TABLE OF CONTENTS

APPENDICES

EXECUTIVE SUMMARY

The long-term strategy of the San Jose/Santa Clara Water Pollution Control Plant (Plant) and its tributary agencies is to implement integrated, data driven programs to achieve cost-effective protection of South San Francisco Bay. The array of programs involved in achieving this strategy and complying with regulatory requirements can be summarized in five broad categories: Flow reduction through water conservation, recycling, and environmental enhancements; pollution prevention partnerships and education; special studies to ensure that good science is the basis of our actions; achievement of optimum performance from the collection and treatment infrastructure to further enhance flow and pollutant reduction prior to discharge; and cooperative regional programs such as the Watershed Management Initiative to maximize stakeholders participation, prioritizing of key goals and, thus, effectiveness.

The key focus over the second six months of 1998 has been flow reduction for the protection of the endangered species living in the salt marsh adjacent to the Plant. Through a combination of flow reduction projects, the Plant has remained under its 120 mgd flow limit during the 1998 dry season.

Month	**Influent Flow**	**Recycled Flow**	**Effluent Flow**
July	128.2	2.4	125.8
August	123.2	4.0	119.2
September	121.6	4.0	117.6
October	120.1	3.0	117.0
Lowest Consecutive 3-month Average			117.9

The following major efforts contributed to the success of the flow reduction campaign:

- South Bay Water Recycling has connected 140 customers to the system, with an additional 100 customers to be connected by the next irrigation season. The maximum expected demand is 13 million gallons per day (mgd).
- Industrial Partnerships and technical support have contributed to a reduction of 0.8 mgd of flow from industrial users.
- With a boost from 'Slow the Flow' campaign including an enhanced rebate for residential Ultra Low Flush Toilets (ULFT) retrofit, Indoor Water Conservation programs have reduced flows by over 1 mgd during the reporting period. Approximately 29,000 ULFTs were installed in the first six-month period of the fiscal year 1998-1999. This is 80% of the goal for the entire fiscal year.

In addition:

- The Flow Audit Study was initiated with over 50 companies participating. The completed studies are due May 31, 1999.
- The Plant is working with stakeholders to prioritize issues and determine the best use of mitigation resources to protect the endangered species. The group determined that the highest priority was the restoration of Bair Island. That plan was submitted to the Regional Board on December 10, 1998 and accepted in a letter dated December 23, 1998. The proposal will go to Treatment Plant Advisory Committee (TPAC) and City Council for approval in February 1999.
- The trunkline and upstream monitoring program has tracked a dramatic decrease in the loading of copper and nickel to the sanitary sewer system since 1996 (44% and 62% respectively for total copper and nickel).
- Progress on the Santa Clara Basin Watershed Management Initiative is continuing. Over the last six months, sixteen agencies have signed the 'signatory document' defining the purpose, roles, and ground rules for participating in the Initiative. Work on the watershed assessment is continuing. The next major milestone is a preliminary assessment report in late 1999.
- Work is proceeding on the development of technical studies in support of the development of a Total Maximum Daily Load (TMDL) for copper and nickel for South San Francisco Bay. This project is part of the Watershed Management Initiative stakeholders' process. Technical work includes the development of the conceptual model, assessment of pollutant levels and impairment, and evaluation of hydrodynamic models.
- Other research studies include trace level monitoring of the South Bay, the nickel acute-to-chronic ratio study, salt marsh conversion assessment, the stream flow augmentation pilot project, wetlands creation pilot, avian botulism, and local effects monitoring. These projects are discussed in detail in the report.

The Next Six Months

Over the next six months, program efforts will focus on:

- The Watershed Management Initiative and the TMDL project;
- Developing information on headworks loading and organics sources;
- Industrial Partnerships to address pollutant loading and flow;
- Marsh Mitigation alternatives and streamflow augmentation;
- Flow reduction, including Groundwater Infiltration Reduction program, indoor water conservation, and South Bay Water Recycling; and
- Stakeholder involvement and outreach.

ABBREVIATIONS

BASMAA	Bay Area Stormwater Management Agencies Association
BAPPG	Bay Area Pollution-Prevention Group
BMP	Best Management Practice
BNR	Biological Nutrient Removal
BOD	Biological Oxygen Demand
CBS	Clean Bay Strategy Report
City	City of San José
ESD	Environmental Services Department
EDTA	Ethylenediamine Tetraacetate
FIP	Financial Incentives Program
IC/ID	Illicit Connections/Illegal Dumping
IU	Industrial User
IU Academy	Industrial User Academy
MAS	Mass Audit Study
MECL	Mass Equivalent Concentration Limit
MFR	Maximum Feasible Reduction
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
Plant	San José/Santa Clara Water Pollution Control Plant
POTW	Publicly-Owned Treatment Works
RCMP	Reasonable Control Measures Plan
SPC/DOE	Statistical Process Control and Design of Experiment
Regional Board	San Francisco Bay Regional Water Quality Control Board
SBWR	South Bay Water Recycling
Water District	Santa Clara Valley Water District
South Bay	San Francisco Bay, South of Dumbarton Bridge
State Board	State Water Resources Control Board
SWPPP	Storm Water Pollution Prevention Plan
TSS	Total Suspended Solids
TPAC	Treatment Plant Advisory Committee
ULFT	Ultra Low-Flush Toilet
URMP	Urban Runoff Management Program

AF/yr.	Acre-foot per year
gpd	gallons per day
lf	linear foot
mgd	million gallons per day
mg/l	milligrams per liter
ppd	pounds per day

µg/l	micrograms per liter

I. FLOW REDUCTION and WETLAND MITIGATION

Introduction:

In 1990, the California State Water Resources Control Board reported that between 1970 and 1985, a total of 381 acres of salt marsh in the South Bay had been affected as a result of increasing discharges of high-quality but fresh water effluent from the Plant. This conversion to brackish or fresh water marsh, and consequent loss of this habitat affects two endangered species, the California clapper rail and the salt marsh harvest mouse.

The State Board ordered the Plant to implement actions to protect the marsh from conversion caused by flows that exceed 120 million gallons per day (mgd) average dry weather effluent flow (ADWEF) and to submit a mitigation proposal involving the creation or restoration of 380 acres of wetlands or equivalent habitat. In response, the City of San Jose (City), on behalf of the Plant and its tributary agencies, proposed a South Bay Action Plan in 1991. The three main components of that plan were to purchase and restore salt marsh properties equivalent to 380 acres to mitigate past conversion of salt marsh; implement indoor water conservation programs to reduce influent flows to the Plant by 15 mgd; and implement South Bay Water Recycling to reduce effluent discharged to the Bay during dry weather.

By 1996, despite significant progress in implementing the 1991 Plan, ADWEF flows still had not been brought below 120 mgd, and in fact had averaged 132 mgd -- probably due to the emergence of Santa Clara Valley from both a drought and economic recession. A 1997 Revised South Bay Action Plan was subsequently proposed by the City and adopted by the Regional Water Quality Control Board, which called for expansions to the indoor water conservation and water recycling programs plus the addition of programs for industrial water recycling/reuse, inflow/infiltration reduction, and environmental enhancement pilots.

Status Update:

A detailed look at the progress in each program is presented the subsections that follow. The combined efforts of these programs has brought the ADWEF below 120 mgd, as shown in Table 1.

TABLE 1

Month	Influent Flow	Recycled Flow	Effluent Flow
July	128.2	2.4	125.8
August	123.2	4.0	119.2
September	121.6	4.0	117.6
October	120.1	3.0	117.0
Lowest Consecutive 3-month Average			117.9

I-A. SOUTH BAY WATER RECYCLING

South Bay Water Recycling (SBWR) is an on-going, multi-year effort to reuse high quality effluent from the Plant. The goal of the program is to provide a reliable "drought-proof" water supply and protect the endangered species habitat at the south end of San Francisco Bay.

I-A1. PHASE 1

Current Status:

Phase 1 facilities include a diversion structure, transmission pump station, two remote booster pump stations with one four-million gallon reservoir and approximately 60 miles of distribution pipeline. The total design and construction cost for these facilities was approximately $140 million. Phase 1 is designed to distribute up to 15 mgd of recycled water during the peak dry-weather months for irrigation, industrial and other purposes. During the first season of operation, prior to completion of the third pump station, up to 4 mgd of recycled water was delivered in the lower pressure zones to more than 100 customers in Santa Clara, Milpitas and San Jose.

Construction:

All pipeline and pump station construction is complete, including the 12th Street microtunnel project. The Keyes Street booster pump station (PS5) and the four-million gallon reservoir have been commissioned and are presently serving downstream customers as far as the south end of Senter Road. Start-up tests at the Yerba Buena Road combined booster pump station revealed electrical and mechanical problems affecting the reliability of the two low-volume high-pressure distribution pumps. The high-volume high-pressure pumps passed the start-up test and are now fully operational. The contractor is now addressing these problems with the low volume pumps; when operational, the system will be able to serve

several other major customers, including Evergreen College, the Villages Golf Course and the Silver Creek Valley Country Club.

Customers: A special team was mobilized last spring to obtain "right-of-entry" from landowners adjacent to the pipeline, allowing the City to perform retrofit work on private property on behalf of South Bay Water Recycling. 805 of the customers signed on this project. The remaining 20% opted to sign either the original retrofit Grant Agreement or the simplified form whereby the customer performs retrofit construction in exchange for an equivalent value of recycled water.

Between June 1 and September 30, construction was completed on more than 50 sites for a total of 112 customers connected to the system with a projected maximum dry-weather recycled water demand of 7 mgd. Actual deliveries for the months of August and September averaged only 4 mgd. Heavy spring rains, which caused high ground water and wet soils, and cooler summer weather, resulted in reduced need for water for irrigation. Nevertheless, as shown in Table 1 above, when recycled water deliveries were subtracted from Plant influent flows, effluent discharged to the Bay remained under 120 mgd for the three lowest consecutive dry weather months.

To date, a total of 140 customers with a total maximum dry-weather demand of 10 mgd, have been connected. Customer retrofits are either out for bid or under construction for another 100 customers. This will add 3 mgd of estimated demand before the next irrigation season. Pipeline extensions to connect additional customers, including undeveloped properties in the vicinity of the pipeline that might be cultivated temporarily to increase overall demand, are now being evaluated.

Mandatory Use of Recycled Water for Landscape Irrigation

All new and existing water customers with an annual non-potable water use of 5 acre-foot per year (AF/yr.) or more will be required to connect to SBWR system.

Some of the cities that use recycled water under the SBWR program have enacted some ordinances that require hook-up of irrigation to recycled water where available. The program is currently conducting a market assessment to determine those areas within the recycled water service area where this goal can be met. Ordinances are being reviewed and evaluated for their effectiveness to address the expanded use of recycled water.

Construction of Deferred and Infill Projects

Due Date: Begin construction by January 31, 1999

The 1997 Revised South Bay Action Plan requires that construction of infill and deferred extensions to the SBWR pipeline commence on or before January 31, 1999. In June 1998, an evaluation and selection process was completed for 12 separate projects, totaling 11,000 linear feet of pipe, in the cities of Santa Clara, Milpitas and San Jose. These projects were awarded in October 1998, three months ahead of schedule and, combined yield a maximum dry weather usage of 3 mgd. The infill projects are scheduled to be operational before the commencement of the dry weather season on May 1, 1999.

Southern Alignment and Agricultural Extension

Due Date: Begin construction by January 31, 2001

The Revised Action Plan currently proposes a southern extension of the SBWR system to reach large urban landscape and agricultural customers in the Coyote Valley area of south Santa Clara County. According to the terms of the Revised Action Plan, construction of these facilities should begin by January 31, 2001. These extensions are now being developed and evaluated along with other alternatives in the context of the "South Bay Water Recycling Master Plan and Phase 2 Development" program.

I-A2. PHASE II and MASTER PLAN

Phase 2

Construction of Phase 2 facilities is scheduled to begin in January 2001. The Program is now developing a series of alternative Phase 2 projects designed to deliver an additional 15 mgd of recycled water. This effort is being implemented through a resource partnership that includes the cities of San Jose, Santa Clara and Milpitas, five wastewater tributary agencies, five water retailers, the Santa Clara Valley Water District (Water District), and the U.S. Bureau of Reclamation. It is being considered in conjunction with the Master Plan for 2020 to ensure appropriate consistency with the long-term goals.

Master Plan for 2020

The overall goal of the South Bay Water Recycling Master Plan for 2020 is:

- to identify, assess and prioritize project alternatives to distribute up to 100 mgd of recycled water by 2020; and
- to identify and select Phase 2 facilities that will increase recycled water deliveries to 30 mgd and be compatible with the Master Plan.

