CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 93-068
NPDES NO. CA0004961

WASTE DISCHARGE REQUIREMENTS FOR:

TOSCO CORPORATION
AVON REFINERY
CONTRA COSTA COUNTY

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

1. Tosco Corporation, Avon Refinery (hereinafter called the discharger), by application (Report of Waste Discharge) dated September 17, 1992 and subsequent amendment dated March 5, 1993, has applied for reissuance of National Pollutant Discharge Elimination System (NPDES) permit No. CA0004961.

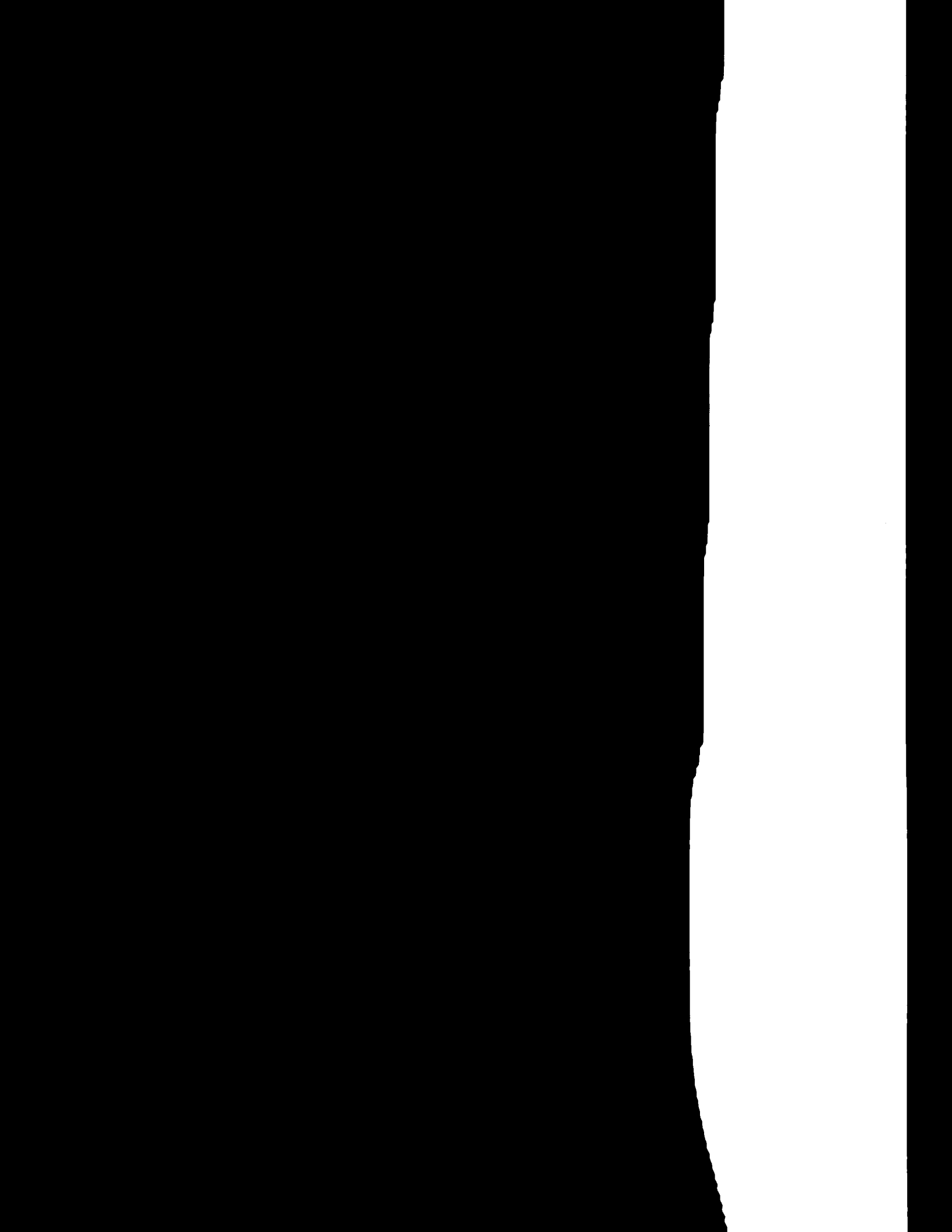
2. The discharge of wastewater from the Avon Refinery is currently governed by Waste Discharge Requirements specified in Order No. 88-053, adopted by the Board on April 20, 1988. Order No. 88-053 was amended by Order Nos. 88-108 (adopted June 15, 1988), 91-026 (adopted February 20, 1991), 91-099 (adopted June 19, 1991), and 92-102 (adopted August 19, 1992). The conditions of Order No. 88-053 as amended, were continued in effect past the expiration date, in accordance with NPDES regulations, by letter of the Executive Officer dated April 20, 1993.

