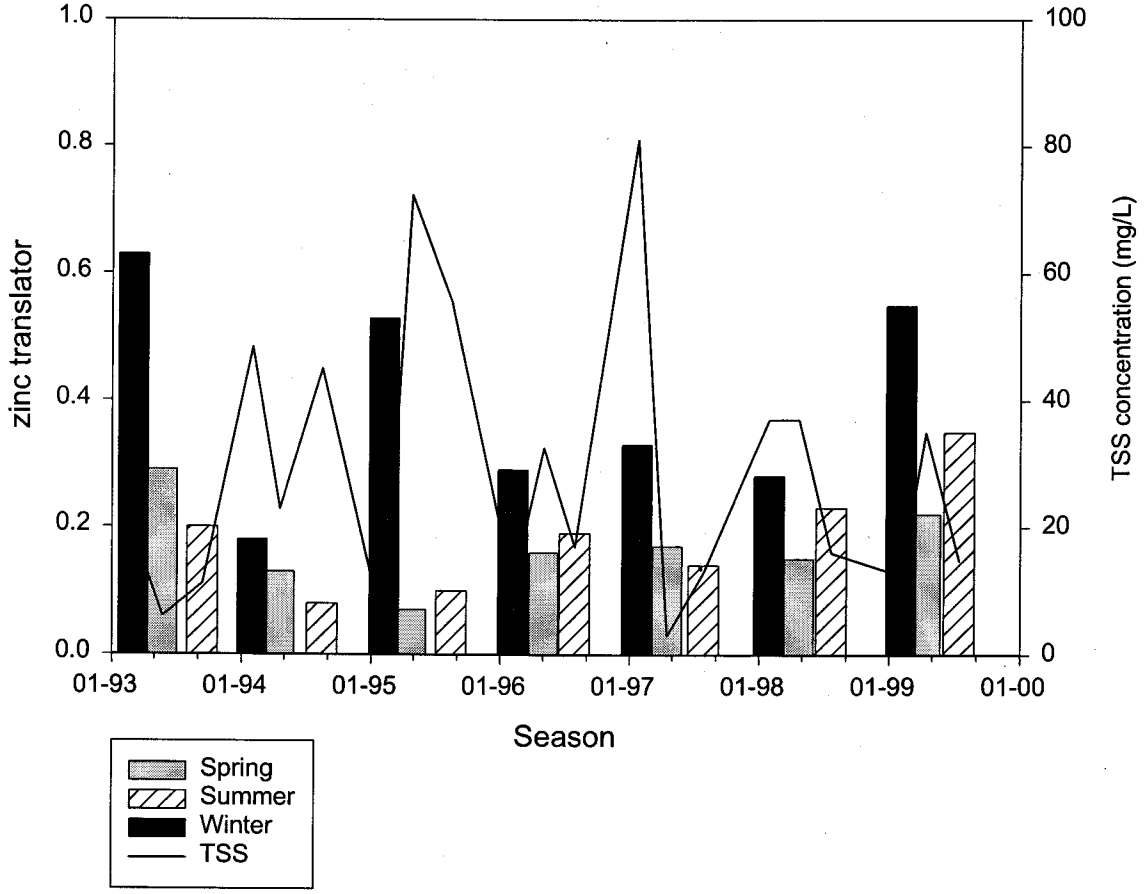
RMP STATION BA30 DUMBARTON BRIDGE DATA

Station Code	Date	total Zn*	dissolved Zn	translator Zn	Chlorophyll-a	Conductivity	DO	DOC	pH	Salinity (by SCT)	Silicates	Temp	TSS	Season
		µg/L	µg/L		mg/m3	µmho	mg/L	mg/L	pH	o/oo	mg/L	°C	mg/L	
BA30	03/02/1993	4.13	2.61	0.63	1.9	NA	9.8	3.41	8.0	13.8	5.1	12.0	19.1	winter
BA30	05/24/1993	3.26	0.94	0.29	2.4	NA	7.2	2.80	7.9	22.2	2.6	21.0	6.0	spring
BA30	09/13/1993	2.76	0.55	0.20	1.6	39000	6.9	2.19	7.9	28.7	5.0	21.0	11.2	summer
BA30	01/31/1994	8.02	1.45	0.18	1.5	30200	8.2	1.53	7.9	27.3	1.3	11.0	48.5	winter
BA30	04/18/1994	8.63	1.10	0.13	4.1	31700	7.9	2.88	8.1	25.7	2.2	20.0	22.8	spring
BA30	08/15/1994	7.82	0.62	0.08	1.6	43600	7.3	2.73	8.0	29.5	0.4	23.0	45.1	summer
BA30	02/06/1995	3.96	2.08	0.53	14.5	20500	9.4	3.32	7.7	16.5	4.2	14.2	3.2	winter
BA30	04/24/1995	14.85	0.97	0.07	44.6	18200	8.5	4.11	8.0	13.4	3.7	16.9	72.3	spring
BA30	08/15/1995	9.31	0.95	0.10	1.9	33300	6.2	3.00	7.8	22.2	4.8	22.9	55.6	summer
BA30	02/05/1996	6.60	1.91	0.29	1.1	26200	9.2	3.15	7.9	22.0	3.7	13.5	10.6	winter
BA30	05/02/1996	6.30	1.01	0.16	4.5	24500	6.6	2.58	7.9	15.5	0.9	22.3	32.5	spring
BA30	07/29/1996	3.70	0.70	0.19	4.5	31000	6.7	2.55	8.0	19.0	4.8	24.4	16.9	summer
BA30	01/21/1997	9.70	3.20	0.33	2.3	12380	8.6	3.97	7.7	7.1	6.0	10.5	81.0	winter
BA30	04/16/1997	4.70	0.80	0.17	22.3	32470	10.5	2.79	8.3	NA	2.0	18.4	3.0	spring
BA30	07/28/1997	5.00	0.70	0.14	4.0	43020	7.2	2.96	7.7	27.8	4.0	23.4	13.0	summer
BA30	01/28/1998	7.50	2.10	0.28	2.9	29830	10.1	2.81	7.5	19.0	2.0	13.4	37.0	winter
BA30	04/22/1998	5.30	0.80	0.15	34.2	23890	9.3	3.02	8.4	14.5	1.0	17.4	37.0	spring
BA30	07/21/1998	4.80	1.10	0.23	2.7	32720	r 7.3	2.91	7.9	20.5	5.0	22.1	16.0	summer
BA30	02/02/1999	5.50	3.00	0.55	3.0	29300	8.5	2.33	7.9	26.1	1.1	9.8	12.5	winter
BA30	04/12/1999	8.20	1.80	0.22	16.5	28300	9.9	2.53	8.2	17.1	1.1	14.0	35.0	spring
BA30	07/14/1999	4.90	1.70	0.35	9.0	42000	6.2	3.20	7.8	25.0	1.1	23.2	14.8	summer
Statistics														
# samples		21	21	21	21	19	20	21	21	20	21	21	21	
minimum		2.76	0.55	0.07	1.1	12380	6.2	1.5	7.5	7.1	0.4	9.8	3.0	
maximum		14.85	3.20	0.63	44.6	43600	10.5	4.1	8.4	29.5	6.0	24.4	81.0	
average		6.43	1.43	0.25	8.6	30111	8.2	2.9	7.9	20.6	3.0	17.8	28.2	
geometric mean		5.92	1.25	0.21	4.5	28883	8.1	2.8	7.9	19.6	2.3	17.1	20.0	
median		5.50	1.10	0.20	3.0	30200	8.4	2.9	7.9	21.3	2.6	18.4	19.1	
standard deviation		2.81	0.80	0.15	11.8	8276	1.4	0.6	0.2	6.1	1.8	4.9	22.1	
90th percentile		9.31	2.61	0.53	22.3	42204	9.9	3.4	8.2	27.9	5.0	23.2	55.6	

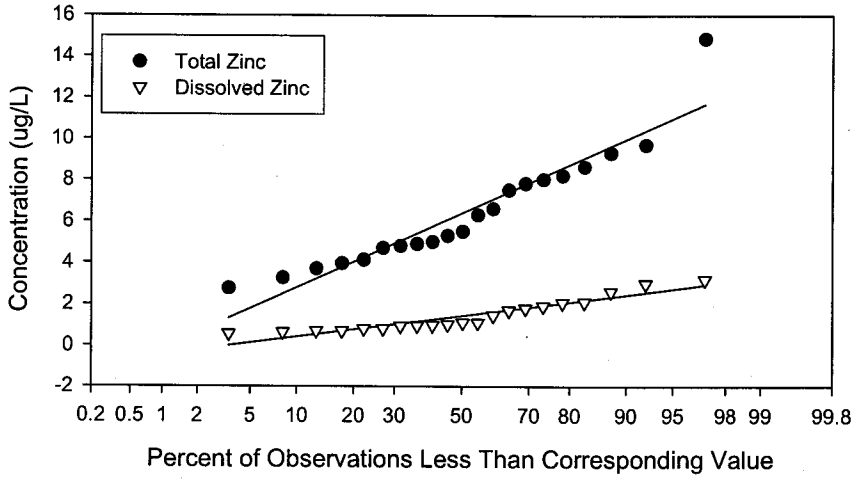
F:\SU32\SU32-29\RPA\RMP Translators\[zn&physicochem data.xls]BA30


Total Zinc at Station BA30
total zinc concentration (ug/L)
TSS concentration (mg/L)
16
14
12
10
8
6
4
2
0
100
80
60
40
20
0
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Dissolved Zinc at Station BA30
dissolved zinc concentration (ug/L)
TSS concentration (mg/L)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
100
80
60
40
20
0
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Spring
Summer
Winter
TSS

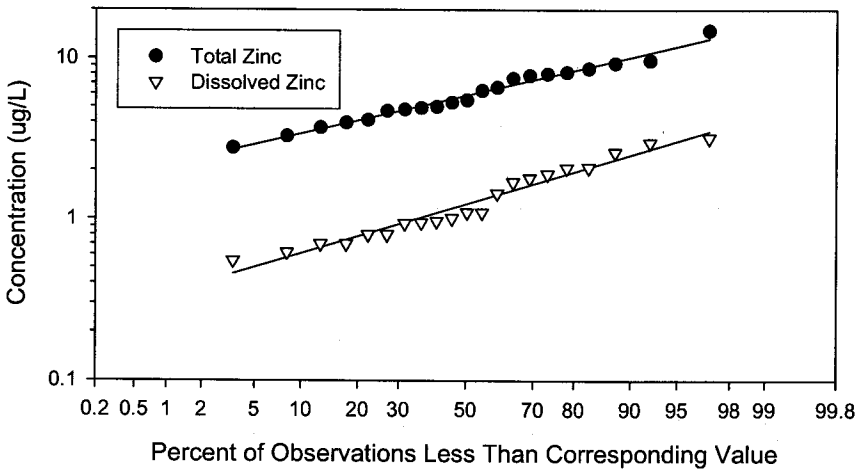
Zinc Translator at Station BA30



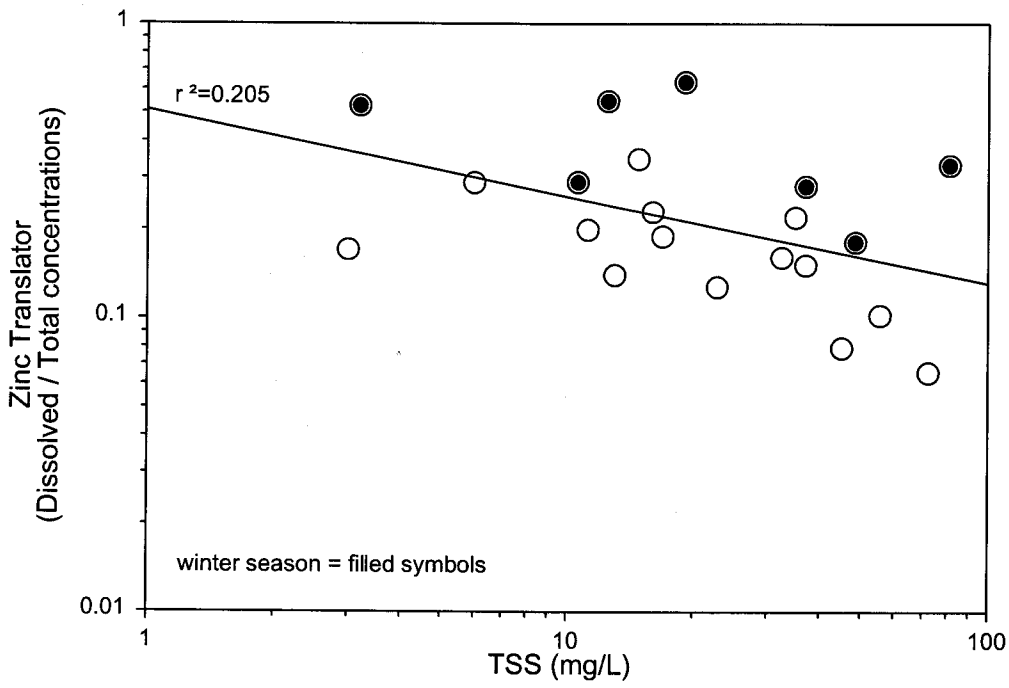
Normal Probability Plot for
Total and Dissolved Zinc at BA30



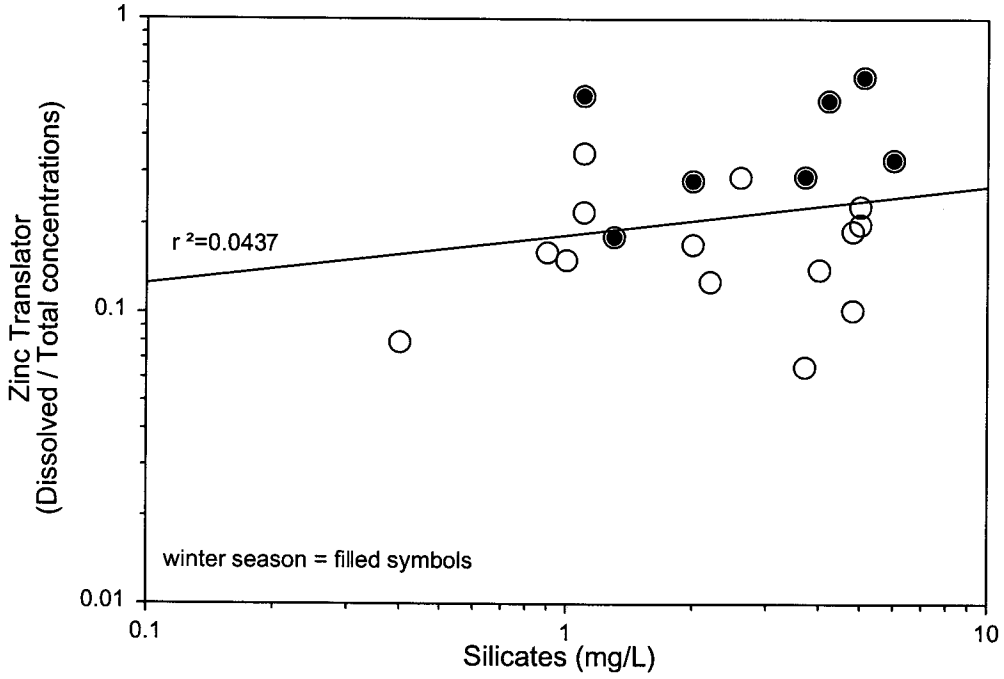
Lognormal Probability Plot for
Total and Dissolved Zinc at BA30