In August 1998, the City executed an agreement with Montgomery Watson to provide management and engineering support for the "SBWR Master Plan and Phase 2 Development Program." The City also executed an agreement with the Santa Clara Valley Water District to jointly fund and participate in the planning effort and integrate development of recycled water with their long-term water supply plans. In addition, the SBWR Master Plan is being linked to the Bay Area Regional Water Recycling Program, a project sponsored by the U.S. Bureau of Reclamation to identify potential regional uses of recycled water through 2040. This level of interjurisdictional coordination will help ensure that the selected project provides maximum benefit to the community as a whole.

A kickoff meeting with all resource teams and agency sponsors was held on October 14, 1998 to clarify tasks, objectives and schedules. According to the current schedule, the Master Plan will be completed in May 1999 followed by selection of the preferred Phase 2 alternative(s). The selected Phase 2 project will be designed concurrently with the environmental work required to obtain NEPA and CEQA clearances so that project construction can begin in January 2001.

Potable Water Reclamation Demonstration Project

Phase 2 work included a workshop held on Wednesday, December 9, 1998 on potable reuse, groundwater recharge sites in Santa Clara Valley, and reservoir augmentation to Anderson Reservoir. Consultants presented California Department of Health Services guidelines for recharge basin operation with recycled water. Distances, travel time, and wells which would be influenced were presented. Models of groundwater influence from recycled water recharge in spreading basins was presented as preliminary data for site selection and direct injection of recycled water through injection wells was discussed. Representatives from the water retailers, Water District and City staff were there to identify potential issues with this use of recycled water. Comments will be incorporated into the Master Plan, and a follow up meeting will be held before completion of the Master Plan. Recommendations will include proposals for pilot and demonstration projects, as well as additional studies.

I-B. INDUSTRIAL RECYCLE AND REUSE

The objective of the Industrial Recycle/Reuse Program is the development and implementation of projects to ensure that Industrial Users (IUs) in the Plant's service area are reducing use of potable water, and recycling their own wastewater or using SBWR in their facilities to the largest extent possible. To do this, staff is becoming involved in the planning process for industries upgrading facilities, expanding, and/or moving in this area at a point were implementing water

conservation, reuse and recycling can be most cost effective. In 1998, this Program initiated the Flow Audit program as part of the implementation of the Tier 1 Contingency Plan. In September 1, 1998 the Plant submitted a report on progress to date to the Regional Board. A copy of that report is attached in Appendix A.

The Flow Audit program requires that all dischargers with flow over 100,000 gpd complete an audit in accordance with the Flow Audit Protocol. A listing of all these companies is in Appendix A, Table 1. Industrial discharge permits for the dischargers were amended to require completing the Flow Audit Study by May 31, 1999.

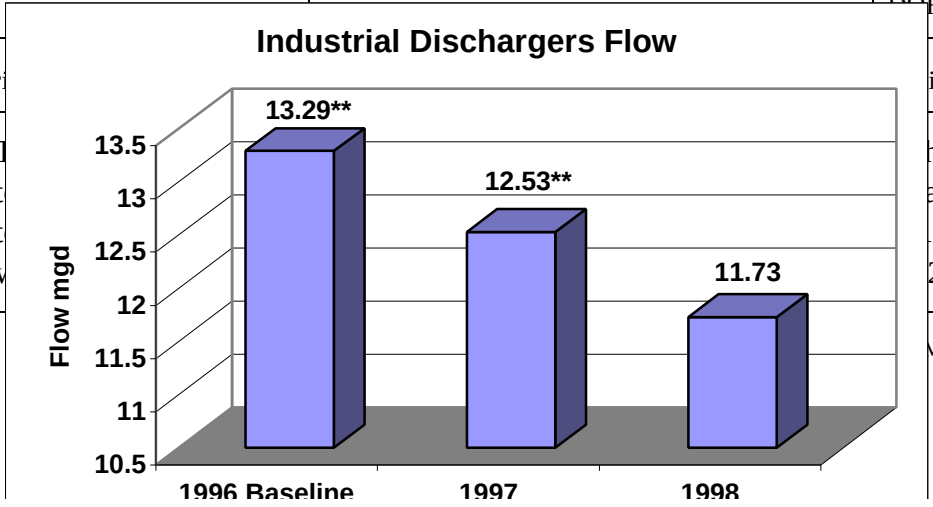
The Protocol (attached in Appendix B) has been completed and implementation has begun. The Flow Audit Study Protocol was developed with extensive input from all stakeholders. The Protocol was finalized in December 1998. Two workshops were conducted. The first workshop was held on November 19, 1998, for staff from the cities of San Jose, Milpitas and Santa Clara. The second workshop was held on December 8, 1998 for all the companies that are required to complete the study and stakeholders. Over 100 participants attended this workshop.

The completed studies will be reviewed for completeness and accuracy. The results will be summarized and included in the July 1999 Clean Bay Strategy (CBS) Update Report.

In addition, staff continued to work with industry in a variety of cooperative efforts, providing technical and staff support. The status of these efforts is summarized in the following table.

COMPANY	TYPE OF PROJECT	STATUS
The Printed Circuit Board partners (Tyco; South Bay Circuits; Paragon Electronic Systems, and HADCO Santa Clara)	Working to evaluate pollutant and flow reduction projects at their facilities	Active: Completing data collection and evaluation phase. Voluntarily participating in the Flow Audit Studies. See separate report Section II-B3
The Semiconductor group (Hewlett Packard, IBM, Intel, National Semiconductor, and Siliconix)	Working to conserve water and maximize reuse of industrial process flows.	Active: Information sharing and investigating resources available to assist in flow reduction projects.

Candescent Technologies (existing facility)	Recycling industrial wastewater to cooling towers and back into manufacturing processes.	Completed one cooling tower recycling project on 9/15/98 (Phase I). Currently evaluating a second tower (Phase III). Design of Phase II (recycling back to the manufacturing process)
Candescent Technologies (proposed facility)	Design the facility maximizing the recycling opportunities for both industrial processes and non- domestic uses.	Permitting phase
California Paperboard	Use of SBWR in the manufacturing process	Testing phase
LSI Logic	Working on completing a Flow Audit Study.	In progress
Dynamic Circuits	Working on completing a Flow Audit Study.	In progress
Hitachi	Use of SBWR in cooling towers.	Permitting phase
Maxmedia	Maximize the internal recycling opportunities for all processes. This includes recycling industrial wastewater in manufacturing, cooling towers and scrubbers.	Redesign phase to include proposed expansion of the facility.
Owens Corning Fiberglass	Evaluating the use of SBWR in their manufacturing process and cooling towers.	No progress
Calpine	Use of SBWR in cooling towers, and evaluating its use for ultra-pure water in boilers.	Final design phase and legal agreements
San Jose State University	Use of SBWR in cooling towers	Connection completed, waiting DOHS approval
Behri		ign and permitting phase



T heir flows
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v 29 mgd.

MITIGATION

*Baseline period for the Recycle/Reuse Project
**Flows corrected in 12/98 after detailed analysis of the Source Control database

I-C. INDOOR WATER CONSERVATION

The Indoor Water Conservation element of the Revised Action Plan commits to a total flow reduction of 5-8 mgd over a five-year period, with an annual flow reduction goal of not less than 1 mgd. The flow reduction goal for fiscal year 1998-99 is 1.5 mgd. The conservation programs have already achieved more than 1 mgd reduction during the first half of the fiscal year.

Indoor water conservation programs focus most heavily on residential customers (as contributors of approximately 70% of Plant flows), and especially on the retrofit to Ultra Low Flush Toilets (ULFTs) as the single most effective residential water conservation measure. Program incentives include rebates, vouchers, and full-service installation depending on the program element. Other measures, such as retrofit to low-flow showerheads and the use of high-efficiency washing machines are also promoted.

In the business sector, the program's efforts include ULFT retrofits and the more flexible Financial Incentive Program (FIP), which offers rebates for equipment and process changes that reduce a company's effluent to the Plant.

I-C1. ULFT REBATE PROGRAM

Serving primarily single-family residences by providing rebates of $75 per ULFT, the Rebate Program is offered by the Santa Clara Valley Water District and administered through local water companies. The Plant provides marketing support for the program throughout the tributary area. There were several campaign elements that drove this program to success this summer; specific outreach efforts are described in Section V of this report.

# ULFTs			Flow Reduction (gpd)		
FY 98/99 Goal	FY 98/99 to Date	Program Total (1992 to Date)	FY 98/99 Goal	FY 98/99 to Date	Program Total (1992 to Date)
11,000	12,450	82,604	330,000	415,953	3,207,791

I-C2. COMMUNITY PARTNERSHIP PROGRAM (CPP)

This program offers free ULFTs and installation services to "hard to reach" communities in San Jose. The second phase of CPP debuted in March 1998, with the current contract to be completed by June of 1999. Recently, the final contract option was exercised, bringing the total contract goal to 15,000 ULFTs covering both last and current fiscal years. The focus of this next period will be the

procurement process for the next phase, which is slated to expand to the tributary service area of the Plant.

# ULFTs			Flow Reduction (gpd)		
FY 98/99 Goal	FY 98/99 to Date	Program Total (1996 to Date)	FY 98/99 Goal	FY 98/99 to Date	Program Total (1996 to Date)
11,377	7,682	36,305	341,000	230,460	1,391,335

I-C3. MULTI-FAMILY DWELLING (MFD) VOUCHER PROGRAM

Providing "pre-bates" of $75 per ULFT and free toilet recycling services to apartment owners and managers, this Program has been very successful since the inclusion of installation incentives. These incentives are post-project rebates of $25 per ULFT installed. A second offering of the installation incentive concluded in August 1998 and resulted in signups for some 5,000 ULFTs. To align these campaigns with property managers' property improvement schedules, the next offer began in December 1998 and will run through March of 1999. This time, the installation incentive will range from $10 - $25 with early sign-ups qualifying for higher rebate amounts.

# ULFTs			Flow Reduction (gpd)		
FY 98/99 Goal	FY 98/99 to Date	Program Total (1996 to Date)	FY 98/99 Goal	FY 98/99 to Date	Program Total (1996 to Date)
12,000	8,270	16,403	660,000	462,185	920,870

I-C4. COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL (CI&I) ULFT PROGRAM

Activity in the last reporting period has focussed on the CI&I Voucher Program, which offers up to $150 per toilet for businesses switching to ULFTs. This program is still quite new but is garnering increased interest, particularly in the hotel and industrial complex sectors. The remainder of the fiscal year will continue to highlight the Voucher Program and begin another round of replacing toilets in City facilities.

# ULFTs			Flow Reduction (gpd)		
FY 98/99 Goal	FY 98/99 to Date	Program Total (1997 to Date)	FY 98/99 Goal	FY 98/99 to Date	Program Total (1997 to Date)
1,650	318	1,009	41,000	15,264	48,432

I-C5. FINANCIAL INCENTIVES PROGRAM (FIP)

Rebates of up to $50,000 per project are provided to companies that implement equipment and process changes that reduce the amount of discharge to the sanitary sewer. Rebate amounts are based on the amount of flow reduction expected from a project, at a rate of $4 per ccf/year of flow savings. The program continues to focus on large dischargers with an increase in activity expected from the upcoming

flow audits. In addition to the completed projects summarized below, there are currently 20 outstanding applications with associated flow savings estimated at 0.5 mgd.

# Completed Applications		Flow Reduction (gpd)		
FY 98/99 to Date	Program Total (1991 to Date)	FY 98/99 Goal	FY 98/99 to Date	Program Total (1991 to Date)
3	42	200,000	69,000	623,000

I-C6. OTHER CONSERVATION PROGRAMS

Horizontal Axis Washing Machines

With the August 1998 execution of a second agreement with the Santa Clara Valley Water District for cost-sharing of water conservation programs, the Plant began co-funding the District's participation in the Horizontal Axis Washer Rebate Program offered by PG&E. This program offers customers a rebate of up to $175 toward the purchase of these water- and energy-efficient units. With the recently announced extension of the program by PG&E, it is expected that program performance in the Plant's service area could double the original goal shown below. Upon further evaluation of this technology for its market and savings potential, it is anticipated that the Plant will take an increased role in promoting these washers.

# Washers			Flow Reduction (gpd)		
FY 98/99 Goal	FY 98/99 to Date	Program Total (1998 to Date)	FY 98/99 Goal	FY 98/99 to Date	Program Total (1998 to Date)
3,456	2,609	2,609	50,500	38,117	38,117

I-D. GROUNDWATER INFILTRATION (GWI) REDUCTION PROGRAM

Short Term Projects

Downer-Canoas (DC) Basin Area

Downer-Canoas (DC) Basin refers to the sewer basin lying between the Guadalupé River and the Canoas Creek – roughly from Santa Teresa Boulevard, through Blossom Hill Road and up to Almaden Expressway.

