CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 00-003
NPDES PERMIT NO. CA0038768

WASTE DISCHARGE REQUIREMENTS FOR:

THE CITY OF AMERICAN CANYON, NAPA COUNTY

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

1. The City of American Canyon, hereinafter referred to as the discharger, has applied to the Board for issuance of waste discharge requirements and a permit for the discharge of pollutants to waters of the State and the United States under the National Pollutant Discharge Elimination System (NPDES).

FACILITY DESCRIPTION

2. The discharger proposes to construct, own and operate the City of American Canyon Wastewater Treatment and Reclamation Facility (the Plant), located at the west end of Eucalyptus Road adjacent to the City of American Canyon, Napa County, California. Access to the plant is from Green Island Road. The Plant will provide tertiary level treatment of wastewater from domestic, commercial and industrial sources within the City of American Canyon. The discharger's service area has a present (1998) population of approximately 10,000.

3. The US Environmental Protection Agency (USEPA) and the Board have classified this discharger as a major discharger.

PURPOSE OF ORDER

4. The discharger currently pumps raw wastewater generated in its service area to the Napa Sanitation District's (NSD) treatment plant for advanced treatment and disposal to the Napa River. The discharger plans to construct a new wastewater treatment facility and disconnect from the NSD system. A Final Environmental Impact Report has been prepared and was certified on March 18, 1999. Design has been completed. A new NPDES permit is required before the discharger can begin operation. The new wastewater treatment facility is a "new discharger" as defined in current regulations promulgated by the USEPA, although it is an existing source since the new facility will treat waste that was previously treated by the NSD facility. The net effect on receiving waters will be a decrease in loading due to a greater total percentage of wastewater reclaimed by the discharger than by NSD, as well as this permit's requirement that the discharger meet water quality objectives at the end-of-pipe. NSD currently reclaims approximately 20% of its yearly flows, while the discharger will be reclaiming between 25% and 37% of its yearly flows. Also, NSD's permit, which will be reissued before American Canyon's plant is operational, will be drafted to require mass limits that hold their discharge to loadings presently discharged by NSD; i.e., NSD's mass limit will be based on flow which excludes American Canyon's influent.

5. This NPDES Permit regulates the discharge of treated wastewater from the American Canyon plant to the North Slough, which is tributary to the Napa River and San Pablo Bay. The receiving waters are

considered impaired on the list prepared pursuant to Clean Water Act section 303(d), and total maximum daily loads (TMDLs) have not been completed for the waters. Since the American Canyon plant is a new discharger into an impaired waterbody, the discharge requirements are established so that the discharge will not cause or contribute to the violation of water quality standards. This is accomplished by including water quality-based effluent limitations established at the level of water quality criteria at end-of-pipe. For 303(d) listed toxic pollutants (see Finding 29 and 30), until a TMDL is established, future loading from the new Plant cannot exceed the current mass loading. This is accomplished by establishing mass limits, which are based on the current wastewater flow from American Canyon to NSD and the water quality objectives, for those constituents with detectable concentrations that are impairing the water body.

BACKGROUND

6. The discharger has been evaluating disconnecting from the NSD plant and constructing a new wastewater treatment facility for several years. In early 1998, the discharger had nearly completed design of a new plant based on a deep water discharge into the Napa River. Discussion with the Board staff at that time prompted the discharger to decide that water reuse in combination with a wetlands discharge to the North Slough, might be a more desirable project. The discharger proceeded with the redesign of the plant to a microfiltration process with nutrient removal to produce a high quality effluent suitable for wetlands and unrestricted water reuse in accordance with statewide water reuse criteria in Title 22 of the California Code of Regulations. At about the same time, the discharger was also beginning to work on a conceptual project to restore over 500 acres that was historically subject to tidal inundation to a tidal marsh. As a result, the proposed new wastewater treatment plant and effluent discharge was developed as a complementary project for the wetlands restoration effort. Therefore, the proposed new wastewater treatment plant will be associated with a wetlands restoration project intended to provide a net environmental benefit. The removal of the discharger's existing wastewater ponds (approximately 30 acres) from the wetlands area will provide more area for wetland restoration while eliminating the potential risk from winter flooding at the pond site. The location of the new treatment plant's outfall will also allow discharge of highly treated effluent that is low in turbidity and nutrients into North Slough.

DISCHARGE DESCRIPTION

7. Existing average annual flows from the discharger to NSD are approximately 1.0 million gallons per day (mgd) and approximately 3.2 mgd during peak wet weather (PWWF). Upon start-up of the plant, the flows are expected to be approximately 1.2 mgd ADWF and 4.0 mgd PWWF. The plant will have an average dry weather flow design capacity of 2.5 million gallons per day (mgd), and a peak wet weather capacity of 5.0 mgd. The treatment plant will be separated into two parallel process streams to keep wastestreams with higher total dissolved solids (TDS) concentrations separate from lower TDS wastestreams. Wastewater from the North Basin, which services the area in the northern portion of the City and has higher TDS concentrations of approximately 2,000 mg/L (roughly 25% of the total flow), will be separated from the Main Basin wastewater, which is lower in TDS. The tertiary treated wastewater from this lower TDS water will be reclaimed and used for agricultural and landscape irrigation. Initially, the reclaimed wastewater will be used for irrigation of vineyards at various locations primarily to the north and east of the plant. Development in American Canyon may increase the potential for reclamation. Possible uses include landscape irrigation at parks, schools and other common irrigation areas; toilet flushing; and dust control at construction sites. The discharger has prepared a Recycled

Water Master Plan and intends to maximize the use of reclaimed water. A map showing the location of the Plant is included as Attachment A.

8. The treated and disinfected effluent (E-001-S) will be discharged throughout the wet season to the North Slough (Lat. 38°11'11", Long. 122°16'27") where it will eventually enter the Napa River through existing tidal wetlands. From May 1 through October 31, the lower TDS effluent (E-002-R), which amounts to 75% of the total dry weather flow, will be distributed to various irrigation sites in the vicinity. The higher TDS effluent, which amounts to 25% of the total dry weather flow, will continue to discharge to the North Slough. The higher TDS effluent is approximately 2,000 mg/L, which is lower than the TDS concentration in North Slough, at approximately 12,000 mg/L. This Order regulates discharges to the North Slough from the Wastewater Treatment Plant.

9. During peak summer months irrigation demand can exceed 100 percent of total Plant flow. However, due to the higher TDS from the North Basin area, this effluent will not be reclaimed but will be discharged year-round to the North Slough. Irrigation demand estimates indicate that approximately 50% of the wastewater produced during the year can be used for irrigation. Discharges of treated wastewater to land will be regulated by Order 96-011, General Permit for water reuse in the San Francisco Bay area, issued January 17, 1996.

10. The names and locations of the Plant's discharge points are as follows:

Discharge Point Name	Code	Latitude	Longitude
North Slough outfall (E-001-S)	E-001-S	38° 11' 11"	122° 16' 27".
Irrigation Reuse outfall* (E-002-R)	E-002-R		

*Reclaimed water discharges to land only.

Attachment A shows the locations of the Plant and discharge points and is included as part of this Order.

WETLANDS RESTORATION

11. The discharger is in the process of a two-phased project to restore 511 acres of historical tidal wetlands, which are currently diked off. Phase I is the acquisition of the property while Phase II will be the design, construction and monitoring of the wetland area. Phase I consists of acquiring 453 acres of wetlands adjacent to North Slough and the Napa River, from the Port of Oakland, using 1998 CALFED funding. In addition, the discharger will donate an additional 58 acres of adjacent wetlands and upland areas to this restoration effort, and create a visitor viewing area and interpretive program on the east side of the Napa River near its mouth with San Francisco Bay. Approximately 70% of the project lands would be granted in fee title to the California Department of Fish and Game (CDFG) to manage as a wildlife area. The discharger would retain fee-title ownership of 30% of the project lands, and manage those lands in a manner compatible with CALFED objectives. Phase I is nearly complete. A second grant application has been submitted to CALFED for the Phase II work and funding has been secured. See Attachment A for locations of the wetland areas, existing and new wastewater facilities.

12. Phase II work would include the following:

- CEQA / NEPA documentation
- Permitting
- Remove wastewater pond berms and demolish existing wastewater ponds

- Final design plans and specifications for earthwork/demolition/restoration work
- Breach levees, restore tidal action
- Construct new levees to protect City facilities
- Restoration of Port of Oakland upland
- Construct viewing/educational area facilities
- Monitoring and data collection (short- and long-term)

13. The project site is unique in that it defines the historic edge of the Bay, and has a largely intact system of tidal sloughs, which are largely cut-off from tidal action by a levee at the confluence of North Slough and the Napa River. During the 1997 floods, a small breach in one levee was formed, thereby allowing partial tidal influence. This breach has not yet been repaired. The project will allow the restoration of tidal marsh, which is contiguous with adjacent natural upland transition areas, and will create a unique habitat for several CALFED priority species. Restoration of tidal wetlands would be achieved by removal of approximately 30 acres of City-owned sewage ponds, breaching existing levees along the Napa River, restricting cattle grazing, and creating wetlands in upland areas. This project would contribute to the restoration of priority habitats, including tidal perennial aquatic habitat, saline emergent wetland habitat, tidal sloughs, seasonal wetlands, and perennial grasslands. The restoration of these habitats would provide ecological benefits for many target species, including delta smelt, splittail, Chinook salmon, California clapper rail, California black rail, salt marsh harvest mouse, shorebirds, wading birds and waterfowl, and others.

14. This project is consistent with the San Francisco Bay Area Wetlands Ecosystem Goals Project and Comprehensive Conservation and Management Plan by supporting the Plan's objectives for the maintenance of freshwater flows to the Bay and the restoration and preservation of marshes on the perimeter of the Bay. In addition, this project is consistent with the 1995 San Francisco Bay Basin Water Quality Control Plan (Basin Plan). It is also consistent with the Central Valley Project Improvement Act, the Recovery Plan for Sacramento-San Joaquin Delta Native Fishes, and the Recovery Plan for Salt Marsh Harvest Mouse and California Clapper Rail, all of which point to restoration of tidal marshes and sloughs as critical for species recovery.

15. The City will oversee monitoring efforts once the project has been completed with the work being done by City personnel, consultants, or the CDFG. The data collected will feed into an adaptive management plan that will guide the on-going management of the tidal marsh. A monitoring program will be in place for the life of the project with initial support from CALFED funds, and long-term support from CDFG resources.

16. The following organizations support and are participating in the planning of the wetlands restoration project.

- City of American Canyon
- California Department of Fish and Game (CDFG)
- Napa County Land Trust
- Port of Oakland
- South Napa Waste Management Authority
- Coastal Conservancy
- U.S. Army Corps of Engineers
- Natural Resource Conservation Service
- Ducks Unlimited, Inc.

17. This restoration effort will be closely coordinated with the continued restoration and management of CDFG's Napa Sonoma Marsh complex located immediately to the south of the project site.

COLLECTION SYSTEM AND TREATMENT PROCESS DESCRIPTION

18. *Collection System and Pump Stations.* The discharger's wastewater collection system includes about 36 miles of major trunk sanitary sewer lines, and four pump stations. Two pump stations have on-site emergency power systems. The discharger has an ongoing program for preventive maintenance and capital improvements for these sewer lines and pump stations in order to ensure adequate capacity and reliability of the collection system.

19. **Treatment Process and Effluent Flow Description**

a. *Treatment Process.* The treatment plant will have two segregated wastewater treatment process streams: Process Train 1 will be used for treating the higher TDS wastewater from the City's commercial and industrial North Basin, and Process Train 2 will be used for treating approximately 75% of the total flow, which is primarily low TDS domestic wastewater. The plant operators will have the flexibility of combining the two treated streams or discharging them separately after treatment. The treatment process will consist of an emergency overflow basin (5 million gallons (MG)), screening (two self-cleaning inclined cylindrical screens), grit removal (one vortex-type grit removal chamber for Main Basin flow only), biological treatment using nitrifying aeration tanks with an anoxic zone for denitrification along with immersed membranes for solids separation (4 rectangular basins), ultraviolet (UV) disinfection for all flow discharged to the wetlands, and use of sodium hypochlorite and a chlorine contact tank for disinfection of recycled water for irrigation. Secondary treatment will be accomplished with an activated sludge treatment system and immersed microfiltration membranes for solids separation. A cascade aeration outlet structure will be used to elevate dissolved oxygen levels in effluent discharged to the wetlands. Plant influent flow will be measured through two magnetic flow meters prior to the headworks. A treatment process schematic diagram (Attachment B) is included as part of this Order.

b. *Effluent Flow Measurement.* Plant effluent flow will be diverted either directly to the irrigation distribution system, or to the outfall pipeline to the North Slough discharge point. Plant effluent flow discharged to the North Slough (E-001-S) and flow to irrigation (E-002-R) will be measured separately.

c. *Effluent Monitoring.* The effluent compliance monitoring point will be at the discharge from the UV disinfection channel (E-001-S) for effluent released to the wetlands or at the discharge of the chlorine contact chamber effluent (E-002-R) for the reclaimed water. The UV disinfected effluent (E-001-S) will flow to the North Slough. The chlorinated final effluent (E-002-R) flows to the wet well of the Reclaimed Water (RW) pump station. During peak irrigation demands, the effluent would be pumped from the wet well to the recycled water distribution system. During periods when irrigation demands are less than the flow through Process Train 2, any effluent from microfiltration in excess of the RW pump station demands will be diverted (prior to the chlorine contact tank) to the UV facilities. This will ensure that all disinfected effluent to the North Slough contains zero chlorine residual. In the event of excess flow reaching the reclaimed water pump station, an overflow weir will divert that excess water to the emergency storage basin. The UV system has been sized to accommodate the total plant flow during winter periods to provide the required disinfection. A standby bank of UV equipment will be included in the disinfection facilities to insure reliability. Only water delivered to the recycled water irrigation system will be chlorinated. A 1.0 MG recycled water reservoir will be constructed to meet peak

irrigation demands. A chlorine residual of 5.0 ppm will be maintained at the discharge from the chlorine contact tank to ensure that a chlorine residual is maintained in the recycled water distribution system.

The effluent discharged to North Slough (E-001-S) may be a combination of Process Trains 1 and 2 at any given time. The actual percentage of this blend varies daily based on Plant effluent flow and irrigation demands. Thus, this Order specifies that E-001-S shall be monitored continuously for flow, chlorine residual and pH and by daily grab samples for dissolved oxygen and temperature.

The wetlands area to the south of the proposed new wastewater treatment facilities and the North Slough have historically not been the subject of water quality monitoring and aquatic evaluation. Therefore, as a result of the proposed wastewater discharge to the North Slough and the proposed wetlands restoration project, the discharger performed an aquatic characterization study of the North Slough. The purposes of that study were to:

- Provide a foundation for understanding the North Slough surface water quality through quantitative data gathering,
- Provide a foundation for understanding the North Slough aquatic communities through qualitative presence/absence data gathering, and
- Obtain data of known quality that may serve as a foundation reference for future study.

The results of that study are presented in a report entitled (Draft) Aquatic Characterization of North Slough, Napa County, California, dated March 8, 1999. Sampling was performed during October, November and December of 1998 at three locations shown on the Attachment A. The sampling program evaluated water quality parameters and characterization of invertebrates and fisheries of the North Slough. It did not include sediment sampling, tissue sampling and toxicity analysis, nor did it include bird, mammalian or vegetative studies. Future wetland monitoring will be included in Phase I and II of the Aquatic Assessment Monitoring Program, Attachment C of the SMP.

20. Wet Weather Flow Handling

Treatment Plant and Collection System. The Plant will have a wet weather treatment capacity of 5.0 mgd, and additional facilities for handling peak wet weather flows. These facilities include a 5 MG capacity earthen basin to store wastewater during instantaneous peak periods greater than the plant capacity and during emergency conditions. During peak flows or some other emergency event, influent can be diverted to and temporarily stored in the basin and subsequently returned to the Plant for full treatment after Plant flows have subsided, or the problem corrected. The Plant and storage basin will provide containment and treatment of all wastewater flows. The plant has been designed for at least a 100-year storm event. Upon initial operation, plant flow will be approximately 1.2 mgd with peak plant capacity of 5.0 mgd, which is equal to the capacity of the collection system to deliver wastewater to the plant. When combined with the 5 MG storage basin, the peak wet weather capacity in the plant should provide adequate protection to assure that wet weather bypass to the wetlands will not occur.

Wastewater collection systems are subject to increased flows during wet weather due to rainfall-induced infiltration and inflow. The Basin Plan states that, depending on the level of water quality protection required, collection systems should be designed to contain different recurrence interval storm flows. The Provisions require the discharger to conduct a study to evaluate the relative costs of providing infrastructure to accommodate 20-year, 10-year and 5-year storm events relative to the beneficial uses protected. The discharger will then develop recommended collection system and treatment plant peak wet

weather flow design criteria based on this study. The Executive Officer may review these recommendations and determine the appropriate level of protection to be provided to prevent controllable adverse impacts on beneficial uses.

21. Solids Handling and Disposal

a. *Solids Handling.* Solids removed from the wastewater stream will be stored in two earthen clay lined sludge storage basins (3 MG each). The sludge storage basins will be slightly aerated to reduce odor. The supernatant returned to the headworks can be placed in Process Train 1 and ultimately discharged to the North Slough or returned to Process Train 2. The basins have been sized to provide an estimated storage capacity of up to 10 years of sludge.

b. *Solids Disposal.* Annual biosolids production in the year 2000 is projected to be about 130 dry metric tons (dmt). The ultimate method of disposal has not yet been determined. Alternatives will be evaluated during the first five years of operation and a method of disposal selected prior to the sludge basin capacity being exhausted. The land application of municipal wastewater biosolids is regulated by the USEPA under federal regulations found in 40 Code of Federal Regulations (CFR) 503 (Standards for the Use or Disposal of Sewage Sludge), published as a final rule on February 19, 1993. Disposal of the biosolids will comply with all Federal and State Regulations.

BASIS OF EFFLUENT LIMITS AND DISCHARGE REQUIREMENTS

22. *Basin Plan.* The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on June 21,1995. This updated and consolidated plan represents the Board's master water quality control planning document. The revised Basin Plan was approved by the State Water Resources Control Board (SWRCB) and the Office of Administrative Law on July 20, 1995, and November 13, 1995, respectively. The Basin Plan identifies beneficial uses and water quality objectives for waters of the state in the Region, including surface waters and groundwaters. The Basin Plan also identifies effluent limitations and discharge prohibitions intended to protect beneficial uses. This Order implements the plans, policies and provisions of the Basin Plan.

23. *Beneficial Uses.* The beneficial uses identified in the Basin Plan for waters of the Napa River (NR) and the brackish Napa Wetlands (NW) are:

Agricultural Supply	(NR)
Navigation	(NR)
Water Contact Recreation	(NR), (NW)
Non-contact Water Recreation	(NR), (NW)
Commercial and Sport Fishing	(NW)
Wildlife Habitat	(NR)
Preservation of Rare and Endangered Species	(NR), (NW)
Fish Migration	(NR), (NW)
Fish Spawning	(NR), (NW)
Estuarine Habitat	(NW)
Warm Freshwater Habitat	(NR), (NW)
Cold Freshwater Habitat	(NR)

24. *Undesignated Beneficial Uses.* The North Slough is tributary to the Napa River. The Basin Plan has not yet established beneficial uses specific for the North Slough. Board policy has been to use the tributary rule to interpret which beneficial uses are currently or potentially supported where beneficial uses have not been specifically designated. Any change in beneficial uses must be made in a Basin Plan amendment.