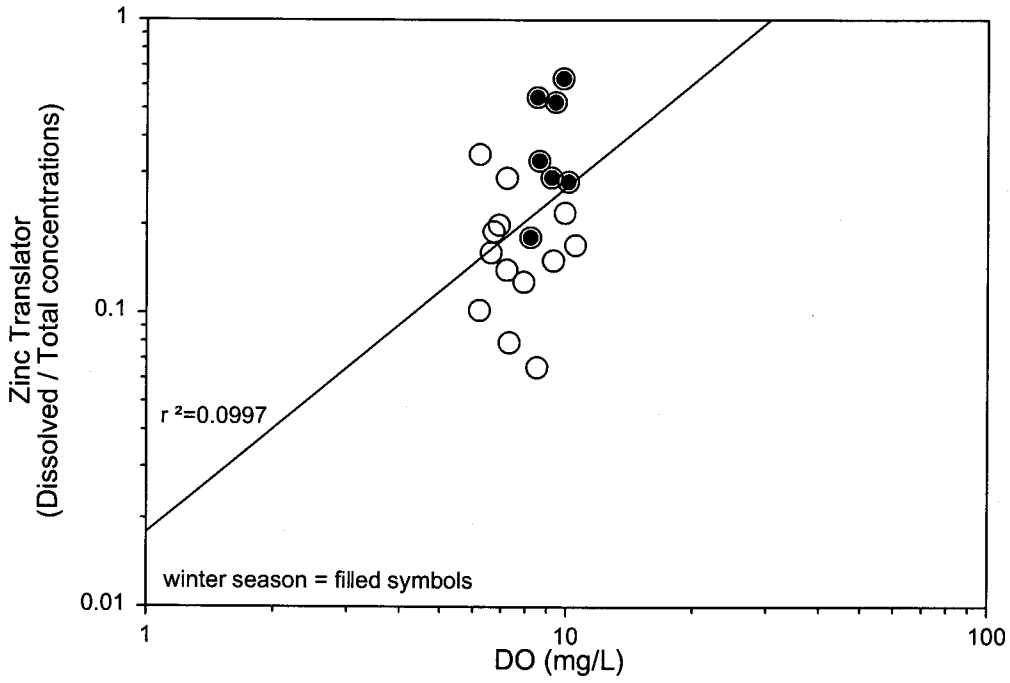
Scatter plot for
TSS vs. Translator for Zinc at BA30



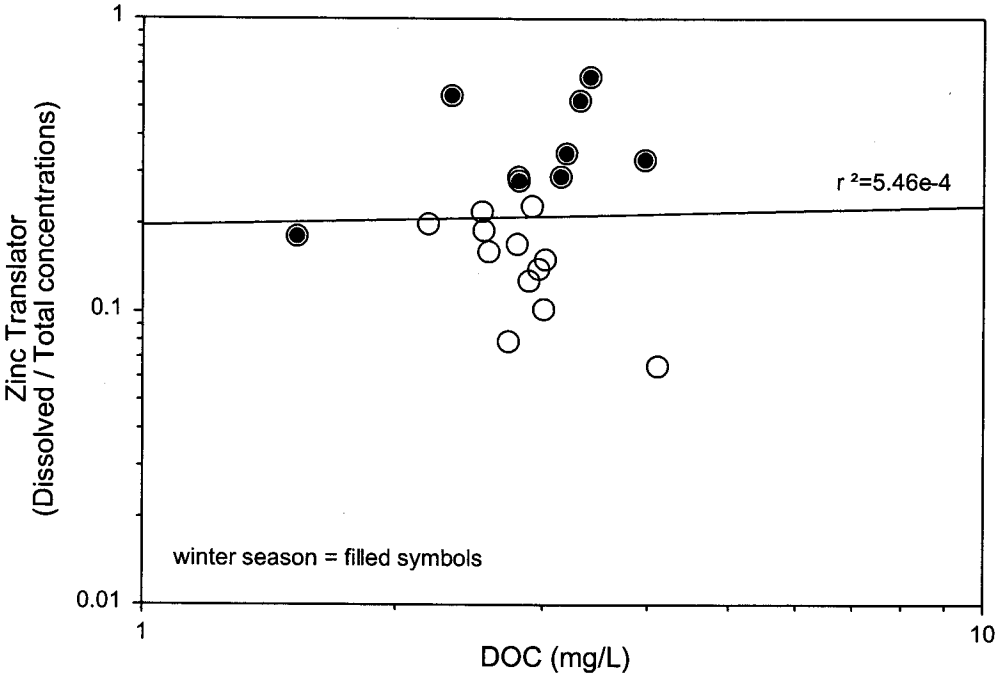
Scatter plot for
Silicates vs. Translator for Zinc at BA30

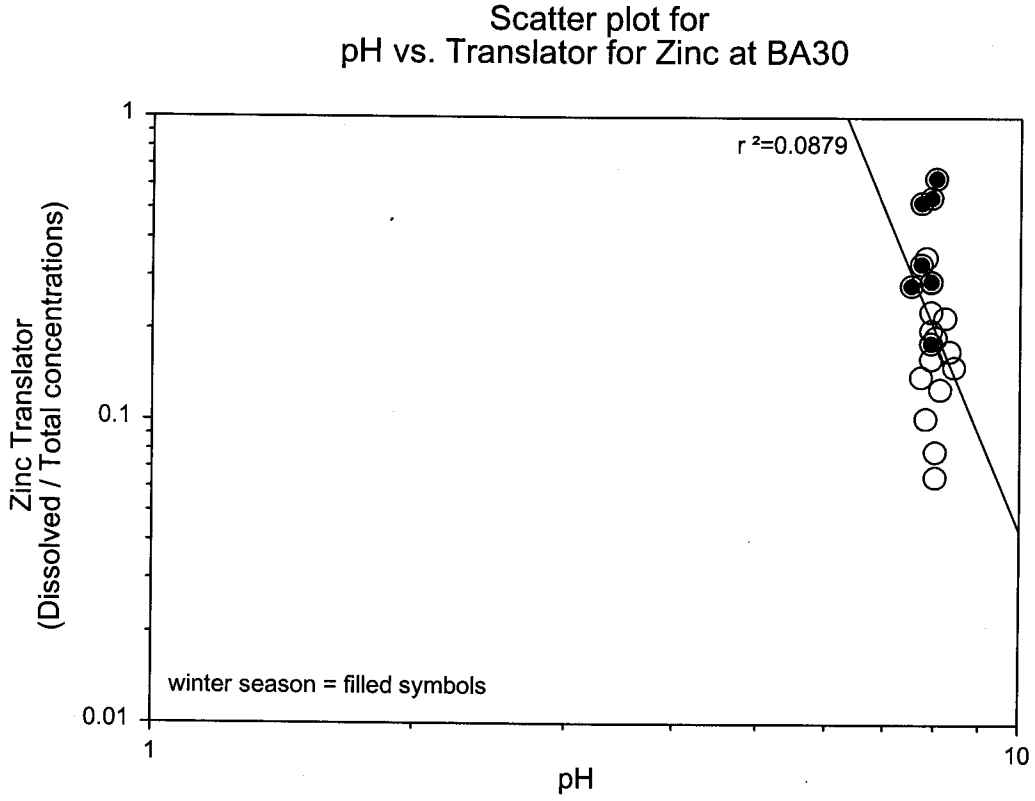


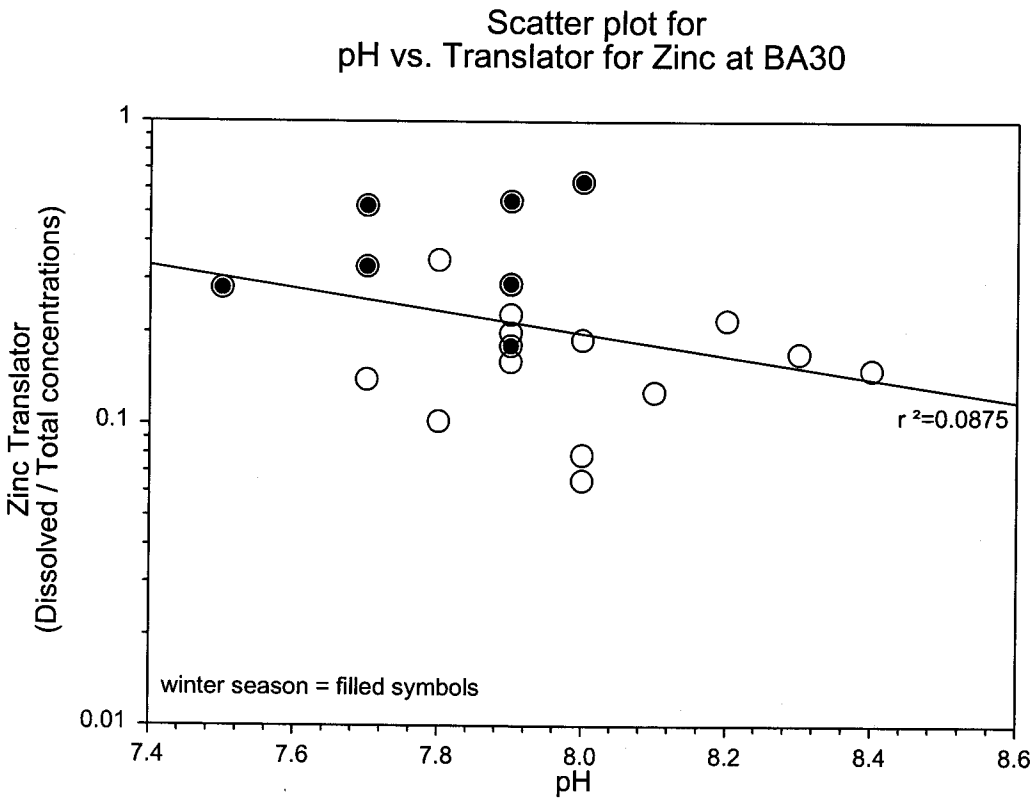
Scatter plot for
DO vs. Translator for Zinc at BA30



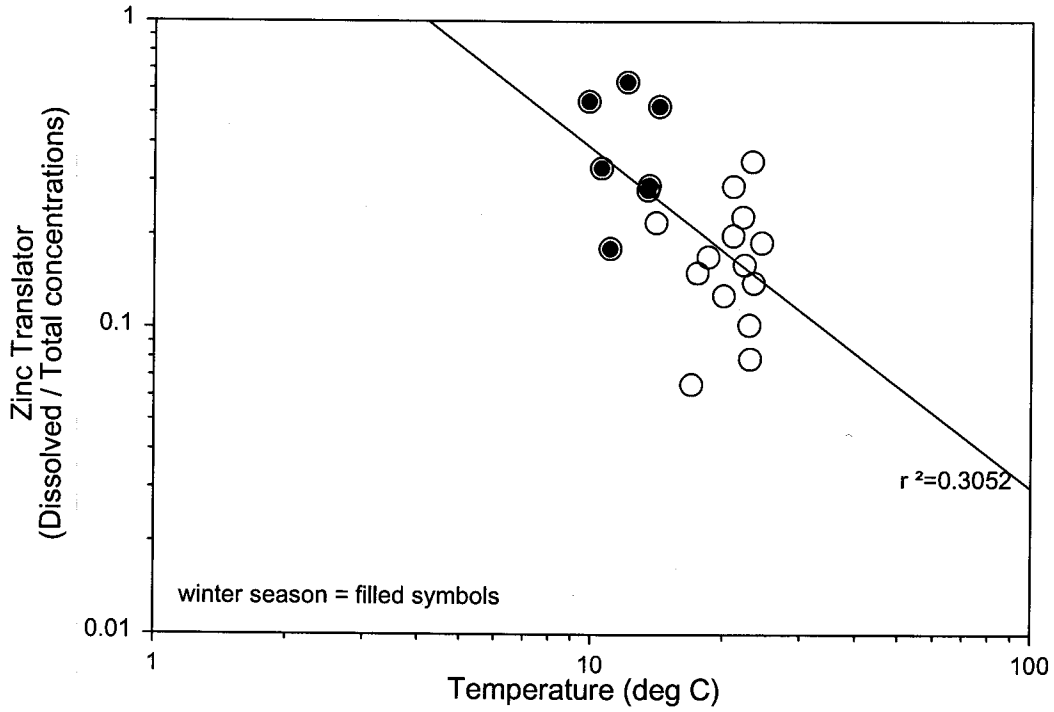
Scatter plot for
DOC vs. Translator for Zinc at BA30