The City completed flow monitoring of all three (3) basins in the DC area in February 1998. After analysis of the flow monitoring data in one of the basins, it was determined that the most potential for GWI reduction was in sub-basin 8 of DC Basin 1 (DC-1). Subsequently, a Closed Caption Television (CCTV) specialist inspected the pipes and manholes in that sub-basin. The CCTV work was completed in June 1998. Review of the videos, did not reveal any significant signs

of GWI or defects in the pipes or pipe joints. However, structural defects were detected in some manholes.

It was suspected that the flow monitoring data obtained in January and February were not accurate due to the excessively wet weather caused by the El Nino event. The flow monitoring was repeated in July 1998 to re-collect flow data and also to investigate manhole defects and leaks. Analysis of new data showed the following potential for GWI reduction in the DC Basin area:

Sub-basin	GWI (mgd)	No. of MH
2C	0.51	140
3B	0.59	190
2D	0.31	170
1C	1.46	460
3C	0.23	150
Total	3.10	1,110

Based on previous CCTV in DC-1 sub-basin 8 and manhole investigation work in sub-basin 1 of DC-1 and sub-basin 1 of DC-2, the most severe structural damage and GWI were found in the manhole structures and not the pipes. Therefore, the City's consultant recommended more extensive inspection of manholes in the above sub-basins prior to rehabilitation of the sewer lines.

The following is a list of recommended action items planned in the DC Basin area:

- Inspect manholes in trunk sewers in sub-basins 2C, 3B, 2D, 1C and 3C (potentially 3.1 mgd GWI reduction);
- Rehabilitate 11 leaky manholes with active GWI in sub-basin 1 of DC-2 (potentially 0.25 mgd GWI reduction);
- Perform dye test at the siphon near the Water District percolation ponds in DC-1 sub-basin 8 to verify the estimated 0.2 mgd GWI;
- Fill abandoned 36-inch RCP in sub-basin 1 of DC-1 with concrete slurry to eliminate rainfall dependent infiltration/inflow.

The GWI consultant will be conducting structural inspections of approximately 120 manholes in the sub-basin 2C of Downer Canoas Basin 2. Flow monitoring indicated a GWI of 0.51 MGD from this sub-basin which has approximately 41,000 lineal feet (lf.) of piping. Structural inspection of manholes is expected to

identify the manholes with leaks and also generate data for design for rehabilitation/repair. Contract documents for the rehabilitation/repair of the manholes in sub-basin 2C will be completed in about four months.

Monterey-Riverside 1-C, Sanitary Sewer Rehabilitation Project

Lining and grouting of the entire 5,000 lf. of 48-inch Reinforced Concrete Pipe (Pipe) and 3,000 lf. of 54-inch Pipe have been completed. The pipeline is being proofed for dips, and site clean-up and street paving are underway. A substantial GWI leak has been observed in one of the manholes in the pipeline. Since the manhole is beyond repair, it will be replaced under a separate contract.

Long Term Projects by City of San Jose

Flow monitoring of basins W and X (approximately 400,000 lf. and 800,000 lf. of sewer lines respectively) has been completed. Analysis of flow monitoring results by the consultant with conclusions and recommendations will follow.

As a part of GWI detection, analyses were conducted on samples of wastewater from thirteen (13) groundwater monitoring stations for BOD, TDS, fluoride, conductivity and temperature. The consultant is analyzing this data in conjunction with the flow monitoring data.

GWI reduction work will be planned depending upon the results of flow monitoring work.

I-E. MARSH MITIGATION

In 1993, the reissuance of the Plant's NPDES discharge permit included a provision that the Plant mitigate for 380 acres of salt marsh habitat lost as a result of prior operations. To achieve the provision, and to establish a bank for possible future salt marsh conversion, the Plant agreed to fund the restoration of two parcels: the Moseley Tract and a portion of the Baumberg Tract. These tracts are located in the South Bay and have been identified by the U.S. Fish and Wildlife Service as important additions to the San Francisco Bay National Wildlife Refuge. On September 18, 1996, the Regional Board unanimously accepted the Plant's Salt Marsh Mitigation Proposal, State Board Resolution No. 96-137, which resolved that the Plant's proposal fulfills its wetlands mitigation requirements of Order No. WQ 90-5.

In an effort to support its goal of ensuring that decision making is based on sound science, the City entered into a consultant agreement with the San Francisco Estuary Institute (SFEI) in April of 1997. The agreement will provide the City with important scientific information necessary for understanding the ecological

influences of local freshwater inputs and other factors on South Bay tidal marshes. The reports that result from the contract will describe the expected natural and anthropogenic factors that may impact tidal marsh conversion, such as land elevation relative to the tides, and will describe methods to monitor the controlling factors related to tidal marsh conversion. The final reports will be completed by June of 1999.

I-E1. MARSH MITIGATION PROJECT - BAUMBERG TRACT

The Plant entered into a cost-sharing agreement with the State and other agencies for the purchase and restoration of the 815-acre Baumberg Tract. The Plant complied with its financial obligations under the cost-sharing agreement with the State Resources Agency by providing $6,031,080 for the acquisition and restoration costs of 360 acres of the Baumberg Tract in May 1996. A consultant contract for the project's Restoration and Management Plan was executed by the State in April 1997. The draft Plan and permit applications are in the draft stages of development, with the actual restoration work scheduled to begin in the spring 1999.

I-E2. MARSH MITIGATION PROJECT - MOSELEY TRACT

The Plant acquired the Moseley Tract from the Port of Oakland in September 1996. The Plant plans to implement a passive tidal restoration to this 54-acre site, which historically was used as a duck club by the Moseley family. The site was cleared of 250 cubic yards of debris and electrical and water utilities by the San José Conservation Corps in October 1996. The four old wells on-site were grout –sealed and a well abandonment certificate was received from the San Mateo County Department of Health Services in October 1997. The Plant has acquired consultant services for the site restoration and management plan, as well as land surveying services. Due to El Nino conditions, the site interior did not convert to a natural dry state this year (as it does typically by late summer), so there were some delays in the field work. In fact, pumping was required in November in order to allow for the site to be flown for the topographic survey. The actual restoration work is scheduled to begin in fall 1999 once the site dries.

I-E3. MARSH MITIGATION PROJECT - TIDAL SALT MARSH MITIGATION ALTERNATIVES

On June 17, 1998, the Regional Board adopted Order No. 98-052 reissuing the NPDES permit for the Plant. Provision 2.2 in the permit requires the Plant to "submit a plan for mitigation of wetland losses caused by the discharge and not covered by previous Orders, including a schedule for implementation acceptable to the Executive Officer." The traditional approach toward mitigation would have been to purchase and/or restore appropriate wetlands to salt marsh habitat.

However, due to the limited availability of suitable wetlands habitat in the San Francisco Bay area, the Plant initiated a process to determine the acceptability of alternatives to classic marsh mitigation.

In April 1998, the Plant transmitted to the Regional Board a proposal to conduct an interest-based approach to address and resolve the marsh conversion issues. In June 1998, the Regional Board approved the concept of a "Mitigation Alternative Feasibility Report" that would be developed through a series of stakeholder meetings over a six-month period. The report would be submitted to the Executive Offices, on or before January 15, 1999.

The Plant, in collaboration with Regional Board staff, initiated an open stakeholder process in August 1998 to discuss the viability of four proposed marsh mitigation alternatives. Through this process, stakeholders reached agreement that the purchase and restoration of Bair Island was the highest priority mitigation project in the San Francisco Bay area. The City's feasibility report and accompanying recommendations were tentatively accepted by the Executive Officer on December 21, 1998.

II. POLLUTANT REDUCTION

The purpose of the following Plant programs is to reduce the flow of pollutants to the South San Francisco Bay. This is accomplished through a multi-pronged continuous improvement approach involving infrastructure optimization, pretreatment programs, partnerships with industry, special studies to ensure that programs are based on good science and regional cooperative programs including the Urban Runoff Management Program, and the Watershed Management Initiative.

II-A. SJ/SC WATER POLLUTION CONTROL PLANT

II-A1. OPERATIONS and MAINTENANCE MANUAL

The letter submitted to the Regional Board on November 30, 1998 outlining the updates made in the operations and maintenance manual, contingency plan, and the reliability updates, and the Regional Board's response dated December 16, 1998, are included in Appendix C.

II-A2. HEADWORKS LOADING ANALYSIS WORKPLAN

The purpose of the Headworks Loading Analysis is to develop an appropriate methodology to quantify flows and concentrations from various sectors including residential, commercial, un-permitted industrial, institutional, and inflow and infiltration (I/I). The information will be used to evaluate local limits and focus outreach and enforcement activities.

Background

The previous headworks loading analysis was conducted in 1993 and focused on the development of local industrial discharge limits for copper, nickel, and cyanide. In that study, the flow from the residential sector was estimated using 1992 water use records, and flow from the commercial sector was estimated by subtracting the residential and industrial flows from the total Plant influent. Pollutants of concern were limited to copper, nickel, and cyanide.

Objectives

This workplan proposes a Headworks Loading Analysis study to:

1) Identify sources of pollutants of concern not previously studied.
2) Improve the flow quantification methodology for the commercial, un-permitted industrial, and institutional sectors and I/I and estimate flow contribution for all sectors.

3) Determine limiting factors for water use/reuse and identify sources that contribute limiting pollutants.
4) Generate hydraulic and conventional pollutant loading data to support a sanitary sewer rate study.

It is the objective of this study to incorporate data from the Selected Organics Source Investigation and the Special Study for Certain Organic Pollutants. Whenever possible, common elements of these workplans will be implemented simultaneously.

Tasks and Timelines

Table 1 lists the specific tasks and timelines to accomplish the above objectives.

Table 1
Tasks and Timelines

Quantify residential and commercial flow using potable water sales in the Plant service area for 1998.	Obtain waters use records **4/99** Estimate sector flows **9/99**
Quantify industrial pollutant contribution.	Calculate industrial flow and pollutant concentrations using Source Control database **6/99**
Quantify inflow and infiltration using ADS sanitary sewer flow monitoring system.	Review monthly reports for indications of inflow and infiltration. **Begin immediately – continue ongoing review.** Identify collection system inflows **9/2000** Identify collection system infiltration **12/2000**
Develop list of pollutants of concern for investigation.	List of toxic pollutants for study **3/99** List of pollutants that limit recycled water use/reuse **4/99**
Design monitoring program for identifying and quantifying sources of pollutants of concern.	Evaluate existing Plant data to determine pollutant fate and calculate removal rates for pollutants of concern **3/99** Conduct literature search to identify known or established sources of pollutants of concern **6/99** Develop sampling protocol for pollutants to be monitored **7/99** Develop monitoring program to identify and characterize pollutants of concern **7/99** Conduct monitoring **7/99 – 7/2000**
Submit program report detailing results of the Headworks Loading Analysis and propose elements for future work.	Submit program report to Regional Board **6/2000**

Table 2 lists the preliminary pollutants to be studied.

Table 2
Pollutants for Study
Preliminary List

Pollutant Type	Pollutant
Toxic Pollutants	Copper, mercury, nickel, tributyl tin, organochlorine pesticides, PCBs, MTBE
Recycled Water Limited Use	TDS, boron, sodium, chloride
Conventional Pollutants	BOD, TSS, NH_3

II-A3. SELECTED ORGANIC SOURCE INVESTIGATION WORKPLAN

The purpose of the Selected Organics Source Investigation is to comply with NPDES Permit provision and meet the following objectives:

1. Determine whether permitted industrial dischargers discharge any organochlorine pesticides, PCBs, and dioxins to the Plant.
2. Review other potential sources in order to reasonably account for organochlorine pesticides, PCBs, and dioxins that are noted or suspected in the Plant influent.
3. Identify source control and pollution prevention opportunities.

Background

Monitoring for organic priority pollutants in Plant influent, effluent, and biosolids is conducted twice each year. Some of these pollutants have been detected in low concentrations, often at or near the method detection limit. Quantification of organic priority pollutants in Plant influent and effluent is difficult due to the matrix interferences that mask method resolution and pollutant detection. The Plant is currently working with the other South Bay POTWs to develop a workplan for a Special Effluent Study for Certain Organic Pollutants to quantify organic pollutants using low-level techniques.

Objectives

The objectives of the Selected Organics Source Investigation are:

1. Determine the presence of organochlorine pesticides and PCBs in Plant influent.
2. Review records of permitted industrial dischargers for the use or generation of organochlorine pesticides, PCBs, and dioxins.
3. Identify other potential sources of organochlorine pesticides, PCBs, and dioxins to the Plant.

4. Confirm the presence and contribution of pollutants from identified and potential sources.

Tasks and Timelines

Table 1 lists the specific tasks and timelines to accomplish the above objectives.