25. *Regulatory Basis of Effluent Limits.* Effluent limitations in this Permit are based on the plans, policies and water quality objectives and criteria of the Basin Plan, *Quality Criteria for Water* (USEPA 440/5-86-001, 1986 and subsequent amendments, known as the "Gold Book"), applicable Federal Regulations (40 CFR Parts 122 and 131), National Toxics Rule (57 FR 60848, 22 December 1992; 40 CFR Part 131.36(b), referred to as the NTR), National Toxics Rule Amendment (Federal Register Vol. 60, No. 86, 4 May 1995 pg. 22229-22237), and Best Professional Judgment (BPJ) as defined in the Basin Plan.

U.S. EPA guidance documents upon which BPJ was developed may include in part:

- Technical Support Document for Water Quality Based Toxics Control March 1991 (TSD),
- Region 9 Guidance for NPDES Permit Issuance February 1994,
- Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria October 1, 1993,
- Whole Effluent Toxicity (WET) Control Policy July 1994,
- Draft National Guidance for the Permitting, Monitoring, and Enforcement of Water Quality-based Effluent Limitations set Below Analytical Detection/Quantification Levels March 18, 1994,
- National Policy Regarding Whole Effluent Toxicity Enforcement, August 14, 1995,
- Clarifications Regarding Flexibility in 40 CFR Part 136 Whole Effluent Toxicity (WET) Test Methods, April 10, 1996,
- Interim Guidance for Performance - Based Reductions of NPDES Permit Monitoring Frequencies, April 19, 1996,
- Regions 9 & 10 Guidance for Implementing Whole Effluent Toxicity Programs Final May 31, 1996,
- Draft Whole Effluent Toxicity (WET) Implementation Strategy February 19, 1997, Draft Whole Effluent Toxicity (WET) Implementation Strategy February 19, 1997,
- Proposed Rule for Water Quality standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California, August 5, 1997.

26. Basis for Effluent Limits

a. *Technology and Water Quality Based Limits.* Permit effluent limits for conventional pollutants are technology-based (tertiary treatment using immersed microfiltration membranes). Toxic substances are

regulated by water quality based effluent limitations (WQBEL) derived from USEPA national water quality objectives listed in the Basin Plan Table 3-4, the NTR, or the Gold Book. Further details about the effluent limitations are given in the associated Fact Sheet, which is incorporated in this Order.

b. *Marine and Freshwater Objectives and Limits*. The 1995 Basin Plan and 1992 NTR include formulas for calculating freshwater aquatic life objectives based on site-specific hardness. The Basin Plan states that freshwater effluent limitations shall apply to discharges to receiving waters with salinity levels lower than 5 parts per thousand (ppt) at least 75 percent of the time in a normal water year. Salt-water effluent limitations shall apply to discharges receiving waters with salinities greater than 5 ppt at least 75% of the time in a normal water year. The Basin Plan further states that for discharges to waters with salinities in between these two categories or to tidally influenced freshwater that support estuarine beneficial uses, effluent limitations shall be the lower of the marine or freshwater effluent limitation, based on ambient hardness. Water quality monitoring performed in October, November, and December 1998 determined that salinity in the North Slough immediately downstream of the proposed discharge location (E-001-S) ranged from 7.4 to 14.1 ppt. (One sample taken in November 1998 indicated a salinity of 0.8 ppt near the proposed E-001-S discharge location, but it is believed that this is not a representative sample due to a probable plugged culvert that restricted outflow.) The samples taken during December had the lowest salinity levels, at all the sampling locations in the North Slough, and are therefore likely the result of wet weather runoff. The North Slough is tidally influenced but is not specifically listed in the Basin Plan as a wetland area, although the North Slough may be considered part of the Napa Wetlands area, which is identified as supporting estuarine beneficial uses. Therefore, the beneficial uses identified for the Napa Wetlands would apply to the North Slough. The discharger may perform a study to investigate beneficial uses of the North Slough in the vicinity of the discharge and the percent of time for which salinities are greater or less than 5 ppt. However, this Order's effluent limitations are based on the lower of the marine and fresh water quality objectives based on the waters having salinities in between the two categories described above.

c. *Ambient Hardness*. Receiving water hardness varies with geographic location (increasing to the South), tidal influences and seasonal rainfall. The hardness data collected in the North Slough during October, November, and December 1998 ranged from 330 to 2800 mg/L. Freshwater effluent limitations for applicable toxic constituents were evaluated using the formulas in the Basin Plan Table 3-4 based on a conservatively derived hardness of 330 mg/L as $CaCO_3$. Saltwater effluent limitations for applicable toxic constituents were evaluated using the Basin Plan Table 3-3.

d. *North Slough WaterQuality*. The North Slough wetland is subject to tidal influence and freshwater flows from the Napa River. Limited water quality testing has been performed in the North Slough. The Environmental Impact Report (EIR) prepared by American Canyon included water quality data for the North Slough. Some subsequent testing has been performed which assists in characterizing the receiving water quality. More discussion is provided in the section below.

27. Shallow Water Discharge

North Slough. The North Slough is a seasonal drainage area that collects stormwater runoff from a relatively small watershed draining the eastern slope of Napa Valley. The North Slough wetland is subject to tidal influence and flows in the Napa River. Brackish in nature, the North Slough remains wet throughout the year as a result of a breach in the southern perimeter levee. Two channels lead to the North Slough in the vicinity of the discharge; the western-most channel is dry during the summer season. The discharge from the Plant will be to the western channel leading to the North Slough. Approximately

500 to 600 feet of the western-most channel, before it reaches the main slough, will be effluent-dominated during the summer months. It is classified by the Board as a shallow water discharge, and effluent limitations are calculated assuming no dilution (D=0). The actual dilution received by the discharge during the winter months has not been measured or modeled.

The Basin Plan, Shallow Water Discharges section (p. 4-12), specifies the issues that must be addressed to support requests for dilution credit. Shallow water dischargers may apply to the Board for exceptions to the assigned dilution ratio of D=0 (and thus the shallow water effluent limitations) based on demonstration of compliance with water quality objectives in the receiving waters and implementation of an aggressive pretreatment and source control program. Based on special studies, the discharger may consider applying for limited dilution credit.

28. Reasonable Potential Analysis

The discharger has prepared an Environmental Impact Report that included water quality testing from the North Slough and projected effluent quality from the new wastewater treatment facilities. The discharger has also submitted an application for Waste Discharge Requirements (dated November 2, 1998) to the Board that included raw wastewater sampling data over a one-year period. The toxic constituents analyzed were: arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc, cyanide, PAHs, and phenol. The discharger's influent, assuming a conservative 60% removal rate, was used for a preliminary reasonable potential analysis. This projected effluent quality is reflected in Section B: Effluent Limitations. Water quality-based effluent limitations were included in this Order only if a reasonable potential exists to cause, or contribute to an excursion above any applicable narrative or numerical water quality objectives.

Effluent limits in this permit are based on: 1) Table 3-3 Basin Plan saltwater quality objectives, 2) Table 3-4 Basis Plan freshwater quality objectives 3) Table 4-3 of the Basin Plan for shallow water discharges, or 4) the preliminary receiving water quality for the North Slough.

The result of this screening analysis is that arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc, cyanide and PAHs are the constituents found to have reasonable potential to exceed the applicable objectives. Water quality objectives for copper, lead, zinc, and cyanide were used from Basin Plan Table 3-3 for saltwater and the objective for mercury from Table 3-4 for freshwater. The discharge limitation for nickel was established based on Basin Plan Table 4-3 for shallow water discharges.

Based on the Reasonable Potential analysis, numeric limits are required to be included in the permit for arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc, cyanide and PAHs. Under the federal Clean Water Act and the State Water Code, constituents of this nature are controlled by the requirement for secondary treatment.

This Order requires continued monitoring and an annual evaluation of all constituents listed in the Self-Monitoring Plan. If significant increases occur in the concentrations of the constituents, the discharger will be required to investigate the source of the increases and establish remedial measures if the increases pose a threat to water quality.

A reopener provision is included in the permit that allows numeric limits to be added to the permit for any constituent that in the future exhibits reasonable potential to cause or contribute to an exceedance of a water quality standard. This determination will be made by the Board based on monitoring results.

29. 303(d) Listed Pollutants

The Board issued a final staff report on March 9, 1998 listing impaired water bodies in this Region. The list was prepared in accordance with Section 303(d) of the federal Clean Water Act to identify specific water bodies where water quality standards are not expected to be met after implementation of technology-based effluent limitations on point sources. On May 12, 1999, USEPA approved a revised list that included additional pollutants and water bodies. San Pablo Bay is listed as one of the impaired water bodies on the 303(d) list. The list of pollutants impairing San Pablo Bay (hereinafter the 303(d) list) are identified to be copper, mercury, nickel, selenium, exotic species, PCB total, dioxin and furan compounds, chlordane, DDT, Dieldrin, Diazinon, and dioxin-like PCBs.

30. Total Maximum Daily Loads and Waste Load Allocations

Based on the Water Quality-Limited Waterbodies (303(d)), the Board intends to adopt Total Maximum Daily Loads (TMDLs) for San Pablo Bay. The TMDLs will establish waste load allocations (WLA) for point sources and load allocations for non-point sources that will result in achieving the water quality standards for the water body. Application of the WLA may result in revised water-quality based effluent limits from the limits in this permit. The final effluent limitation will be derived from the WLA.

The following summarizes the Board's strategy to collect water quality data and to develop TMDLs, including associated time frames and funding mechanisms for this work:

a. Data collection - The Board will request individual point (including municipal stormwater) and non-point dischargers collectively to assist in developing and implementing analytical techniques for detecting 303(d)-listed pollutants to at least their respective level of concern or water quality objective. The Board will also require dischargers to characterize loadings from their facilities into the water quality-limited waterbodies. The results will be used to (1) update and revise the 303(d) list and (2) support TMDL development.

b. Policy and TMDL development - Adoption of a future TMDL for mercury will be considered by the Board as part of the Basin Plan triennial review process. This process will refine the timing and mechanism for development of other pollutant-specific TMDLs.

c. Funding mechanism - The Board anticipates receiving resources from federal and state agencies for development of TMDLs. The Board intends to supplement these resources to ensure timely development of TMDLs by allocating development costs among all dischargers through the Regional Monitoring Program (RMP) or other appropriate group funded mechanisms. The discharger has shown a willingness to participate in this group effort toward an equitable allocation of allowable loading.

31. Copper

a. *Plant Performance and Ambient Concentrations*. Raw wastewater copper concentrations averaged 42 µg/L for the period May 1997 through August 1998, with a range of 0.1 µg/L to 66 µg/L (all but the

one sample, at a concentration of 0.1 µg/L, were from 30 to 66 µg/L). Based on preliminary treatment plant removal efficiency, the average effluent concentrations are projected to be 4 µg/L.

The monitoring performed during October, November and December 1998 for receiving water quality in the North Slough found levels that ranged from below detection levels to 25 µg/L. Regional Monitoring Report (RMP) data for 1995 through 1997 showed near-total copper concentrations in Napa River ranging from 3.1 to 9.8 µg/L and averaging 5.13 µg/L (San Pablo Bay data from same time period ranged from 2.2 to 10 µg/L and averaged 6.3 µg/L). Dissolved concentrations for the Napa River and San Pablo Bay averaged 1.8 and 1.6 µg/L, respectively, and were all below USEPA's dissolved copper criteria of 3.1µg/L.

b. *Site Specific Copper Objective.* In 1984, the USEPA promulgated a national saltwater and freshwater copper objective of 2.9 µg/L. The Board developed a bay-wide site-specific water quality objective for copper for San Francisco Bay of 4.9 µg/L in 1991. The site-specific objective for copper employed the "water effect ratio" approach developed by the USEPA. This approach provides a measure of the binding capacity of natural waters (dependent on particulate matter) relative to the binding capacity of reference waters (filtered oceanic water).

The Basin Plan was amended on October 21, 1992, to include the site specific water quality objective of 4.9 µg/L copper for San Francisco Bay and again on June 16, 1993, to incorporate a wasteload allocation for copper. On April 21, 1994, the SWRCB remanded these Basin Plan amendments as a consequence of the court decision, which invalidated the California Enclosed Bays and Estuaries Plan and Inland Surface Waters Plan (State Plans).

In the best professional judgment of the Board, the Bay-wide site-specific objective of 4.9 µg/L is protective of the most sensitive designated beneficial use of San Francisco Bay water with respect to copper: habitat for aquatic organisms. The study and associated staff analysis are described in a September 25, 1992, Board staff report entitled "Revised Report on Proposed Amendment to Establish a Site Specific Objective for Copper for San Francisco Bay." The staff report states that the copper objective is best applied where Bay "background" waters provide dilution, which may, or may not, include slough sites. The report also noted that developing separate objectives for sloughs might be desirable from the standpoint of refining our ability to assess risk. However, at that time the scientific tools (brackish species protocols) for such an effort were not available.

In 1996, the USEPA promulgated a revised national saltwater dissolved copper criteria of 3.1 µg/L. This revised criteria incorporates new scientific data generated during site-specific studies of both New York Harbor and the San Francisco Bay. In order for the Board to consider application of the dissolved criteria to the discharge, an appropriate translator based on effluent and receiving water data must be developed. This Order requires the discharger to conduct a study to generate data that may be considered by the Board for translation of the dissolved criteria to a total recoverable effluent limit.

c. *Effluent Limits for Copper.* This Order establishes a water quality based effluent limit (WQBEL) of 4.9 µg/L. The discharge limitation of 4.9 µg/L is based on the receiving water quality objective included in the Basin Plan for brackish water. This Order also establishes a mass-based limit for copper that is based on average current flow to NSD (1 mgd) and the water quality objective, 4.9 µg/L. Compliance with the mass limit will be based on 12-month moving average loads calculated from effluent flow and the water quality objective of 4.9 µg/L. The discharger has prepared a recycled water system master plan and will be requiring new development to install dual piping in areas where recycled water distribution is

planned. The discharger will investigate additional potential copper source control and corrosion control measures as cited in the provisions.

32. Mercury

a. *Mercury Water Quality Objectives*. For mercury, the national chronic criterion is based on the protection of human health. The criterion is intended to limit the bioaccumulation of methyl-mercury in fish and shellfish to levels, which are safe for human consumption. As described in the Gold Book, the freshwater objective is based on the Final Residual Value of 0.012 µg/L was derived from the bioconcentration factor of 81,700 for methylmercury with the fathead minnow, and which assumes that essentially all discharged mercury is methylmercury. The saltwater objective of 0.025 µg/L was similarly derived using the bioconcentration factor of 40,000 obtained for methylmercury with the Eastern oyster.

b. *Ambient Concentrations and Attainment.* The monitoring performed during October 1998 for preparation of the Draft EIR for receiving water quality in the North Slough did not detect mercury. Subsequent testing was performed in November and December of 1998. The November samples from the North Slough found mercury at 0.2 µg/L, however the December samples did not detect mercury with detection limit of 0.010 µg/L. However, ambient concentrations of mercury in the water column are not indicative of what is causing impairment to the Bay. Waterbodies are listed as impaired as a result of fish tissue concentration, rather than water column concentration. Ultra-clean sampling and analytical techniques for mercury (USEPA Methods 1669 and 1631) are now required of all dischargers with NPDES permits to discharge to the Bay. The difference between effluent concentration levels using these techniques has been shown to be quite large. Therefore, as these techniques become more widely available, attainability of this limit becomes more and more feasible.

c. *Mercury Sources.* Major sources of mercury to San Francisco Bay include riverine inputs and storm water runoff. Atmospheric deposition is not well quantified but is believed to be a major source. Studies conducted by the Santa Clara Valley Non Point Source Pollution Control Program (Metals Control Measures Report - January 1997) found point sources to contribute three percent of the measured mercury loading to the Bay and diesel fuel combustion from tailpipes to contribute 33 percent. However, much more investigation is needed into the forms of mercury in the effluent and the proximity of the effluent to methylating environments, since it is methylmercury that bioaccumulates and thus methylation rates that are the key components in determining environmental effects from various sources.

The discharger has performed raw wastewater sampling for a period from May through July 1997 plus monthly sampling for the period from September 1997 through August 1998. The results of this sampling found mercury in the raw wastewater in all seven of the samples taken during May, June and July of 1997 but in only 5 of the 12 monthly samples. The concentrations ranged from 0.06 µg/L to 5.4 µg/L, with only two samples higher than 0.28 µg/L (1.6 and 5.4). Ten of the 12 samples that detected mercury ranged from 0.06 µg/L to 0.28 µg/L. The average of all 12 samples in which mercury was detected averaged 0.5 µg/L. These results would suggest that these two samples may not be representative of normal conditions and with more monitoring data mercury levels would be consistent with the other four values, or not detected. Future ultra-clean sampling and analytical techniques for mercury may also show that these are artificially high results. Using the detection limit as the concentration for samples where mercury was not detected, the calculated average of the twelve most recent monthly sample results (May 1998 through April 1999) is 0.100 µg/L. Through its pollution prevention program and storm water program, the discharger will conduct public education and outreach

programs aimed at reducing the discharge of pollutants to its sewer system from residential and commercial sources.

d. *Treatment Plant Performance and Attainability.* Since this is a new plant, treatment plant performance and mercury removal are unknown. Preliminary treatment plant test results suggest that removal rates may be in the range of 65%. Therefore the effluent could be expected to contain concentrations of 0.2 µg/L at times. Based on the twelve most recent monthly sample results (May 1998 through April 1999), the average concentration in the effluent is expected to be 0.039 µg/L.

e. *Effluent Limits for Mercury.* This Order establishes a water quality based effluent limit for mercury of 0.012 µg/L based on the narrative water quality objective in the Basin Plan. In order to reduce total loading to the impaired system, this Order also establishes a mass limit calculated from the average flow, 1 mgd, and the water quality objective, 0.012 µg/L. Compliance with the mass limit will be based on 12-month moving average loads, including that which is reclaimed. Due to the bioaccumulative nature of mercury and the benefits to be gained from aggressive pollution prevention activities, this Order also includes a mass trigger value, which, like the limit, is based on 12-month moving average loads, but, unlike the mass limit, excludes that portion of the effluent which is reclaimed. When the discharger's effluent reaches this trigger value, the response actions specified in Provision 15 of this Order are required. Because this discharger is a "new discharger" into an impaired waterbody, they have, on their own volition, initiated and developed a very aggressive mercury source control program (see Attachment F). This was a voluntary requirement; that is, the discharger proposed and developed the program, thereby making it mandatory. The requirements of the program are explained in Provision 17 of this permit The Board does not intend to require this of existing dischargers unless the dischargers self-initiate or the Board adopts the program as policy.

The discharge to the North Slough will be part of a recycled water program aimed at maximizing the use of reclaimed water. The discharger has prepared a recycled water system master plan and will be requiring new development to install dual piping in areas where recycled water distribution is planned. Since the discharger is required to hold mass loadings to its present quantity, any increase in flow may require an associated increase in reclamation.

f. *Special Studies and Schedules.* Board staff is in the process of developing a plan to address mercury compliance for the North Bay shallow water dischargers, including the discharger. This Order requires the discharger to develop and implement a source control program as necessary to comply with, or evaluate their ability to comply with the 0.012 µg/L limit. The source control program shall be implemented to reduce to the maximum extent practicable any significant, controllable sources that may be contributing to mercury toxicity in the receiving waters. This Order also encourages the discharger to work with the other shallow and deep-water dischargers to optimize both source control efforts and assessment of alternatives for achieving compliance.

The Board intends to work towards an overall reduction of mercury mass loading in the watershed. This Permit's Provisions contain a time schedule and reopener clause according to which the discharger will implement a source reduction study and participate in studies being directed by the Board, and in other watershed based activities, aimed at mercury source identification and reduction. Prior to expiration of this Permit, the Board may reopen this Permit to incorporate an alternate mercury limit if adequate information has been developed to support such a limit. The permit may also be reopened in order to consider a mass offset program if the discharger has shown that it has performed to the maximum extent practicable all source control and storm water best management practices.