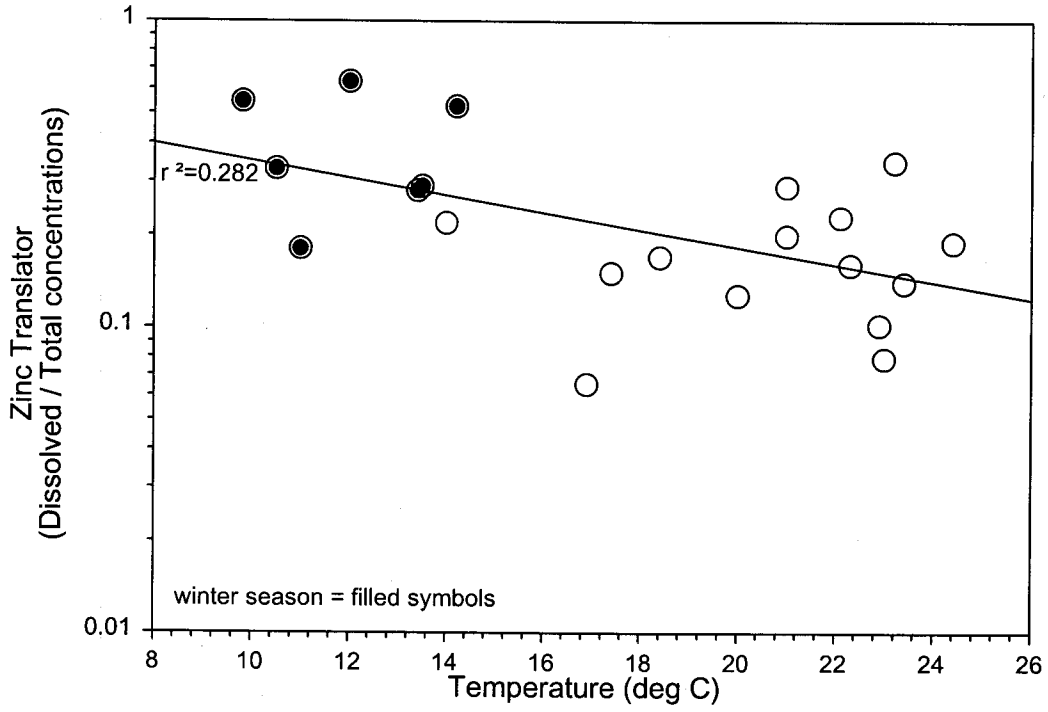

Scatter plot for
pH vs. Translator for Zinc at BA30
r ²=0.0879
winter season = filled symbols
Zinc Translator
(Dissolved / Total concentrations)
1
0.1
0.01
1
10
pH


Scatter plot for
pH vs. Translator for Zinc at BA30
r ²=0.0875
winter season = filled symbols
Zinc Translator
(Dissolved / Total concentrations)
1
0.1
0.01
7.4
7.6
7.8
8.0
8.2
8.4
8.6
pH

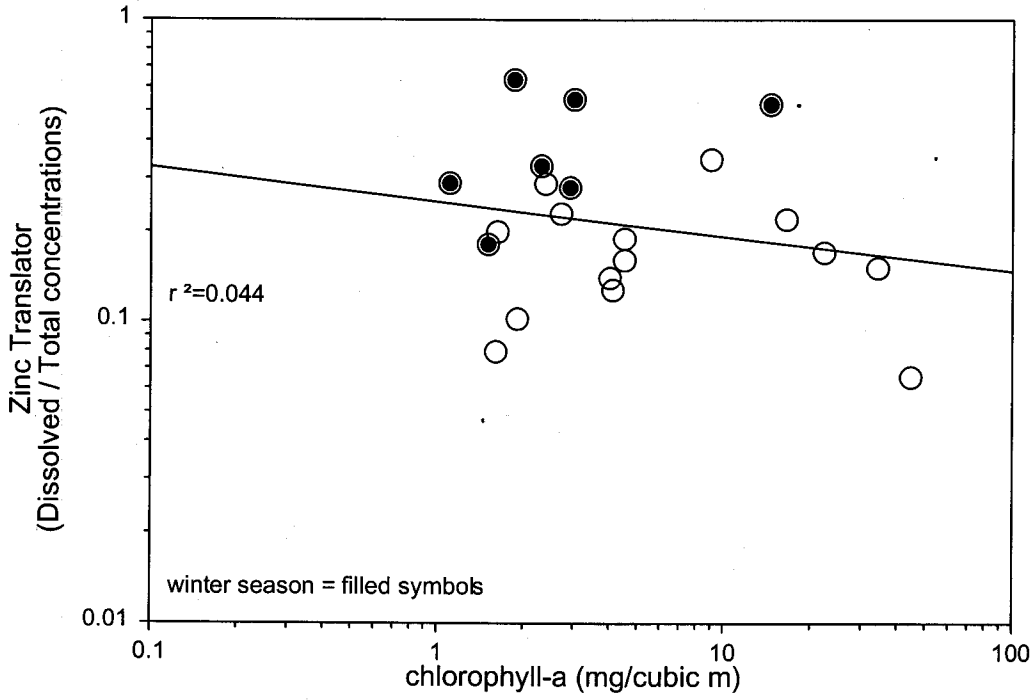
Scatter plot for
Temperature vs. Translator for Zinc at BA30



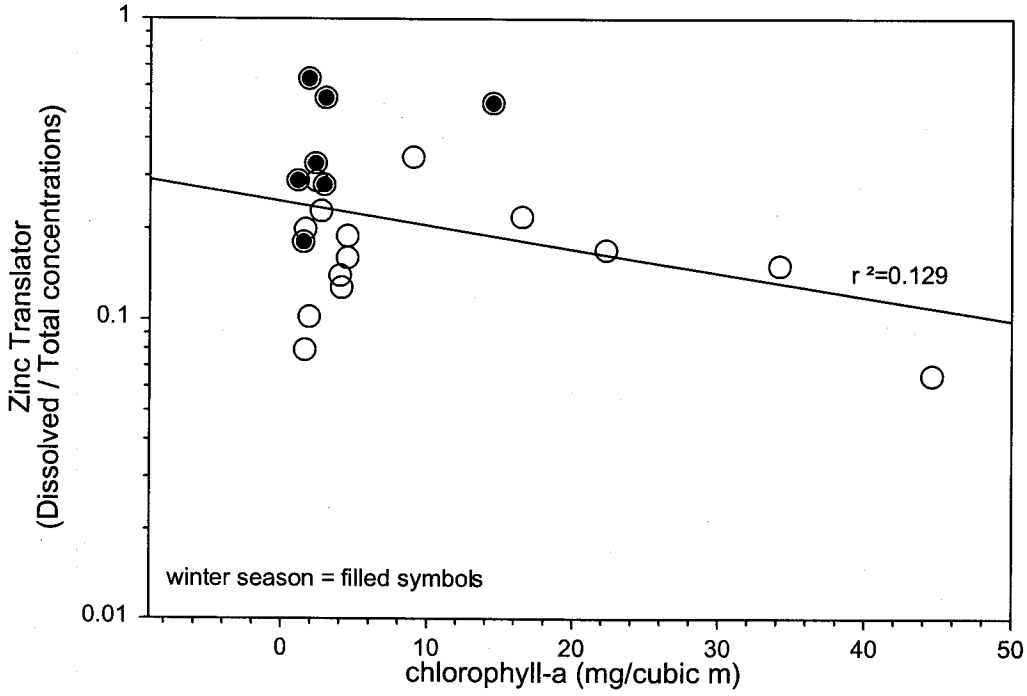
Scatter plot for
Temperature vs. Translator for Zinc at BA30



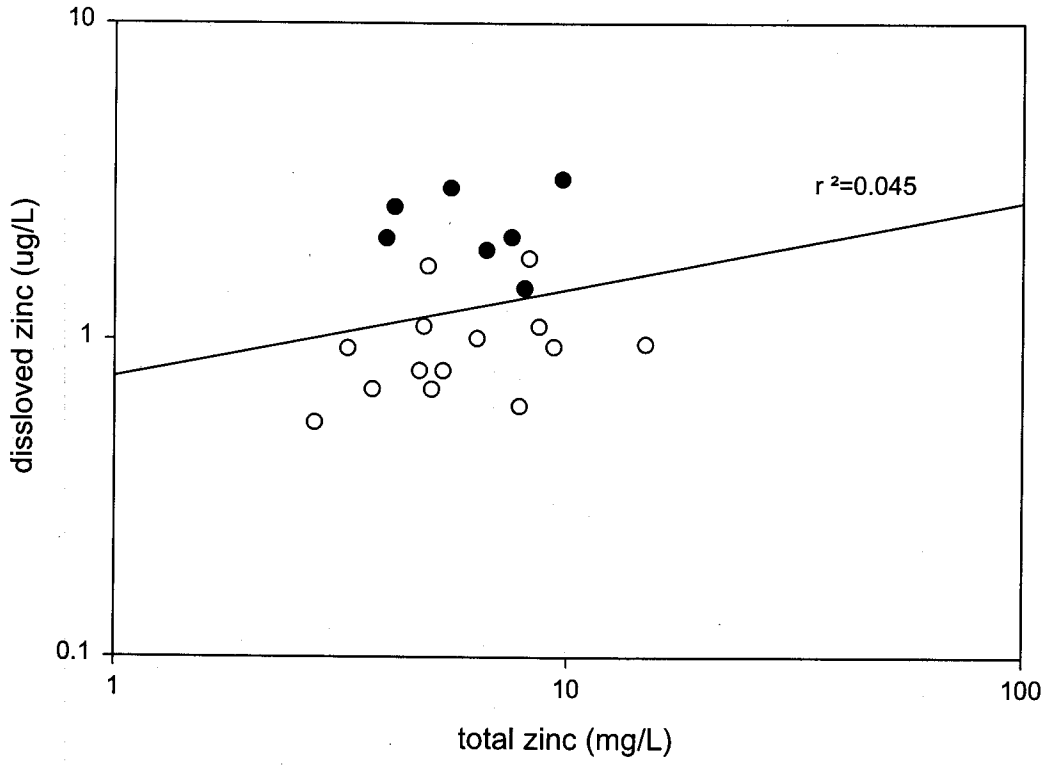
Scatter plot for
Chlorophyll a vs. Translator for Zinc at BA30



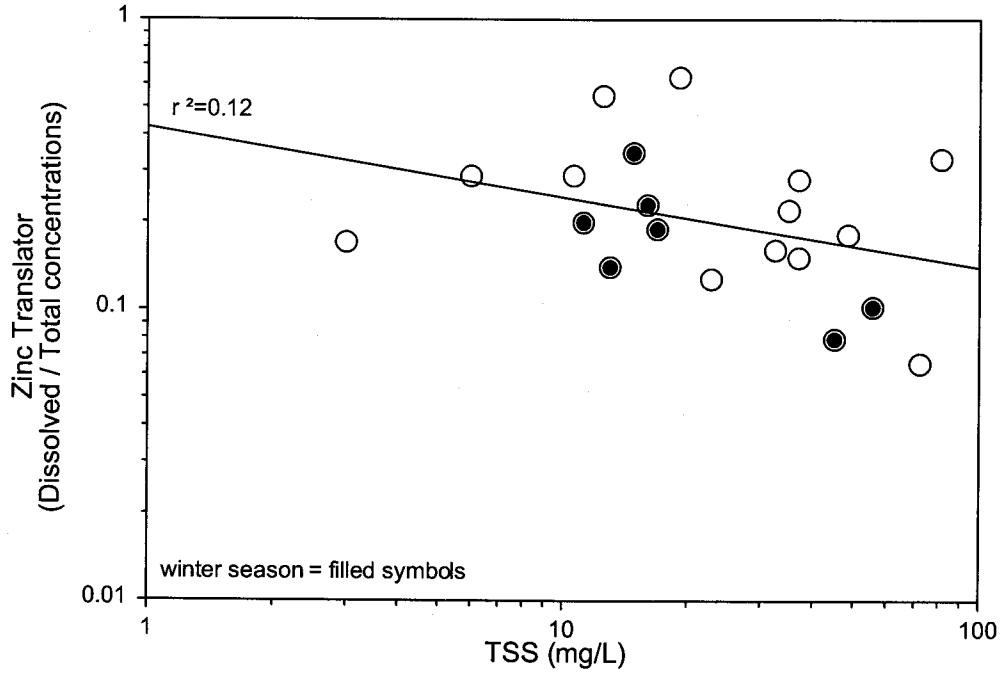
Scatter plot for
Chlorophyll a vs. Translator for Zinc at BA30



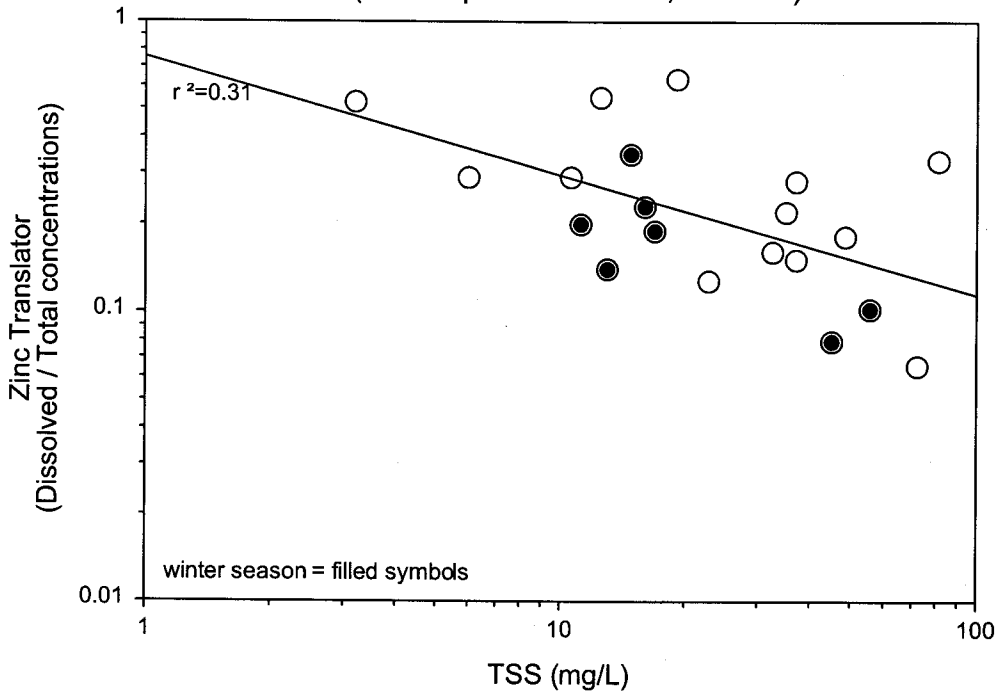
Total Zinc vs Dissolved Zinc at BA30



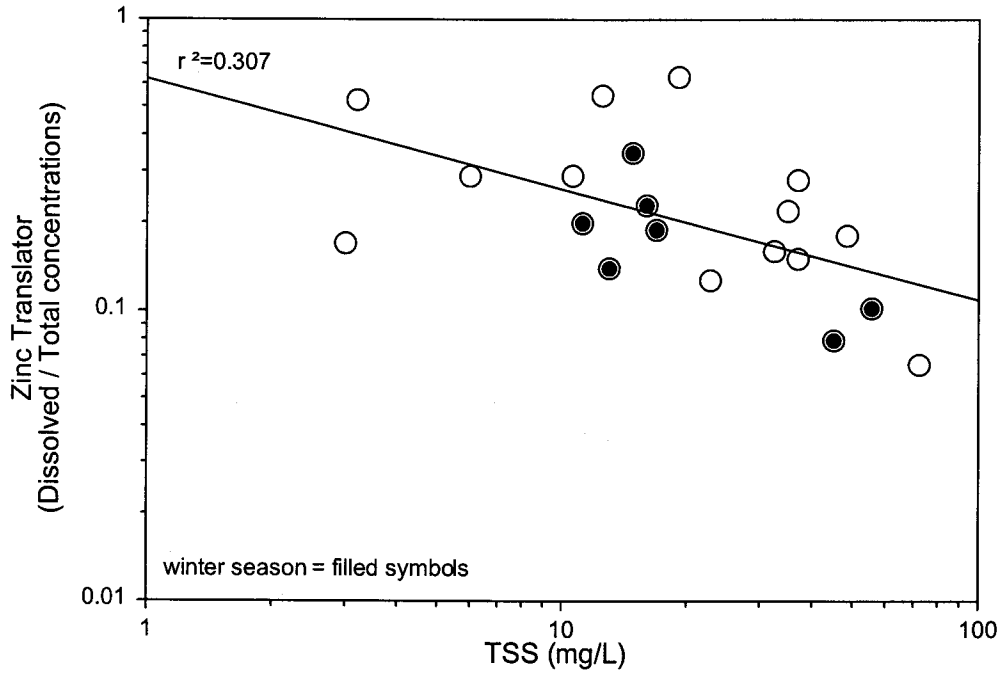
Scatter plot for
TSS vs. Translator for Zinc at BA30
(1 data point removed, 2/6/95)