Table 1

Objectives	Task & Timeline
Identify the presence and quantities of organochlorine pesticides, PCBs, and dioxins in plant influent.	Review monitoring results of plant influent and effluent monitoring of organochlorine pesticides and PCBs. **3/99** Monitor plant influent weekly for 12 weeks to confirm presence of organochlorine pesticides and PCBs. **6/99** Incorporate data obtained from Special Effluent Study for Certain Organic Pollutants. **as data becomes available**
Determine whether permitted industrial Dischargers discharge any organochlorine pesticides, PCBs, and dioxins.	Review Dischargers files and records for the storage, use, or generation of organochlorine pesticides, PCBs, and dioxins. **6/99**
Identify potential sources of organochlorine pesticides and PCBs that are noted or suspected in plant influent.	Survey uses and applications of organochlorine pesticides and PCBs and create a list of potential sources within the Plant's service area. **6/99**
Confirm sources of organochlorine pesticides and PCBs.	Develop monitoring program to confirm potential sources are discharging organochlorine pesticides and PCBs. **7/99** Conduct monitoring. **7/99 – 12/99**
Identify opportunities for source control and pollution prevention.	Develop control mechanisms to reduce the amount of organochlorine pesticides and PCBs discharged to the sanitary sewer system **6/2000**
Submit program report	**6/2000**

II-A4. TRUNKLINE AND UPSTREAM MONITORING

Background

In October 1995, the Plant developed and implemented a Trunkline and Upstream Monitoring Program to focus on tracing pollutants upstream from the Plant. The long-term intent of the program is to:

- Identify the sources of pollutants entering the Plant to specific trunklines (or cities) of origin.
- Attempt to identify whether pollutants enter the Plant in a consistent manner or in slug loads.
- Trace the pollutants by continually moving upstream to their sources.

This status report presents pollutant loading at the five trunkline sites over a three year period and discusses significant trends at the trunkline and upstream sites.

Trunkline Monitoring Sites: Wastewater flowing into the Plant can be isolated into three trunklines and two upstream sites approximately representing San José, North San José, Milpitas, and Santa Clara. The current monitoring sites that represent the total flow entering the Plant are:

T-1 represents wastewater flows from the City of Milpitas.

T-2 represents wastewater flows from San José, the southeast quadrant of Santa Clara, and the West Valley Sanitation District.

T-3 represents wastewater flows from North San José.

U-SC1 represents wastewater flows from Santa Clara between the Guadalupé River and San Tomas Aquino Creek north of Central Expressway.

U-SC2 represents wastewater from Santa Clara west of San Tomas Aquino Creek. The City of Cupertino discharges wastewater into the sewers of Santa Clara and contributes to the flow at U-SC2.

Upstream Monitoring Sites

No additional upstream sites have been established in the last six months. Upstream site U-M2, established during the previous reporting period, continues to be monitored for a potential source of extreme values in this area.

Of the upstream monitoring sites established, two are continually monitored for industrial discharge activity. Listed below are the upstream monitoring sites that have consistently shown elevated pollutant levels attributed to industrial activity.

U-SC3 - this site collects wastewater from Santa Clara south of Central Expressway and east of San Tomas Aquino Creek. This site flows through T-2.

U-SJ2 - this site collects wastewater from the North San Jose industrial park bounded by Trimble Rd., Brokaw Rd., Trade Zone Blvd., and the Western Pacific Railroad. This site flows through T-2.

Mass Loading

Figures 1 through 4 show the average daily mass loading for the five trunklines entering the Plant during the past three years. The charts compare the loading during six reporting periods of approximately six months each.

Figure 1 shows the average daily loading of total copper at each of the trunklines. Current total copper loading at the trunklines has decreased 27 percent from the previous reporting period; the lowest level since monitoring began. Total copper loading at the trunklines has decreased 44 percent from the first reporting period. The current decrease in total copper loading is a result of lower average concentrations at four of the five trunklines. Total copper concentrations show less variance and an absence of extreme values compared to the reporting periods. A portion of the 44 percent decrease since the first reporting period is a result of a nine percent reduction in the estimated flow at T-2.

Figure 2 shows the average daily loading of dissolved copper at each of the trunklines. Current dissolved copper loading at the trunklines has decreased 21 percent from the previous reporting period and 46 percent from the first reporting period. The current decrease in dissolved copper loading is a result of minor decreases in dissolved copper concentrations at three of the five trunklines and a reduction in the estimated flow at T-2.

Figure 3 shows the average daily loading of total nickel at each of the trunklines. Current total nickel loading at the trunklines has decreased 29 percent from the previous reporting period and 62 percent from the first reporting period. The average total nickel concentration at T-1 has decreased 61 percent from the previous reporting period. This decrease accounts for ten percent of the total nickel reduction to the Plant. The remainder of the total nickel reduction to the Plant is a result of a decrease in the average total nickel concentration and estimated flow at T-2.

Figure 4 shows the average daily loading of dissolved nickel at each of the trunklines. Current dissolved nickel loading at the trunklines has decreased 30 percent from the previous reporting period and 57 percent from the first reporting period. The current decrease in dissolved nickel loading is a result of a decrease in average dissolved nickel concentrations and estimated flow at T-2. This decrease at T-2 reverses the changes noted between the fourth and fifth reporting period. The long-term trend of decreasing dissolved nickel loading at the trunklines is a result of decreasing loading at T-1.

Program Findings

The combined average daily loading for copper and nickel at the five trunkline sites has decreased significantly during the past six months. Recent data indicate that copper and nickel are entering the Plant at lower concentrations than during previous reporting periods. Current pollutant concentrations have less variance and an absence of extreme values. This trend is a result of ongoing pollution prevention, source control, and monitoring programs that have focused on sources of copper and nickel.

Future Program Activities

The Trunkline and Upstream Monitoring Program will continue to monitor the trunkline and upstream sites as needed to search out sources of extreme pollutant concentrations. Program data will be used to support surveillance, inspection, and outreach efforts.