33. *Cyanide*. During the 12-month raw wastewater monitoring period between September 1997 and August 1998, cyanide was detected in only one sample at a level of 4.7 µg/L. Effluent cyanide concentrations are expected to be below the detection limit of 3 µg/L. Other plants have experienced interference from other compounds that are also detectable by cyanide analysis that result from effluent chlorination. Since the plant will use UV for disinfection for effluent discharged to the wetlands, this should not be a problem. Table 3-3 of the Basin Plan establishes water quality objective for cyanide of 5 µg/L. This Permit contains a water quality based limit of 5 µg/L based on the water quality objective in the Basin Plan.

34. *Total and Fecal Coliform*. The Basin Plan specifies water quality objectives for both total and fecal coliform. The Basin Plan allows the Board to substitute fecal coliform limitations for total coliform limitations provided that it can be conclusively demonstrated through a program approved by the Board that such substitution will not result in unacceptable adverse impacts on the receiving water. The Board can also consider establishing less stringent discharges during wet weather. The most restrictive beneficial use in the Napa River and the Napa Wetlands (and thus the North Slough) is body contact recreation, for which the fecal coliform water quality objective is a log mean of 200 Most Probable Number (MPN)/100 mL and a 90th percentile of 400 MPN/100 mL. Operating under a fecal coliform standard of disinfection control would allow the discharger to reduce power consumption from the UV disinfection facilities.

This Permit authorizes that the discharger may demonstrate bacteriological compliance with either the specified total or fecal coliform limits, after the discharger has established to the satisfaction of the Board that the use of fecal coliform limits will not impair the identified beneficial uses in the vicinity of the outfall. If the discharger wishes to pursue fecal coliform limits, the discharger will conduct an investigation in accordance with a beneficial uses work plan to be submitted for prior approval by the Executive Officer.

35. *Acute Toxicity*. USEPA promulgated updated acute and chronic toxicity test methods on October 16, 1995, in 40 CFR Part 136. Dischargers have identified several practical and technical issues that need to be resolved before implementing the new procedures. The primary issue is that the use of younger, possibly more sensitive fish may necessitate a reevaluation of permit limits. Acute testing of very young larval fish begins to approximate a chronic toxicity test. SWRCB staff recommended to the regional boards that new or renewed permit holders be allowed a time period in which new laboratories can become proficient in conducting the new tests. The Monitoring Program allows the discharger to continue using the current test protocols until further guidance is provided by SWRCB or Board staff on conducting the new tests and interpreting the compliance results compared to current test results.

36. Chronic Toxicity

a. *Program history*. The Basin Plan contains a narrative toxicity objective that "All waters shall be maintained free of toxic substances in concentrations that are lethal to or produce other detrimental responses to aquatic organisms" and that "there shall be no chronic toxicity in ambient waters." The Board initiated the Effluent Toxicity Characterization Program (ETCP) in 1986 with the goal of developing and implementing toxicity limits for each discharger based on actual characteristics of both receiving waters and waste stream. Two rounds of effluent characterization were conducted by selected dischargers beginning in 1988 and in 1991. A second round was completed in 1995, and the Board is

evaluating the need for a third round. Board guidelines for conducting toxicity tests and analyzing results were published in 1988 and last updated in 1991.

The Board adopted Order No. 92-104 in August 1992 that amended the permits of eight dischargers to include numeric chronic toxicity limits. Shallow water dischargers were assigned limits of an eleven sample median value of 1 TUc and 90th percentile value of 2 TUc. The Order was appealed to the SWRCB by three South Bay dischargers. By letter dated November 8, 1993, the SWRCB informed the petitioners that, "Because Order No. 92-104 was based largely on the Plan, the Regional Board will have to reconsider the order if the Plan is invalidated." (which it subsequently was) The letter also committed to providing the regional boards with guidance on issuing permits in the absence of the State Plans (*Guidance for NPDES Permit Issuance,* February 1994).

b. *SWRCB Toxicity Task Force Recommendations.* The Toxicity Task Force provided several consensus based recommendations in their October 1995 report to the SWRCB for consideration in redrafting of the State Plans. A key recommendation was that permits should include narrative rather than numeric limits, with numeric test values used as toxicity "triggers" to first accelerate monitoring, then to initiate Toxicity Reduction Evaluations (TREs).

c. *Regional Board Program Update and BPJ.* The Board intends to reconsider Order No. 92-104 as directed by the SWRCB, and to update, as appropriate, the Board's Whole Effluent Toxicity (chronic and acute) program guidance and requirements. This will be done based on analysis of discharger routine monitoring and ETCP results, and in accord with current USEPA and SWRCB guidance. In the interim, decisions regarding the need for and scope of chronic toxicity requirements for individual dischargers will continue to be made based on BPJ as indicated in the Basin Plan.

d. *Permit Requirements.* The Regional Monitoring Program (RMP) has not detected any consistent ambient receiving water toxicity during routine three per year tests at multiple sites around the Bay from 1993 through 1995. Reported incidents have been episodic, and may have been related to high Delta outflows and/or agricultural runoff carrying organophosphate pesticides to which the bioassay organisms are highly sensitive. During February 1996, toxicity was observed at San Joaquin, Sacramento River, and the Grizzly Bay monitoring stations. Given the absence of widespread toxicity, the RMP has proposed to alter its toxicity monitoring to focus on episodic events. Ambient toxicity will be re-evaluated as part of the receiving water beneficial use studies to be conducted per the Provisions.

It is expected that with reliable wastewater treatment operation, and implementation of aggressive source control, pollution prevention, and storm water quality management programs, the discharger is unlikely to cause or contribute to a condition that causes ambient toxicity to be exceeded. In accordance with USEPA and SWRCB Task Force guidance, and based on BPJ, the Permit includes the Basin Plan narrative toxicity objective as the limit, implemented via monitoring with accelerated monitoring and TRE triggers.

e. *Permit Reopener.* The Board will consider amending the Permit to include numeric toxicity limits if the discharger fails to aggressively implement all reasonable control measures included in its approved TRE work plan, following detection of consistent significant non-artifactual toxicity.

37. *Mass Emission Limit for Copper, Mercury, and Nickel.* Mass emission limits for copper, mercury, and nickel are included in the Order, as specified in the Provisions, due to the impairment caused by these pollutants. The purposes of the mass emission limits are to maintain the status quo in the receiving

waters without further contributing to existing impairments and to encourage reclamation. The discharger has prepared a recycled water system master plan aimed at maximizing the use of reclaimed water. New developments will be required to install dual piping in areas where the recycled water distribution system is planned.

BASIN PLAN DISCHARGE PROHIBITIONS AND EXCEPTIONS

38. Discharge to the North Slough is contrary to one of the Discharge Prohibitions identified in the Basin Plan. The Basin Plan states, in part:

"It shall be prohibited to discharge:

> Any wastewater which has particular characteristics of concern to beneficial uses at any point at which the wastewater does not receive a minimum initial dilution of at least 10:1, or into any non-tidal water, dead-end slough, similar confined waters, or any tributary thereof.

39. The Basin Plan states that exceptions to the above prohibition will be considered for discharges where:

- An inordinate burden would be placed on the discharger relative to the beneficial uses protected and an equivalent level of environmental protection can be achieved by alternate means, such as an alternative discharge site, a higher level of treatment, and/or improved treatment reliability; or
- A discharge is approved as part of a reclamation project; or
- It can be demonstrated that net environmental benefits will be derived as a result of the discharge."

The new wastewater treatment plant and discharge to the Wetlands restoration area will provide the following environmental benefits:

- The removal of the old wastewater ponds (approximately 30 acres) from the wetland area will provide more area for restoration while eliminating the flooding potential at the existing ponds during the winter.
- The new treatment plant will discharge highly treated effluent that is low in solids, BOD, and nutrients, thus removing a portion of the NSD discharges of higher solids, BOD, and nutrients directly into the Napa River, which is an impaired water body for sediment and nutrients. The following is a comparison of NSD discharges to the Napa River and projected American Canyon general effluent quality.

Parameter	Napa Sanitary District	American Canyon
BOD (mg/L)	8 to 10	2 to 5
Total Suspended Solids (mg/L)	10 to 15	<1 to 2
Ammonia Nitrogen (mg/L)	<1 to 11	1 to 2

- Effluent limitations for coliform for the discharge to the North Slough will be 2.2 MPN for the new plant, whereas current winter limitations for the NSD are 23 MPN and 240 MPN during certain flow conditions.

- The new plant will use UV for disinfection for all effluent discharged to the North Slough, thus resulting in less chlorinated hydrocarbon formation and discharge through disinfection using chlorine, which is the current method used at NSD.
- Removal of existing cattle grazing from the Upper wetland area.
- Removal of existing Eucalyptus tree cover from the North Slough in the vicinity of the new wastewater treatment plant and upland wetlands.
- Restrict public access to the Upper wetland area and preserve it as a riparian environment.

40. The Basin Plan further states that:

> "Significant factors to be considered by the Regional Board in reviewing requests for exceptions will be the reliability of the discharger's system in preventing inadequately treated wastewater from being discharged to the receiving water and the environmental consequences of such discharges."

41. The Board has historically granted an exception to the prohibitions stated above, provided that the discharge afforded a net environmental benefit and the discharger complied with the requirements of its Permit. The requirements of those permits included maximizing reclaimed water use for irrigation, emergency wastewater storage preparation, completion of technical reports on maximizing reclaimed water use and discharge impacts on beneficial uses, and implementing report recommendations. The proposed discharge from the American Canyon plant will similarly include a combination of wetland discharge and maximizing the use of reclaimed water. The discharger has prepared a recycled water system master plan and will require new development to install dual piping in areas where recycled water distribution is planned. Therefore, based on the information submitted by the discharger, the proposed project is similarly expected to result in a net environmental benefit.

42. Given the above considerations, exceptions to the shallow water discharge prohibitions described in the findings above are warranted for the discharges of tertiary treated effluent to North Slough, provided the discharger accomplishes the following:

a. Provides a net environmental benefit;
b. Provide high quality treated effluent;
c. Operate all treatment facilities to assure high reliability and redundancy;
d. Provide treated effluent to the North Slough; and
e. Work to use the maximum feasible amount of reclaimed effluent for irrigation, and minimize discharges to North Slough during dry weather.

OTHER DISCHARGE CHARACTERISTICS AND PERMIT CONDITIONS

43. Treatment Plant Storm Water Discharges

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

b. *Coverage under Statewide Storm Water General Permit.* The State Board adopted a statewide NPDES permit for storm water discharges associated with industrial activities (NPDES General Permit CAS000001, adopted November 19,1991, amended September 17,1992, and reissued April 17, 1997). The general permit is applicable to municipal wastewater treatment facilities. The discharger will obtain coverage under the general permit for storm water discharges from the discharger's Plant and prepare a Storm Water Pollution Prevention Plan for the Plant.

44. *American Canyon Urban Runoff Management Program.* The Board intends to issue concurrently with this Order a municipal storm water NPDES permit for the discharger's service area. The population of American Canyon is currently less than 10,000 population, less than that required under the Phase I requirements of the Clean Water Act for municipal stormwater dischargers. The program's components include but are not limited to the following: municipal maintenance activities for street sweeping and storm drain cleaning, public information and participation, new development site controls, illicit discharge mitigation and prevention, and a business inspection program. Prior to reissuance of this permit, the discharger may petition the Board to reopen both the stormwater permit as well as this permit in order for the Board to assess the feasibility and discharger's eligibility to implement a mass offset or trading program for mercury. The discharger must, however, present evidence that they have reduced mercury loading to the Bay to the maximum extent practicable by all avenues including source control, treatment optimization, reclamation, and stormwater BMPs.

45. *Source Control and Pollution Prevention Programs.* The discharger will implement and maintain an effective source control program. As part of its source control program, the discharger will also conduct a pollution prevention program in accordance with Basin Plan requirements and in coordination with its storm water program.

46. O&M *Manual.* An Operations and Maintenance Manual will be prepared and maintained by the discharger for purposes of providing Plant and regulatory personnel with a source of information describing all equipment, recommended operation strategies, process control monitoring, and maintenance activities.

47. *CEQA.* This Order serves as an NPDES Permit. An Environmental Impact Report has been prepared and certified in accordance with the provisions of Chapter 3 (commencing with Section 21100) of Division 13 of the Public Resources Code (California Environmental Quality Act) pursuant to Section 13389 of the California Code.

The American Canyon Wastewater Treatment and Reclamation Project Draft EIR (December 31, 1998) recommends several mitigation measures to protect water quality. In addition to obtaining and complying with the NPDES Permit, the EIR recommends that the City 1) implement an industrial pre-treatment program targeting the sources of metals, inorganic and organic contaminants in the sewer system, 2) investigate adjusting the pH of the drinking water supply to minimize the leaching of lead and copper from piping, and 3) participate in a program to educate residents and businesses about the consequences of disposing of harmful pollutants and toxins in the sewer system. Implementation of these measures will fully mitigate the effects of the discharge to North Slough.

48. *Public Notice.* The discharger and interested agencies and persons have been notified of the Board's intent to issue requirements for discharge and have been provided an opportunity to submit their written views and recommendations.

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

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

A. DISCHARGE PROHIBITIONS

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

2. a. Discharge of treated wastewater at any point where it does not receive a minimum initial dilution of 10:1, or into dead-end sloughs and similar confined waters, is prohibited, except as defined in prohibition 2.b. below.

   b. Based on the findings, exceptions to this prohibition are granted, for the discharges described in the findings of this Order. These exceptions are conditional upon continued compliance with the requirements of this Order, and in particular the conditions specified in the provisions of this Order.

3. The bypass or overflow of untreated or partially treated wastewater to waters of the State, either at the Plant or from the collection system or pump stations tributary to the Plant, is prohibited.

4. Average dry weather flows greater than 2.5 mgd are prohibited. The average dry weather flow shall be determined over three consecutive dry weather months each year.

5. Discharge of effluent from the Main Basin to North Slough is prohibited during the dry weather period each year, from May 1 through October 31, unless the discharger submits a report, which may be initially submitted over the telephone, to the Executive Officer and the Executive Officer approves it. This report must fully explain the need for discharges and the calculated dilution the discharge may receive during this period (e.g. high flows related to late spring or early fall storm events, when reclamation is not feasible).

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

7. Storm water discharge from the facility grounds shall not cause pollution, contamination, or nuisance.

B. EFFLUENT LIMITATIONS

The term "effluent" in the following limitations means the fully treated wastewater effluent flrom the discharger's waswater treatment facility, as discharged to North Slough. The effluent discharged to North Slough shall not exceed the following limits, as measured at Station E-001-S:

1. **Conventional Pollutants.** The effluent limits shall not exceed the following limits:

	Monthly	**Weekly**	**Daily**	**Instantaneous**

Constituent	Unit	Average	Average	Maximum	Maximum
a. Biochemical Oxygen Demand (BOD_5, 20°C)	mg/L	10	15	20	
b. Total Suspended Solids(TSS)	mg/L	10	15	20	
c. Settleable Matter	mg/L-hr	0.1			0.2
d. Oil & Grease	mg/L			10	
e. Ammonia Nitrogen	mg/L	2.0	3.0	4.0	
f. Turbidity	NTU			10	

2. **85 Percent Removal - BOD_5 and TSS**

The arithmetic mean of the BOD_5 and TSS values, by weight, for effluent samples collected in each calendar month shall not exceed 15 percent of the arithmetic mean of the respective values, by weight, for influent samples collected at approximately the same times during the same period.

3. **Coliform Bacteria**

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

a. The moving median value for the most probable number (MPN) of total coliform bacteria in any seven consecutive samples shall not exceed 2.2 MPN/100 mL; and

b. Any single sample shall not exceed 23 MPN/100 mL.

The discharger may use alternate limits of bacteriological quality instead of meeting 3.a and 3.b above (total coliform limits) if the discharger can establish to the satisfaction of the Board that the use of the fecal coliform limits will not result in unacceptable adverse impacts on the beneficial uses of the receiving water.

4. **pH**:

The pH of the effluent shall not exceed 8.5 nor be less than 6.5.

5. **Chlorine Residual**

The effluent shall not contain a residual chlorine concentration greater than 0.0 mg/L at any time. This concentration limit is defined as below the limit of detection in standard test methods.

6. **Toxic Substance Effluent Limitations**

The effluent discharged shall not exceed the following limits. (All limits are in units of µg/L, unless otherwise specified) (a)(b):

Constituent	Daily Average (µg/L) (b)	Monthly Average (µg/L) (b)	Mass Limits (kg/month)
Arsenic (e)	20		
Cadmium (e)	1.1		

Chromium (VI) (e, h)	11		
Copper (c, e, f)	4.9		0.56 kg/month
Lead (e)	5.6		
Mercury (e, f)		0.012	0.0014 kg/month
Nickel (d, e, f)	7.1		0.81 kg/month
Selenium	5		
Silver (e)	2.3		
Zinc (d, e)	58		
PAHs (g)	0.049		
Cyanide	5		

(a) All analyses shall be performed using current USEPA methods, as specified in "Test Methods for Evaluating Solid Wastes Physical/Chemical Methods", SW-846, Third Edition, or equivalent reference approved in writing by the Executive Officer. Method Detection Limits, Practical Quantification Limits, and quantitative levels will be taken into account in determining compliance with effluent limitations. Mercury shall be sampled and analyzed using ultra-clean methods, USEPA Method 1669, "Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria", and Method 1631, "Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence".

(b) Limits apply to the average concentration of all samples collected during the averaging period (i.e., Daily = 24-hour period; Monthly = calendar month). Compliance determinations shall be based on available analyses for the time interval associated with the effluent limitation. When only one sample analysis is available in a specified time interval (e.g., monthly average), that sample shall serve to characterize the discharge for the entire period.

(c) A corrosion control, source control, and Plant optimization study shall be performed to evaluate the feasibility of further reducing copper loading to and from the treatment plant according to the tasks and schedule identified in the provisions of this Order.

(d) Effluent limitation may be met as a four-day average. If compliance is to be determined based on a four-day average, then four separate 24-hour composite samples shall be obtained over four consecutive days, and the concentration results for each composite sample shall be reported, as well as the average of the four.

(e) Metal limits are expressed as total recoverable metals.

(f) Compliance with the mass emission limit shall be based upon calculations in Provision 13. The discharger shall demonstrate compliance with the mass-based limit using the discharge flow after diversion for reclamation. The mass and concentration limits may be revised upon completion of a Total Maximum Daily Load and Waste Load Allocation process. The permit may be modified to include a different requirement following completion of a TMDL and Waste Load Allocation, if consistent with the antibacksliding rule in the Clean Water Act Section 402(o). Compliance with the mercury concentration limit of 0.012 µg/L may be based on a 3-month running average.

(g) The water quality based effluent limit for PAHs refers to the limit for each of the eight PAHs listed in Provision 19. Compliance will be based on the practical quantitation level (PQL) for each PAH, 4 µg/L.

(h) The discharger may meet the limit for hexavalent chromium as total chromium.

7. **Whole Effluent Acute Toxicity**

Acute Toxicity: Representative samples of the effluent shall meet the following limits for acute toxicity: (see Provisions of this Order for more information)

The survival of organisms in undiluted effluent shall be an eleven (11) sample median value of not less than 90 percent survival, and an eleven (11) sample 90 percentile value of not less than 70 percent survival. The eleven sample median and 90th percentile effluent limitations are defined as follows:

11 sample median: Any bioassay test showing survival of 90 percent or greater is not a violation of this limit. A bioassay test showing survival of less than 90 percent represents a violation of this effluent limit, if five or more of the past ten or less bioassay tests show less than 90 percent survival.