3. The discharger operates a petroleum refinery with an average crude-run throughput of approximately 150,000 barrels per day. The discharger manufactures gasoline and diesel fuel and is classified as a cracking refinery as defined by the U.S. Environmental Protection Agency (USEPA) in 40 CFR 419.20. The discharger discharges treated process wastewater, storm water runoff, and other wastes as described below to Suisun Bay, a water of the United States.

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

5. The Report of Waste Discharge and recent self-monitoring reports describe the discharges as follows:

   a. Waste 001 consists of approximately 4 million gallons per day (MGD) of process wastes, cooling tower and boiler blowdown, sanitary wastes, storm water runoff, tank draws and ballast water, extracted groundwater from remediation activities, and reject water from water treating. In addition, Foster-Wheeler Cogeneration Plant contributes approximately 0.16 MGD of cooling tower and boiler blowdown, Monsanto Company Catalyst Plant contributes approximately 0.01 MGD of process wastewater, and Cardox contributes approximately 0.03 MGD of cooling tower blowdown from its carbon-dioxide plant. Storm water



runoff to Waste 001 consists of runoff from most of the developed areas of Tracts 1, 2 and 3 shown on Figure 1. This includes runoff from the AT&SF Railroad, Southern Pacific Transportation Company, Foster Wheeler Energy Corporation, and Air Products (starting in December 1993).

Most of the wastewater sources to Waste 001 are treated using physical, chemical and biological treatment processes including activated carbon adsorption. Two streams are not treated through this system. These include reject water from water treating and clean storm water runoff from areas not affected by industrial activities. Waste 001 is discharged to Suisun Bay (lat. 38°02'54", long. 122°05'22") through a 27-inch pipe equipped with a multi-port diffuser, located under the Avon Wharf 45 feet below mean lower low water level. The diffuser provides at least 10:1 initial dilution.

Waste 001 may be discharged on an emergency basis to an unnamed slough tributary to Suisun Bay. This discharge is a safety overflow for the discharger's canal system, and is permitted only to prevent severe damage to canal dikes.

b. Waste 003 is storm water runoff from area approximately 110 to 120 acres, located south of the AT&SF Railroad tracks and west of Solano Way (the central and west portion of Tract 4 tank farm). It is discharged via a pipe syphon to Walnut Creek (lat. 38°00'44", long. 122°03'55") north of the creek's confluence with Grayson Creek.

c. Waste 004 is storm water runoff from an area 140 to 150 acres. The runoff come from areas i) north of Highway 4 and west of Solano Way (the southeast portion of the Tract 4 tank farm), and ii) north of Highway 4 and east of Solano Way (all of the Tract 6 tank farm). This includes runoff from Monsanto Company Catalyst Plant, Cardox, Chevron Bulk Terminal Station, Sante Fe Pacific Pipeline Partners, Texaco Pump Station, and Pacific Gas and Electric Company substation. It normally is combined with Waste 001, but may be discharged via pipe syphons to the head of Hastings Slough (lat. 38°01'21", long. 122°03'30").

d. Waste 005 consists of miscellaneous discharges of storm water runoff by sheet flow from small areas in the refinery. These areas total approximately 10 to 20 acres, and are associated with industrial activities. Storm water runoff from these areas is currently not regulated or managed with storm water runoff from other areas of the refinery.

6. The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on September 16, 1992, and the State Water Resources Control Board (State Board) approved it on April 27, 1993. The Basin Plan specifies water quality objectives for Suisun Bay and contiguous waters.

7. The Board adopted revisions to the Basin Plan, specifically a site specific water quality criteria for copper on October 21, 1992, and a mass emission strategy for copper on June 16, 1993. State Board approval of these revisions is pending.