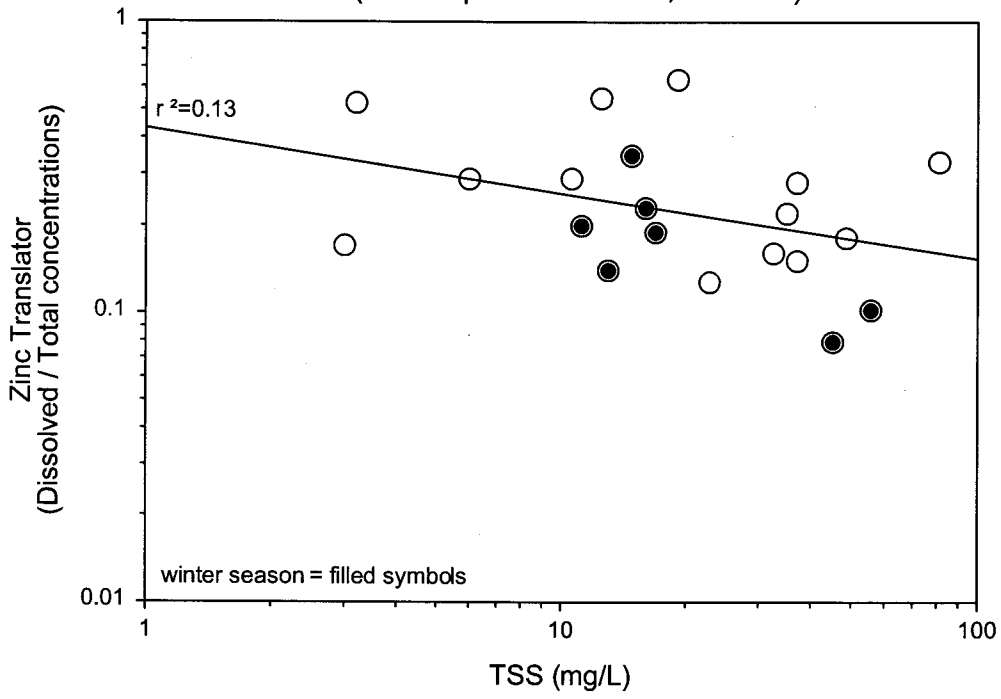
Scatter plot for
TSS vs. Translator for Zinc at BA30
(1 data point removed, 4/16/97)



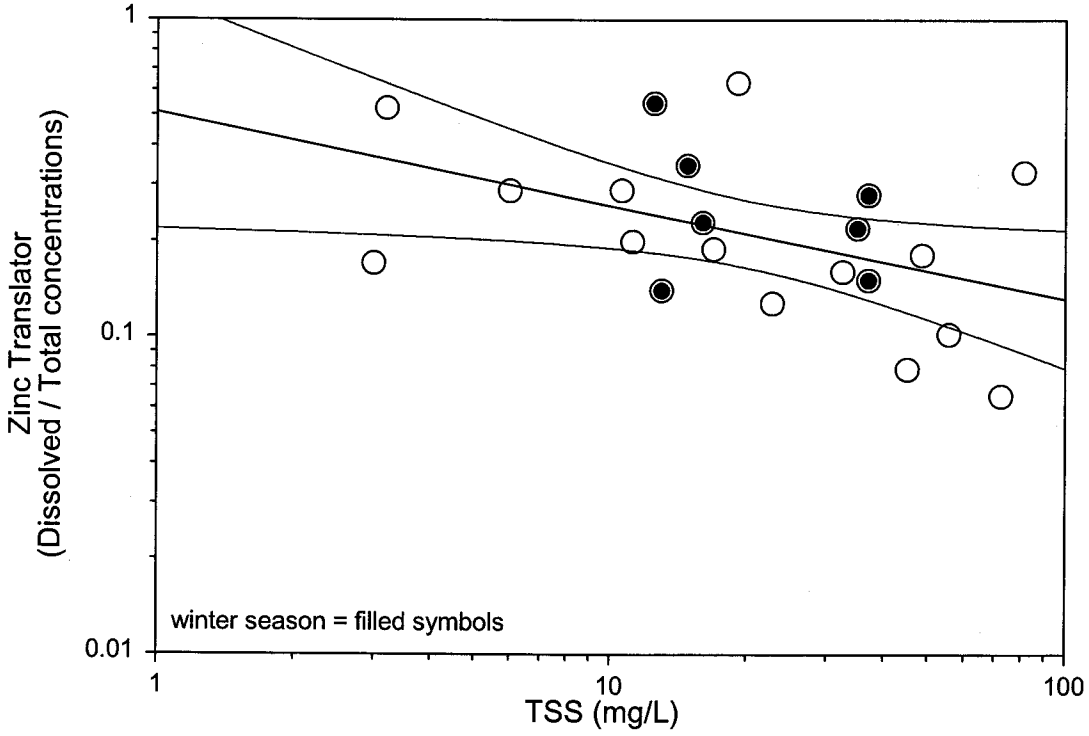
Scatter plot for
TSS vs. Translator for Zinc at BA30
(1 data point removed, 1/21/97)



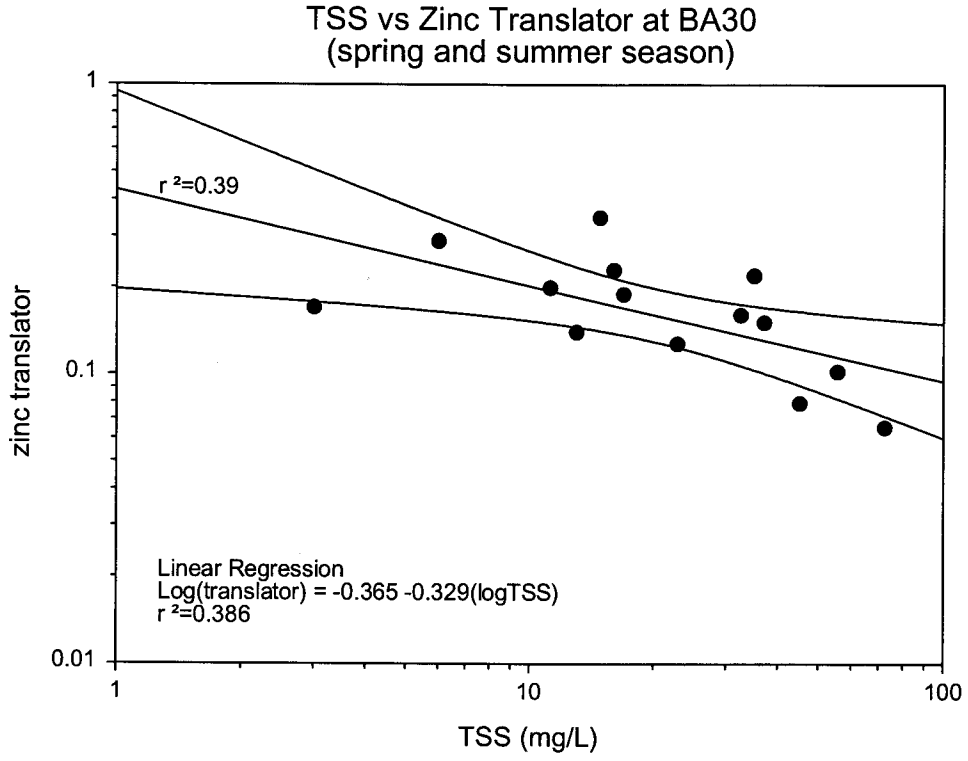
Scatter plot for
TSS vs. Translator for Zinc at BA30
(1 data point removed, 4/24/95)

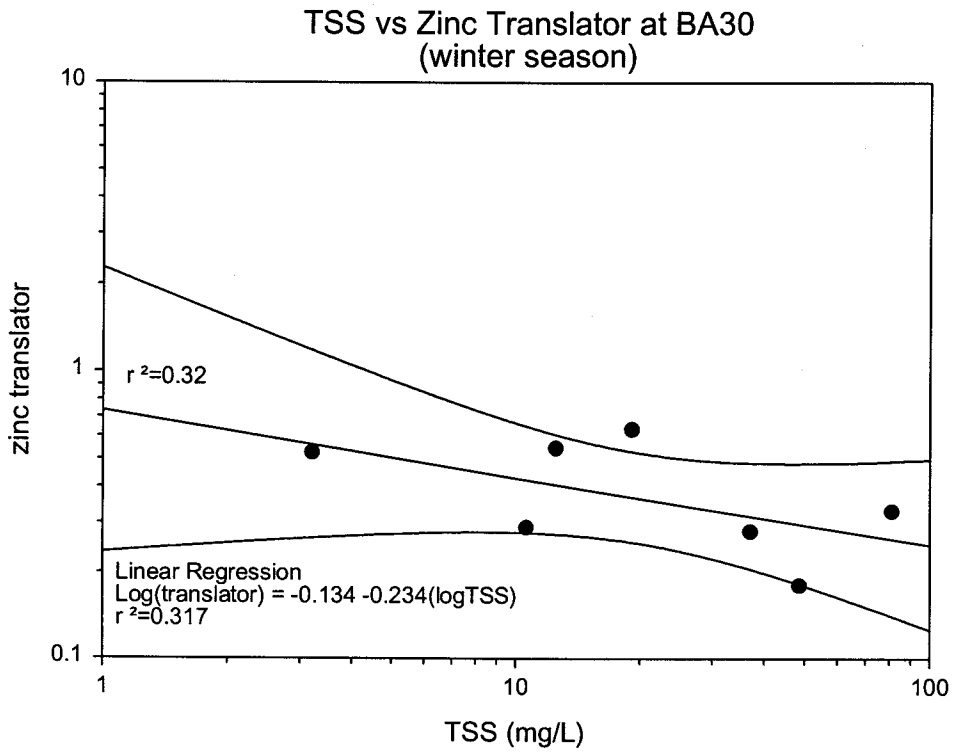


Scatter plot for
TSS vs. Translator for Zinc at BA30
Linear Regression with 95% Confidence Interval

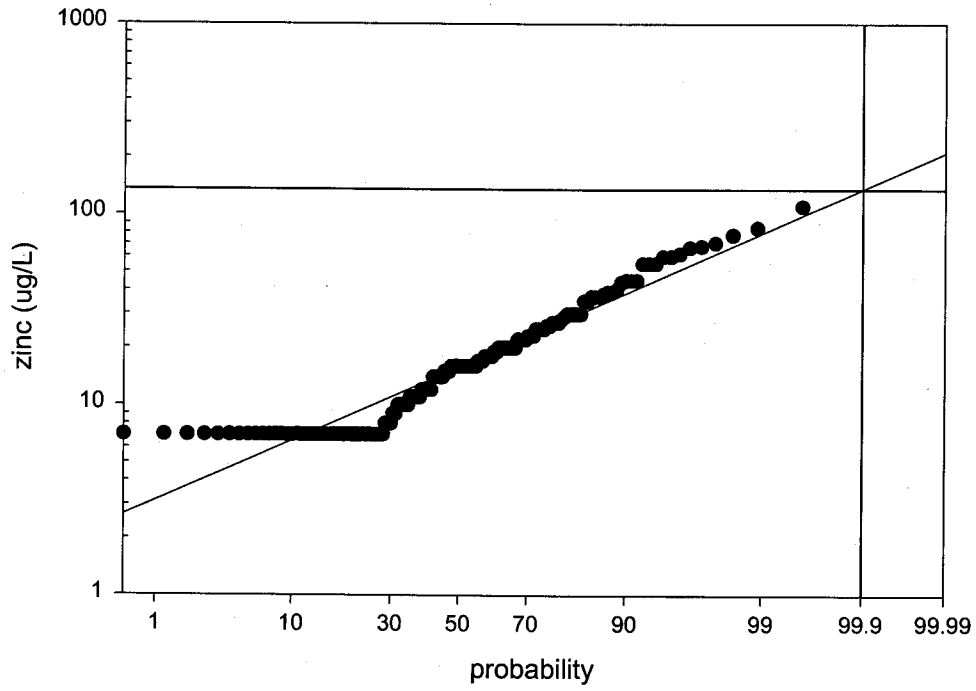


Linear Regression
Log(translator) = -0.293 -0.294(logTSS)
r^2=0.205

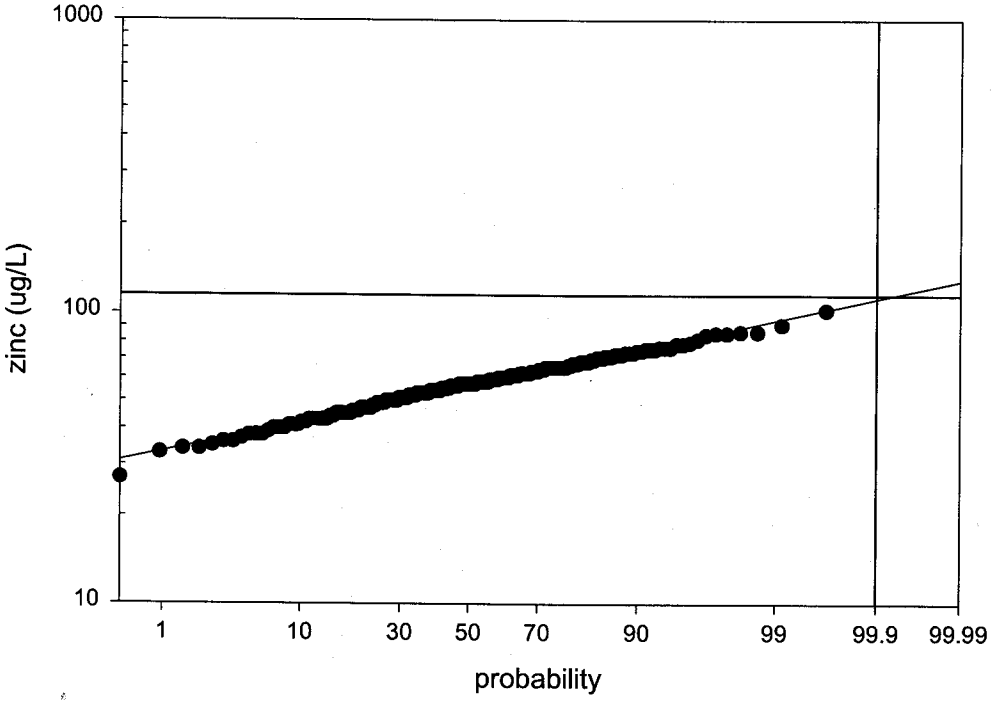

TSS vs Zinc Translator at BA30
(spring and summer season)
zinc translator
1
0.1
0.01
r ²=0.39
Linear Regression
Log(translator) = -0.365 -0.329(logTSS)
r ²=0.386
1
10
100
TSS (mg/L)