Figure 1
Total Copper Loading by Trunkline

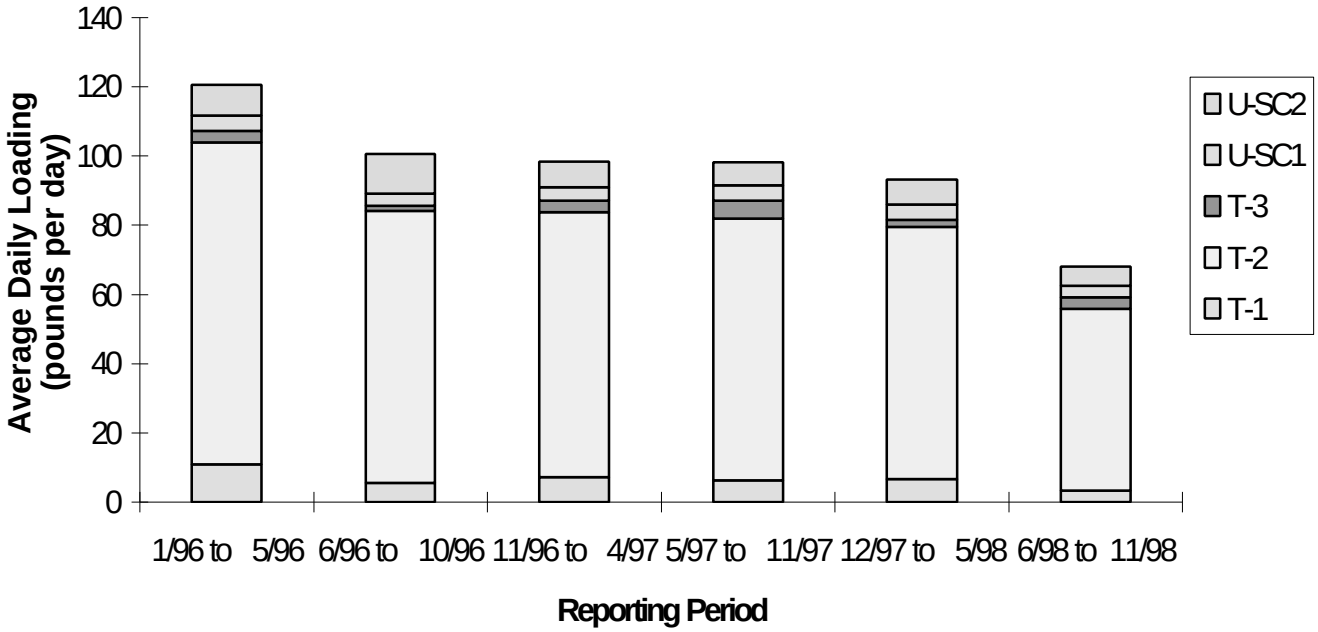


Figure 2
Dissolved Copper Loading by Trunkline

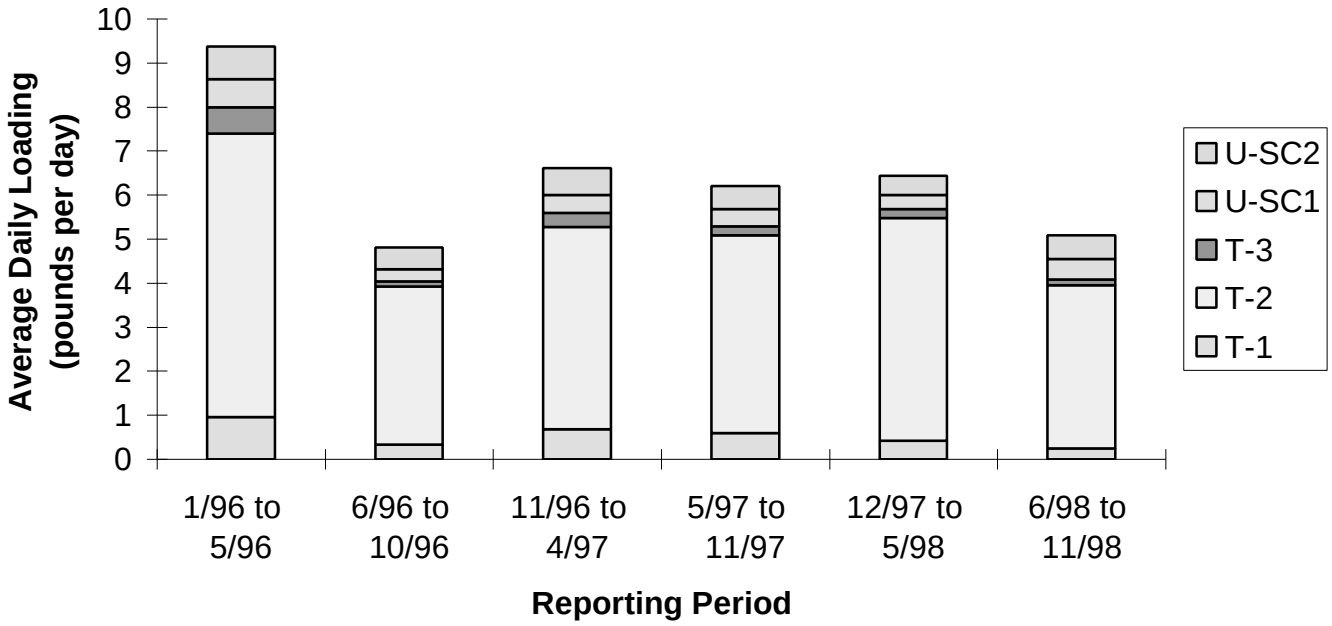


Figure 3
Total Nickel Loading by Trunkline

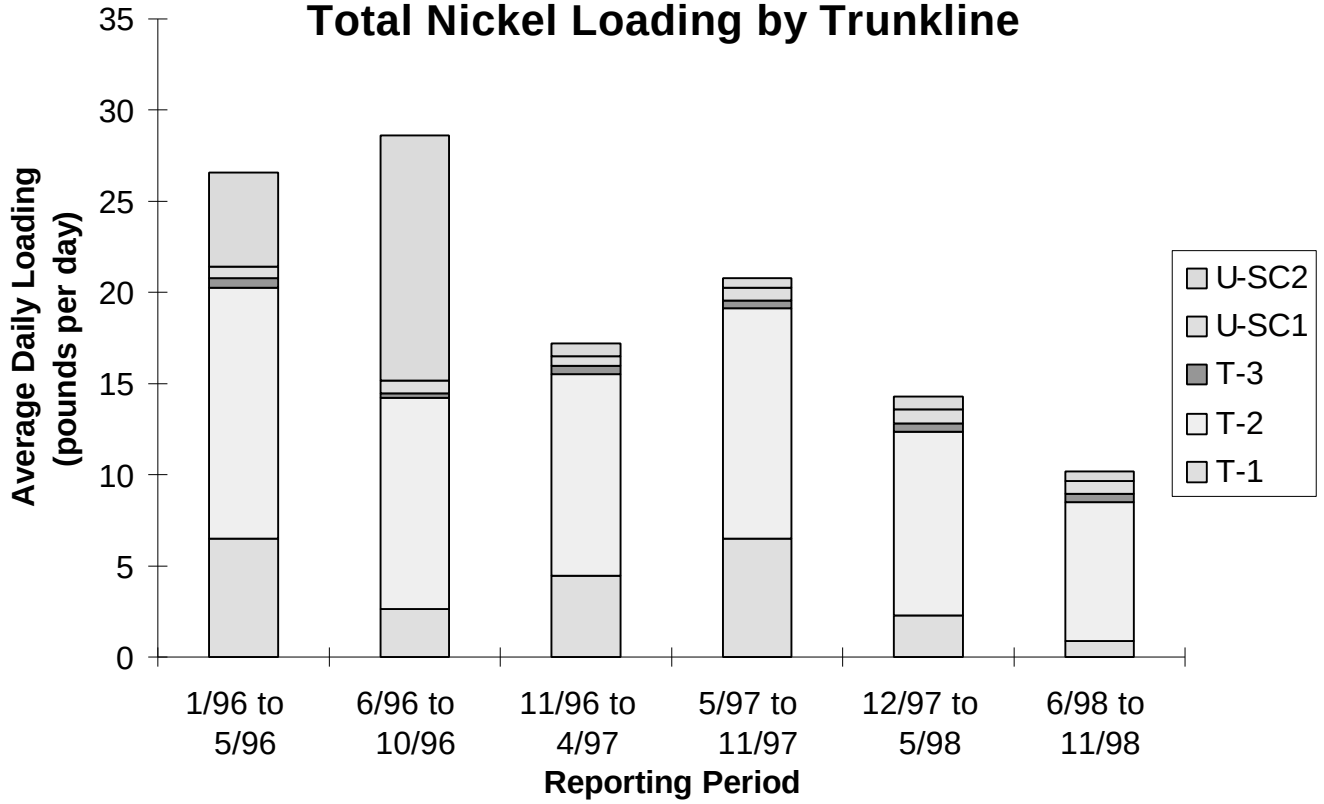
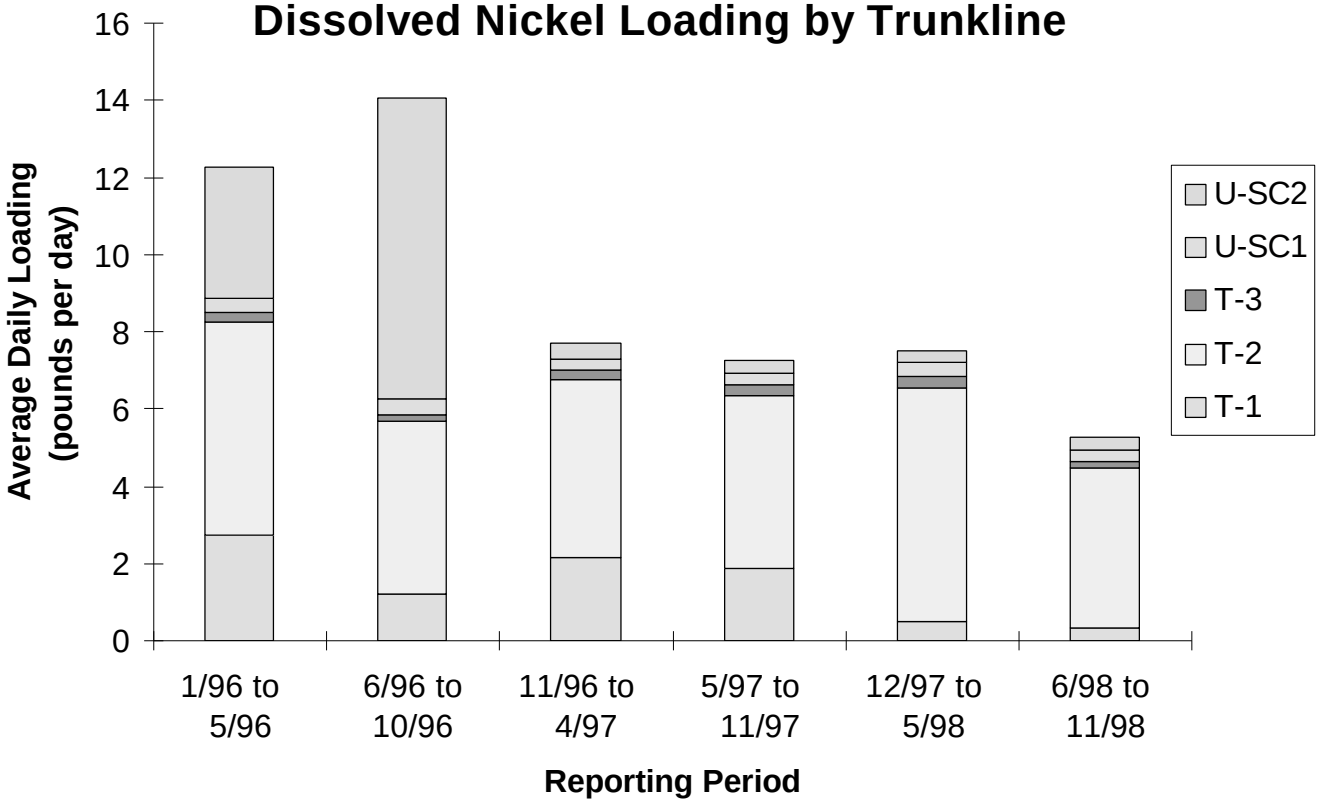


Figure 4
Dissolved Nickel Loading by Trunkline



II-A5. PLANT STUDIES

Biological Nutrient Removal (BNR)

The Plant has developed a plan for converting Nitrification into a single stage BNR process. The preparation for conversion is underway and is expected to be complete by July 1999.

Modeling of the BNR process as a training tool and as a tool for enhancing process control is in progress. The system for Automatic Sludge Retention Time control of BNR in Nitrification was installed. Design of the ammonia–airflow control loop has been completed and will be tested in the Spring of 1999. Four on-line turbidimeters were tested, and the report on their performance is currently under development. In order to improve process reliability, a new monitoring station for BNR effluent will be designed in the Spring of 1999. After converting Nitrification into a single stage BNR process, the Plant will monitor the combined

full-scale BNR and filtration process over the following year and assess the need for any chemical additions to meet Title 22 recycled water requirements.

II-B. THE PRETREATMENT PROGRAM

II-B1. INDUSTRIAL WASTEWATER DISCHARGE MUNICIPAL CODE

In preparation for implementing the Commercial/Industrial/Institutional flow audit requirement from Tier I of the Contingency Plan, it was necessary to change the Municipal Codes of the Cities and Agencies discharging to the Plant to require a Flow Audit Study for any company discharging greater than 100,000 gpd to the sanitary sewer. The previous language did not mention flow, and therefore many non-industrial facilities did not fall under the pretreatment program's authority to regulate and require reports, even though they may have a discharge of greater than 100,000 gpd.

In order to implement the Audit requirements, the definition of Critical User was changed to read as follows:

> Critical User means a discharger whose wastewater contains priority pollutants, or who discharges any waste other than sanitary sewage which has the potential to cause interference, or who discharges in excess of 100,000 gallons per day.

This Code change will allow the Plant to permit and require Flow Audit Studies from any discharger who meets the new definition.

As of January 1, 1999, San Jose, Santa Clara, Milpitas, Cupertino Sanitary District, and West Valley Sanitation District had all adopted the new definition. Burbank and Sunol Sanitary Districts will make the necessary change in 1999. Since they do not have any dischargers with flows above 100,000 gpd, it is less urgent that these Districts adopt the new language.

II-B2. NEW INDUSTRY/DEVELOPMENT PROGRAM

The City continues to review new developments during the planning process to identify and address wastewater discharge quality and flow issues that will affect the Plant. These reviews ensure consideration of water efficiency, recycled water use, and wastewater flow and pollutant loading minimization as early as possible in the development planning process. The pilot process to accomplish these reviews was begun September 1997. Active participation in the City’s development review process has been maintained since that time.

During the period July 10, 1998 through December 31, 1998, staff reviewed and responded to:

- 4 Administrative Draft Environmental Impact Reports (EIR);
- 19 Projects identified for potential adoption of water-conservation or other flow reduction measures that go beyond current Municipal Code requirements;
- 46 Projects identified for potential wastewater pretreatment and pollutant reduction measures; and
- 54 Projects identified for potential use of recycled water.

Coordination of comments on all environmental elements has proven valuable in gaining consideration of special wastewater and recycled water measures. Project review efforts to maintain support of the City's other environmental programs were similarly increased.

San Jose's Redevelopment Agency and Office of Economic Development often participate in industrial site discussions prior to the regular development process. These agencies therefore provide another early opportunity to deal with the issues of future wastewater volumes, pollutants of concern, use of recycled water and water efficiency. ESD had become active in these departments' discussions of projects that have significant discharge potential.

New development in other cities and sanitation districts tributary to the Plant also has the potential to add wastewater discharge sources. Once the pilot process is working smoothly, similar work will begin in the other agencies.

The role of the Building division in selecting and installing plumbing configurations that incorporate the newest proven and accepted water recycling practices provides additional opportunities to manage changes in flow volumes and pollutant loading. Staff is beginning to work with the Building division on these issues.

Next Steps

Current roles are being re-evaluated. Evaluations include:

- Effectiveness of development review in reducing flows and pollutants;
- Continuation of the integrated environmental input needed by the City's planning process;
- Coordination with the Building Division when permitting commercial or industrial water recycling or reuse configurations; and
- Coordination with the City's Redevelopment Agency and Office of Economic Development.

II-B3. INDUSTRIAL DISCHARGER RESEARCH STUDIES (Printed Circuit Board Manufacturers Partnership)

The Printed Circuit Board (PCB) partners continued working with the City to evaluate pollutant and flow reduction projects at their facilities during Phase III of the partnership. The research group has established copper, nickel and lead baseline information and will continue evaluating feasible reduction(s) by sharing the lessons learned from each other. Partner companies include:

- HADCO Santa Clara, Inc.,
- Paragon Electronic Systems,
- South Bay Circuits, Inc.,
- Tyco Printed Circuit Group.

PHASE II Conclusions

HADCO's initial wastewater treatment system metal removal efficiency study was completed. Results indicate that the system at HADCO has a removal efficiency of 99.9% for copper and 96.3% for nickel. Approximately 45% of the copper and 96% of the nickel discharged is in a dissolved form. HADCO also estimates achieving approximately 60% recycling of wastewater on site.

HADCO's results, and the other three partner's results, are contained in Table 1.

PHASE III Projects

Upon obtaining the results from Phase II testing, the partners compiled the data and began discussing the results. It was decided by consensus that an economic yardstick should be employed to further compare the treatment systems. Several factors were considered in the make up of this costing analysis. These included:

- Total labor costs;
- Chemicals;
- Total parts and repairs;
- Water sewer rate;
- Lab charges;
- Sludge costs;
- Gallons of water used;
- Pounds of copper in waste stream;
- Copper in sludge;
- Average copper discharge;
- Pounds copper to POTW; and
- Pounds copper removed.

Each of the partners gathered information about the operation of their respective systems and the table below was formed to help illustrate the findings.