90th percentile: A bioassay test showing survival of less than 70 percent represents a violation of this effluent limit if one or more of the past ten or less bioassay tests show less than 70 percent survival.

8. **Whole Effluent Chronic Toxicity**

Compliance with the Basin Plan narrative toxicity objective shall be demonstrated according to the following tiered requirements based on results from representative samples of the treated effluent meeting test acceptability criteria and Provisions 12 and 13.

a) Routine monitoring;
b) Accelerate monitoring after exceeding a three sample median value of 1 TUc[(1)] or a single sample maximum of 2 TUc;
c) Return to routine monitoring if accelerated monitoring does not exceed either "trigger" in "b";
d) Initiate approved TRE work plan and continue accelerated monitoring if monitoring confirms consistent toxicity above either "trigger" in "b";
e) Return to routine monitoring after appropriate elements of TRE work plan are implemented and toxicity drops below "trigger" levels in "b", or as directed by the Executive Officer.

[(1)] A TUc equals 100 divided by the no observable effect level (NOEL). The NOEL is determined from IC, EC, or NOEC values. These terms, their usage, and other chronic toxicity monitoring program requirements are defined in more detail in the Self-Monitoring Program of this Order. Monitoring and TRE requirements may be modified by the Executive Officer in response to the degree of toxicity detected in the effluent or in ambient waters related to the discharge.

9. Mercury Mass Loading Trigger

Until a final water quality-based effluent limit based on TMDL/WLA for mercury is established, the discharger shall demonstrate that the current mercury mass loading to the receiving water does not

increase. If monthly mass loading for mercury exceeds the following limit, actions specified in Provision 15 shall be initiated.

Mercury load trigger = 0.0010 kg/month [a]

[a] This mass loading "trigger" will be superseded upon completion of Total Maximum Daily Load and Waste Load Allocation. According to the antibacksliding rule in the Clean Water Act, Section 402(o), the permit may be modified to include a less stringent requirement following completion of a TMDL and waste load allocation, if the bases for an exception to the rule are met.

The mass emission loading for mercury shall be calculated as follows in lieu of G.12 and 13 in the Standard Provision and Reporting Requirements:

Flow = Running average of last 12 months of effluent flow discharged to North Slough in mgd, measured at E-001-S

Hg Concentration = Running average of last 12 monthly mercury concentration measurements in µg/L, measured at E-001-S

Mass emission loading, in kg/month = Flow x Hg Concentration x 0.1135

C. RECEIVING WATER LIMITATIONS

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

a. Floating, suspended, or deposited macroscopic particulate matter or foam;
b. Bottom deposits or aquatic growths to the extent that such deposits or growths cause nuisance or adversely affect beneficial uses;
c. Alteration of temperature, turbidity, or apparent color beyond present natural background levels;
d. Visible, floating, suspended, or deposited oil or other products of petroleum origin; and
e. Toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on wildlife, waterfowl, or other aquatic biota, or which render any of these unfit for human consumption, either at levels created in the receiving waters or as a result of biological concentration.

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

a. Dissolved Oxygen: 5.0 mg/L, minimum
7.0 mg/L, minimum, at all other times of the year

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

b. Dissolved Sulfide: 0.1 mg/L, maximum

c. pH: Variation from normal ambient pH by more than 0.5 pH units.

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

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

3. The discharge shall not cause a violation of any particular water quality standard for receiving waters adopted by the Board or the SWRCB as required by the Clean Water Act and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Clean Water Act, or amendments thereto, the Board will revise and modify this Order in accordance with such more stringent standards.

4. Storm water discharges shall not cause or contribute to a violation of any applicable water quality objective for receiving waters contained in the Basin Plan.

D. SLUDGE MANAGEMENT PRACTICES REQUIREMENTS

1. All sludge generated by the discharger must be disposed of in a municipal solid waste landfill, reused by land application, or disposed of in a sludge-only landfill in accordance with 40 CFR Part 503. If the discharger desires to dispose of sludge by a different method, a request for permit modification must be submitted to the USEPA 180 days before start-up of the alternative disposal practice. All the requirements in 40 CFR 503 are enforceable by USEPA whether or not they are stated in an NPDES permit or other permit issued to the discharger.

2. Sludge treatment, storage, and reuse shall not create a nuisance, such as objectionable odors or flies, or result in groundwater contamination.

3. Duty to mitigate: The discharger shall take all reasonable steps to prevent or minimize any sludge use or disposal which has a likelihood of adversely affecting human health or the environment.

4. The discharge of sewage sludge shall not cause waste material to be in a position where it is, or can be carried from the sludge treatment and storage site and deposited in the waters of the State.

5. The sludge treatment and storage site shall have facilities adequate to divert surface runoff from adjacent areas, to protect boundaries of the site from erosion, and to prevent any conditions that would cause drainage from the materials in the temporary storage site. Adequate protection is defined as protection from at least a 100-year storm and protection from the highest possible tidal stage that may occur.

6. For sludge that is applied to the land, placed on a surface disposal site, or fired in a sewage sludge incinerator as defined in 40 CFR 503, the discharger shall submit an annual report to the USEPA and the Board containing monitoring results and pathogen and vector attraction reduction requirements as specified by 40 CFR 503, postmarked February 15 of each year, for the period covering the previous calendar year.

7. Sludge that is disposed of in a municipal solid waste landfill must meet the requirements of 40 CFR 258. In the annual self-monitoring report, the discharger shall include the amount of sludge disposed of, and the landfill(s) to which it was sent.

8. Permanent on-site sludge storage or disposal activities are not authorized by this permit. A report of Waste Discharge shall be filed and the site brought into compliance with all applicable regulations prior to commencement of any such activity by the discharger.

9. Sludge Monitoring and Reporting Provisions of this Board's "Standard Provisions and Reporting Requirements", dated August 1993, apply to sludge handling, disposal and reporting practices.

E. PROVISIONS

1. Permit Compliance

The discharger shall comply with the limitations, prohibitions, and other provisions of this Permit immediately upon its adoption by the Board.

2. Mercury Reduction Study and Schedule

The discharger shall participate with the Board and other North Bay shallow water dischargers in identifying cross media watershed-wide sources of mercury impacting the receiving waters and in developing potential control measures. The discharger shall also participate in Board development of site-specific objectives and/or a wasteload allocation.

Reductions in mercury effluent concentrations should be achieved through source control, pollution prevention, and optimization of treatment plant processes. This study shall be conducted in accordance with the following tasks and time schedule:

Task	Compliance Date
a. Submit a study plan, acceptable to the Executive Officer, to investigate mercury sources within the collection system, to investigate means to optimize mercury removal by treatment plant processes, and to evaluate industrial, commercial and residential contributions to mercury loading and possible means by which these sources can be reduced.	December 1, 2001
b. Following approval by the Executive Officer commence work in accordance with the study plan and time schedule submitted pursuant to Task 2.a.	60 days after EO approval
c. Submit an interim report, acceptable to the Executive Officer, documenting the initial findings of the study plan as implemented in Task 2.b. Submittal shall include an action plan for follow-up work necessary to maximize source reductions from potential sources.	November 1, 2002
d. Implement action plan defined in interim report.	January 1, 2003
e. Submit a final report, acceptable to the Executive Officer, documenting findings of source reduction work and efforts made to minimize mercury in the collection system and treated effluent.	April 1, 2004

This permit establishes a mercury mass emission limit of 0.0014 kg/month, which is calculated based on a water quality based concentration limit of 0.012 µg/L and current effluent flow from American Canyon of 1.0 mgd. Compliance will be required upon commencement of discharge from the new treatment plant. However, the Board will take into account the time needed to stabilize and optimize a new biological treatment processes when taking any enforcement actions. This limit may be revised in response to mass offset, site specific objective studies and/or TMDLs to be conducted prior to the final compliance date.

3. Copper Reduction Study and Schedule

The discharger shall document current copper reduction and control activities, evaluate the feasibility of potential enhancements to those activities, including enhancement of copper corrosion control in the water supply system, and develop and implement a source identification and reduction plan for sources of copper. This program shall be aimed at taking all reasonable and economical steps to reduce influent copper concentrations and shall be developed and implemented in accordance with the following tasks and time schedule:

Task	Compliance Date
a. The discharger shall submit a report, acceptable to the Executive Officer, documenting efforts taken to reduce influent copper concentrations, including details of any measures taken by local water agencies to reduce corrosion in the supply system, and the feasibility of further optimization of corrosion control efforts.	December 1, 2001
b. The discharger shall submit a report, acceptable to the Executive Officer, documenting copper and mercury removals across the treatment plant, and evaluating potential measures for further concentration and/or mass loading reductions.	June 1, 2002
c. The discharger shall submit a report, acceptable to the Executive Officer, documenting efforts to identify any other significant copper sources in the community to the wastewater and storm water systems. Assessment of options for source reduction shall be provided for any identified sources.	June 1, 2003

This permit establishes a copper mass emission limit of 0.56 kg/month which is calculated based on a water quality based concentration limit of 4.9 µg/L and current flow from American Canyon of 1.0 mgd Compliance will be required upon commencement of discharge from the new treatment plant. However, the Board will take into account the time needed to stabilize and optimize a new biological treatment processes when taking any enforcement actions. This limit may be revised in response to mass offset, site specific objective studies and/or TMDLs to be conducted prior to the final compliance date. If the discharger can consistently comply with the copper effluent limit after the startup period, Provision 3 will be suspended. Suspension of Provision 3 does not exempt the discharger from complying with other applicable requirements under the pretreatment program.

4. Copper Translator Study and Schedule

In order to develop information that may be used to establish a water quality based effluent limit based on dissolved copper criteria, the discharger shall implement a sampling plan to collect data for

development of a dissolved to total copper translator. This work shall be performed in accordance with the following time schedule:

Tasks	Compliance Date
a. The discharger shall submit a study plan, acceptable to the Executive Officer, for collection of data that can be used for establishment of a dissolved to total copper translator, as discussed in the Findings. Within 30 days after Executive Officer approval, the discharger shall begin implementation of the study plan. The study plan shall provide for development of translators in accordance with USEPA guidelines and any relevant portions of the Basin Plan, as amended, and shall consider changes to the character of the receiving waters, that could affect the relative concentrations of dissolved and total copper. The study must take into account metals partitioning in the receiving waters that may be season specific.	May 1, 2002
b. The discharger shall submit a report, acceptable to the Executive Officer, documenting the results of the copper translator study, which may also include any other site specific information that the discharger would like the Board to consider in development of a TMDL and WLA or a revised water quality based effluent limitation for copper.	November 1, 2004

The Board intends to hold a hearing to consider the results of this study, and any other site specific studies the discharger chooses to conduct, and to determine whether adequate information exists upon which to adopt a different WQBEL from the 4.9 µg/L established in this Order. This permit establishes a water quality based effluent limit of 4.9 µg/L, which may be revised in response to site specific objective and TMDL studies.

5. Wetlands Monitoring Plan.

The wetlands restoration project will include on-going monitoring funded by CALFED and the CDFG. The purpose of the wetlands monitoring included in the NPDES permit is interim in nature and only intended to bridge the time period until permanent monitoring begins. Further, this interim monitoring program will use an adaptive approach. The first phase will include a continuation of the monitoring for 18 months at three sampling locations within the wetland area as performed by the City of American Canyon as specified in its Aquatic Characterization Study. At the conclusion of that period the monitoring program will be evaluated and adapted based on the results and the progress of the wetlands restoration project. At the end of each phase, the discharger shall submit a report, acceptable to the Executive Officer, containing the results and conclusions of the work performed and a plan for the next phase of monitoring. Methods and description of sampling sites will be submitted and subject to Executive Officer approval for Phases I and II for plants (e.g., species composition and dominance, and lists of wetland indicator plants and exotic species) and wildlife. A figure delineating all wetlands affected by the proposed discharge will be supplied. The following is a summary of the phased monitoring program that is included in the Self-Monitoring Program, Attachment C.

Phase IA – Perform quarterly (January, April, July, and October) water quality, invertebrate and fishery sampling at three locations identified as S1, S2 and S3 for 18 months, or a total of six sampling periods, as shown on the attached site plan. Details of the sampling program are included in the Self-Monitoring Program.

Phase IB – Evaluate the results of the monitoring program, the status of the wetlands restoration project and adapt the monitoring as appropriate for the next 42 months.

Phase II – Continue with water quality/habitat monitoring as necessary to evaluate long-term trend and status of the wetland values and functions as may be affected by wastewater discharge.

6. Collection System Design Storm Study and Schedule

The discharger shall conduct a study of the existing collection system and its ability to accommodate a 20-year recurrence interval wet weather wastewater flow. If it is determined that the existing system does not have adequate capacity to accommodate a 20-year storm event, then the discharger shall conduct a study to evaluate the costs of improvements to achieve the 20-year storm event objective. The study, if required, shall include the relative costs versus impacts on receiving water beneficial uses from collection system overflows after a 5-year, a 10-year, and a 20-year recurrence interval event, as described in Finding 20 and in accordance with the Basin Plan Maintenance Level Approach. The study shall be conducted in accordance with the following tasks and time schedule:

Task	Compliance Date
a. Evaluate the existing collection system for capacity to accommodate a 20-year recurrence interval wet weather wastewater flow.	September 1, 2001
b. If required, develop a study plan, acceptable to the Executive Officer, to evaluate the relative impacts on receiving water beneficial uses from collection system overflows occurring after a 5-year, 10-year, and 20-year recurrence interval event, and comparative costs of designing new and rehabilitated portions of the main interceptor collection system to contain the 5 and 10 year versus 20 year stormflow.	January 1, 2002
c. Following approval by the Executive Officer commence work in accordance with the study plan and time schedule submitted pursuant to Task 5.b.	60 days after EO approval
d. Submit a final report, acceptable to the Executive Officer, documenting the results of the complete study as described in Task 6.a including recommended design criteria and the results of the cost comparison for providing 5 and 10 year versus 20 year protection.	January 1, 2003

7. Contingency Plan.

The discharger's Contingency Plan, as required by Board Resolution 74-10 (attached), shall be reviewed, and updated as necessary, annually. The discharge of pollutants in violation of this Order where the discharger has failed to develop and/or adequately implement a contingency plan will be the basis for considering such discharge a willful and negligent violation of this Order pursuant to Section 13387 of the California Water Code. Annually, the discharger shall submit to the Board a report discussing the status of the Contingency Plan review and update, including a description or copy of any completed revisions, or a statement that no changes are needed.

8. Operations and Maintenance Manual.

The discharger's Operations and Maintenance Manual shall be reviewed annually, and updated as necessary, and within 90 days of completion of any significant facility or process changes. Annually, the discharger shall submit to the Board a report discussing the status of the O&M Manual review and update, including an estimated time schedule for completion of any revisions determined necessary, a description or copy of any completed revisions, or a statement that no revisions are needed.

9. Compliance with Discharge Prohibition Exceptions

The discharger shall ensure compliance with Discharge Prohibition A.2 in accordance with the following:

a. Continue to operate the treatment facility to produce the highest quality effluent possible, consistent with good operating practices.

b. Continue to maintain and operate treatment facilities in a manner that maximizes redundancy and reliability of unit processes;

c. Continue to provide high quality effluent on a seasonal basis (typically November through April); and

d. Continue to work to use the maximum feasible amount of reclaimed water for irrigation, and to minimize discharges to North Slough during dry weather.

10. Wet Weather Discharges

Violations of Prohibitions A.1, A.2, or A.3 of this Order which occur as a result of wet weather flows in excess of a 20-year recurrence interval wet weather event at the Plant, shall be evaluated for potential enforcement actions by the Board on a case by case basis. The Executive Officer will determine what appropriate recurrence interval is necessary following submittal of a report satisfying the requirements of the provisions of this Order.

11. Compliance with Acute Toxicity Limits (Effluent Limitation B.7. of this Order)

a. Compliance with the acute toxicity effluent limitation shall be evaluated by measuring survival of test fishes exposed to undiluted effluent for 96 hours in flow-through bioassays. Each fish species represents a single bioassay.

b. Two fish species will be tested concurrently. These shall be the most sensitive species determined from the results of concurrent screening of the following three species: three-spine stickleback, rainbow trout and fathead minnow according to a work plan approved by the Executive Officer. The three species screening requirement can be met using either flow-through or static renewal bioassays, and all tests must be completed within ten days of initiating the first test.

c. Based on the results of the concurrent screening, the Executive Officer may consider allowing compliance monitoring with only one fish species (the most sensitive, if known), if the discharger can also document that the acute toxicity limitation has not been exceeded during three consecutive years, or that acute toxicity has been observed in only one of two fish species.

d. All bioassays shall be performed according to protocols approved by the USEPA or SWRCB, or published by the American Society for Testing and Materials (ASTM) or American Public Health Association, or as directed in writing by the Executive Officer.

12. TRE for Chronic Toxicity

If there is a consistent exceedance of either of the chronic toxicity monitoring triggers, the discharger shall implement a TRE in accordance with a TRE work plan acceptable to the Executive Officer. The TRE work plan shall be submitted to the Executive Officer within 90 days of adoption of this Order. The TRE shall be initiated within 15 days of the date of violation. TREs need to be site specific but should follow USEPA guidance and be conducted in a step-wise fashion. Tier I includes basic data collection, followed by Tier 2 which evaluates optimization of the treatment system operation, facility housekeeping, and the selection and use of in-plant process chemicals.

If unsuccessful in reducing toxicity, Tier 3, a Toxicity Identification Evaluation (TIE) should be initiated and all reasonable efforts using currently available TIE methodologies employed. Assuming successful identification or characterization of the toxicant(s), Tier 4 is to evaluate final effluent treatment options and Tier 5 is to evaluate within plant treatment options. Tier 6 consists of follow-up and confirmation once the toxicity control method has been selected and implemented.

Many recommended TRE elements parallel source control, pollution prevention, and storm water control program best management practices (BMPs). To prevent duplication of effort, evidence of complying with those requirements may be sufficient to comply with TRE requirements if the pollutants targeted by those programs are suspected to be the cause of the chronic toxicity. Support for this may include results of a Phase I TIE or other data as acceptable to the Executive Officer. By requiring the first steps of a TRE to be accelerated testing and review of the facility's TRE work plan, a TRE may be ended in its early stages.

The Board recognizes that identification of causes of chronic toxicity may not be successful in all cases. Consideration of enforcement action by the Board will be based in part on the discharger's actions in identifying and reducing sources of consistent toxicity.

13. Screening Phase for Chronic Toxicity

The discharger shall conduct screening phase compliance monitoring as described in the Self-Monitoring Program under either of these two conditions:

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

b. Prior to Permit reissuance, except when the discharger is conducting a TRE/TIE. Screening phase monitoring data shall be included in the application for Permit reissuance. The information shall be as recent as possible, but may be based on screening phase monitoring conducted within five years before the Permit expiration date.

The discharger shall conduct screening phase compliance monitoring in accordance with a proposal submitted to, and acceptable to, the Executive Officer. The proposal shall contain, at a minimum, the elements specified in Part B of the Self-Monitoring Program of this Order, or alternatives as approved by the Executive Officer. The purpose of the screening is to determine the most sensitive test species for subsequent routine compliance monitoring for chronic toxicity.