TSS vs Zinc Translator at BA30
(winter season)
zinc translator
10
1
0.1
r ²=0.32
Linear Regression
Log(translator) = -0.134 -0.234(logTSS)
r ²=0.317
1
10
100
TSS (mg/L)

Sunnyvale Zinc Effluent Concentration
(11/99-10/02)



San Jose Zinc Effluent Concentration
(11/99-10/02)



San Jose Plant Effluent Zinc Concentrations

	Zinc Effluent	Data Sorted by Concentration	
Date	ug/L	Date	Zn Effluent (ug/L)
04/06/99	49	05/29/01	27
05/04/99	47	01/02/02	33
06/01/99	36	05/20/01	34
07/06/99	40	07/24/01	34
08/05/99	42	08/01/01	35
09/01/99	52	06/01/99	36
10/07/99	51	07/10/01	36
11/02/99	57	12/26/00	37
12/02/99	56	09/04/00	38
01/04/00	62	04/08/01	38
02/01/00	78	04/15/01	38
03/08/00	73	09/11/01	39
04/04/00	63	07/06/99	40
05/02/00	56	11/26/00	40
06/06/00	61	06/26/01	40
07/04/00	41	07/04/00	41
08/01/00	59	03/25/01	41
08/17/00	69	05/24/01	41
08/20/00	65	08/05/99	42
08/22/00	65	01/08/02	42
08/24/00	59	04/10/01	43
08/27/00	56	04/12/01	43
08/29/00	65	04/29/01	43
08/31/00	60	05/06/01	43
09/04/00	38	08/14/01	43
09/05/00	60	12/25/01	43
09/06/00	73	10/02/01	44
09/10/00	85	12/04/01	44
09/12/00	102	04/01/01	45
09/14/00	73	04/17/01	45
09/17/00	59	05/13/01	45
09/19/00	61	06/05/01	45
09/21/00	52	07/17/01	45
09/24/00	65	11/20/01	45
09/26/00	67	05/15/01	46
09/28/00	76	05/27/01	46
10/01/00	62	03/19/02	46
10/03/00	78	05/04/99	47
10/05/00	65	05/08/01	47
10/09/00	54	08/07/01	47
10/10/00	76	08/28/01	47
10/12/00	68	10/30/01	47
10/15/00	59	01/02/01	48
10/17/00	74	03/04/01	48
10/19/00	72	04/06/99	49
10/22/00	55	06/19/01	49
10/24/00	71	07/02/01	49
10/26/00	75	09/25/01	49
10/29/00	58	11/05/00	50

San Jose Plant Effluent Zinc Concentrations

	Zinc Effluent	Data Sorted by Concentration	
Date	ug/L	Date	Zn Effluent (ug/L)
10/31/00	60	01/15/01	50
11/02/00	59	02/19/01	50
11/05/00	50	03/11/01	50
11/07/00	55	10/23/01	50
11/08/00	63	03/26/02	50
11/12/00	53	10/07/99	51
11/14/00	65	03/13/01	51
11/16/00	66	10/09/01	51
11/19/00	72	12/18/01	51
11/20/00	55	02/05/02	51
11/21/00	67	09/01/99	52
11/26/00	40	09/21/00	52
11/28/00	75	03/22/01	52
11/30/00	69	03/27/01	52
12/03/00	63	11/12/00	53
12/05/00	70	01/21/01	53
12/07/00	70	02/25/01	53
12/10/00	62	05/01/01	53
12/12/00	71	05/10/01	53
12/14/00	61	06/12/01	53
12/17/00	58	10/16/01	53
12/19/00	91	10/09/00	54
12/20/00	64	03/18/01	54
12/21/00	79	03/20/01	54
12/26/00	37	09/18/01	54
12/27/00	64	11/27/01	54
12/28/00	65	02/26/02	54
01/02/01	48	10/22/00	55
01/03/01	84	11/07/00	55
01/04/01	68	11/20/00	55
01/07/01	66	04/24/01	55
01/09/01	86	01/15/02	55
01/11/01	56	12/02/99	56
01/15/01	50	05/02/00	56
01/16/01	86	08/27/00	56
01/18/01	85	01/11/01	56
01/21/01	53	11/06/01	56
01/23/01	72	11/02/99	57
01/25/01	67	02/11/01	57
01/28/01	60	03/08/01	57
01/30/01	65	04/05/01	57
02/01/01	74	04/19/01	57
02/04/01	61	08/21/01	57
02/06/01	75	11/13/01	57
02/08/01	71	01/22/02	57
02/11/01	57	03/05/02	57
02/13/01	70	03/12/02	57
02/15/01	58	10/29/00	58
02/19/01	50	12/17/00	58

San Jose Plant Effluent Zinc Concentrations

	Zinc Effluent	Data Sorted by Concentration	
Date	ug/L	Date	Zn Effluent (ug/L)
02/20/01	64	02/15/01	58
02/22/01	63	04/03/01	58
02/25/01	53	09/05/01	58
02/27/01	65	12/11/01	58
03/01/01	68	02/12/02	58
03/04/01	48	08/01/00	59
03/06/01	65	08/24/00	59
03/08/01	57	09/17/00	59
03/11/01	50	10/15/00	59
03/13/01	51	11/02/00	59
03/15/01	60	08/31/00	60
03/18/01	54	09/05/00	60
03/20/01	54	10/31/00	60
03/22/01	52	01/28/01	60
03/25/01	41	03/15/01	60
03/27/01	52	02/19/02	60
03/29/01	62	06/06/00	61
04/01/01	45	09/19/00	61
04/03/01	58	12/14/00	61
04/05/01	57	02/04/01	61
04/08/01	38	05/03/01	61
04/10/01	43	01/04/00	62
04/12/01	43	10/01/00	62
04/15/01	38	12/10/00	62
04/17/01	45	03/29/01	62
04/19/01	57	04/26/01	62
04/22/01	76	05/17/01	62
04/24/01	55	04/04/00	63
04/26/01	62	11/08/00	63
04/29/01	43	12/03/00	63
05/01/01	53	02/22/01	63
05/03/01	61	12/20/00	64
05/06/01	43	12/27/00	64
05/08/01	47	02/20/01	64
05/10/01	53	08/20/00	65
05/13/01	45	08/22/00	65
05/15/01	46	08/29/00	65
05/17/01	62	09/24/00	65
05/20/01	34	10/05/00	65
05/22/01	68	11/14/00	65
05/24/01	41	12/28/00	65
05/27/01	46	01/30/01	65
05/29/01	27	02/27/01	65
06/05/01	45	03/06/01	65
06/12/01	53	11/16/00	66
06/19/01	49	01/07/01	66
06/26/01	40	09/26/00	67
07/02/01	49	11/21/00	67
07/10/01	36	01/25/01	67

San Jose Plant Effluent Zinc Concentrations

Date	Zinc Effluent ug/L	Data Sorted by Concentration Date	Zn Effluent (ug/L)
07/17/01	45	10/12/00	68
07/24/01	34	01/04/01	68
08/01/01	35	03/01/01	68
08/07/01	47	05/22/01	68
08/14/01	43	08/17/00	69
08/21/01	57	11/30/00	69
08/28/01	47	12/05/00	70
09/05/01	58	12/07/00	70
09/11/01	39	02/13/01	70
09/18/01	54	10/24/00	71
09/25/01	49	12/12/00	71
10/02/01	44	02/08/01	71
10/09/01	51	10/19/00	72
10/16/01	53	11/19/00	72
10/23/01	50	01/23/01	72
10/30/01	47	03/08/00	73
11/06/01	56	09/06/00	73
11/13/01	57	09/14/00	73
11/20/01	45	10/17/00	74
11/27/01	54	02/01/01	74
12/04/01	44	10/26/00	75
12/11/01	58	11/28/00	75
12/18/01	51	02/06/01	75
12/25/01	43	09/28/00	76
01/02/02	33	10/10/00	76
01/08/02	42	04/22/01	76
01/15/02	55	02/01/00	78
01/22/02	57	10/03/00	78
01/29/02	81	12/21/00	79
02/05/02	51	01/29/02	81
02/12/02	58	01/03/01	84
02/19/02	60	09/10/00	85
02/26/02	54	01/18/01	85
03/05/02	57	01/09/01	86
03/12/02	57	01/16/01	86
03/19/02	46	12/19/00	91
03/26/02	50	09/12/00	102
# samples	184		
# NDs	0		
average	57.5		
st dev	12.6		
avg+3*stdev	95.2		
geomean	56.2		
geo stdev	1.2		
geo avg*geostdev^3	110		
max	102		
probit	115		

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City of Sunnyvale Plant Effluent Zinc Concentrations

Date		Zn Effluent ug/L
04/06/99		16
04/14/99		39
04/19/99		62
04/25/99		67
05/04/99		9
05/12/99	<	7
05/17/99	<	7
05/23/99		12
06/01/99	<	7
06/06/99		20
06/16/99		10
06/22/99		11
06/27/99		16
07/08/99		40
07/13/99	<	7
07/21/99	<	7
07/25/99		14
08/04/99	<	7
08/10/99		8
08/15/99		14
08/23/99		10
09/01/99	<	7
09/07/99	<	7
09/13/99	<	7
09/19/99		10
09/28/99		14
10/06/99		9
10/12/99		7
10/17/99		18
10/25/99		11
11/03/99		16
11/09/99		30
11/15/99		25
11/21/99		23
12/01/99		25
12/06/99		16
12/14/99		27
12/19/99		23
12/27/99		11
01/05/00		18
01/11/00		27
01/17/00		27
01/23/00		44
02/01/00		28
02/09/00		25
02/13/00		17
02/23/00		26
02/29/00		29
03/05/00		18

Data Sorted by Concentration

Date		Zn Effluent (ug/L)
05/12/99	<	7
05/17/99	<	7
06/01/99	<	7
07/13/99	<	7
07/21/99	<	7
08/04/99	<	7
09/01/99	<	7
09/07/99	<	7
09/13/99	<	7
10/12/99		7
05/02/00	<	7
08/09/00	<	7
08/14/00	<	7
08/22/00	<	7
08/27/00	<	7
09/06/00	<	7
09/13/00	<	7
09/18/00	<	7
09/24/00	<	7
10/03/00	<	7
10/09/00	<	7
10/15/00	<	7
10/25/00	<	7
10/31/00	<	7
11/05/00	<	7
01/23/01	<	7
04/16/01	<	7
05/29/01	<	7
06/13/01	<	7
06/18/01	<	7
06/24/01	<	7
07/23/01	<	7
08/01/01	<	7
08/07/01	<	7
08/13/01	<	7
08/20/01	<	7
08/26/01	<	7
09/23/01	<	7
11/13/01	<	7
03/06/02	<	7
03/18/02	<	7
08/10/99		8
04/04/01		8
05/01/01		8
05/04/99		9
10/06/99		9
06/16/99		10
08/23/99		10
09/19/99		10

City of Sunnyvale Plant Effluent Zinc Concentrations

Date	Zn Effluent ug/L	Data Sorted by Concentration Date	Zn Effluent (ug/L)
03/15/00	35	06/25/00	10
03/20/00	22	07/23/00	10
03/26/00	78	06/22/99	11
04/04/00	17	10/25/99	11
04/09/00	15	12/27/99	11
04/19/00	12	05/09/01	11
04/24/00	23	09/12/01	11
05/02/00	< 7	05/23/99	12
05/10/00	39	04/19/00	12
05/15/00	16	03/04/01	12
05/21/00	30	07/01/01	12
05/29/00	68	07/19/01	12
06/06/00	22	07/25/99	14
06/14/00	37	08/15/99	14
06/19/00	16	09/28/99	14
06/25/00	10	02/26/01	14
07/05/00	110	09/04/01	14
07/10/00	45	04/09/00	15
07/18/00	25	11/14/00	15
07/23/00	10	12/10/00	15
08/01/00	20	04/06/99	16
08/09/00	< 7	06/27/99	16
08/14/00	< 7	11/03/99	16
08/22/00	< 7	12/06/99	16
08/27/00	< 7	05/15/00	16
09/06/00	< 7	06/19/00	16
09/13/00	< 7	04/22/01	16
09/18/00	< 7	05/13/01	16
09/24/00	< 7	07/09/01	16
10/03/00	< 7	12/26/01	16
10/09/00	< 7	01/02/02	16
10/15/00	< 7	01/13/02	16
10/25/00	< 7	02/13/00	17
10/31/00	< 7	04/04/00	17
11/05/00	< 7	10/03/01	17
11/14/00	15	10/17/99	18
11/19/00	20	01/05/00	18
11/27/00	20	03/05/00	18
12/05/00	30	04/10/01	18
12/10/00	15	06/05/01	19
12/18/00	20	11/08/01	19
12/25/00	20	06/06/99	20
01/03/01	30	08/01/00	20
01/09/01	45	11/19/00	20
01/15/01	20	11/27/00	20
01/23/01	< 7	12/18/00	20
02/05/01	85	12/25/00	20
02/14/01	45	01/15/01	20
02/20/01	35	09/19/01	20