Table 1: Treatment Cost and Performance

COMPANY	$ PER POUND[1] COPPER REMOVAL	COST[2] PER GALLON	Gal/ ssqft[3]	REMOVAL EFFICIENCY[4]		AVERAGE[5] DAILY FLOW	%[6] DISSOLVED DISCHARGE	
				COPPER	NICKEL		COPPER	NICKEL
HADCO[A]	$13.73	$ 0.0140	3.38	99.89	96.31	370,000	45	96
SOUTH BAY (BUILD #1) [B]	$21.00	$ 0.0190	1.35	99	86	58,550	74.27	64.66
SOUTH BAY (BUILD #3) [C]	$159.00	$ 0.0200	1.78	98	53	49,276	47.42	94.66
PARAGON[D]	$25.568	$ 0.0155	12.22	99.42	52.94	81,900	99.46	42.8
TYCO[E]	$29.27	$ 0.0193	9.79	98.9	82.35	90,467	50	92

[1] $ per pound- Total operating cost of waste water treatment system including but not limited to chemicals, labor, repairs divided by total lbs. of copper removed

[2] Cost- Total operating cost (as defined in #1 above) divided by total gallons of water consumed (discharged) by industrial sewer

[3] - Total gallons of water divided by surface square feet. Surface square feet is defined by total surface of inner layers plus total surface of outer layers of the printed circuit board

[4] - Removal efficiency is total copper/nickel removed divided by total copper/nickel in influent prior to treatment

[5] - Average Daily Flow is the average gpd of water discharge by industrial discharger

[6] - Percent of discharge metals that is dissolved

[A] - Hadco Corporation - Combination of Ion Exchange, Precipitation, Batch and Recycle

[B] - South Bay Circuits Inc: Building #1. - Chemical Precipitation

[C] - South Bay Circuits Inc. Building #3 - Ion Exchange

[D] - Paragon Electronic Systems - Ion Exchange

[E] - Tyco Printed Circuit Group: Santa Clara Division - Chemical Precipitation and Batch Treatment

The partners discussed these findings at length as they tried to evaluate the results and determine the differences from each system. Some of the issues discussed were:

- Copper removal efficiency was very high for each partner. This may be expected since copper has been recognized as a pollutant of concern for PCB manufacturers and most pre-treatment systems were designed to remove copper.
- The cost to treat per gallon was comparable from partner to partner. This is interesting since each partner's plant configuration was different.
- Paragon's nickel removal efficiency was below the other partners. This may be explained by the fact that, as an Ion exchange system, the resins contained in the system were chosen for copper removal. Also, the amount of nickel present in the wastewater prior to treatment was very low. Experience has found that it is more difficult and costly to remove small quantities of metal in waste streams.
- The nickel levels going into the ion exchange system were at or below the detection level on several samples taken at Paragon during the test.
- The price per pound of copper disposal appears lower for HADCO than the other partners.
- Due to the disparity of gallons water used per surface square foot processed, g/ssqft, the partnership decided to study this in the future. The partnership will address this issue as stated in 6.3 of the 'Summary of Current and Future Activities" section.

The efficiency for copper removal was very good for all partners. The partners decided that, in future studies, the reduction of nickel and flow might produce larger net results. To this end, the partners met with Dr. David Sedlak to talk about his report in the July 1998 Status Report. Dr. Sedlak explained his findings to the partnership. The partners and Dr. Sedlak discussed investigating possible approaches to reducing nickel EDTA from Printed Circuit Board manufacturers.

The partnership is pleased with the progress made in understanding the different partner's treatment facilities. The development of the unit of measure, gal/ssqft, helped compare each facility, regardless of size, using a common "measuring stick." The partners agreed this and other collaborations will guide the partnership to other discoveries which may help in the reduction of pollutants from the partners and, hopefully, other Printed Circuit Board manufacturers.

Summary of Current and Future Activities (January 98 to October 98):

1. Evaluate copper, nickel, and lead removal efficiency of the existing wastewater treatment processes at team members' facilities (Completed)
2. Develop mass balance for the team member's processes (waste streams, pretreatment, and wastewater discharge) (On going)
3. Plan sampling and flow monitoring programs (Completed)
   - 3.1. Implement sampling and flow monitoring programs (Completed)
   - 3.2. Conduct data analysis and obtain results (On going)
4. Conduct economical studies (On going)
5. Partnership Progress Report
   - 5.1. Submit progress report to City and partners for the period (July 98 to October 98) by October 31, 1998 (Completed)
6. Recommended projects for future evaluation (Next Steps)
   - 6.1. Extend Research Agreement
   - 6.2. Develop $/lb. overall removal cost for nickel, copper, and lead
   - 6.3. Flow reduction
     - 6.3.1. Implement sampling and flow monitoring programs at specific processes
     - 6.3.2. Evaluate existing engineering solutions installed by team members at critical production processes
   - 6.4. Develop water quality and contaminant levels for process rinse waters
     - 6.4.1. Determine the feasibility and availability of the Plant's supply of Recycled water for the partners
     - 6.4.2. Investigate Industry Focus of the Flow Audit Study (FAS)
   - 6.5. Dissolved Nickel reduction
     - 6.5.1. Site-Specific Wastewater Treatment
     - 6.5.2. Investigate the applicability of wastewater segregation at selected facilities
     - 6.5.3. Evaluate existing engineering solutions installed by team members at critical production process
     - 6.5.4. Conduct data analysis and optimization processes and apply SPC/DOE principles
     - 6.5.5. Recommend optimum set-ups at the pretreatment processes at the team members' companies
   - 6.6. Evaluate results and findings
   - 6.7. Progress Reports
     - 6.7.1. Submit report to the City by June 30, 1999 for inclusion in the July 1999 CBS
     - 6.7.2. Submit report to the City by October 15, 1999 as a closing of the partnership

II-B4. INDUSTRIAL POLLUTANT LOADING STATUS

In the July 1998 report, we reported that we would begin reporting the year-to-date average daily flow and copper and nickel loading for the three permitted industrial sectors: Group 1, Group 2 and Group 3 Dischargers. The current information will be compared to a 1997 baseline.

Due to technical difficulties with the pretreatment program database, the information could not be compiled by industrial sector. We are developing a procedure, which will accurately produce the necessary data. Industrial loading will be reported by sector in the July 1999 report.

II-C. URBAN RUNOFF MANAGEMENT

II-C1. INDUSTRIAL STORM WATER PILOT PROJECT

In 1987, the Clean Water Act was amended to regulate municipal and industrial storm water discharges under the National Pollutant Discharge Elimination System program. The regulation states that storm water discharged directly or indirectly through municipal storm sewer should be regulated by an NPDES permit.

The NPDES permit required the Santa Clara Valley Urban Runoff Pollution Prevention Program (Program) to develop a revised Metals Control Measures Plan (MCMP) to reduce copper and other metals in storm water. The Storm Water Monitoring Pilot Program was created with the following main objectives:

- Review the suitability of the MCMP data
- Assess the significance of industrial storm water discharge relative to MCMP; and
- Determine the extent to which industries have met the objectives of the General Permit and implemented the SWPPP's.

Appendix D contains a full report of the Industrial Storm Water Monitoring Pilot Program.

II-C2. URBAN RUNOFF MANAGEMENT PROGRAM

The Santa Clara County Urban Runoff Pollution Prevention Program and each co-permittee submitted its Annual Report to the San Francisco Bay Regional Water Quality Control Board on 9/1/98 and will be submitting the updated work plan on 3/1/99. Copies are available upon request.

III. RESEARCH and SPECIAL STUDIES

III-A. SPECIAL EFFLUENT STUDY FOR CERTAIN ORGANIC POLLUTANTS

On November 24, 1998 the Plant submitted for consideration a work plan outlining its proposed special effluent study for certain organic pollutants to comply with Provision E. 9 of Regional Board Order 98-052. This study was jointly developed by the three South Bay dischargers (Palo Alto, San Jose/Santa Clara, and Sunnyvale) to conduct low level monitoring with ultra clean procedures and techniques on select organic priority pollutants. The study plan recommended submitting a final project report on December 31, 2001, eleven months later than requested by Order 98-052. The dischargers requested this time extension since: (1) sufficient time is necessary up front to select qualified laboratories before any sampling and testing begin; (2) ultra-trace level sampling and chemical analyses are extremely laborious, and (3) March/September sampling corresponds to monitoring already required by the NPDES permit and by the pretreatment program. The Regional Board staff approved the proposal with modifications on January 13, 1999.

III-B. MERCURY TMDL PARTICIPATION PLAN

On June 17, 1998, the Regional Board reissued the three South Bay discharger NPDES permits which all contain a specific provision for mercury TMDL participation: "*participation with the Regional Board and other South Bay Dischargers in identifying cross media watershed-wide sources of mercury impacting the receiving water and potential control measures*," as well as participation "*in [the] Regional Board TMDL process development of site specific objectives and/or a wasteload allocation and mass effluent limits for mercury*." The Plant is presently in compliance with the 12 parts-per-trillion mercury limit contained in its permit, and has been in compliance since March 1996, averaging just 3 parts-per-trillion of total mercury.

On November 24, 1998 the City submitted for consideration a Mercury Participation Plan that included the following objectives: (1) to continue low level effluent monitoring for mercury and (2) to participate in the Regional Board's region-wide mercury phased TMDL investigation. The City advocated participation in the Regional Board's South Bay mercury program in coordination with the Santa Clara Basin Watershed Management Initiative. The City also

agreed to provide adequate resources for its participation in the development of a region-wide mercury strategy and any resulting phased TMDL studies, as appropriate. The Regional Board accepted the proposal on January 13, 1999.

III-C. SPECIAL STUDIES SUPPORTING SITE SPECIFIC OBJECTIVES (SSO) and TOTAL MAXIMUM DAILY LOAD (TMDL) DEVELOPMENT

III-C1. NICKEL ACUTE-TO-CHRONIC RATIO STUDY

In 1986, the U.S. Environmental Protection Agency (EPA) established the National Water Quality Criterion for marine nickel as 8.3 parts per billion (ppb). Special investigations conducted by the Plant on the toxicity of nickel in 1990-1991 indicated that there was valid scientific literature on which to base a recalculation of the national nickel criterion. In 1995, our research established a recalculated nickel value of 10.2 ppb, using EPA criteria amendment methods. These investigations also suggested that the lack of chronic toxicity data on marine species biased the national criterion development toward freshwater data.

When calculating Water Quality Criteria, acute toxicity test results are often translated to chronic toxicity protection with the use of a Final Acute-to-Chronic Ratio (FACR). In the case of nickel, two Acute-to-Chronic Ratios (ACRs) for freshwater species (35.58 and 29.86) were combined with one saltwater ACR (5.48) to produce the marine FACR of 17.99. Staff hypothesized that responses to toxicity tests, which produce the ACRs, would be different in fresh and saltwater. Therefore, the Plant initiated studies in 1997 to determine the acute and chronic response of three local marine species (topsmelt, red abalone, and mysid shrimp) to nickel.

The University of California - Santa Cruz submitted its final report on October 30, 1998. Acute-to-Chronic ratios for the three species were topsmelt (6.22), mysid shrimp (6.73), and red abalone (5.50); verifying the Plant's original hypothesis. When these ACR values are combined with the existing fresh and saltwater ACR's, the revised marine water quality criterion for nickel would range from 11.9 to 13.9 ppb. If the fresh water ACR data were excluded from the Final ACR calculation, the resulting saltwater nickel FACR would be 5.959 and the new nickel marine water quality criterion would range from 20.9 to 24.4 ppb.

III-C2. SPATIAL AND TEMPORAL TRACE LEVEL MONITORING IN SOUTH SAN FRANCISCO BAY

During 1998, Plant staff continued to monitor water quality parameters bi-weekly in the South Bay at twelve sampling sites representing deep, mid-channel, shallow mudflats, and areas of significant stream influence. The on-going purpose of this

investigation is to describe spatial and temporal trends in water column quality and ultimately to develop a more robust database on which beneficial use assessment and impairment can be based. Results through September 1998 demonstrate decreasing ambient copper and nickel concentrations in the extreme South Bay on a gradient northward. High total metal concentrations correlate strongly with storm events (high wind). Levels of measured total copper and nickel correlate with Total Suspended Solids (TSS) and, to a lesser degree, with Total Organic Carbon (TOC) and Dissolved Organic Carbon (DOC). Total mercury values are highest near the confluence of Coyote Creek and Guadalupé River, possibly originating from abandoned cinnabar mines in the watershed. Current data corroborate findings of the Regional Monitoring Program, studies conducted by the US Geological Survey, and San Jose's 1996/97 water effect ratio (WER) findings. Finally, the Plant intends to continue monitoring water column quality in 1999 and will evaluate the merit of sediment sampling in the South Bay.

III-C3. CALCULATION OF TMDL FOR COPPER AND NICKEL IN SOUTH SAN FRANCISCO BAY

The TMDL efforts to date can be separated into two phases. The first phase covers the period from March to July 1998, during which time three tasks were initiated: Project Management, Stakeholder Involvement, and Conceptual Model Development. The Project Management activities have included the development of project plans for the seven tasks that are presently active. The major stakeholder involvement activities focused on developing the stakeholder group. These activities involved meeting with representatives from regulatory agencies, environmental groups, industry, and local municipalities to define the role of the stakeholder group; developing group-operating procedures; and facilitating the initial group meetings. Conceptual Model Development activities included the development of the physical, chemical, and biological database for copper and nickel in the South Bay, and the development of a conceptual model of fate and transport as well as ecological processes for these pollutants.

The second phase of the TMDL project covers the period August to December 1998. The major effort during this period has been developing the information and procedures that will guide the remainder of the TMDL effort. This work has been conducted under Conceptual Model Development as well as five additional tasks that were initiated during this period: Assess Pollutant Levels and Levels of Impairment (Task 2), Evaluate Existing 2- and 3-D Models (Task 4), Integration with the WMI (Task 7), Technical Review (Task 9), and Regulatory Process (Task 10). Products produced during this period include: a GIS-based database that brings together different types and sources of information that will be used throughout the project; the establishment of a technical review committee and the procedures to review technical products; a Source Characterization Report that

identifies and quantifies the major sources of copper and nickel that enter the South Bay; and the Task 4.1 Model Report that provides an evaluation of existing 2- and 3-D models that could be utilized in the South Bay.