14. Mass Emission Limit

The discharger shall not exceed mass emission limits for copper, mercury, and nickel of 0.56 kg/month, 0.0014 kg/month, and 0.81 kg/month, respectively. The mass emission shall be calculated as follows:

Flow = Running average of last 12 months of effluent flow in mgd, measured at E-001-S

Cu, Hg, or Ni Concentration = Running average of last 12 monthly concentration measurements in µg/L, measured at E-001-S

Mass emission, in kg/month = Flow x Cu, Hg, or Ni Concentration x 0.1135

15. Mass Emission Loading Reduction

If mass loading for Hg exceeds the trigger level specified in B.9 of this Order, then the following actions shall be initiated and subsequent reports shall include but not be limited to the following:

I. Notification: Any exceedance of the trigger specified in Effluent Limitation B.9 shall be reported to the Board in accordance with section E.6.b in the Standard Provisions and Reporting Requirements (August 1993).
II. Identification of the problem: Resample to verify the increase in loading. If re-sampling confirms that the mass loading trigger has been exceeded, determine whether the exceedance is flow or concentration-related. If the exceedance is flow related, identify whether it related to changes in reclamation, increase in the number of sewer connections, increases in infiltration and inflow (I/I), wet weather conditions, or unknown sources. If the exceedance is concentration-related, identify whether it is related to industrial, commercial, residential, or unknown sources.
III. Investigation of corrective action: • Investigate the feasibility of the following actions: Improving public education and outreach • Reducing inflow and infiltration (I/I) • Increasing reclamation • Develop a plan and time schedule, acceptable to the Executive Officer to implement all reasonable actions to maintain mercury mass loadings at or below the mass loading trigger contained in Effluent Limitation B.9.
IV. Investigation of additional prevention measures: In the event the exceedance is related to growth and the plan required under III is not expected to keep mercury loads below the mass load trigger, work with the local planning department to investigate the feasibility and potential benefits of requiring water conservation, reclamation, and dual plumbing for new development.

16. Pretreatment Program

The discharger shall implement and enforce their pretreatment program in accordance with the substantive requirements contained in the following cited Board Order and federal regulations,

except that the discharger is not required to have a pretreatment program that meets the criteria established in 40 CFR 403.8 and 403.9 or requires approval in accordance with 40 CFR 403.11:

a. Enforcement of National Pretreatment Standards (e.g. prohibited discharges, Categorical Standards) in accordance with 40 CFR 403.5 and Section 307 (b) and (c) of the Clean Water Act.

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

c. Board Order 95-015, and its amendments thereafter.

The above Order and federal regulations are applicable to the discharger's pretreatment program only to the extent they are required of treatment plants having a design flow of less than 5 mgd.

17. Mercury Source Control Program

The discharger, on its own volition, has developed an aggressive Mercury Source Control Program as described in Attachment F of this Order. The discharger shall carry out the tasks within the time schedules set forth in Attachment F, entitled "City of American Canyon Mercury Virtual Elimination Program". Attachment F is incorporated by reference into this permit.

The discharger shall report on its compliance with Attachment F as part of its bi-annual reporting in accordance with the requirement of Provision 18 below.

18. Pollution Prevention Program

a. The discharger shall participate in the Pollution Prevention Program (previously known as Waste Minimization Program) as described in Chapter IV of the Basin Plan under "Pollution Prevention."

b. The discharger shall implement a Pollution Prevention Program in order to reduce pollutant loadings to the Plant and, subsequently, to receiving waters.

c. Annually, the discharger shall submit to the Board a Pollution Prevention Annual Report, which shall include a compliance progress report on the Mercury Source Control Program, and a Midyear Progress Report, by January 31 and July 31 respectively, that are acceptable to the Executive Officer. These reports should include the following:

(1) Documentation of the discharger's efforts and progress;
(2) Evaluation of the program's accomplishments; and
(3) Identification of specific tasks and associated time schedules for future efforts.

19. PAH and Other Organic Compounds Detection Limits

If the analytical methods for PAHs, or other organic compounds are improved or new methods developed which lower the analytical quantification limit below that specified in the Self-Monitoring Program, and the discharger, using the new or improved methods, finds these constituents consistently present at levels above their respective water quality objectives, the discharger shall notify the Executive Officer. The

discharger shall also accelerate monitoring for these constituents to characterize the discharge, and, within 90 days develop and initiate a source identification and reduction investigation acceptable to the Executive Officer. During this time, compliance shall be determined at the former analytical quantification limit specified in the Self-Monitoring Program. "Consistently" as stated above is defined as present at levels above the respective objective in more than two consecutive monitoring events.

The discharger shall participate in a regional study to determine if alternative analytical methods with lower detection levels for PAHs and other organic compounds are currently available through commercial laboratories. To the extent that non-EPA approved (40CFR136) methods are used, the results will not be used for compliance purposes.

Furthermore, if one of the following eight PAHs is found at levels equal to or greater than the practicable quantitation limit (PQL), then the discharger shall accelerate monitoring to one sample per month for each of the eight PAHs. The PQL shall be five times the method detection limit. If any of the eight PAHs is detected consistently for three consecutive months at or above the PQL, then the discharger shall notify the Executive Officer, accelerate monitoring, and initiate a source identification and reduction investigation. This program will include an investigation and evaluation of the collection system and pretreatment program.

Constituent	Unit	Reporting Level
1,2-Benzanthracene	µg/L	0.8
3,4-Benzofluoranthene	µg/L	0.8
Benzo[k]fluoranthene	µg/L	0.8
1,12-Benzoperylene	µg/L	0.8
Benzo[a]pyrene	µg/L	0.8
Chrysene	µg/L	0.8
Dibenzo[a,h]anthracene	µg/L	0.8
Indeno[1,2,3-cd]pyrene	µg/L	0.8

20. Wastewater Facilities Evaluation.

The discharger shall regularly review and evaluate its wastewater collection, treatment and disposal facilities in order to ensure that all facilities are adequately staffed, supervised, financed, operated, maintained, repaired, and upgraded as necessary, in order to provide adequate and reliable transport, treatment, and disposal of all wastewater from both existing and planned future wastewater sources under the discharger's service responsibilities. A summary of the results of this review and evaluation shall be submitted to the Board annually.

21. Self-Monitoring Program.

The discharger shall comply with the Self-Monitoring Program for this Order (attached), as adopted by the Board, and as may be amended by the Executive Officer.

22. Standard Provisions.

The discharger shall comply with all applicable items of the "Standard Provisions and Reporting Requirements for NPDES Surface Water Discharge Permits" dated August 1993 (attached), or any amendments thereafter.

23. Change in Control or Ownership

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

b. To assume operation of this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order (see Standard Provisions, referenced above). The request must contain the requesting entity's full legal name, the address and telephone number of the persons responsible for contact with the Board and a statement. The statement shall comply with the signatory paragraph described in Standard Provisions and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code.

24. Reopener.

The Board may modify, or revoke and reissue, this Order and Permit if present or future investigations demonstrate that the discharge(s) governed by this Order will cause, have the potential to cause, or will contribute to adverse impacts on water quality and/or beneficial uses of the receiving waters. The Board may reopen this Permit within five years of adoption to review results of the discharger's and Board staff's mercury studies and decide whether a final limit or revised interim limit/revised compliance schedule should be added.

25. NPDES Permit.

This Order shall serve as a National Pollutant Discharge Elimination System (NPDES) permit pursuant to Section 402 of the Clean Water Act or amendments thereto, and shall become effective 10 days after the date of its adoption provided the USEPA Regional Administrator has no objection. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.

26. Order Expiration.

This Order expires on January 19, 2005. The discharger must file a report of waste discharge in accordance with Title 23, Chapter 3, Subchapter 9 of the California Administrative Code not later than 180 days before this expiration date as application for reissuance of waste discharge requirements.

I, Lawrence P. Kolb, Acting Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on January 19, 2000.

for Lawrence P. Kolb
Acting Executive Officer

Attachments:

A. Plant and Discharge Location Map
B. Treatment Process Schematic Diagram
C. Self-Monitoring Program
   SMP Attachment A - Definition of NOEL
   SMP Attachment B - Chronic Toxicity Screening Phase Monitoring Requirements
   SMP Attachment C - Interim Water Quality and Aquatic Assessment Monitoring Program for the North Slough
D. Standard Provisions and Reporting Requirements, August 1993
E. Board Resolution No. 74-10
F. Mercury Source Control Program: "City of American Canyon Mercury Virtual Elimination Program"

ATTACHMENT A

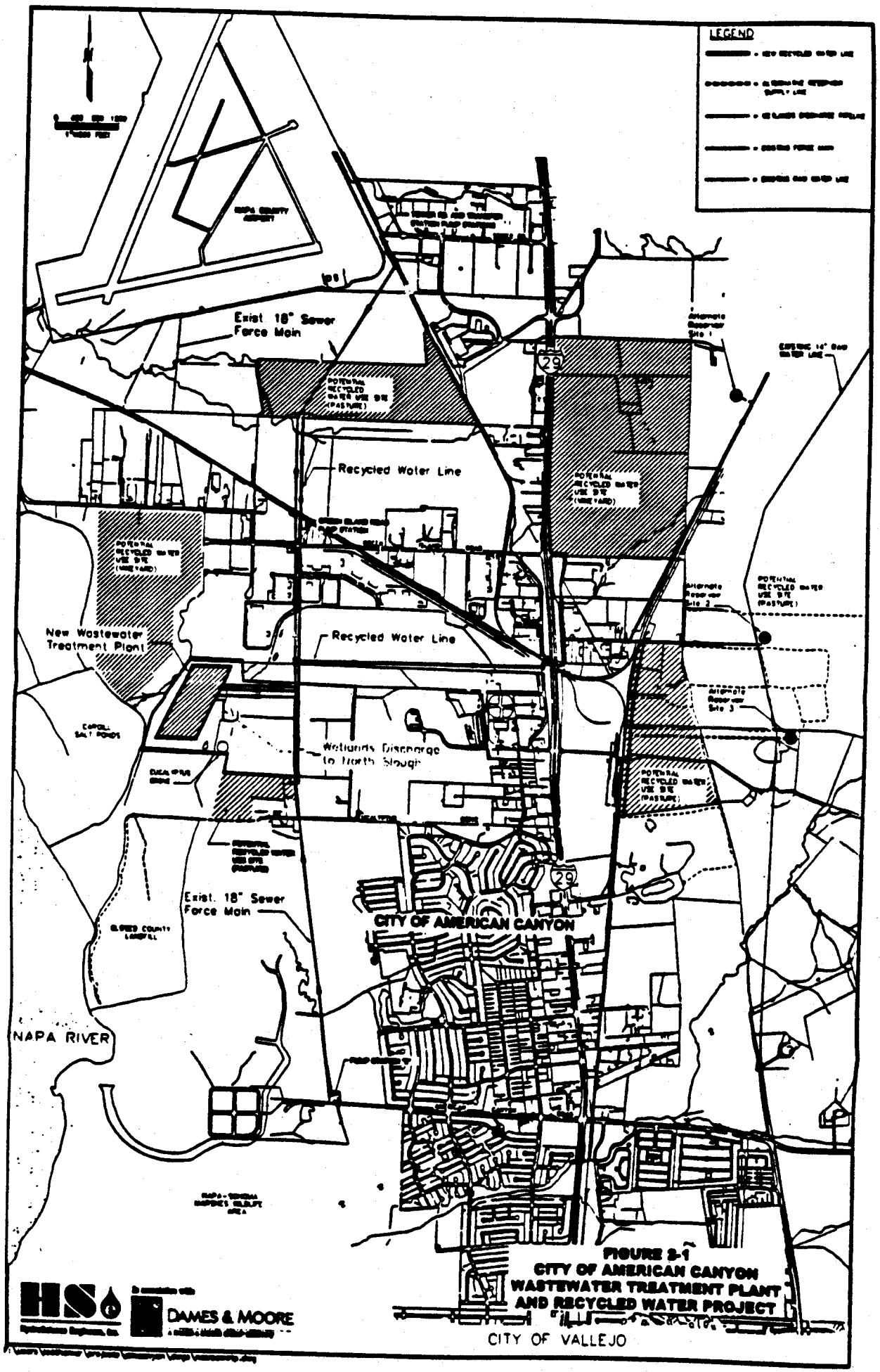
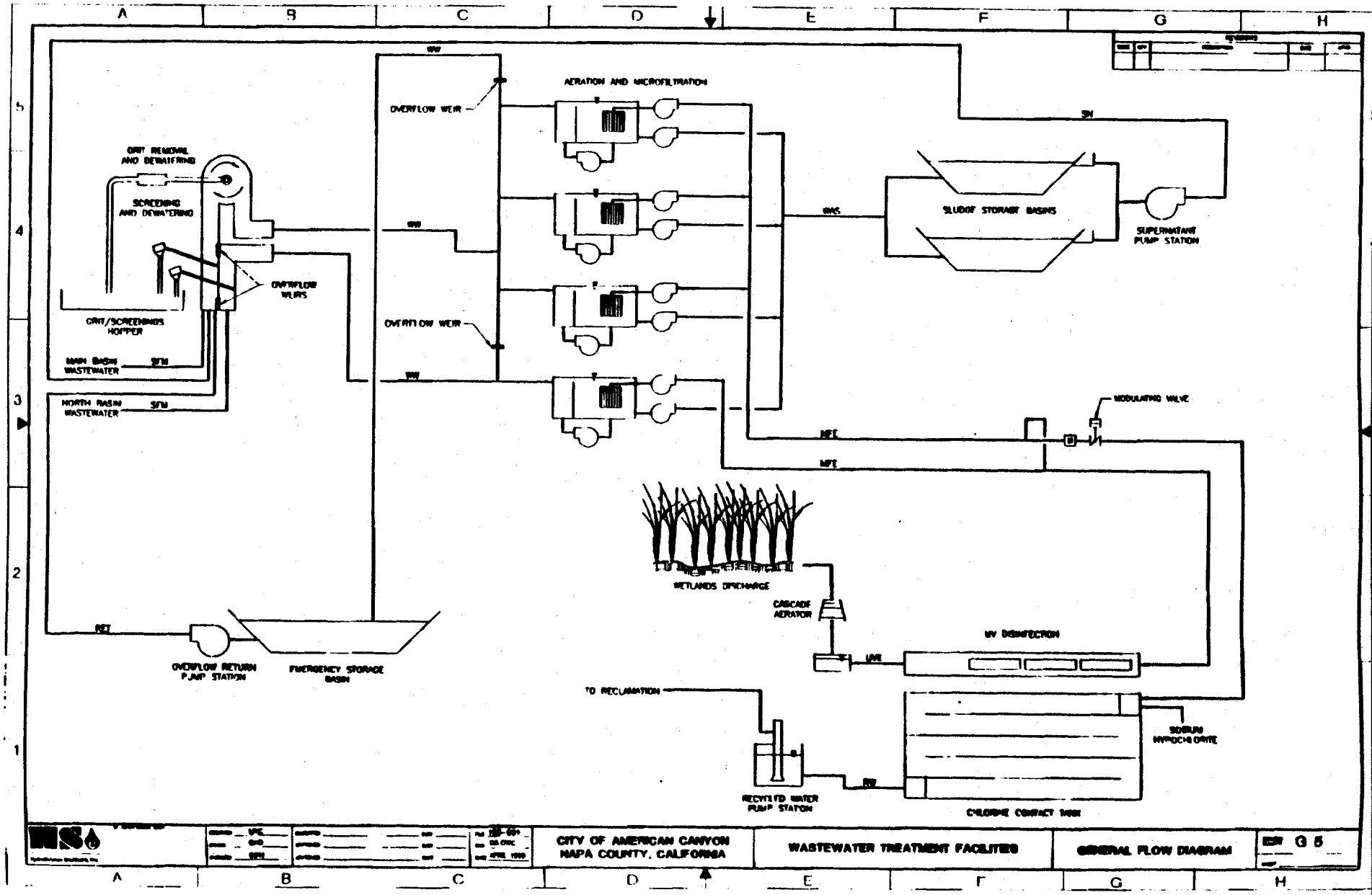


FIGURE 2-1
CITY OF AMERICAN CANYON
WASTEWATER TREATMENT PLANT
AND RECYCLED WATER PROJECT

HS

DAMES & MOORE

ATTACHMENT B


GRIT REMOVAL AND DEWATERING
SCREENING AND DEWATERING
OVERFLOW WEIRS
GRIT/SCREENINGS HOPPER
MAIN BASIN WASTEWATER
NORTH BASIN WASTEWATER
SFM
OVERFLOW WEIR
OVERFLOW WEIR
AERATION AND MICROFILTRATION
WAS
SLUDGE STORAGE BASINS
SUPERNATANT PUMP STATION
MODULATING VALVE
MFE
MFE
WETLANDS DISCHARGE
CASCADE AERATOR
UV DISINFECTION
UVE
TO RECLAMATION
SODIUM HYPOCHLORITE
RECYCLED WATER PUMP STATION
CHLORINE CONTACT TANK
RET
OVERFLOW RETURN PUMP STATION
EMERGENCY STORAGE BASIN
CITY OF AMERICAN CANYON
NAPA COUNTY, CALIFORNIA
WASTEWATER TREATMENT FACILITIES
GENERAL FLOW DIAGRAM
G 5

ATTACHMENT C

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM

FOR

CITY OF AMERICAN CANYON
WASTEWATER TREATMENT PLANT

AMERICAN CANYON, NAPA COUNTY

NPDES PERMIT NO. CA0038768

ORDER NO. 00-003

CONSISTS OF

PART A (dated August 1993)

AND

PART B

SELF-MONITORING PROGRAM
PART B

I. DESCRIPTION OF SAMPLING STATIONS

A. INFLUENT

Station	Description
A-001	At any point in the treatment facilities headworks at which all waste from the North Basin (the northern portion of the service area) tributary to the treatment system is present, and preceding any phase of treatment. It is the flow through Process Train 1of the treatment plant.
A-002	At any point in the treatment facilities headworks at which all waste from the Main Basin (the southern portion of the service area) tributary to the treatment system is present, and preceding any phase of treatment. It is the flow through Process Train 2 of the treatment plant.

NOTE: Total Plant Influent is the sum of flow received from both North and Main Basins.

B. EFFLUENT

Station	Description
E-001-S	Effluent to North Slough Outfall At a point in the treatment facility, at which all waste tributary to the discharge outfall is present and at which point adequate disinfection is assured for discharge to the North Slough.
E-002-R	Effluent to Irrigation Reuse At a point in the treatment facility, at which point adequate disinfection is assured for irrigation.

NOTE: Total Plant Effluent is the sum of flow discharged to North Slough (E-001-S) and to Irrigation Reuse (E-002-R).

C. RECEIVING WATERS

Station	Description
C-1	At a point in North Slough directly above the center of the outfall.

C-2	At a point in the North Slough located 500 feet downstream of the center of the outfall
C-R	At a point in North Slough located 2,000 feet downstream from the diffuser.

D. TREATMENT PLANT PERIMETER (Land Observations)

Station	Description
P-1 to P-8	Points located at the corners and at midpoints along the perimeter (fence line) of the wastewater treatment facilities.

NOTE: A drawing showing the locations of these stations shall be included in the Annual Report, and in the monthly report if stations change.

E. OVERFLOWS

Station	Description
O-1 through O-'n'	At points in the collection system including manholes, pump stations, or any other location where overflows and bypasses occur.
NOTE:	1. A map and description of each known or observed overflow or bypass location shall accompany each monthly report. A summary of these occurrences and their locations shall be included with the Annual Report for each calendar year.
	2. Each occurrence of a bypass or overflow shall be reported to the regional Board in accordance with the reporting requirements specified in Section G.1 and B.2 of the Self-Monitoring Program Part A.

II. SCHEDULE OF SAMPLING, ANALYSIS AND OBSERVATION

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

III. MODIFICATION OF PART A (August 1993)

A. This monitoring program does not include the following sections of Part A:

C.2.d.; C.2.f.; D.4.; and E.3.

B. This monitoring program includes the following modifications of Part A:

1. Section F.5., Annual Reporting: The first sentence is revised to read:

'The discharger shall submit to the Board an Annual Report for each calendar year, to be received no later than February 15 of the following year.'