City of Sunnyvale Plant Effluent Zinc Concentrations

Date		Zn Effluent ug/L	Data Sorted by Concentration Date	Zn Effluent (ug/L)
02/26/01		14	03/20/00	22
03/04/01		12	06/06/00	22
03/12/01		60	03/28/01	22
03/20/01		60	12/17/01	22
03/28/01		22	11/21/99	23
04/04/01		8	12/19/99	23
04/10/01		18	04/24/00	23
04/16/01	<	7	11/15/99	25
04/22/01		16	12/01/99	25
05/01/01		8	02/09/00	25
05/09/01		11	07/18/00	25
05/13/01		16	02/23/00	26
05/21/01		30	12/09/01	26
05/29/01	<	7	12/14/99	27
06/05/01		19	01/11/00	27
06/13/01	<	7	01/17/00	27
06/18/01	<	7	02/01/00	28
06/24/01	<	7	02/29/00	29
07/01/01		12	11/09/99	30
07/09/01		16	05/21/00	30
07/19/01		12	12/05/00	30
07/23/01	<	7	01/03/01	30
08/01/01	<	7	05/21/01	30
08/07/01	<	7	03/15/00	35
08/13/01	<	7	02/20/01	35
08/20/01	<	7	06/14/00	37
08/26/01	<	7	10/10/01	37
09/04/01		14	11/26/01	37
09/12/01		11	12/04/01	38
09/19/01		20	04/14/99	39
09/23/01	<	7	05/10/00	39
10/03/01		17	07/08/99	40
10/10/01		37	01/23/00	44
10/17/01		55	07/10/00	45
10/22/01		55	01/09/01	45
10/28/01		55	02/14/01	45
11/08/01		19	10/17/01	55
11/13/01	<	7	10/22/01	55
11/18/01		71	10/28/01	55
11/26/01		37	03/12/01	60
12/04/01		38	03/20/01	60
12/09/01		26	04/19/99	62
12/17/01		22	04/25/99	67
12/26/01		16	05/29/00	68
01/02/02		16	11/18/01	71
01/13/02		16	03/26/00	78
03/06/02	<	7	02/05/01	85
03/18/02	<	7	07/05/00	110

City of Sunnyvale Plant Effluent Zinc Concentrations

Date	Zn Effluent ug/L	Data Sorted by Concentration Date	Zn Effluent (ug/L)
# samples	146		
# NDs	40		
average	21.0		
st dev	18.0		
avg+3*stdev	74.9		
geomean	15.9		
geo stdev	2.0		
geo avg*geostdev^3	137		
max	110		
probit	135		

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City of Sunnyvale Water Supply Sampling at Wright Plant Turnout

Date	Zn (ug/L)	Date	Zn (ug/L)	Date	Zn (ug/L)
Year 2001	MDL=4.6	Year 2000	MDL=4.6	Year 1999	MDL=7
01/02/01	250	01/04/00	521	01/04/99	357
01/16/01	260	01/18/00	639	01/15/99	273
02/06/01	250	02/07/00	532	01/19/99	246
02/20/01	240	02/22/00	550	01/26/99	286
03/06/01	284	03/06/00	566	02/01/99	380
03/20/01	207	03/20/00	583	02/08/99	280
04/03/01	282	04/03/00	604	02/19/99	362
04/17/01	250	04/17/00	579	02/23/99	421
05/01/01	226	05/01/00	560	03/01/99	316
05/15/01	263	05/15/00	572	03/08/99	489
06/05/01	230	06/05/00	427	03/16/99	301
06/10/01		06/19/00	600	03/22/99	365
06/19/01	255	07/03/00	600	03/29/99	437
07/03/01	306	07/17/00	430	04/06/99	571
07/10/01	270	07/31/00	490	04/20/99	534
07/17/01	305	08/15/00	530	05/04/99	532
07/25/01	206	09/06/00	320	05/17/99	350
08/01/01	260	09/19/00	510	06/02/99	434
08/15/01		10/04/00	220	06/15/99	443
08/21/01	276	10/18/00	380	07/06/99	440
09/05/01	384	11/01/00	310	07/20/99	
09/19/01	61	11/14/00	240	08/03/99	495
10/03/01	229	12/06/00	250	08/17/99	455
10/17/01	254	12/19/00	250	09/07/99	507
11/13/01	232			09/21/99	486
11/27/01	173			10/05/99	482
12/04/01	235			10/18/99	564
12/18/01	208			11/01/99	542
				11/15/99	560
				12/06/99	525
				12/20/99	512

average all years= 383

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RATIONALE FOR USE OF EXISTING RMP DATA FOR LOWER SOUTH BAY METALS TRANSLATOR CALCULATIONS

10/08/02

The Regional Board adopted Resolution 92-043 on April 15, 1992 that endorsed in concept the development and implementation of the Regional Monitoring Program for Trace Substances (RMP). The initial sampling design was based on the Bay Protection and Toxic Cleanup Program (BPTCP) pilot studies conducted during 1991 and 1992. Stations were primarily located in the deeper shipping channels along the "spine" of the Estuary and were selected to collect baseline data on trace substances in the Estuary and to determine seasonal and long-term trends in contaminant concentrations. Additional stations were added over the years to fill in spatial gaps and to monitor near major tributaries and at the estuary interface.

Each year the monitoring plan has been reviewed and adjusted as deemed appropriate by the RMP's advisory committees. External review of the RMP's technical and administrative structure is conducted every five years to ensure that the RMP adapts to scientific and technological advances and continues to be useful to the regulatory and scientific communities. Trace metals sampling was conducted three times per year from 1993 – 1999, typically in February, April, and July to capture the range of Delta outflows (from high to low flows).

Sampling during the period of declining Delta outflows during April was discontinued during 2000 since the dry season was determined to be more indicative of ambient contaminant concentrations in the Estuary. In 2000 chromium was removed from the list of analytes measured in water, sediment, and tissue samples. Additional revisions were made in 2001 and the "redesigned" RMP began to be fully implemented in 2002. Modifications included shifting sampling frequency from seasonal to annual dry season sampling to reduce interannual variation. Only three fixed stations will continue to be sampled (Sacramento and San Joaquin Rivers and Golden Gate Bridge), with the other stations based on an annual randomized sample design.

The RMP produces high quality, nationally recognized data. Sampling is conducted in accordance with the "Field Sampling Manual for the Regional Monitoring Program for Trace Substances" (February 2001). This manual outlines the sampling methods and standard operating procedures for water, sediment, and bioaccumulation sampling. The "2001 Quality Assurance Project Plan for the Regional Monitoring Program for Trace Substances" (September 2000) includes the San Francisco Estuary Institute's (SFEI) quality assurance and quality control (QA/QC) protocols and requirements for contract laboratories associated with the RMP. It addresses QA/QC measures both in the field and in the laboratory.

All available RMP total and dissolved metals data from March 1993 through July 1999 (generally 21 datapoints) were used to directly calculate metals translators (i.e. ratio of dissolved to total metal) in accordance with the EPA translator guidance document ("The Metals Translator: Guidance for Calculating A Total Recoverable Permit Limit From A Dissolved Criterion" (June 1996)). The 21 pairs of datapoints are over double the minimum (of 10) recommended in the USEPA guidance document.

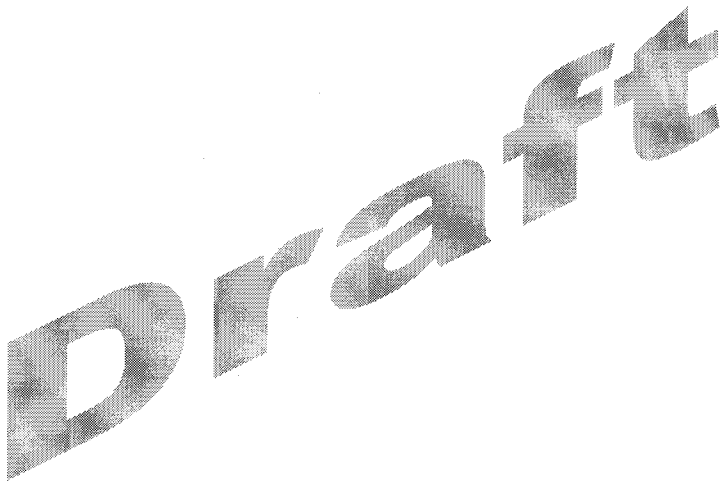
Translator values calculated for both the BC10 (Yerba Buena) and BA30 (Dumbarton Bridge) RMP stations were quite consistent, showing there to be relatively little spatial variability. In the 1993-1999 timeframe samples were collected three times per year and thus captured the full range of seasonal variability (that is primarily a function of Delta outflow).

ATTACHMENT B

SUNNYVALE TRANSLATOR CASE STUDY MEMO

(EOA August/December 1997)

(hard copy only, available upon request)



Attachments: Standard Language and References Available Online

Attachment G: Self –Monitoring Program, Part A.

Part A
Standard Provisions and Reporting Requirements: Available on line.
(http://www.swrcb.ca.gov/~rwqcb2/Agneda/04-17-02/res74-10standprov.doc)

Attachment H: Board Resolution No. 74-10
[See (http://www.swrcb.ca.gov/~rwqcb2/Agenda/04-17-02/res74-10.doc]

Attachment I: Mercury Staff Report [See [http://www.swrcb.ca.gov/rwqcb2/sfbaymercurytmdl.htm] click on the link for "Project Report."

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 its Approved Pretreatment Program or modified Pretreatment Program 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 its pretreatment program activities over the previous twelve months. In the event that the Discharger is not in compliance with any conditions or requirements of the Pretreatment Program, 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 its 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.

6. The Discharger may combine the annual pretreatment report with the semiannual pretreatment report (for the July through December reporting period). The combined report shall contain all of the information requested in Appendices A and B and will be due on January 31st of each year.

7. The Discharger shall conduct the monitoring of its treatment plant's influent, effluent, and sludge as described in Appendix C entitled, "Requirements for Influent, Effluent and Sludge Monitoring," which is made part of this Order. The results of the sampling and analysis, along with a discussion of any trends, shall be submitted in the semiannual reports. A tabulation of the data shall be included in the annual pretreatment report. The Executive Officer may require more or less frequent monitoring on a case-by-case basis.

APPENDIX A (Pretreatment)

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 Discharger, the POTW and/or the industrial user 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 Discharger 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 Discharger. 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 a brief description of the individual SIU's type of business. 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: (Pretreatment)

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 (Pretreatment)

REQUIREMENTS FOR INFLUENT, EFFLUENT AND SLUDGE MONITORING

The Discharger shall conduct sampling of its treatment plant's influent, effluent and sludge at the frequency as shown in Table 2 on Page 8 of the Self-Monitoring Program (SMP).

The monitoring and reporting requirements of the POTW's Pretreatment Program are in addition to those specified in Table 1 of the SMP. Any subsequent modifications of the requirements specified in Table 1 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 by both Table 1 and the Pretreatment Program. The Pretreatment Program monitoring reports shall be sent to the Pretreatment Program Coordinator.

1. Influent and Effluent Monitoring

The Discharger shall monitor for the parameters using the required test methods listed in Table 2 (page 8 of the SMP). Any test method substitutions must have received prior written Regional Board approval. Influent and Effluent sampling locations shall be the same as those sites specified in the Self-Monitoring Program.

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 K: Discharger Infeasibility Analysis (Cyanide Limit)

(Cyanide Limit- method and results)

Palo Alto Regional Water Quality Control Plant
Infeasibility Analysis
March 24, 2003

Background

The Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California, known as the State Implementation Policy (SIP), establishes procedures and policies for issuing Water Quality Based Effluent Limits (WQBELs) in California. The SIP procedures require that Regional Boards conduct a Reasonable Potential Analysis (RPA), and that WQBELs be included in NPDES permits for any pollutant for which reasonable potential is indicated. The SIP also states that interim limits should be established when the Discharger demonstrates that it is infeasible to immediately comply with the final WQBELs calculated according to SIP procedures.

The SIP requires that the following justification be provided to the Regional Board to authorize the inclusion of interim effluent limits in a NPDES Permit:

a) Documentation that diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream;
b) Documentation of source control and/or pollution minimization efforts currently underway or completed;
c) A proposed schedule for additional or future source control measures, pollutant minimization actions, or waste treatment (i.e., facility upgrades); and
d) A demonstration that the proposed schedule is as short as practicable.

Pollutants to be Evaluated

This Infeasibility Analysis is based on the RPA conducted by Regional Board staff for the Palo Alto Regional Water Quality Control Plant (RWQCP). The pollutants for which findings of infeasibility and interim limits are proposed are as follows:

- Cyanide
- Dibromochloromethane
- Benzo(b)fluoranthene
- Indeno(1,2,3-cd)pyrene
- Dieldrin
- 4,4'-DDE
- Heptachlor Epoxide

Table 1 below summarizes each of the pollutants and the City's request for interim limits.

Table 1: Summary of pollutants with reasonable potential for which interim limits are requested

Pollutant	Basis for Reasonable Potential	Water Quality Criterion (µg/L)	Maximum Effluent Concentration (µg/L)	Proposed Interim Limit (µg/L)
Cyanide	Effluent	1	5	32
Dibromochloromethane	Effluent	34	56	86
Benzo(b)fluoranthene	Background	0.049	ND	10
Indeno(1,2,3-cd)pyrene	Background	0.049	ND	10
Dieldrin	Background	0.00014	ND	0.01
4,4'-DDE	Background	0.00059	ND	0.05
Heptachlor Epoxide	Background	0.00011	ND	0.01

Cyanide

The water quality criterion for cyanide specified in the CTR is 1 µg/L. Cyanide was detected in 6 of 39 effluent samples that were collected between January 2000 and February 2003. The maximum effluent concentration during this time period was 5 µg/L. Of the 6 detected values, 5 have been observed since January 2002. The proposed final limits for cyanide based on the procedure in the SIP are 0.05 µg/L for the Average Monthly Effluent Limit (AMEL) and 1.0 µg/L for the Maximum Daily Effluent Limit (MDEL). Palo Alto is unable to comply with the final limits for cyanide, and requests that the Regional Board adopt an interim limit.

Cyanide has been detected occasionally but not consistently in the Palo Alto influent. Typically, cyanide is not present in wastewater influent but is generated in the treatment plant disinfection process. For example, in a study conducted by Sonoma Valley County Sanitation District, no obvious residential or commercial sources of cyanide in wastewater were identified[1]. In addition, based on a review of the literature[1] (including a study being conducted by water Environment Research Foundation (WERF)), effluent cyanide levels may be due to chlorination processes or may be the result of analytical interferences.