The activities over the next six months will focus on conducting the Beneficial Use Impairment Assessment to determine if ambient levels of copper and nickel in the South Bay have impaired the beneficial uses defined in the Water Quality Plan for the San Francisco Basin. The conceptual model will also be distributed and reviewed by the TMDL Work Group as well as the Technical Review Committee.

III-D. SALT MARSH CONVERSION ASSESSMENT

The 1998 comparative study of South Bay plant marsh associations and accompanying wetlands conversion assessment has not been fully completed. Staff is currently reviewing the draft report submitted in December 1998. Preliminary estimates indicate that approximately 39 acres of saline marsh were converted to brackish marsh habitat between 1997 and 1998. The loss of saline marsh in the Study area is coincident with a similar (relative to size) loss of saline marsh in the Reference area, which is not influenced by Plant effluent flows. Similar modifications to marsh habitat in both the Study area and Reference area suggest that large scale environmental conditions are likely controlling the observed shifts in South San Francisco Bay marshes. Much of this is due to the above average annual precipitation during the past four years, especially with the rains produced by El Nino in 1998. The final report will be available in the first quarter of 1999.

III-E. STREAM FLOW AUGMENTATION PILOT PROJECT

The primary objectives of stream flow augmentation are to enhance habitat and improve water quality in streams, using recycled water. Because using recycled water for habitat enhancement is not well documented, short-term pilot studies with comprehensive monitoring programs are being designed to assess both the positive and negative impacts of recycled water on aquatic habitats. Presently, summer stream flows and water quality within the Santa Clara Valley Basin are insufficient to support healthy populations of cold-water species. Cold-water species of special interest include the Steelhead trout, proposed for federally listing as threatened, and fall-run Chinook salmon, likely to be proposed for listing.

A pilot project is currently in the planning and permitting phases for releasing recycled water into Coyote Creek during the 1999 dry season. The Coyote Creek Pilot is a stakeholder driven project that involves local environmental groups, regulatory agencies and several City departments.

The anticipated release location is northeast of Senter Road and Umbarger Road (between Tully and Capital Expressways). Pre-release monitoring of water quality, fisheries, macroinvertebrates and habitat quality has been conducted and is being used to develop biological monitoring plans and operations criteria. CEQA documentation and NPDES permit language is being drafted for stakeholder and regulatory review. Facilities for treating and delivering the recycled water are also currently being designed.

To date, construction of the Streamflow Augmentation mobile pilot dechlorination system is approximately 90% completed. Final completion is anticipated by January 1999. The Programmable Logic Control (PLC) program for the system is being developed by the design consultant and expected to be downloaded into the system by end of January 1999 for field testing. A two-week test-run using recycled water at the Plant will be scheduled immediately following the control program installation.

III-F. WETLANDS CREATION PILOT PROJECT

A wetlands creation feasibility pilot project using recycled water is being investigated as one of the environmental enhancement projects envisioned in the Revised South Bay Action Plan. The primary benefits of a wetlands creation pilot project include aesthetic value, habitat enhancement, and public education. This feasibility project may be more fully developed once the stream flow augmentation pilot(s) have demonstrated initial positive results. Identification of potential location(s) and site specific designs could be developed over the next 12 to 18 months. A stakeholder process will also be used to further develop the pilot project concept.

III-G. AVIAN BOTULISM

The Plant provides for the regular monitoring of Artesian Slough and Coyote Creek for the presence of avian botulism and other avian diseases. The San Francisco Bay Bird Observatory conducts this special program monitoring. Prompt collection and disposal of the ill and deceased animals collected in the surveyed area enable the detection and control of larger disease outbreaks. The typical monitoring period extends from May to November. Twenty-four surveys are conducted within this period. The 1998 monitoring effort, at mid-year, reported no outbreaks of avian botulism. However, during the fall there was an outbreak of avian botulism in many of the San Francisco Bay sloughs. An annual

report was completed in January 1999, and a final accounting of these outbreaks is available from that report.

A wildlife census is conducted during the surveys, yielding information on the numbers and types of vertebrates in the study area. The data show large fluctuations in the average monthly counts, which may be attributed to a number of factors, including time of day, tides, and weather, that are known to affect bird activity. Duck hunting, which is allowed in portions of the study area also contribute to the large fluctuation in counts. Of special interest is the heron and egret breeding colony along the central portion of Artesian Slough. It is one of the largest and most diverse heron and egret breeding colonies in the state. Annual reports are submitted to the Regional Board, the California Department of Fish & Game, and the US Fish and Wildlife Service. A copy of the annual report and the transmitted letter to the Regional Board dated January 22, 1998 is attached in Appendix E.

III-H. LOCAL EFFECTS MONITORING

Local Effects Monitoring (LEM) studies have been conducted at a site in Coyote Creek near the discharge points for the San Jose/Santa Clara and Sunnyvale wastewater treatment plants since 1994. The US Geological Survey collects tissue samples from the marine clam *Macoma balthica* and sediment samples six times throughout the year. Sediment samples are analyzed for trace metals, grain size, and Total Organic Carbon (TOC). Tissues are analyzed for trace metals, mantle water salinity, and lipid content to determine the overall condition of the clams at time of sampling. The 1997 LEM's preliminary conclusion is that "regional scale contamination is more important than unique characteristics of point source inputs."

Inputs of mercury to the South Bay, presumably from abandoned cinnabar mines and carried in runoff during storm events, are believed to be the main sources of this toxic metal. Furthermore, the concentration of most metals in sediments and tissues were similar to levels detected in similar matrices at a site near the Palo Alto wastewater treatment plant. The US Geological Survey will submit a report on the 1998 findings during the first quarter of 1999.

IV. REGIONAL COOPERATIVE EFFORTS

The City is involved in a number of regional cooperative efforts acting on behalf of itself and the Plant. The primary goal of these efforts is to maximize efficiency and effectiveness by prioritizing issues and solutions involving key stakeholders on a regional basis.

IV-A. WATERSHED MANAGEMENT INITIATIVE

The City and Plant have been active participants in the Santa Clara Basin Watershed Management Initiative since its inception in 1996. This is a summary of activity in 1998.

Introduction

In July 1996, the Regional Board selected the Santa Clara Basin as one of two pilot watersheds under their Watershed Management Initiative to develop a watershed plan to guide future regulatory decisions and programs. Stakeholders were convened in the Core Group, which includes the Regional Board, the Cities of San Jose, Sunnyvale, and Palo Alto, stakeholders from other cities in the County, the Water District, environmental and business organizations as well as State and Federal regulatory and resource agencies. In March 1998, San Jose's City Council approved the City's goals for participation in the Santa Clara Basin Watershed Management Initiative and directed continued staff involvement in the Initiative with the goal of preparing a watershed management plan for the Basin.

Progress on the Initiative is proceeding apace. Since March, several important milestones have been achieved. These include 1) Core Group adoption of overall goals for the Initiative process; 2) Core Group finalization of a "Signatory Document" to formalize its representation and decision-making process; and 3) initiation of the development of the Watershed Assessment Report and 4) development of the TMDL and Watershed Grants programs. These actions provide a solid framework for the development and implementation of a Watershed Management Plan to achieve both short- and long-term goals of the Basin's stakeholders.

Goal Setting

To develop long-term goals for the Initiative, the Core Group participated in a consensus-based, facilitated goal setting process in April 1998. As a result, the Core Group adopted a new mission statement and six main goals. These are:

Mission: *Protect and enhance the Watershed, creating a sustainable future for the community and the environment.*

Goals:

1. Ensure that the Watershed Management Initiative is a broad, consensus-based process.
2. Ensure that necessary resources are provided for the implementation of the Watershed Management Initiative.
3. Simplify compliance with regulatory requirements without compromising environmental protection.
4. Balance the objectives of water supply management, habitat protection, flood management and land use to protect and enhance water quality.
5. Protect and/or restore streams, reservoirs, wetlands and the Bay for the benefit of fish, wildlife and human uses.
6. Ensure that the Watershed Management Plan incorporates science and is continuously improved.

These goals are consistent with the City's goals for the participation in the Initiative process approved by Council in March 1998. The goals provide a solid framework from which measurable objectives for the Watershed Management Plan can be developed. With the goals in place, the Core Group had the foundation to finalize its direction and decision-making process such that the Signatory Document could be brought forward to legislative, agency and organizational decision-making bodies.

Signatory Document

The Core Group has been operating under an informal set of ground rules and principles that have evolved over the last two years. With the aim of providing a more formal structure, the Core Group approved a Signatory Document (see Appendix F). The Document incorporates Core Group goals (see above discussion), and sets forth the purpose of the Core Group, its tasks and responsibilities, membership, decision-making process and ground rules for participation.

The Document was reviewed by legal counsels of various member agencies, including the City Attorney's Office, and adopted at the June 1998 Core Group meeting. The document has been signed by many Core Group members including the Regional Board, the US Environmental Protection Agency, Santa Clara Valley Water District Board, Department of Fish and Game, Guadalupé-Coyote Resource Conservation District Board, and the Santa Clara County Manufacturing Group. In September 1998, the San Jose City Council approved and signed the Signatory

Document on behalf of the City itself as well as on behalf of the Plant following approval by the Treatment Plant Advisory Committee. See Appendix E for a complete list of signers to date. Once all participating agencies and organizations have signed, the Signatory Document will serve to guide all future Core Group actions such that its recommendations can receive formal recognition by legislative, agency, and organizational bodies.

Watershed Assessment Report

A driving force for solidifying the overall Watershed Initiative structure and goals has been the need to develop the Watershed Management Plan. The Core Group's Report Preparation Team (Team), comprised of staff with expertise in watershed planning and project management from San Jose, Sunnyvale, and the District has developed a "Road Map" for the Plan. This Road Map lays out a three-step process beginning with the development of a Watershed Assessment Report (Report), followed by a State of the Watershed Report and, finally, the Watershed Management Plan.

Based upon the regulatory drivers underlying the Watershed Initiative process, the Core Group adopted an accelerated schedule calling for Report completion in late 1999. Currently, specific work plan tasks are being finalized. Work on the Assessment Report began in July 1998 using existing staff and a consultant hired through the Urban Runoff Program using $200,000 budgeted in FY 96-97 to fulfill permit required watershed management activities. Once work on the Assessment Report is well underway, the Team will concentrate on outlining the process for developing the State of the Watershed Report, which is targeted for completion in the year 2000. The goal is to begin the century with a vision for sustainable future for the Basin's streams, wetlands and Bay.

The City also believes that, for the Initiative to be effective there must be a strong component of community and stakeholder commitment, involvement and support for the planning and implementation of watershed programs. In order to facilitate community and stakeholder input, the City Council and TPAC, in October 1998, approved development a pilot watershed grants program. The goal of the Grants Program is to:

- Foster and implement innovative solutions to local watershed problems
- Encourage partnerships and joint ventures
- Acquire new participants and challenge existing participants
- Increase awareness of watershed issues
- Leverage resources

1999-2000 Watershed Grants will be awarded for the following general purposes:

- Operating Grants to support participation in the Watershed Management Initiative and other City watershed activities.
- Program Grants for specific projects such as:
  - Programs or projects that would improve water quality, watershed restoration, waste load reduction; source control, flow reduction or other watershed related issues.
  - Scientific studies that would improve the knowledge related to watershed issues
  - Educational-oriented projects and activities.

For this pilot, the City has designated a total grant pool of $360,000. Approximately 25% of those funds are designated for operating grants and the remaining 75% to program grants. Operating grants have a minimum award level of $5,000 and a maximum award level of $25,000. Program grants have a minimum award level of $5,000 and a maximum award level of $60,000. Organizations can submit one proposal in each of the categories. Grant activities should be completed within a one-year timeframe. Grant proposals were due to the City in December 1998. The anticipated start date is March of 1999.

TMDL

The Plant, together with the City, has provided resources for technical consultants and facilitation for the copper and nickel TMDL process for the South Bay. The stakeholder workgroup was formed under the Watershed Management Initiative process.

Thus far, the workgroup has reviewed all technical and other proposals developed by the TMDL consultant team. This has included project plans, responses to comments by stakeholders, minutes of meetings, and the conceptual model. The source characterization report and the evaluation of available models report will be discussed in January 1999.

The technical consultant team has developed a conceptual model of sources of copper and nickel in the South Bay as well as a GIS database with existing information on copper and nickel. The City has also provided technical consultant resources to the efforts to develop a mercury strategy for the South Bay.