IV. REPORTING REQUIREMENTS

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

B. A Self-Monitoring Report shall be submitted for each calendar month. The report shall be submitted to the Board by the last day of the following month. The required contents of these reports are described in SMP Part A, Section F.4.

C. An Annual Report shall be submitted for each calendar year. The report shall be submitted to the Board by February 15 of the following year. The required contents of these reports are described in SMP Part A, Section F.5.

D. Any overflow, bypass or significant non-compliance incident that may endanger health or the environment shall be reported in accordance with SMP Part A, Sections F.1 and F.2, and any additional reporting guidance as may be provided by Board staff. The date, time, duration, location, estimated volume of wastewater discharged, and corrective actions taken for these events shall be reported in the monthly Self-Monitoring Reports.

E. Flow Monitoring and Reporting.

a. Influent and Effluent (A-001, A-002, E-001-S, and E-002-R):
Flows shall be measured continuously, and recorded and reported daily. The following information shall also be reported, for each calendar month: Average, Maximum and Minimum Daily Flows (mgd).

b. Influent (A-001 and A-002):
The following information shall also be reported, on a daily basis:
Maximum and minimum flow rates, and times of occurrence.

c. Effluent to the North Slough (E-001-S):
Record and report Total Monthly Flow (MG).

d. Effluent to Irrigation (E-002-R):
Record and report Total Monthly Flow (MG).

F. BOD and TSS Percent Removal.
Percent removal for BOD and TSS shall be reported for each calendar month, in accordance with Effluent Limitation B.2.

V. CHRONIC TOXICITY MONITORING REQUIREMENTS

A. Test Species and Frequency: The discharger shall collect 24-hour composite samples at E-001-S on consecutive days for critical life stage toxicity testing as indicated in Attachments A and B to this SMP Part B:

After at least twelve test rounds, the discharger may request the Executive Officer to decrease the required frequency of testing, and/or to reduce the number of compliance species to one. Such a request may be made only if toxicity exceeding the TUc values specified in the effluent limitations was never observed using that test species.

B. Conditions for Accelerated Monitoring: The discharger shall accelerate the frequency of monitoring to bimonthly (every two months), or as otherwise specified by the Executive Officer, after exceeding a three sample median value of 1 TUc or a single sample maximum of 2 TUc.

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

D. Dilution Series: The discharger shall conduct tests at 100%, 50%, 10%, 5%, and 2.5%. The % represents percent effluent as discharged. The 100% dilution may be omitted if the marine test species specified is sensitive to artificial sea salts.

VI. CHRONIC TOXICITY REPORTING REQUIREMENTS

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

a. Sample date(s)
b. Test initiation date
c. Test species
d. End point values for each dilution (e.g., number of young, growth rate, percent survival)
e. NOEC value(s) in percent effluent
f. IC_{15}, IC_{25}, IC_{40}, and IC_{50} values (or EC_{15}, EC_{25} ... etc.) in percent effluent
g. TUc values (100/NOEC, $100/IC_{25}$, and $100/EC_{25}$)
h. Mean percent mortality (± s.d.) after 96 hours in 100% effluent
i. NOEC and LOEC values for reference toxicant test(s)
j. IC_{50} or EC_{50} value(s) for reference toxicant test(s)
k. Available water quality measurements for each test (i.e., pH, D.O., temperature, conductivity, hardness, salinity, ammonia)

B. Compliance Summary: Each self-monitoring report shall include a summary table of chronic toxicity data of, at a minimum, samples collected during the most recent year.

C. Reporting Raw Data in Electronic Format: On a semi-annual basis, by February 15 and August 15 of each year, the discharger shall report all chronic toxicity data for the previous semi-annual report in the format specified in Suggested Standardized Reporting Requirements for

Monitoring Chronic Toxicity, August 1993, SWRCB. The data shall be submitted in either high or low density, double 3.5-inch floppy diskettes.

VII. MISCELLANEOUS REPORTING

A. The discharger shall retain and submit (when required by the Executive Officer) the following information concerning the monitoring program for organic and metallic pollutants.

a. Description of sample stations, times, and procedures.

b. Description of sample containers, storage, and holding time prior to analysis.

c. Quality assurance procedures together with any test results for replicate samples, sample blanks, and any quality assurance tests, and the recovery percentages for the internal surrogate standard.

B. The discharger shall submit in the monthly self-monitoring report the metallic and organic test results together with the detection limits (including unidentified peaks). All unidentified (non-Priority Pollutant) peaks detected in the USEPA 624, 625 test methods shall be identified and semi-quantified. Hydrocarbons detected at <10 µg/L based on the nearest internal standard may be appropriately grouped and identified together as aliphatic, aromatic and unsaturated hydrocarbons. All other hydrocarbons detected at > 10 µg/L based on the nearest internal standard shall be identified and semi-quantified.

I, Lawrence P. Kolb, Acting Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in this Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Board Order No. 00-003.

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

3. Is effective as of January 19, 2000.

for LAWRENCE P. KOLB
Acting Executive Officer

Attachments:
Table 1 - Schedule for Sampling, Measurements and Analyses with Footnotes
Table 2 - Priority Pollutants
Attachment A: Chronic Toxicity – Definition of Terms
Attachment B: Chronic Toxicity Screening Phase Requirements
Attachment C: Interim Water Quality and Aquatic Assessment Monitoring Program for the North Slough

TABLE 1

SCHEDULE OF SAMPLING, MEASUREMENT, AND ANALYSIS

Station	Constituent	Unit	Type of Sample	Frequency of Analysis
A-001	Flow Rate [1]	mgd	Continuous	Continuous
& A-002	BOD5, 20°C [2]	mg/L	24 hr composite	3 times/week
	TSS	mg/L	24 hr composite	3 times/week
	Arsenic [8]	µg/L & kg/d	24 hr composite	Monthly
	Cadmium	µg/L & kg/d	24 hr composite	Monthly
	Chromium Total or Hexavalent	µg/L & kg/d	24 hr composite	Monthly
	Copper	µg/L & kg/d	24 hr composite	Monthly
	Cyanide [9]	µg/L & kg/d	24 hr composite	Monthly
	Lead	µg/L & kg/d	24 hr composite	Monthly
	Mercury	µg/L & kg/month	24 hr composite	Monthly
	Nickel	µg/L & kg/d	24 hr composite	Monthly
	Silver	µg/L & kg/d	24 hr composite	Monthly
	Selenium	µg/L & kg/d	24 hr composite	Monthly
	Zinc	µg/L & kg/d	24 hr composite	Monthly
E-001-S	Flow Rate [1]	mgd	Continuous	Continuous
	BOD5, 20°C [2]	mg/L	24 hr composite	3 times/week
	TSS [2]	mg/L	24 hr composite	3 times/week
	Oil & Grease [3,4]	mg/L & kg/d	24 hr composite	Monthly
	Settleable Matter	mL/L-hr	24 hr composite	Daily
	Chlorine Residual [5]	mg/L	Continuous	Continuous
	Total Coliform [6]	MPN/100 mL	Grab	Daily
	Turbidity	NTU	24 hr composite	Daily
	pH	Std Units	Grab	Daily
	Temperature	°F	Grab	Daily
	Dissolved Oxygen	mg/L and % saturation	Grab	Daily
	Acute Toxicity [17]	Survival	24 hr composite	Monthly
	Chronic Toxicity [18]		24 hr composite	Quarterly/Weekly
	Total Sulfides [7]	mg/L	Grab	Daily
	Arsenic [8]	µg/L & kg/d	24 hr composite	Monthly
	Cadmium	µg/L & kg/d	24 hr composite	Monthly
	Chromium Total or Hexavalent	µg/L & kg/d	24 hr composite	Monthly
	Copper	µg/L & kg/d	24 hr composite	Monthly
	Cyanide [9]	µg/L & kg/d	24 hr composite	Monthly
Station	**Constituent**	**Unit**	**Type of Sample**	**Frequency of Analysis**

	Lead	µg/L & kg/d	24 hr composite	Monthly
	Mercury	µg/L & kg/month	24 hr composite	Monthly
	Nickel	µg/L & kg/d	24 hr composite	Monthly
	Silver	µg/L & kg/d	24 hr composite	Monthly
	Selenium	µg/L & kg/d	24 hr composite	Monthly
	Zinc	µg/L & kg/d	24 hr composite	Monthly
	Phenols	µg/L	Grab	Twice/year
	PAHs [11] [21]	µg/L	Grab	Twice/year
	Nitrogens (as N) [16]	mg/L	24 hr composite	Weekly
	Total Phosphate	mg/L	24 hr composite	Weekly
	Standard Observations		Visual	Weekly
E-002-R	Flow Rate [1]	mgd	Continuous	Continuous
	Chlorine Residual [5]	mg/L	Continuous	Continuous
	Total Coliform [6]	MPN/100 mL	Grab	Daily
	Turbidity	NTU	24 hr composite	Daily
	pH	Std Units	Grab	Daily
	Temperature	°F	Grab	Daily
	Dissolved Oxygen	mg/L and % saturation	Grab	Daily
	Total Sulfides [7]	mg/L	Grab	Daily
	Conductivity	:mhos/cm	Grab	Monthly
	Unionized Ammonia	mg/L as N	Grab	Monthly
	Total Dissolved Solids	mg/L	Grab	Monthly
	Chlorophyll a	µg/L	Grab	Monthly
	Arsenic [8]	µg/L & kg/d	24 hr composite	Monthly
	Cadmium	µg/L & kg/d	24 hr composite	Monthly
	Chromium Total or Hexavalent	µg/L & kg/d	24 hr composite	Monthly
	Copper	µg/L & kg/d	24 hr composite	Monthly
	Cyanide [9]	µg/L & kg/d	24 hr composite	Monthly
	Lead	µg/L & kg/d	24 hr composite	Monthly
	Mercury	µg/L & kg/month	24 hr composite	Monthly
	Nickel	µg/L & kg/d	24 hr composite	Monthly
	Silver	µg/L & kg/d	24 hr composite	Monthly
	Selenium	µg/L & kg/d	24 hr composite	Twice/year
	Zinc	µg/L & kg/d	24 hr composite	Monthly
	Nitrogens (as N) [16]	mg/L	24 hr composite	Weekly
	Total Phosphate	mg/L	24 hr composite	Weekly
	Standard Observations		Visual	Weekly

Station	**Constituent**	**Unit**	**Type of Sample**	**Frequency of Analysis**

All C Stations	Turbidity	NTU	Grab	[20]
	pH	Std Units	Grab	[20]
	Temperature	°F	Grab	[20]
	Dissolved Oxygen	mg/L	Grab	[20]
	Nitrogens (as N) [16]	mg/L	Grab	[20]
	Total Phosphate	mg/L	Grab	[20]
	Conductivity	μmhos	Grab	[20]
	Hardness (as CaCO3)	mg/L	Grab	[20]
	Salinity	ppt	Grab	[20]
	Chloryphyll-a	mg/L	Grab	[20]
	Secchi Disk	inches	Grab	[20]
	Water Depth	feet	Grab	[20]
	Standard Observations		Visual	[20]

TABLE 2

Monitoring Frequency for Priority Pollutants [12] [14]

Constituent	Frequency	Notes/Comment
1, 2 - Dichlorobenzene	Q	
1, 3 - Dichlorobenzene	Q	
1, 4 - Dichlorobenzene	Q	
2, 4 - Dichlorophenol	Q	
2, 4, 6 - Trichlorophenol	Q	
4 - Chloro - 3 - Methylphenol	Q	
Aldrin	Q	
A - BHC	Q	
Benzene	Q	
B - BHC	Q	
Chlordane	Q	
Chloroform	M	
DDT	Q	
Dichloromethane	Q	
Dieldrin	M	
Diazinon	M	
Endosulfan	M	
Endrin	Q	
Fluoranthene	Q	
G - BHC (Lindane)	M	

Halomethanes	Q
Heptachlor	Q
Heptachlor Epoxide	Q
Hexachlorobenzene	Q
PAH's	Q/M [11]
PCB's	Q [21]
Pentachlorophenol	Q
Phenol	Q
TCDD Equivalents	A [15]
Toluene	Q
Toxaphene	Q
Tributlytin	M

Footnotes for Table 1 and 2:

1. Flows shall be monitored continuously and the following shall be reported in monthly self-monitoring reports.:

   a. Influent, average, maximum and minimum daily flows (A-001);
   b. Influent, maximum and minimum flow rates and times of occurrence (A-001);
   c. Effluent , daily flows to North Slough outfall (E-001-S);
   d. Effluent, daily average, maximum and minimum flows to Irrigation (E-002-R);

2. The percent removal for BOD and TSS shall be reported for each calendar month, in accordance with Effluent Limitation B.2.

3. Oil and grease sampling shall consist of three grab samples taken at two hour intervals during the sampling day, with each grab being collected in a glass container. The entire volume of each sample shall be composited prior to analysis. Each glass container used for sample collection or mixing shall be thoroughly rinsed with solvent as soon as possible after use, and the solvent shall be added to the composite wastewater sample for extraction and analysis.

4. Grab samples shall be collected coincident with samples collected for the analysis of regulated parameters. In addition, the grab samples must be collected in glass containers. Polycarbonate containers may be used to store tributyltin samples.

5. Chlorine residual concentrations shall be monitored and reported for sampling points both prior to and following dechlorination. Total chlorine dosage (kg/day) shall be recorded on a daily basis.

6. When replicate analyses are made of a coliform sample, the reported result shall be the arithmetic mean of the replicate analysis sample.

7. Sulfide analysis shall be run when dissolved oxygen concentrations fall below 2.0 mg/L.

8. Arsenic must be analyzed for by the atomic absorption, gaseous hydride procedure (USEPA method No. 206.3/Standard Method No. 303E). Alternative methods of analysis must be approved by the Executive Officer.

9. The discharger may analyze for cyanide as Weak Acid Dissociable (WAD) Cyanide using protocols specified in Standard Method No. 4500-CN-I, latest edition.

10. Selenium must be analyzed for by the atomic absorption, gaseous hydride procedure (USEPA method No. 270.3/Standard Method No. 303E). Alternative methods of analysis must be approved by the Executive Officer.

11. Polynuclear aromatic hydrocarbons, PAHs, shall be analyzed using the latest version of USEPA Method 610 (8100 or 8300). The discharger shall attempt to achieve the lowest detection limits commercially available. If an analysis cannot achieve a quantification limit for a particular sample at or below the effluent limits for PAHs, the discharger shall provide an explanation in its self-monitoring report. Note that the samples must be collected in amber glass containers. These samples shall be collected for the analysis of the regulated parameters. An automatic sampler which incorporates glass sample containers, and keeps the samples refrigerated at 4°C, and protected from light during compositing may be used. The 24-hour composite samples may consist of eight grab samples collected at three hour intervals. The analytical laboratory shall remove flow proportioned volumes from each sample vial or container for the analysis.

    For PAHs, the existing limit in the Basin Plan is defined as the sum of sixteen constituents measured in USEPA Method 610. More current data from the NTR lists standards for just eleven of the PAHs measured in Method 610. The USEPA criteria for three of the eleven are higher than the other eight; these are anthracene (NTR objective at 110,000 ppb), fluorene (14,000 µg/L), and pyrene (11,000 µg/L). Therefore, the PAHs of concern permit are the eight PAHs that may be present in the discharge at concentrations which pose a reasonable potential to contribute to water quality impacts. The USEPA criteria for each of these eight PAHs are 0.049 µg/L for saltwater based on updated cancer potency factors (q*) from USEPA's Integrated Risk Information System (IRIS). [USEPA human health criteria calculations from the TSD, with updated cancer potencies (q*) and reference doses (RfD) from the California Office of Environmental Health Hazard Assessment, and in USEPA's Integrated Risk Information System (IRIS). Calculations based on average human body weight of 70 kg, USEPA estimated national average fish consumption of 6.5 g/d, and a 10-6 cancer risk level for carcinogens.]

Constituent	Unit	Reporting Level
1,2-Benzanthracene	µg/L	0.8
3,4-Benzofluoranthene	µg/L	0.8
Benzo[k]fluoranthene	µg/L	0.8
1,12-Benzoperylene	µg/L	0.8
Benzo[a]pyrene	µg/L	0.8

Chrysene	µg/L	0.8
Dibenzo[a,h]anthracene	µg/L	0.8
Indeno[1,2,3-cd]pyrene	µg/L	0.8

12. Selected Toxic Pollutant Monitoring: Monitoring for all of the listed constituents given in SMP Part B Table 2 may be done in conjunction with that conducted for the Pretreatment Program; however, in addition to inclusion with Pretreatment submittals, the results shall be submitted with the monthly Self-Monitoring Report for the period of monitoring.

13. The discharger shall attempt to achieve the lowest detection limits commercially available using the latest versions of USEPA Methods 608 (or 8080).

14. The latest versions of USEPA Methods 624 (or 8240), and 625 (or 8270) shall be used.

15. The latest version of USEPA Method 1613 shall be used to determine TCDD Equivalents, and the discharger shall attempt to achieve the lowest detection limits commercially available. Analysis results at or below the quantification limits listed below may be considered zero for use in the calculations for compliance determination with the TCDD Equivalents limit.

Isomer Group	Quantification Limit
2,3,7,8-tetra CDD	5 pg/L
2,3,7,8-penta CDD	5 pg/L
2,3,7,8-hexa CDDs	10 pg/L
2,3,7,8-hepta CDD	10 pg/L
octa CDD	25 pg/L
2,3,7,8-tetra CDF	5 pg/L
1,2,3,7,8-penta CDF	5 pg/L
2,3,4,7,8-penta CDF	5 pg/L
2,3,7,8-hexa CDFs	10 pg/L
2,3,7,8-hepta CDFs	10 pg/L
octa CDF	25 pg/L

If the analysis performed cannot achieve the quantification limits specified above, the discharger shall provide an explanation in its self-monitoring report. Another sample shall be analyzed if the reported quantification limits are significantly above the limits specified above.

16. Ammonia (as N) shall be measured as Total Ammonia; the unionized fraction shall be calculated based on the total ammonia, pH , total dissolved solids or salinity, and temperature.

17. Flow-through bioassays shall be conducted with the two of the most sensitive fish species determined from concurrent screenings of three-spine stickleback, rainbow trout and fathead minnow pursuant to Provision E.11. of this Order. The Executive Officer may allow compliance monitoring with only one fish specie (the most sensitive, if known) provided that the discharger conducts sufficient screening with rainbow trout. The following constituents shall be measured on a daily basis, and reported for the bioassay sample stream: pH, Temperature, and Dissolved Oxygen (Sulfides if D.O. falls below 2.0 mg/L).

18. Critical Life Stage Toxicity Test shall be performed and reported in accordance with the Chronic Toxicity Requirements specified in Sections V and VI of the Self-Monitoring Program contained in this Order.

19. Monitoring for pH shall be done continuously; the minimum and maximum pH values for each day shall be reported in monthly self-monitoring reports.

20. Stations C-1, C-2A, C-2B, and CR shall be monitored monthly, and on the same day.

21. The discharge shall conduct low-level monitoring with ultra-clean procedures for PAHs, PCBs, pesticides, and dioxins. The discharger shall utilize 3-5 laboratories and determine the reproducibility of results over a two-year period conducting sampling on a semi-annual basis. The purpose of this work is to establish the pollutant levels in the effluent using ultra-clean sampling procedures and low-level analytical procedures. To the extent that non-EPA approved (40CFR136) methods are used, the results will not be used for compliance purposes.

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

ATTACHMENT A

CHRONIC TOXICITY - DEFINITION OF TERMS

A. No observed effect level (NOEL) for compliance determination is equal to IC25 or EC25. If the IC25 or EC25 cannot be statistically determined, the NOEL shall be equal to the NOEC derived using hypothesis testing.