Palo Alto's previous permit limit for cyanide was 5 µg/L, which the treatment plant effluent has not exceeded. Therefore, cyanide has not been previously identified as a pollutant of concern and Palo Alto has had no reason to conduct source investigations for this constituent. In addition, as noted above, it is unlikely that these investigations would be fruitful based on the influent data. However, treatment plant monitoring has been conducted to evaluate cyanide levels at various points in the treatment process. Cyanide levels in secondary effluent prior to chlorination are lower than in the final effluent. As noted below in the discussion of dibromochloromethane, the City is investigating approaches to reducing chlorine doses that may result in reductions of cyanide generation associated with chlorination.

[1] Debbie Webster, Sonoma Valley County Sanitation City, CA. Letter to Tobi Tyler, San Francisco Bay Regional Water Quality Control Board. Sonoma Valley County Sanitation City Cyanide Reduction Study. December 20, 2000.

A proposed interim limit was computed as a "pooled data" value representative of all advanced secondary wastewater treatment facilities in the San Francisco Bay region. The "pooled data" value for the interim performance-based limit (IPBL) is 32 µg/L. Details of the computation for this IPBL are shown in Attachment A. Palo Alto therefore requests that an IPBL of 32 µg/L be included for the term of the NPDES permit.

Dibromochloromethane

The water quality criterion for dibromochloromethane specified in the CTR is 34 µg/L. The effluent data set used in the Reasonable Potential Analysis conducted by Regional Board staff contained two samples with a concentration of 56 µg/L. Four of the six data points were greater than the water quality criterion. The effluent limit calculation procedures contained in the SIP result in the following final limits: AMEL = 34 µg/L, MDEL = 68 µg/L. Palo Alto is unable to comply with the final limits for dibromochloromethane, and requests that the Regional Board adopt an interim limit.

The City has documented the levels of dibromochloromethane in its effluent by complying with its existing self-monitoring plan, which requires sampling of the Plant influent and effluent twice per year. Dibromochloromethane is a byproduct of disinfection with chlorine, and has consistently been either not detected in the Plant's influent, or detected at levels of 2 to 3 µg/L. Therefore, no efforts have been made to evaluate possible sources of this pollutant in the Plant's service area. The City is currently conducting a Bacteriological Study approved by the Regional Board. The Study involves assessing the impact of lower chlorine dosages in the treatment process on total coliform, fecal coliform, and enterococci bacterial counts in the Plant's effluent and in the Bay. The City intends to replace the current total coliform permit limit with an enterococci limit, which would allow the lower chlorine dosages to continue. It is anticipated that the reduction in chlorine use may result in lower concentrations of dibromochloromethane in the Plant's effluent. The City requests that the following Compliance Schedule be included in the NPDES permit:

Item	Due Date
Submit Work Plan (the work plan will include tasks intended to define the correlation between Plant chlorine dosages and formation of dibromochloromethane, such as conducting monitoring throughout the treatment process and analyzing chlorine dosage histories)	September 1, 2003
Submit Final Report (the final report will report the findings of the tasks defined in the work plan, and will describe any further tasks necessary to comply with the final effluent limit)	September 1, 2004

The RPA performed by the Regional Board utilized an effluent data set containing six data points from 1999-2002. For the purpose of calculating an interim performance-based limit (IPBL) for dibromochloromethane, the City proposes that effluent data from 1996 through the present be utilized. Disregarding the recent initiation of the Bacteriological Study, the chlorine disinfection process at the Plant has remained essentially unchanged for many years. Since the dibromochloromethane observed in the Plant's effluent is a byproduct of the chlorination process, data from sampling prior to 1999 are relevant to IPBL calculation.

Two possible interim limits were calculated using 15 data points from 1999 through 2003. Dibromochloromethane was detected and quantified in all of the samples. Using the Regional Board's method of setting performance-based limits at three standard deviations above the mean concentration (99.87th percentile), IPBLs calculating from the untransformed and log-transformed data sets were 86 and 283 µg/L, respectively. The City requests that an IPBL of 86 µg/L be included for the term of the NPDES permit.

Dieldrin, 4,4'-DDE, Benzo(b)Fluoranthene, Indeno(1,2,3-cd)Pyrene and Heptachlor Epoxide

The RPA conducted by the Regional Board indicated that reasonable potential existed for these five pollutants because the maximum background concentrations at the Dumbarton Station (BA30) in San Francisco Bay exceeded the respective water quality criteria. In accordance with SIP procedures, final AMEL limits for each of these pollutants are set equal to the water quality criteria. However, none of these pollutants have been detected in the RWQCP's effluent sampling, and the detection limits reported in the City's sampling for these pollutants are greater than the water quality criteria. Current analytical methods are unable to detect and quantify these pollutants below the Minimum Levels specified in Appendix 4 of the SIP. Each of the Minimum Levels specified in the SIP is greater than the respective water quality criterion. The RWQCP is therefore unable to determine whether it is possible to comply with final effluent limits for these pollutants. We request that the Regional Board set interim limits equal to the Minimum Levels for these pollutants for the term of the NPDES permit.

Dieldrin, 4,4'-DDE, and heptachlor epoxide are breakdown products of the organochlorine pesticides aldrin, DDT, and heptachlor, respectively. All of these pesticides were banned by EPA in the early 1970s. Benzo(b)fluoranthene and Indeno(1,2,3-cd)pyrene are Polyaromatic Hydrocarbon (PAH) pollutants that are believed to be ubiquitous products of combustion. None of these pollutants have been detected in the RWQCP's influent or effluent monitoring, and it is unlikely that POTW discharge to the Bay would be a significant pollutant loading source.

The RWQCP has not instituted pollution prevention programs that address these pollutants individually. However, the RWQCP and City of Palo Alto implement programs that are intended to reduce storm water and sanitary sewer discharges of pesticides and PAHs generally. Palo Alto operates a Household Hazardous Waste (HHW) program that accepts pesticide products. Residents are encouraged to dispose of unused pesticide products at the monthly HHW events, which are advertised in local newspapers and through utility bill stuffers. Palo Alto recently collaborated with Acterra to create a brochure for households that are moving, encouraging them to utilize the HHW program when cleaning out garages and other parts of their homes where chemicals are stored. Palo Alto also actively promotes and participates in the "Our Water, Our World" program. This program encourages the use of Integrated Pest Management practices as alternatives to use of chemical pesticides. RWQCP staff work with local hardware stores to ensure that "Our Water, Our World" fact sheets, and the less-toxic products recommended by them, are available to shoppers.

Palo Alto also conducts public education outreach to residents to reduce discharges of combustion byproducts such as dioxins and PAHs. Palo Alto passed a City ordinance banning the installation of wood-burning fireplaces in new construction. The RWQCP developed a brochure entitled "Cars Pollute Water Too", which encourages vehicle owners to keep their vehicles properly maintained so that tailpipe emissions and automotive vehicle fluid leaks are minimized. In addition to these public outreach activities, Palo Alto has implemented a program to use biodiesel as a replacement for regular diesel in some of its diesel heavy equipment.

Given that these five pollutants have not been detected in the RWQCP's influent or effluent, no new source control or pollutant minimization programs are planned at this time. However, the RWQCP intends to continue implementing programs that address pesticides and PAHs as general pollutant classes.

Attachment A

Interim Performance-Based Limit for Cyanide – Method and Results

The purpose of this documentation is to describe the methods and present results of analyses to determine an Interim Performance-Based Limit (IPBL) for cyanide for Palo Alto's Regional Water Quality Control Plant, and other advanced secondary wastewater treatment facilities, as desired.

Methods

The method used to calculate an IPBL for cyanide was based on methods established by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) to calculate regionwide IPBLs for mercury (Katen 2001). This method results in IPBLs that are intended to be representative of regionwide effluent quality of wastewater treatment facilities using secondary and advanced secondary treatment processes. In brief, the method described in Katen 2001 consists of the following elements:

- Blanks and duplicates were removed from the dataset. Potential outliers were identified by examination of boxplots, and were verified, corrected, or removed.
- Distributions of raw and log-transformed data were evaluated using probability plots and the Anderson-Darling test for normality.
- Effluent data from San Francisco Bay region municipal dischargers were evaluated to establish whether data may reasonably be pooled into appropriate subgroups. Methods of evaluation included inspection of boxplots and probability plots, and Mood's Median Test. Based on these evaluations, data were pooled into Secondary Treatment and Advanced Secondary Treatment subgroups.
- Percentiles were calculated from the distribution parameters of the log-transformed data for each of the two pooled datasets, based on the evidence that the data were lognormally distributed. The 99.87^{th} percentile was selected as the IPBL for each subgroup. Note that the 99.87^{th} percentile is equivalent to a predicted concentration three standard deviations above the mean of log-transformed data, and is more stringent than the once-in-three-years allowable exceedance rate recommended by US EPA (equivalent to the 99.91^{st} percentile concentration). The 99.87^{th} percentile concentration can be expected to be exceeded with an average frequency of approximately once every 2.1 years.
- The mercury IPBLs are proposed as monthly average limits not to be exceeded. While cited as a "standard approach" for setting effluent limits in Katen 2001, this differs from USEPA's recommended approach of limits with an allowable frequency of exceedance.

The methods described in Katen 2001 were used as the basis for developing a cyanide IPBL for advanced secondary wastewater treatment facilities, with some modifications. The dataset used was based on discharger data provided by the SFRWQCB on 3/15/2003. The final dataset consisted of all effluent cyanide concentrations reported from January 1999 through the February 2003 for the advanced secondary treatment facility subgroup. Summary information for this dataset is provided in Table 1. The advanced secondary treatment subgroup established for mercury was also used for cyanide. Cyanide IPBLs were calculated only for the advanced secondary treatment subgroup, which consisted of the treatment facilities for Fairfield-Suisun Sewer District, Mountain View Sanitary District, Palo Alto, Petaluma, San Jose/Santa Clara, San Mateo City (dry season discharge only), and Sunnyvale.

Because the cyanide data included a relatively high proportion of data below detection (69%), summary statistics and distribution parameters were estimated using the methods of Helsel and Cohn (1998). This method is consistent in concept with the Regional Board's recommended "log-Probit method" for estimating IPBLs from data sets with data below detection, and provides unbiased estimates of distribution parameters and percentiles. Potential outliers were identified by inspection of probability plots and evaluation of distribution parameters.

The high percentage of cyanide data below detection also required alternate methods of evaluating the normality of the underlying distribution of the data. The assumption that the data were lognormally distributed was evaluated based on the R^2 -statistic for a best-fit linear regression of the natural log-transformed data. This method is consistent with the Anderson-Darling test of normality in that both use the probability plot regression line fit statistic as a measure of normality of the data. Probability plots of the log-transformed cyanide data were also inspected for systematic deviations from normality.

Results

Summary statistics for cyanide concentrations reported in effluent of San Francisco Bay region advanced secondary treatment facilities are presented in Table 2. Inspection of a probability plot of detected cyanide data (Figure 1) indicates that the data are approximately lognormal. The high R^2-value (0.9466) for the probability regression of natural log-transformed data also confirms the assumption of lognormality. No extreme value outliers were identified in the dataset used (Figure 1).
Based on the approximate lognormality of the data, IPBLs were calculated from the distribution parameters of the natural log-transformed data. Cyanide IPBLs based on the 99.87^{th} and 99.91^{st} percentiles were 32 µg/L and 35 µg/L, respectively, rounded to two significant digits (Table 3 and Figure 1). These IPBLs represent performance-based cyanide limits that are expected to be exceeded less than one day in 2.1 years (32 µg/L) and less than one day in 3 years (35 µg/L), on average.

References

Katen, K. 2001. Staff Report — Statistical Analysis of Pooled Data From Regionwide Ultraclean Mercury Sampling For Municipal Dischargers. California Regional Water Quality Control Board, San Francisco Bay Region. Oakland, California.

Helsel, D., and T. Cohn. 1988. Estimation of descriptive statistics for multiply-censored water quality data. Water Resources Research 24: 1997-2004.

Table 1. Summary of effluent dataset used for calculating CN IPBLs.

Permittee	Number of Detected Data	Number of Data Below Detection	Total Number of Data	Percent of Total Dataset
Fairfield-Suisun Sewer District	52	29	81	21.9%
Mt. View Sanitary District	4	24	28	7.6%
Palo Alto	6	35	41	11.1%
Petaluma Permit	9	12	21	5.7%
San Jose & Santa Clara	2	56	58	15.7%
San Mateo City	19	7	26	7.0%
Sunnyvale	23	92	115	31.1%
Grand Totals	115	255	370	100%

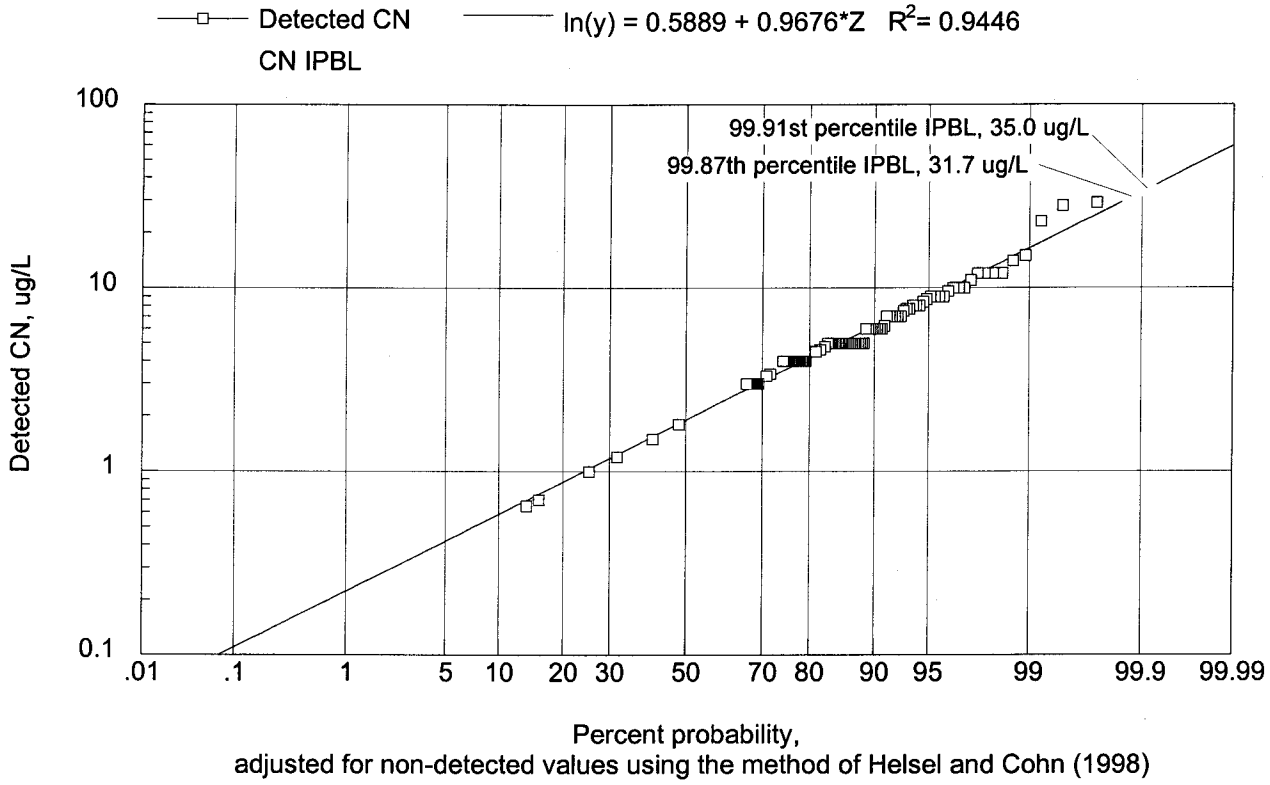
Table 2. Summary statistics for CN in effluent from SF Bay Area advanced secondary treatment facilities.