Other WMI Support

In addition to technical information and resources, including TMDL consultant support, the City and Plant have provided the following resources in support of the Watershed Management Initiative:

- Funding for a contract with MIG, Inc. to provide independent facilitation to the core group and subgroups as needed, as well as to provide leadership on process issues, such as the development of objectives for the WMI.
- Funding for the Program Manager position was shared equally by the Plant, Sunnyvale, Palo Alto, and the Water District.

The Watershed Management Initiative has made significant progress in the last 6 months in moving toward the watershed assessment, TMDL development, and the development of objectives for the initiative. The City and Plant will continue to participate in this important effort through participation in the Core Group and subgroups, commenting on products and proposals of these groups, and providing technical, staff, and financial resources and expertise to the Initiative.

IV-B. REGIONAL MONITORING PROGRAM

The Regional Monitoring Program (RMP) is a comprehensive monitoring program assessing sediment and water quality parameters, as well as toxicity, in the San Francisco Bay and Delta. Monitoring is performed three times per year (February, April, and July). Two additional stations in the southern end of the Bay are monitored in cooperation with the Regional Board, the San Francisco Estuary Institute (SFEI), the Plant (station C-3-0) and Sunnyvale Plant (station C-1-3).

Rainfall during January 1997 was estimated at 390% above average and runoff in the San Francisco Bay/Delta was at or above flood stage. El Nino effects were noted such as depressed salinity in February with accompanying elevated TSS, higher chlorophyll a concentration (particularly in the South Bay), and warmer waters in the Central Bay during summer months. Concentrations of many near-total metals were higher in the North Bay than in previous years with one minor exception in 6/91. Most near-total metals in the South Bay did not show elevated concentrations in 1997 despite increased runoff. Near total metals in the Southern Sloughs were generally higher during February than in April or August. Sediments sampled by the RMP will be compared to pre-industrialized sediment cores from the Estuary. In this way, anthropomorphic sources may be distinguished from geological sources.

This region-wide monitoring program and its accompanying special research topics are indispensable management tools for the greater Bay/Delta governments. The Plant will continue its active support and participation in the Regional Monitoring Program in 1999.

V. OUTREACH

The City and Plant provided outreach on flow reduction and pollution prevention. Flow reduction outreach is done in support of the Water Efficiency Program and pollution prevention outreach is done to support the activities of the Environmental Enforcement program. Highlights of the outreach activities for the last six months are presented below.

V-A. FLOW REDUCTION PUBLIC OUTREACH

V-A1 SOUTH BAY WATER RECYCLING

SBWR public outreach and promotion has three primary goals:

(1) increase public acceptance of recycled water;
(2) convince potential customers to retrofit their facilities and educate them about the use of recycled water; and
(3) mitigate the impacts of construction activity on the general public, particularly commuters and those living or working along the pipeline.

Public outreach activities continuing during the past quarter included:

- A summer newsletter distributed to 60,000 residents and businesses along the pipeline route.
- Presentations at a number of fairs and trade show (1998 Turf and Landscape Expo, 1998 Building Owners and Managers Association Trade Show, etc).
- Outreach aimed at retrofit customers on the benefits of recycled water use.

VA-2 ULTRA-LOW FLUSH TOILETS

ULFT Rebate Program

As part of the Revised South Bay Action Plan Tier One Contingency, an additional outreach campaign was launched in August. This campaign was designed to affect the 1998 Average Dry Weather Effluent Flows (ADWEF).

The campaign was developed to raise public awareness of the consequences of discharging too much fresh water into the San Francisco Bay, overcome objections and misperceptions about ultra-low flush toilets, and provide a strong call to action in all outreach materials.

Prior to the campaign launch, the Plant executed a cost-sharing agreement with the Santa Clara Valley Water District. Included in this agreement was the provision of a limited time offer for the Rebate Program, offering an additional $25 above the regular $75 rebate. Participants needed to retrofit their older model toilets by October 15 to qualify.

The campaign included:

- Three English language television commercials;
- One Spanish language television commercial;
- Two newspaper print advertisements;
- One bus sign;
- One direct mail piece;
- Two Val-Pak inserts;
- dedicated a website;
- Attendance at several community events including the Home & Garden Show, Willow Glen Founders Day and the Berressa Flea Market; and
- Spanish radio interviews.

Slow the Flow and Save the Bay Local Business Awareness Campaign

In conjunction with the residential ULFT campaign, efforts continued on the Slow the Flow and Save the Bay Local Business Awareness Campaign during the 1998 June through October period. As mentioned in the previous update, the campaign was co-sponsored by the Silicon Valley Manufacturing Group, the Silicon Valley Chamber of Commerce, Santa Clara Valley Water District and the tributary agencies of the Plant. The campaign's purpose was to encourage employees to purchase ULFTs for their homes. Companies participating ranged in size from Hewlett-Packard and Adobe Systems to Aki's Bakery.

Campaign elements included:

- posters;
- pay check stuffers;
- a special website for participants to request information;
- presentations by City staff members at company sites. (Over 40 company presentations were given.)

In addition to the above, two news conferences were held to kick-off the campaign and another to congratulate all the companies that participated and helped the campaign be successful. Information about the campaign appeared in the San Jose Mercury News, San Jose Business Journal, KNTV Channel 11, Bay Cable Television, KCBS Radio and Spanish language television KSTS covered the campaign. There was also an opinion letter published in the Mercury News Business section written by Craig Barrett, President of Intel Corporation supporting the Slow the Flow campaign.

Multi-Family Dwelling Outreach

A second postcard mailing was sent to apartment managers and owners offering an additional $25 to the existing $75 rebate for a limited time. Getting multi-family

complexes retrofitted has always been important, because retrofitting one complex has the potential of getting 10 to 300 ULFTs installed.

Outreach to Real Estate Professionals

A brochure on the ULFT rebate program was modified to be used specifically by real estate professionals to encourage new and prospective homebuyers and sellers to install ULFTs. In addition to the brochure, a universal ULFT rebate application was developed through the cooperation of the local water retailers. This simplifies the process for a new homebuyer or seller to apply for a rebate and does not require the real estate agent to identify the appropriate water retailer for a particular area.

Results

The program was very successful with almost 30,000 ULFTs installed during the period. This was the largest number of ULFTs installed in any one 6 month period and 1,450 more ULFTs than the residential rebate program goal for the entire year.

From the activities listed above, over 13,500 calls were received requesting applications. Over 1,000 requests were received from the Spanish speaking community. (This is the most requests received from any campaign for information in Spanish.) The Slow the Flow campaign achieved its goal of signing up 100 companies to participate, and over 100,000 employees received the Slow the Flow message.

Activities in the Next Six Months

Plans are to continue outreach to apartment owners and managers. A print advertisement and direct mail piece is planned offering the limited time $100 rebate, but the rebate amount will decrease to $95 and then to $85 over time. This tactic is designed to create urgency and get apartment owners and managers to apply sooner rather than later.

The Real Estate Board partnership will continue with the development of a brochure explaining the importance of water conservation and providing saving tips and information on the Rebate Program. This brochure is slated to be distributed with escrow packets at various Title Companies, as well as through other real estate professionals.

V-B. POLLUTANT REDUCTION OUTREACH

Staff focussed their attention during the last six months on establishing clear priorities, assessing outreach effectiveness, and coordinating San Jose's outreach with other local and regional outreach programs.

San Jose evaluated public sector marketing, and selected surveys as a method to assess outreach effectiveness. A description of that method is included in Appendix G Part II. Planning for outreach activity is now done by audience. Five audiences were identified: general; targeted; non-regulated commercial/industrial; regulated industrial/commercial/institutional; and municipal and agency audiences. The general audience refers to primarily residents. "Non-regulated" refers to businesses not regulated by the Pretreatment Program. "Regulated Industrial/Commercial" includes the Plant's permitted industrial dischargers.

A wide range of outreach activities support San Jose's water pollution prevention programs. The outreach activities during this reporting period are highlighted below and detailed in Appendix G Part I.

V-B1. REGIONAL OUTREACH

Staff continues to participate on various regional committees to coordinate the Plant's outreach activities with those in the tributary area, as well as throughout the San Francisco Bay Area. During this reporting period, outreach staff participated in the following regional activities and projects:

- Chaired Bay Area Pollution Prevention Group's (BAPPG) Public Education and Technology Transfer Committee.
- Coordinated BAPPG budget with Association of Bay Area Governments and Bay Area Dischargers Association. Changes implemented during the period resulted in a 10% net increase to the BAPPG project budget.
- Coordinated development and translation of regional Spanish radio ads for BAPPG in conjunction with radio station KSOL.
- Chaired the Outreach subcommittee of the Santa Clara Basin Watershed Management Initiative.

V-B2. GENERAL OUTREACH

San Jose uses speaking engagements (speaking engagements to high schools and colleges are reported under Targeted Outreach, *School and Youth Outreach*), an Internet web site, Plant tours, and public events to reach these audiences.

ESD Web Site

As advertisement of the site by means of ESD publications and by word of mouth continues, traffic has increased, and is expected to continue rising. Since the last site traffic analysis, the ESD site has been averaging:

- 5369 user sessions per month (up from 2548 last report).
- 178 user sessions per day (up from 84 last report) [these are not "hits", there were an average of 4942 hits per day for this reporting period].

The web address is: http:// www.ci.san-jose.ca.us/esd

Plant Tours

During 1998, the San Jose/Santa Clara Water Pollution Control Plant hosted 835 people, ranging from Junior High school biology classes to Taiwanese engineers, during 61 tours of the facility.

Events

This year's Home and Garden Show in the Santa Clara Convention Center was held on September 11-13, 1998. ESD's participating divisions decided to focus entirely on indoor water use reduction, and specifically emphasized the limited time rebate offer of $100 per ultra-low flush toilet installed. Because of the single message focus (pollution prevention was addressed only when the public directly questioned staff on that topic), 600 rebate packets were given out to residents who expressed definite interest in using them before the October expiration. If all these residents took advantage of the special rebate program, an estimated flow reduction ranging from 18,000 to 36,000 gallons per day would result.

V-B3. TARGETED OUTREACH

School and Youth Outreach

School Programs for the reporting period stressed water conservation, pollution prevention and the Bay protection afforded by the Plant.

Over the past six months, the City has distributed 93 *It's Wet, It's Wild, It's Water* teacher's packets. Each packet includes lesson plans and a video covering water conservation and household pollution prevention. Total distribution to date is 921 packets.

During the first half of the 1998-99 school year, City Park Rangers gave water awareness presentations to 55 classes, grades 4-7, representing more than 1500 San Jose students.

Staff gave presentations to about 300 students during 9 high school science classes and one college biology class in the first half of this 1998-99 school year. The presentations dealt with where biodegradation is good (the protection of the Bay

provided by the Plant) and where it is bad (when pollutants from our streets get into the creeks and Bay).

V-B4. COMMERCIAL AND INDUSTRIAL OUTREACH

Commercial outreach activities for this reporting period include an Industrial User Academy class, two issues of an Industrial User Newsletter (see Appendix F), and one speaking engagement to 50 members of the Bay Area Coaters Association. ESD also provides outreach to commercial facilities through its Website. Fifty-one percent of the user sessions at the Website were classified as from a company (i.e. industrial or commercial inquiry).

Industrial User Academy

During the reporting period, staff combined the original six individual core class materials and material from "The Pretreatment Training Course" by USEPA/WEF into a two-day class that includes a tour of the Plant and the Laboratory. This class was given on December 3 - 4, 1998. Twenty-two participants from 18 companies attended the two-day class. The class was well received. The class size was limited to 22 participants due to the tour of the Plant. The next two-day IU Academy class is expected to be offered within the next six months.

Industrial User Newsletter

During the reporting period, two issues of *Tributary Tribune* (an industrial user newsletter) were mailed to 400 permitted companies. The summer issue discussed the approval of the Plant's new National Pollutant Discharge Elimination System Permit; the Amendment of San Jose's Administrative Citation Schedule of Fines; and an update on the "Slow the Flow" Campaign. The fall '98 issue presented more details on the Administrative Citations, and also featured an article on the regulation of storm water discharges.

APPENDIX A

1. Industrial Recycle/Reuse Project Status Update-September 1, 1998
2. Table 1: Tier 1 Dischargers

APPENDIX B

Flow Audit Study Protocol

The protocol is available upon request. For a copy call (408) 945-3000.

APPENDIX C

1. Workplan for O&M Manual, Reliability Study, and Contingency Plan-November 30, 1998
2. Regional Board's Response Letter-December 16, 1998

These letters are available upon request. For a copy call (408) 945-3000

APPENDIX D

Industrial Storm Water Monitoring Pilot Program

APPENDIX E

1998 Avian Botulism Monitoring Report

This report is available upon request. For a copy call (408) 945-3000

APPENDIX F

1. Watershed Management Initiative Signatory Document
2. List of WMI Signatories

APPENDIX G

Outreach Program