B. Effective concentration (EC) is a point estimate of the toxicant concentration that would cause an adverse effect on a quantal, "all or nothing," response (such as death, immobilization, or serious incapacitation) in a given percent of the test organisms. If the effect is death or immobility, the term lethal concentration (LC) may be used. EC values may be calculated using point estimation techniques such as probit, logit, and Spearman-Karber. EC25 is the concentration of toxicant (in percent effluent) that causes a response in 25% of the test organisms.

C. Inhibition Concentration (IC) is a point estimate of the toxicant concentration that would cause a given percent reduction in a non-lethal, non-quantal biological measurement, such as growth. For example, an IC25 is the estimated concentration of toxicant that would cause a 25% reduction in average young per female or growth. IC values may be calculated using a linear interpolation method such as EPA's Bootstrap Procedure.

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

ATTACHMENT B

CHRONIC TOXICITY - SCREENING PHASE REQUIREMENTS

A. The discharger shall perform screening phase monitoring:

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

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

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

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

2. Two stages:

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

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

3. Appropriate controls; and

4. Concurrent reference toxicant tests.

CHRONIC TOXICITY

TABLE B-1

CRITICAL LIFE STAGE TOXICITY TESTS FOR ESTUARINE WATERS

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

TOXICITY TEST REFERENCES

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

2. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms. EPA/600/R-95/136. August 1995

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

TABLE B-2
CRITICAL LIFE STAGE TOXICITY TESTS FOR FRESH WATERS

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

TOXICITY TEST REFERENCE

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

TABLE B-3
TOXICITY TEST REQUIREMENTS FOR STAGE ONE SCREENING PHASE

REQUIREMENTS	RECEIVING WATER CHARACTERISTICS		
	DISCHARGES TO COAST	DISCHARGES TO SAN FRANCISCO BAY[1]	
	Ocean	Marine	Freshwater
Taxonomic Diversity	1 plant 1 invertebrate 1 fish	1 plant 1 invertebrate 1 fish	1 plant 1 invertebrate 1 fish
Number of tests of each salinity type:			
Freshwater[2]	0	1 or 2	3
Marine	4	3 or 4	0
Total number of tests	4	5	3

[1] Marine refers to receiving water salinities greater than 5 ppt at least 75% of the time during a normal water year.
Fresh refers to receiving water with salinities less than 5 ppt at least 75% of the time during a normal water year.

[2] The fresh water species may be substituted with marine species if:

1) the salinity of the effluent is above 5 parts per thousand (ppt) greater than 75% of the time, or

2) the ionic strength (TDS or conductivity) of the effluent at the test concentration used to determine compliance is documented to be toxic to the test species.

ATTACHMENT C

INTERIM WATER QUALITY AND AQUATIC ASSESSMENT MONITORING PROGRAM FOR THE NORTH SLOUGH

The monitoring program described herein was developed as a continuation of the Aquatic Characterization Study performed by the City of American Canyon in 1998. This interim assessment will establish baseline conditions in the North Slough before it begins receiving treated effluent, and will develop information and protocols that can be used in other wetland restoration projects in the region. Specifically, the program will investigate the potential for mercury bioaccumulation within the wetland before and after completion of the project. This monitoring program is intended to provide preliminary information that will help design a more comprehensive long-term monitoring strategy conducted as part of the City's CALFED wetlands restoration project.

Although wetlands enhance beneficial uses such as spawning and habitat, they can also facilitate conversion of inorganic mercury to methylmercury, which then bioaccumulates in aquatic ecosystems. This is a regional concern, because there is currently a fish consumption advisory in San Francisco Bay due to elevated mercury concentrations in fish. There are numerous wetlands restoration efforts planned or implemented throughout the region, but to date there has been no investigation of how these restorations affect mercury bioaccumulation. This study will provide the first assessment of mercury methylation in a wetland before and after a restoration project. That information is a critical first step towards understanding how wetlands can best be designed and managed to minimize mercury bioaccumulation. The Regional Board needs that kind of management information in order to implement a total maximum daily loading (TMDL) for mercury.

MONITORING LOCATIONS

With input from the California Department of Fish and game (CDFG) staff, three monitoring locations will be established approximately at the location shown on the attached location map. Some of the sampling locations are different than those used in the previously completed Aquatic Characterization Study. S1 will be at the same location as used previously, and is intended to gather information on the water quality in the immediate location of the proposed effluent mixing zone. Sites S2 and S3 of the original Aquatic Characterization Study will not be sampled. Instead, new sampling points to the east will be chosen at locations that provide more information as to the impact of the tidal action on the land area to be restored to wetlands, but will be spatially located from north to south at relatively the same locations as before. These two new locations will be referred to as S4 and S5. This monitoring program

does not propose sampling at S2 and S3, however, considering the possibility that sampling may again occur at these points, stations S2 and S3 will remain in there present positions.

Stations will be measured through use of global positioning satellite (GPS) during the first sampling event. Measurements will be documented and reported in a North Slough water quality data summary report. All samples will be collected as sub-surface samples, taken from a mid-point of the station cross-section at approximately 60 percent of the point's depth. Thermal and/or chemical stratification of North Slough is a possibility. However, the action of tides coupled with the relatively shallow depths would suggest turbulent mixing, subsequently eliminating any prolonged stratification.

FREQUENCY AND DURATION

Since the wetlands restoration project will include on-going monitoring funded by CALFED and the CDFG, the purpose of the wetlands monitoring included in this permit is interim in nature and only intended to bridge the time period until permanent monitoring begins. Further, this interim monitoring program will use an adaptive approach. The first phase will include a continuation of the monitoring for 18 months at three sampling locations within the wetland area as performed by the City of American Canyon in its Aquatic Characterization Study. At the conclusion of that period the monitoring program will be evaluated and adapted based on the results and the progress of the wetlands restoration project. The following is a summary of the phased monitoring program.

PHASE I

Perform quarterly (January, April, July, and October) water quality, invertebrate and fishery sampling at three locations identified as S1, S4 and S5 for 18 months, or a total of six sampling periods, as shown on the attached site plan. Quarterly botanical and wildlife surveys will also be conducted.

Collection of water, fish, and invertebrate samples will take approximately 6 hours. As such, sampling will occur over a high/slack/low daily tidal regime. To this end, sample dates will occur during periods of spring and neap tides. Time of sample collection will be recorded on sample bottles, chain-of-custody, and field sampling worksheets.

PHASE II

Evaluate the results of the monitoring program, the status of the wetlands restoration project and adapt the monitoring as appropriate for the next 42 months. Continue with water, fishery, invertebrate, botanical, and wildlife monitoring only as necessary to evaluate wastewater effluent quality and estuary health.

WATER QUALITY ASSESSMENT

This water quality assessment will sample trace metals (priority pollutant metals – dissolved), cyanide, nutrients (nitrate, total phosphorus, potassium), ammonia, chloride, dissolved sulfide, hardness as calcium carbonate, total dissolved solids (TDS), total suspended solids (TSS), conductivity, salinity, pH, dissolved oxygen (DO), temperature, and total coliform bacteria (quantified). In addition, standard pesticide and herbicide screens will be conducted, as well as PCBs, PAHs, tributyltin, and dioxins/furans. Total mercury and methylmercury will be analyzed in water samples and sediment samples. Constituents and analysis methods are summarized in **Table C-1**.

These measurements are intended to provide an assesment of the overall water quality in North Slough prior to project completion. Dissolved metal concentrations will be measured rather than total recoverable concentrations because of the much greater bioavailability of dissolved metals. Nutrient and TSS data help understand biogeochemical processes within the slough. For example, high sulfide concentrations indicate microbial sulfate reduction, which is a known mechanism for mercury methlyation. The ratio of methylmercury to total mercury helps quantify the relative methylation efficiency of the wetland. A recent national survey has demonstrated that areas with methyl/total ratios exceeding 5% are associated with substantial mercury bioaccumulation.

DATA ASSURANCE AND QUALITY CONTROL PLAN

OVERVIEW

The purpose of this quality assurance and control plan is to relate objectives of the project to the specific sampling and analytical techniques. The sampling plan contained herein was developed to assure the quality of samples collected and their transport as well as assure the quality of data gathered in the field utilizing field analysis equipment in order to attain the projects objectives accurately and efficiently in a manner technically defensible. The sampling plan outlines the experimental design behind attaining project objectives as well as the methodology for the physical collection of samples and transport of samples in the field. This quality assurance and control plan addresses the selection of laboratory analytical methodologies used in the analysis of collected samples, but does not address the quality assurance and control plans of the analytical laboratory itself. These quality assurance and control procedures are available at the selected laboratories.

This data assurance and quality control plan has been prepared to demonstrate:

- Sample collection procedures are appropriate for achieving project objectives,
- Identified analytical procedures are appropriate for achieving project objectives,
- Quality control procedures are sufficient for obtaining data of known quality, and
- Data collected is technically defensible.

Due to the nature of the existing project area, a relatively new condition a result of a recent breach in the perimeter levee, some modification of the sampling protocols contained herein may be required. Should a significant modification to these sampling protocols be required a consequence of unforeseen field conditions, these modifications will be documented in detail on field sampling worksheets and communicated to project managers.

TABLE C-1
PARAMETER AND ANALYSIS METHODS

Parameter	Method
Trace Metals (dissolved)	
Antimony (Sb)	EPA 6010/7000
Arsenic (As)	EPA 6010/7000
Berrylium (Be)	EPA 6010/7000
Cadmium (Cd)	EPA 6010/7000
Chromium, Total (Cr)	EPA 6010/7000
Chromium, Hexavalent (Cr VI)	EPA 7196A
Copper (Cu)	EPA 6010/7000
Lead (Pb)	EPA 6010/7000
Mercury, Total and Methyl (Hg) (water and sediment samples will be analyzed)	EPA 6010/7000
Nickel (Ni)	EPA 6010/7000
Selenium (Se)	EPA 6010/7000
Silver (Ag)	EPA 6010/7000
Thallium (Tl)	EPA 6010/7000
Zinc (Zn)	EPA 6010/7000
Organics, Pesticides, Herbicides	
Purgeable Halocarbons	EPA 601
Purgeable Aeromatics	EPA 602
Semivolatiles	EPA 625
Acrolein and Acrylonitrile	EPA 8260
Organochlorine Pesticides and PCBs	EPA 608
Chlorophenoxy Acid Herbicides	EPA 8150
Organophosphorus Pesticides	EPA 8140
Triazine Pesticides	EPA 507
Carbamate Pesticides	EPA 632
Dioxins and Furans	EPA 1613
Tributyltin	GC/FPD
Nutrients	
Ammonia Nitrogen	EPA 350.3
Nitrate Nitrogen	EPA 300.0
Phosphorus, Total	EPA 365.2
Potassium (K)	EPA 6010/7000
Inorganic Analysis	
Chloride	EPA 300.0
Cyanide, Total	EPA 335.2
Sulfide, Dissolved	EPA 376.1
Physical Properties	
Total Dissolved Solids (TDS)	EPA 160.1
Total Suspended Solids (TSS)	EPA 160.2
Hardness, Total as $CaCO_3$	SM 2340B
Conductivity	Field Analysis
Salinity	Field Analysis
Dissolved Oxygen	Field Analysis
Turbidity	Field Analysis
pH	Field Analysis
Temperature	Field Analysis
Biological	
Chlorophyl;	Quantitative Biomass
Coliform, Total	MPN

SAMPLING PLAN

METHODOLOGY

Constituents in **Table C-1** were selected considering the proposed future discharge of treated wastewater effluent and the project objective as previously discussed. North Slough is actively under the influence of tides; the project area is influenced by the ebb and flood of the Napa River near its confluence with San Pablo Bay. As such, brackish to saline surface water is expected.

Two variables affecting the environment of North Slough, both season and tide will be considered to varying degrees through monitoring period. It is the intent of the monitoring program to gather data considered representative of dry and wet weather seasons, as well as the transition periods in the spring and fall as the seasons influence the North Slough. Tidal influence of North Slough occurs through a breach in the southern perimeter levee. Because of this active tidal influence, surface water conditions might possibly vary throughout the extent of North Slough dependent upon the acting tide. The monitoring program will characterize water quality in North Slough under representative neap and spring tides. To achieve this data objective under the constraints of funding, grab samples will be collected rather than composite samples and/or continuous monitoring, which are considered infeasible.

SAMPLE COLLECTION AND STORAGE

Each group of constituents listed in **Table C-1** requires special handling and storage conditions to prevent possible contamination and/or analyte instability. The following collection and storage procedures will be duplicated in practice and order at all sampling stations.

Subsurface samples will be collected utilizing a subsurface grab sampler. Samples will be collected at a depth equivalent to 60 percent of the depth of the sampling point (the middle transect of the sampling station at 60 percent of its depth) using a pre-cleaned 1 Liter (L) borosilicate sampling bottle with teflon cap attached to the end of a subsurface grab sampler. Sampling will be conducted with certified clean powderless nitrile gloves. Samplers will don new gloves between sampling stations and if gloves are damaged during actual sampling.

Upon arrival at a sampling point, but prior to collection of the first sample, an equipment blank will be collected utilizing certified pure reagent grade deionized water (meets ASTM Type 1 standards for reagent water) provided by the selected contract laboratory. Approximately 1 L of this water will be decanted from its container and used to rinse the borosilicate sampling container of the subsurface sampler. This rinsate will then be used to fill a single 250 mL teflon sampling container preserved with nitric acid and a two 250 ml polyethylene sampling containers without preservative. These three samples will be labeled properly as equipment blanks for analysis of trace metals (including Cr VI) and total phosphorus. Due to project cost constraints, equipment blanks are limited due to the greater possibility that trace metals and phosphorus might cross-contaminate as a result of sampling and cleaning technique.

Equipment blank sample containers will be placed in chilled coolers for transport to the laboratory. Analysis of the equipment blank resulting in a finding of non-detect indicates a clean sampling technique negating the need to repeat this process in future sampling events.

Trace Metals, Potassium, Total Hardness (excluding Cr (VI)): The first grab sample will be filtered, and then decanted into a certified clean 1 L amber glass sample container (provided by Sequoia Analytical) preserved with nitric acid and labeled properly with exact time of sample collection. The sample bottle will then be placed in a chilled cooler for transport to the laboratory for analysis. Sediment samples will be collected at each location to be tested for mercury and methylmercury.

Organics: A second and third 1 L grab sample will be collected and decanted into two certified clean 1 L amber glass container containing no preservative for organics analysis and labeled properly with exact time of sample collection. A portion of the second or third grab sample will be used to fill a single 40 mL VOA vile for volatile organics analysis. The sample bottles will then be placed in a chilled cooler for transport to the laboratory for analysis. Special attention will be given to not agitate or aerate the sample during decanting to prevent volatile organic analysis error.

Cr (VI), Dissolved Sulfide, TDS, TSS, Chloride, Nitrate Nitrogen: A fourth 1 L grab sample will be collected and decanted into a certified clean 1 L polyethylene container containing no preservative for hexavalent chromium, dissolved sulfide, TDS, TSS, chloride, nitrate nitrogen and labeled properly with exact time of sample collection. The sample bottle will then be placed in a chilled cooler for transport to the laboratory for analysis. Special attention will be given to not agitating or aerating the sample during decanting to prevent dissolved sulfide analysis error. Filtering of the correct aliquot of this sample for dissolved sulfide analysis will be conducted at the laboratory.

Cyanide, Ammonia Nitrogen, Phosphorus: A fifth 1-L grab sample will be collected for cyanide, ammonia nitrogen, and phosphorus. For cyanide, 500 mL will be decanted into a certified clean 500-mL polyethylene container containing sodium hydroxide pellets and labeled properly with exact time of sample collection. For ammonia nitrogen and phosphorus, the remaining 500-mL will be decanted into a certified clean 500 mL polyethylene container containing sulfuric acid and labeled properly with exact time of sample collection. Both sample bottles will be placed in a chilled cooler for transport to the laboratory for analysis.

Total Coliform and Chlorophyll: A sixth 1 L grab sample will be collected for total coliform and chlorophyll. A 4-ounce coliform container preserved with sodium sulfite will be filled with sample to within approximately 1/2 inch of the top and capped. A 500 mL unpreserved polyethelene container will then be filled for the chlorphyl analysis. The sample containers will be labeled properly with exact time of sample collection. The sample containers will then be placed in a chilled cooler for transport to the laboratory for analysis.

EC, Salinity, DO, Turbidity, and Temperature: The remainder of the sixth grab sample will be analyzed for EC, salinity, turbidity, and temperature in the field and recorded on field worksheets. Based on the salinity reading, the DO meter will be manually adjusted for the salinity of the sample and the DO reading will be taken and recorded on field worksheets. The deficiency in DO analysis because of the inability to stir the sample will be noted on field worksheets. When these subsurface analyses are completed, the same analysis will be conducted at the surface of the sampling station and readings recorded on field worksheets.

After completion of sample collection, the subsurface grab sampler will be disassembled and cleaned in the field. In a clean 5 gallon bucket, 3.75 ounces of Liqui-Nox and 3 gallons distilled water will be mixed. In three separate clean buckets, pure distilled water will be used in a triple rinse procedure. Disassembled parts of the subsurface grab sampler will be cleaned in the Liqui-Nox solution and rinsed in distilled water three separate times. Cleaned parts will be set aside to air dry. The borosilicate sampling bottle will undergo a hydrochloric acid rinse between the first and second distilled water rinse. Acid rinsing is conducted to eliminate metals adsorption with the walls of the glass container.

Upon arriving at the second sample collection point, a second equipment blank will be collected using laboratory provided ultra clean water. Due to project cost constraints, trace metals (carry over from the previous sample) and phosphorus (possibly from the soap) are considered most likely to cross-contaminate as a result of sampling and cleaning technique. Analysis of the equipment blank resulting in a finding of non-detect indicates a clean sampling technique negating the need to repeat this process in future sampling events.

After collection of the second equipment blank, sampling at the second sampling station will proceed as described above. Sampling will conclude with cleaning of sampling equipment and collection of a third equipment blank followed by collection of samples at the third sampling station.

All samples will be immediately stored in chilled coolers for same day transfer to the laboratory's designated courier under proper chain of custody.

DECONTAMINATION

Prior to each use, the subsurface grab sampler will be decontaminated following the procedure outlined below:

1. Borosilicate grab sampler bottle, cap, and grab sampler assembly will be washed in liquinox solution. All equipment will undergo a triple rinse in pure distilled water, following the procedure described below.

2. Approximately 100 mL of 20% hydrochloric acid solution will be placed in borosilicate bottle. Bottle will be capped and acid solution used to rinse the inside of the bottle.

3. Hydrochloric acid rinsate will be decanted from the borosilicate bottle into a glass acid waste bottle. Borosilicate bottle will then be rinsed with copious amount of "ultra pure" reagent water.

4. Borosilicate bottle will be allowed to air dry.

5. Grab sampler assembly will undergo a final third rinse in "ultra pure" reagent water, however, will not undergo the acid rinse to avoid damage to the rubber seal.

Decontamination of field equipment and associated electrodes will consist of rinsing in copious amounts of distilled water and storing and transporting equipment following manufacturer recommended protocols.

FIELD DATA LOGGING AND SAMPLE STORAGE/TRANSPORT

As samples are collected (following the sampling plan described above), legible field notes will be recorded including quantitative sample data measurements as well as qualitative field observations including the following:

1. Ambient weather conditions.
2. Sample condition (clarity, scum, sheen, floating matter, suspended matter, odors, other notable conditions).
3. Sampling observations (foaming samples, off-gassing, bubbling).
4. Any significant alteration or deviation from sampling plan.
5. Signature.