Summary Statistic	
n	370
Percent detected	31.1%
n detected	115
Mean	2.97
Standard Deviation	3.33
Coefficient of Variation	1.12
Lower 95% Confidence Limit about Mean	2.63
Upper 95% Confidence Limit about Mean	3.31
10th percentile	0.60
25th percentile (Lower Quartile)	1.05
50th percentile (Median)	1.96
75th percentile (Upper Quartile)	3.66
90th percentile	6.41
Inter Quartile Range	2.61
Minimum Detected Value	0.65
Maximum Detected Value	29
Minimum Reporting Limit	0.3
Maximum Reporting Limit	5
Probability Regression Statistics for Ln-transformed Data	
Beta_1 (slope)	0.9233
Beta_0 (intercept)	0.6748
R^2 for linear regression	0.9446

Table 3. Interim Perfomance-Based Limits for cyanide, based on SFRWQCB method for developing regionwide mercury IPBLs (Katen 2001).

Percentile	CN IPBLs
99.87%	31.7 ug/l
99.91%	35.0 ug/l

Figure 1. Probability plot of detected cyanide concentrations in effluent.



Attachment L: Response to Comments

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

RESPONSE TO WRITTEN COMMENTS:
ON THE NPDES PERMIT REISSUANCE FOR:

Palo Alto Regional Water Quality Control Plant
Palo Alto, Santa Clara County
NPDES Permit No. CA 0037834

Three comment letters were received on this Tentative Order (TO) from: the City of Palo Alto (City), the Bay Area Clean Water Agencies (BACWA), and WaterKeeper. Staff responses are listed below by order of comment presented in each letter. For brevity, some comments are summarized. For minor edits or clarifications; the change is noted.

Board staff has invested 18 months of resources to participate in a stakeholder process to reissue the three South Bay NPDES permits. Over 25 meetings were held to discuss various elements of the permits, including many of the items that were submitted during this comment period. Unlike most permits, two courtesy drafts were distributed to the stakeholder group and two Board hearings were scheduled for public testimony. Furthermore, one discharger was granted an extension of the public comment period. Board staff believes many of the issues raised have been thoroughly discussed in the stakeholder group forum. The meeting minutes from the stakeholder meetings are included in the Administrative Record and reflect the exchange of information and agreements.
Board staff is disappointed that some of the comments (e.g., chronic toxicity monitoring) are being raised outside of the stakeholder process and at the very tail end of the permitting process.

Below are Board's responses to the City's comments.

Tentative Order

Comment 1: Comment 11, 13, 15, 16, 23, and 24
Clarify specific findings, corrections, and include additional language.

Response 1: Response 11, 13, 15, 16, 23, and 24
Clarification, corrections and language are modified/added to the tentative order.

Comment 12: Dioxin- Finding 105, Provision E.12. The City expressess cost concerns with requirement for dioxin study, and requests the study provision be moved from Order.

Response 12: *After further discussion with the City, we have removed the provision from the tentative order. Instead, a footnote is added to the Self-Monitoring Program to require future dioxin monitoring be performed to achieve one-half Minimum Levels published by USEPA for Method 1613. This is supported by BACWA.*[1] *In addition, the same footnote requires the City to use 4-liter samples to lower the detection limits to the maximum extent feasible. This will*

[1] BACWA letter dated April 23, 2003 from Charles Weir, Chair to Loretta Barsamian, Executive Officer, RWQCB

complement a special dioxin project being conducted by Clean Estuary Partnership to perform an impairment assessment and a conceptual model of dioxin loadings to the Bay.

Additionally, in section E. 7.c. Pollutant Prevention and Minimization Program (PMP), staff added (iii) "For Dioxin TEQ, if the effluent concentrations exceed the WQO" which in effect requires the discharger to conduct additional Pollution Prevention efforts to reduce dioxin reaching surface waters, in the event that levels in the effluent exceed the water quality objective.

Comment 14: The City requests that the ending date stated in the tentative order for compliance with interim limits be changed from October 31, 2008 to "the expiration date of this permit".

Response 14: *The tentative order, if adopted in August, will become effective on November 1, 2003. The five-year compliance schedule will end on October 31, 2008.*

Comment 17: Provision E.2.c. Compliance Schedule for chlorodibromomethane. Discharger requests the Regional Board substitute final steps to the two compliance schedules that would require the City to continue to evaluate compliance attainability during the term of the permit..

Response 17: *After further discussion with the City, the tentative order has been revised to evaluate compliance attainability with appropriate final limits within two years from the permit adoption. If there is attainability issue, it can be identified early and allow time for both the City and the Board to explore compliance options to reach resolution before the five-year compliance schedule is up.*

Comment 18: Provision E.3.c. Compliance Schedule for Cyanide. The City requests the changes noted above in Comment 4:

Response 18: *Same as response 17 above.*

Comment 19: Provision E.5. Request for change to the report submission dates, as reflected in an earlier administrative order draft. Specifically, the change would enable the City to submit its semi-annual and annual pre-treatment reports by the last day of February.

Response 19: *Change can not be accepted. Pre-treatment staff requested that the City not extend the due date of the reports, to remain consistent with requirements for dischargers region-wide. However, the City is free to submit its reports together, and earlier, by the current January deadline. The tentative order is modified to reflect the option of submitting the reports earlier.*

Self-Monitoring Program

Comment 20: ITT Marsh Monitoring. Monitoring schedule for the Emily Renzel Marsh (ITT Marsh) was left out of the tentative order. The City requests it be added back along with a number of changes in monitoring requirements, newly proposed in letter dated July 28, 2003.

Response 20: *Staff acknowledges omission of this important information, and added back the monitoring table for the marsh discharge location, consistent with the previous permit. Staff's responses to the City's specific requests to change its marsh monitoring requirements are as follows:*

1. *The City requests to change Total Coliform monitoring to Enterococcus, consistent with E-001 primary discharge location.* ***Response:*** *Change accepted.*

2. *The City requests to change monitoring frequency for pH and temperature at stations 1-B and 2-B, as historical data is sufficient to capture variability.* ***Response:*** *Change not accepted. Staff believes that ammonia data should be related to pH and temperature, as well as seasonality, storm events and other natural variability to justify changes to sampling requirements. Neither the data nor the request for reduced monitoring were submitted with NPDES renewal application, but during the comment period, which does not enable staff sufficient time to consider the request.*
3. *The City requests that ammonia monitoring at stations 1-B and 2-B be reduced from weekly to monthly, and that sampling time be changed to morning to be consistent with the above request. Upon request, the City submitted the ammonia data sampled over the last 10 years for staff to review.* ***Response:*** *Change not accepted. Data submitted should include ranges, and preferably all data (not averages). Additionally, it should be reviewed along with temperature and pH data linked with seasonal and diurnal variability in the system as well as with extreme events (rainstorms, drought, fish kills). Again, data was submitted during the comment period, and staff did not have sufficient time to evaluate this request. It is the intent of staff to continue to work with the City regarding these requested changes to the Self Monitoring Program.*
4. *Due to vandalism problems with samplers, the City requests that metals sampling at Matadero Creek be changed from 4-day sample to a grab sample.* ***Response:*** *Change accepted.*

Comment 21: SMP, Table 1. The City requests that Table 1 be altered to reflect sampling discussions in previous meetings with staff. Namely, that effluent limits for copper, mercury, nickel, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, 4,4'-DDE, heptachlor epoxide, dieldrin, 2,3,7,8-TCDD and congeners, cyanide, chlorodibromomethane, chlorinated pesticides and PCBs (608), organophosphate pesticides (614), and tributyltin be changed from grab to composite sampling methods.

Response 21: *Change accepted. Staff agreed to this with the condition that a footnote is added to the SMP based on City's practice of compositing grab samples at the lab to make flow-proportional composite samples as opposed to collecting composite samples using an automatic sampler. The tentative order includes a footnote to this effect.*

Comment 22: The City requests that the frequency for chronic toxicity monitoring be changed from monthly to quarterly, because toxicity screening is costly and "rarely yields useful information".

Response 22: *The City has been in Toxicity Identification Evaluation/Toxicity Reduction Evaluation (TIE/TRE) sampling mode since 1991 when it conducted an Effluent Characterization Study. In 1992, the results of the TIE/TRE analysis indicated that zinc contributed to Selenastrum toxicity. From 1993 to present (2003), the City has remained in TIE/TRE mode while reducing zinc in its effluent. As specified in the 1998 permit, routine monitoring shall be performed monthly. However, the 1998 permit also allows twice per year monitoring while the discharger is under TIE/TRE mode.*

At this time, Board staff cannot reduce the chronic toxicity sampling frequency due to the following site-specific circumstances:

- *Because of the limited sampling (twice yearly for over the past ten years), there is not enough data to evaluate compliance consistency or variability with the chronic toxicity narrative objective.*

- *There is uncertainty regarding the chronic toxicity of the effluent because the City has been in the TIE/TRE mode for the past ten years.*
- *The City has conducted a screening test to identify the most sensitive species, which is required once every five years. As a result, the City will switch from a freshwater species (Selenastrum) to a marine species (Macrosystis). Monthly monitoring with a new and different species is warranted until a clear pattern is established.*

Below are Board's responses to BACWA's comments.

BACWA presented four major comments listed below. Where comment is the same as Discharger's above, a reference is provided to the above comments and responses.

Comment 1: Excessive Chronic Toxicity Monitoring Requirements: BACWA requests that frequency for chronic toxicity monitoring be reduced from monthly to quarterly or twice per year. BACWA's request is based on the City's compliance history. BACWA also cites inconsistency in monitoring frequency between this tentative order and other shallow water discharge permits.

Response 1: *See response 22 above. Regarding consistency, the Regional Board advocates consistency among dischargers for a number of factors (not just shallow vs. deepwater dischargers). Equity and consistency issues should consider all of the following factors among dischargers; shallow/deep receiving water, toxicity of receiving water and sediment, plant history for effluent-triggered toxicity, compliance history, amount of reclamation relative to discharge, the number of months a year that effluent is discharged. Staff will look at such a Bay-wide analysis when resources become available.*

Comment 2: Compliance Attainability for Final Effluent Limits.

Response 2: *Assuming BACWA is referring to Section E, and the compliance schedules for chlorodibromomethane and cyanide, see Responses 17 and 18 to the City's comments above.*

Comment 3: Dioxin Special Study

Response 3: *See Response 12 to the City's comment above.*

Comment 4: BACWA requests that the effluent limits for nickel be removed from the tentative order.

Response 4: *The Basin Plan amendment TEXT adopted by the Board and approved by State Board, OAL, and EPA states:*

1. *One of the four elements of the Water Quality Attainment Strategy for copper and nickel in the Lower South SF Bay is: "Metal translators that will be used to compute copper and nickel effluent limits for the municipal wastewater treatment plants . . . ."*[2]

2. *"When the NPDES permits are re-issued, concentration-based effluent limits for these three facilities will be calculated from the chronic copper and nickel SSOs."*[3]

[2] Page 56, Staff Report on Proposed Site-Specific Water Quality Objectives and Water Quality Attainment Strategy for Copper and Nickel for San Francisco Bay South of the Dumbarton Bridge, San Francisco Bay Regional Water Quality Control Board, April 5, 2002

3. *"These translators shall be used to compute copper and nickel effluent limits for POTWs discharging to the Lower South SF Bay when NPDES permits for Lower South SF municipal wastewater dischargers are reissued."*[4]

The Board finds reasonable potential for based on Section 1.3, step 7 of the SIP is appropriate and proper. As stated in the tentative order findings, reasonable potential is established based on copper and nickel cycling in the Lower South San Francisco Bay, sediment toxicity and loading estimates.[5]

Below are Board's responses to WaterKeepers' comments

Comment 1
Board staff correctly found reasonable potential for copper and nickel to cause or contribute to a violation of a water quality standard.

Response 1
Comment noted.

Comment 2
BayKeeper supports the inclusion of mass limits for mercury in the permits. Unfortunately these mass limits are performance-based interim limits and not protective final limits. In lieu of final limits for mercury, the permits include the statement "The final mercury limitation will be based on the Discharger's WLA in the TMDL, and the permit will be revised, as necessary, to include the final WQBEL as an enforceable limitation." BayKeeper strongly disagrees with reliance on a future mercury TMDL as a WQBEL. BayKeeper agrees that the permits should be reopened to incorporate the final WLAs for the South Bay Dischargers. However, BayKeeper does not agree that the Board should wait until a mercury TMDL is adopted to include a final mercury limit in these permits.

Response 2
The tentative order includes the following to address mercury loading from POTWs
(1) significantly reducing the mercury mass limitation from the previous permit;
(2) establishing a performance-based mercury concentration limitation, this is lower than the existing permit limit;
(3) requiring a watershed-based mercury study; and
(4) requiring ongoing pollution prevention efforts.

Most of BayKeeper's comments are better addressed in the development of the Mercury TMDL. The most recent report can be downloaded at http://www.swrcb.ca.gov/rwqcb2/sfbaymercurytmdl.htm. Board staff is preparing a draft Basin Plan amendment and supporting staff report. Board staff will submit the proposed amendment and staff report for scientific peer review and public review, and will formally respond to comments at that time. Board staff currently plans to present the Basin Plan amendment package to the Regional Board for its consideration at a public hearing in fall 2003.

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[3] Page 63 of the above report
[4] Page 64 of the above report
[5] Page 59 of the above report