Using non-erasable waterproof ink label all collected samples will be identified with sample location (S1, S4, S5), sample analysis, sample preservative, date, and time of sample collection. In addition, prior to leaving the sampling site, a chain of custody will be completely filled out and custody seals used if necessary.

All sample storage/transport containers will be certified clean sample containers provided by the laboratory. Samples, after appropriate labeling, will be stored in chilled coolers with blue or water ice. Ice will be placed in sealable bags. Samples will be hand delivered to an assigned courier who will then deliver samples under chain of custody to the laboratory for sample analysis and processing.

Upon receipt of samples by laboratory, the condition of samples will be recorded. It is assumed all samples were received in intact and proper condition unless otherwise noted in the laboratory data report.

ANALYTICAL FIELD EQUIPMENT CALIBRATION

All analytical field equipment will be calibrated following manufacturer's guidelines and protocols. Field equipment will be pre-calibrated in the field prior to collecting field measurements. Conductivity and pH meters will utilize a two point calibration procedure in order to generate a slope bracketing the sample measurement. The DO meter will be adjusted for the samples salinity and use a default barometric

pressure of 1 atmosphere equal to sea level. Calibration of the DO meter will follow the procedures outlined by the manufacturer. Field equipment will be routinely checked with calibration standards throughout the sampling period. Drift in electrodes will be noted in field logs and equipment will be recalibrated if needed.

QUALITY CONTROL CHECKS ON SAMPLING/ANALYSIS PROCEDURES

As descried in the sampling plan, equipment blanks will be collected and analyzed for trace metals and total phosphorus on the first sampling event. Equipment blanks will be preserved, if necessary, and transported with and under similar conditions as the samples. If equipment blanks show no detectable signs of analytes, it is assumed the sampling technique is clean and there is no further need for equipment blank collection.

The laboratory will prepare and analyze the appropriate type and number of batch sample blanks, including method blanks, matrix spikes, internal standards, etc. Laboratory quality control and quality assurance will be the responsibility of the laboratory. However, analytical reports will be reviewed and reduced by to ensure appropriate laboratory quality control procedures were implemented.

If detectable levels of analyte are recorded in equipment blanks, the source will be identified and eliminated, if possible. A corrective action plan will be prepared, documented, and implemented. In such a case, equipment blanks will be collected during the second sampling event and the quality control procedure repeated. If detectable levels of analyte are recorded in equipment blanks or laboratory blanks, such conditions will be noted in the water quality data summary report. Sample data will *not* be adjusted or corrected if detectable levels of analyte are recorded in blanks.

INVERTIBRATES, FISHERY, PLANT AND WILDLIFE OBSERVATION AND SAMPLING

METHODOLOGY

Benthic invertebrate communities will be surveyed with a 6-inch square Wildco Ponar grab. Three subsamples will be collected at each of the three sampling stations. Timing will coincide with the collection of water quality samples. Subsamples will be consolidated, washed and screened through a #30 mesh sieve in the field. All capture invertebrates will be preserved in 70 percent ethanol containing rose bengal stain. Samples will be transported to the laboratory for identification to the lowest possible taxon.

Nektonic invertebrates will be sampled with a 5-inch Wildco Fieldmaster plankton net with an 80 micron mesh size. Three subsamples (one near the water surface, one at approximately half-depth, and one near the bottom of the channel) will be collected at each sampling station through 5-minute trawls. Subsamples will be consolidated and preserved in 70 percent ethanol containing rose bengal stain. Samples will be transported to the laboratory for identification to the lowest possible taxon.

Fish samples at each sampling station will be collected with a 4-ft. by 20-ft. seine with a 1/8-inch mesh size. The seine will be held stationary at one end while the other end will be pulled through the water, forming a half-circle before bringing the two ends back together. Captured fish will be identified in the field to the lowest possible taxon and returned to the sampling area. If field identification is not possible, representative specimen will be preserved in 70 percent ethanol and taken to the laboratory for identification. Macroinvertebrates captured during fish sampling will be processed in the same manner. The seine will be pulled three times and collected specimens identified and counted.

To ensure the collection of bottom dwelling fish (the seine may not adequately sample bottom dwellers), an otter trawl will be used. The otter trawl will be dragged behind a motorized boat (either electric or small outboard) for a total of three passes.

Terrestrial and avian wildlife surveys will be conducted contiguous with fish, invertebrate, and water sampling, as feasibly possible. Avian surveys will be conducted through the establishment of listening/observation stations on transects spaced approximately 300 feet apart. Stations will be established at intervals of approximately 150 feet along transects. Observations will begin upon arrival in the morning for 10 minutes at each station. Observations will be logged in dated/timed notebooks, indicating relative abundance of observed species as well as observed activity. All other incidental observations (i.e., all other wildlife) will be noted, including species, activity, and location. Plant species will also be identified in potentially effected area. A plant species list will be compiled based on observations. Approximate percent coverage of various plant species will be noted.

QUALITY CONTROL PLAN

FIELD DATA LOGGING AND SAMPLE STORAGE/TRANSPORT

As samples are collected following the methodologies described above and recorded with legible field notes on project-specific data sheets. Field observations will include, but are not limited to, the following:

1. Ambient weather conditions
2. Tidal conditions
3. Name and number of species identified in the field
4. Miscellaneous biotic information (e.g. presence of feeding shore birds, etc.)
5. Any significant alteration from sampling plan
6. Signature

Samples for laboratory identification will be transported in 16 oz. wide-mouth plastic jars labeled with non-erasable waterproof ink. Label information will consist of sampling station (S1, S4, S5), date, time, collection method (i.e., tow, Ponar grab, seine), and preservative.

ATTACHMENT D

ATTACHMENT E

ATTACHMENT F

CITY OF AMERICAN CANYON
MERCURY VIRTUAL ELIMINATION PROGRAM

1. INTRODUCTION

Mercury is a 303(d) listed toxic pollutant for the San Pablo Bay. This means that the levels of mercury found in the water, sediment, and/or marine life of the Bay are considered to be too high and are impairing water quality. Mercury bioaccumulates in certain invertebrates, fish that eat the invertebrates, and humans that eat the fish. The concentration of mercury generally increases at each level up the food chain through a process known as biological magnification. Mercury in humans is linked to numerous debilitating and serious illnesses. Water quality objectives have been set for the concentration of mercury in wastewater discharged to the San Pablo Bay from treatment plants. In addition, the San Francisco Bay Regional Water Quality Control Board is developing a Total Maximum Daily Load (TMDL) for mercury based on the water quality requirements for the Bay. All dischargers to the Bay will ultimately be required to comply with TMDL. The City of American Canyon is dedicated to minimizing the discharge of mercury to the Bay from sources within the City. As specified in section **E. Provisions** of Order Number 00-003 (NPDES Permit CA0038768) (Permit), the City of American Canyon (City) is committed to developing and implementing a Mercury Virtual Elimination Program (MVEP). The MVEP will be developed in coordination with the Regional Water Quality Control Board – San Francisco Bay Region, and advocacy groups experienced in development of pollution prevention programs related to mercury reduction. While the details of the MVEP must still be developed and implemented, the basic framework for the MVEP, including committed tasks and compliance dates, is described in this document .

2. SUMMARY

The MVEP includes, but is not necessarily limited to completion of the following tasks by the dates indicated:

Task	Compliance Date
a. Adopt a resolution by the City Council to virtually eliminate mercury pollution in accordance with these general guidelines.	February 1, 2000
b. Develop an implementation plan to virtually eliminate mercury-containing products used by facilities owned or operated by the discharger, which includes an inventory of mercury-containing products, an assessment of alternative products, a schedule for replacing mercury containing-products with viable alternatives that are mercury-free or low mercury (in the case of fluorescent lamps). Product categories shall include, but not be limited to, fluorescent lamps, thermostats, thermometers and other measuring devices and switches.	April 1, 2000
c. Encourage businesses and residents to refrain from the disposal into the municipal waste stream of fluorescent lamps (they must be recycled) or appliances that have not yet had their mercury devises removed.	October 1, 2000
d. Mail or deliver educational materials to all households that encourage residents to avoid mercury-containing products in favor of safer alternatives.	October 1, 2000
e. Begin to implement a takeback program, with financial incentives, to	October 1, 2000

encourage removal of mercury-containing thermometers from homes and commercial institutions.	
f. Begin to implement a takeback program, with financial incentives, to encourage removal of mercury-containing thermostats, in coordination with local, heating, ventilation and cooling (HVAC) vendors and repair services, during installation and maintenance.	April 1, 2001
g. Modify the building code to require that only mercury-free thermostats be installed in all new commercial, industrial and residential construction within the discharger's jurisdiction.	October 1, 2001
h. Recommend to the City Council adoption of an ordinance to minimize mercury pollution from dental facilities that prohibits the use of dental amalgam fillings that contain mercury and requires dental facilities to use best available control technology to remove mercury from waste water.	October 1, 2000

An outline for each proposed component of the MVEP is included below.

3. OUTLINE OF MVEP

The proposed components of the MVEP are outlined below.

3.1 MERCURY VIRTUAL ELIMINATION POLICY

The City will adopt a Mercury Virtual Elimination Policy by resolution of the City Council. The proposed policy is listed below.

3.1.1 Proposed Policy

It is a goal of the City of American Canyon (City) to virtually eliminate mercury releases to the environment that result from human activity. The City's Mercury Virtual Elimination Program will focus on reduction and elimination of mercury sources within the City as well as outside sources that impact the City directly and are within the City's jurisdiction to control. -Sources include manufacturing and commercial processes that use mercury, products that contain mercury as an intentional ingredient, combustion of fuels or wastes that contain mercury, and mercury contaminated soils. Higher priority will be on reduction and elimination of sources as close as possible to the point where the mercury is introduced. The word "virtual" is used in recognition of the fact that total elimination of mercury releases may be impossible due to technological or economic factors.

Virtual Elimination Programs, otherwise known as pollution prevention programs, should consider other adverse environmental impacts that may result from pollution prevention measures specific to mercury. The programs may target either consumers of products containing mercury or manufacturers that use mercury. Both regulatory and non-regulatory pollution prevention and control measures may be needed to attain the virtual elimination of mercury releases.

3.2 MINIMIZATION OF MERCURY USES WITHIN CITY DEPARTMENTS

Many appliances, fixtures, labwares, and other items commonly used in commercial, industrial, and institutional facilities contain mercury. In accordance with the Mercury Virtual Elimination Policy, the City is committed to virtually eliminating the use of mercury-containing items at the City level. The City believes that eliminating the use of mercury at City facilities is an effective way to develop public awareness regarding mercury issues, in addition to reducing the potential discharge of mercury to the environment. All City-run facilities would be included in the MVEP. In addition, all reasonable efforts would be made to include local school buildings in the MVEP. The first step will be to develop an Implementation Plan that includes a "target list" of mercury containing items used at City facilities. Next, non-mercury or low-mercury alternatives and associated costs for each of these items will be identified and assessed for viability. The implementation plan will include a schedule for replacing each of the mercury-containing items with viable and reasonably cost-effective alternatives. The mercury containing items will be transported to the Napa County Household Hazardous Waste Collection Facility, administered by the Napa-Vallejo Waste Management Authority. Arrangements will be made with the vendor at the facility to ensure that the mercury in the items is properly recycled. City facilities that have implemented the minimization program and are "virtually mercury free" will post signs visible to the public. The signs will indicate a mercury-free facility and briefly describe the resulting environmental benefits.

Certain mercury containing items may not have viable alternatives at this time, or the cost of the alternatives may be prohibitively expensive. However, most mercury-containing items do have viable alternatives. In addition, for many of these items, the alternatives have other advantages that may be beneficial to the City. Examples of items with alternatives include:

3.2.1 Fluorescent Lamps

A typical fluorescent lamp contains approximately 14 – 23 mg of mercury. In commercial settings, fluorescent lighting is preferred over incandescent lighting due to longevity of lamps and energy efficiency. When compared to incandescent lights, fluorescent lighting may result in a lower potential for contamination of the environment with mercury because higher energy efficiency generally results in less combustion of fossil fuels at power plants. However, low-mercury fluorescent lamps are available, which contain approximately one-fourth the mercury of conventional lamps. The low-mercury lamps are priced similarly to conventional lamps.

Secondly, the City will consider adopting an ordinance by April 1, 2000 to prohibit the disposal of fluorescent lamps (they will be recycled instead) and to ensure that mercury devices are removed from appliances before disposal.

3.2.2 Thermostats

Most thermostats for control of heating, ventilation, and cooling equipment contain mercury. However, digital thermostats are available that do not contain mercury. Digital thermostats are more costly than conventional mercury-containing thermostats. However, many digital thermostats are programmable; this feature can drastically reduce heating/cooling bills by automatically adjusting the temperature setting over 24-hour and weekly periods to match

building use. Thus, digital thermostats may pay for themselves in energy savings. This has the added effect of further reducing mercury discharges to the environment at power plants.

3.2.3 Thermometers

Mercury-containing thermometers are common household items that are also found in laboratories, school buildings, and office buildings. Alcohol and digital alternatives are available that are priced similarly and have similar accuracy/precision ranges. In addition, digital thermometers generally have faster response times and can be calibrated more easily than mercury thermometers.

3.2.4 Other Appliances

Many other appliances and items used at City facilities may contain switches or other components that contain mercury, such as refrigerator switches and barometers. Mercury-free components are often available for these items. The minimization program will include provisions and a schedule for identifying and replacing mercury-containing appliances or components with mercury-free alternatives.

3.3 Mercury Outreach Program

The City is a member of the Napa-Vallejo Waste Management Authority. This Authority provides solid waste pickup, curbside recycling, and household hazardous waste collection services. The household hazardous waste collection facility is located on Devlin Road in Napa County, is open to the public two weekends per month, and is free to the public. In addition, businesses that qualify as small quantity generators can use the facility for disposal for a charge. This facility currently accepts mercury-containing wastes. The vendor for this facility beneficially recycles most items taken to the facility. Pamphlets describing the facility services have been distributed to City residents through utility bills.

The City will develop an outreach program that encourages the public to avoid the use of mercury-containing items and/or switch to non-mercury alternatives, identifies proper disposal procedures, and outlines housekeeping practices that minimize the potential for releases of mercury to the environment. The outreach program will highlight the availability of the household hazardous waste collection facility for disposal of existing mercury containing items when they are replaced with mercury-free alternatives. Arrangements will be made with the collection facility vendor to assess any impacts to the collection program from an increase in the transport of mercury-containing items to the facility. Recycling practices of the vendor will be reviewed and verified to ensure proper handling of the mercury with minimal potential for accidental release of the mercury to the environment. The outreach program would also describe the efforts conducted by the City to make City facilities virtually mercury free (see above). This would reinforce the value of actively addressing mercury issues and set a positive example for the public to follow.

The outreach program would include several components such as:

3.3.1 Pamphlets

In coordination with advocacy groups, a list of mercury-containing household items will be developed. Proposed local pharmacies for American Canyon will also be contacted to identify over-the-counter products that contain mercury and mercury-free alternatives. This list will be incorporated into pamphlets that could be distributed to City residents via utility bills or direct mailings. The pamphlets will encourage residents to avoid these items and use the alternatives. In addition, the pamphlets would encourage residents to take any mercury-containing items that are no longer required to the household hazardous waste collection facility. Good housekeeping practices would also be highlighted. Housekeeping items that can reduce the discharge of mercury to the environment include items such as installation of timers and sensors to automatically shut off lights when not in use. This extends the life of fluorescent lamps and minimizes energy use, which results in less combustion of fossil fuels at power plants. Household items that can be avoided or substituted with mercury-free alternatives include some pharmaceuticals such as contact lens cleaner, thermometers, and thermostats. Items that can be transported to the household hazardous waste collection facility include:

- Compact fluorescent lamps (which are encourage by power utility companies for energy efficiency)
- Batteries (including those containing mercury)
- Thermometers and thermostats

3.3.2 Mercury Awareness Information Area

The city will develop a mercury awareness information area for display at public events such as the July 4th celebration. Literature regarding mercury contamination in general will be available at the booth. This could include literature specific to City programs, as well as literature developed by other regulatory agencies and environmental groups. The goal of the booth will be to educate the public on issues related to mercury contamination and provide information on how the public can help to reduce the discharge of mercury to the environment.

3.4 Mercury Thermometer Takeback/Rebate Program

As an expansion of the mercury outreach program, the City will develop a takeback/rebate program to provide an active incentive to remove mercury thermometers from homes. This rebate program will be modeled after a similar program developed by the City of Palo Alto. The takeback/rebate program would require the cooperation of the operators of the household hazardous waste collection facility and local pharmacies and/or drug stores. The groundwork for this takeback/rebate program would be laid during development of the previous components of the MVEP.

In general, the program would work as follows. City residents who take a mercury-containing thermometer to the collection facility would receive a coupon redeemable at participating local pharmacies and/or drug stores. The coupon would be good for a discount of up to $5 off the price of a non-mercury digital thermometer. Or, if the participant does not wish to purchase a digital thermometer, the coupon would be good for a lesser discount (approximately $2.50) off

the price of any non-mercury containing item in the store. The merchant would provide the discount to the customer and then send the coupons to the City for collection of the discount.

A brief leaflet will be developed that describes the rebate program and the procedure for participation. The leaflet will also identify other benefits of digital thermometers as an added incentive. The leaflet will be distributed via utility bills and will be available at City facilities and the mercury awareness booth.

3.5 Mercury Thermostat Takeback/Rebate and Building Code Modification

3.5.1 Takeback/Rebate Program

The thermostat takeback/rebate program would be another extension of the outreach program. This program would function similarly to the thermometer program. However, since the cost of non-mercury digital thermostats is generally much higher than comparable quality mercury thermostats, more analysis is required to determine the appropriate value of a coupon to provide a reasonable incentive. In addition, the costs of such a program must be assessed in relation to City budgets. It is likely that such a program would focus heavily on the potential energy savings associated with programmable digital thermostats. An appropriate rebate in combination with future energy savings could provide a reasonable economic incentive for participation.

The City would coordinate with local heating, ventilation, and cooling (HVAC) vendors and repair services to create a procedure and path for proper disposal of mercury thermostats removed in the course of installation and maintenance. This could include transport of the devices back to the manufacturers for reuse or transport to the household hazardous waste collection facility. HVAC vendors and repair services would need to participate in the takeback/rebate program to improve participation. In addition, the City would coordinate with Honeywell to improve awareness and participation in their consolidation point program and recycle-by-mail system.

3.5.2 Building Code

The City will modify its building code to require that mercury-free thermostats be installed in all new commercial, industrial, and residential construction within the City. This requirement will have the added benefit of promoting energy efficiency, which can also result in a decrease in the amount of mercury discharged to the environment.

3.6 City Ordinance Prohibiting the Use of Mercury Amalgam in Dentistry and Considering Advanced Filtration

Mercury has long been a common ingredient (up to 50 percent) in amalgam ("silver") dental fillings. Since the 1980's, mounting evidence has linked human mercury poisoning from fillings to many serious illnesses. Since 1993, California has required warnings signs to be posted at all dental offices that use mercury amalgams. Some countries in Europe have now banned mercury fillings altogether. In addition to serious health effects, the use of mercury in amalgam results in discharges of mercury to the sewer.

In accordance with the Mercury Virtual Elimination Policy, the City will consider a ban of the use of mercury amalgam at dental offices within the City limits by October 1, 2000. Numerous legal issues must be explored regarding this issue, and research must be done to verify that safe alternatives are available. The City feels that such a ban is appropriate for the protection of the health of its citizens and the environment, and can be achieved with minimal impacts.

In addition to task h above, the City will evaluate the discharge from proposed, new dental offices in accordance with the City's sewer use ordinance and require pretreatment if mercury is present in dental wastewater.