8. On April 11, 1991, the State Board adopted the Water Quality Control Plan For Enclosed Bays and Estuaries of California (Enclosed Bays and Estuaries Plan). This plan establishes water quality objectives for a number of chemical specific parameters and for whole effluent acute and chronic toxicity. The Enclosed Bays and Estuaries Plan was amended by the State Board on November 19, 1992.

9. The discharger submitted analytical data on samples collected in March 1991, and July through September 1992, which show detectable levels of dioxins in the Waste 001 discharge. Some of the levels detected show that, at this time, the discharger would not be able to meet a dioxin effluent limit that will be required by the Basin Plan. The discharger initiated a pilot study in March 1993 to determine the effectiveness and feasibility of source treatment using granular activated carbon. Conclusions from this study are not available until about September 1993. This Order specifies an effluent limit for dioxins and a time schedule for compliance by June 30, 1995.

10. This Order requires the discharger to clearly delineate those areas contributing flows to Waste 005, and develop and implement a monitoring program, and measures to minimize the potential for discharge of pollutants from these areas to waters of the State.

11. On May 18, 1988, the Board adopted Resolution No. 88-083, "Statement of Support for Municipal Wastewater Reused in Petroleum Refinery Operations, Contra Costa County."

12. In the future, the discharger may use an unspecified volume of reclaimed water, provided by the Central Contra Costa Sanitary District (hereinafter CCCSD) and the Contra Costa Water District for cooling tower make-up water. The source of the reclaimed water is the permitted discharge (or treated effluent) from the treatment plant operated by the CCCSD (NPDES Permit No. CA0037648). The pollutants in the discharger's Waste 001 discharge may be increased as a result of use of reclaimed water because of the pollutants present in the CCCSD effluent. This Order allows for an increase in pollutants in Waste 001 resulting from use of reclaimed water. There will be no net increase of pollutants discharged from the combined discharges of the discharger and CCCSD as a result of this allowance.

13. The beneficial uses of Suisun Bay, Hastings Slough, and Walnut Creek are:

    a. Water contact recreation
    b. Non-contact water recreation
    c. Navigation
    d. Open commercial and sport fishing
    e. Wildlife habitat
    f. Estuarine habitat
    g. Fish spawning and migration
    h. Industrial uses
    i. Preservation of rare and endangered species
    j. Shellfishing

14. The reissuance of waste discharge requirements for this discharge is exempt from the provisions of Chapter 3 (commencing with Section 21000 of Division 13) of the Public Resources Code (CEQA) pursuant to Section 13389 of the California Water Code.

15. Effluent limitations and toxic effluent standards established pursuant to Sections 208(b), 301, 304, and 307 of the Federal Water Pollution Control Act and amendments thereto are applicable to the discharge.

16. Effluent limitation guidelines requiring the application of best available technology economically achievable (BAT) have been promulgated by the USEPA for the Integrated Subcategory of the Petroleum Refining Point Source Category 40 CFR Part 419 on October 18, 1982 and amended on July 12, 1985. Process wastewater and storm water runoff effluent limitations of this Order are based on these guidelines, the Basin Plan, other State plans and policies, current plant performance, and best engineering judgement. The limitations are considered to be those attainable by BAT in the judgement of the Board.

17. Pursuant to 40 CFR 122.44, "Establishing Limitations, Standards, and Other Permit Conditions," NPDES permits should also include toxic pollutant limitations if the discharger uses or manufactures a toxic pollutant as an intermediate or final product or byproduct. This permit may be modified prior to the expiration date, pursuant to 40 CFR 122.62 and 124.5, to include effluent limitations for toxic constituents determined to be present in significant amounts in the discharge through a more comprehensive monitoring program included as a part of this Order.

18. This Order contains effluent limitations based on recent production rates at this facility. The Board is aware that production can vary and will expedite reissuance of a new permit pursuant to 40 CFR 122.62 and 124.5 upon receipt of an application with new production data.

19. The Board has notified the discharger and interested agencies and persons of its intent to reissue waste discharge requirements, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

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

IT IS HEREBY ORDERED that the discharger, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Federal Water Pollution Control Act and regulations and guidelines adopted thereunder, shall comply the following:

A. Effluent Limitations

1. The discharge of Waste 001 containing constituents in excess of any of the following mass loading limits is prohibited:

Constituent	Units	Monthly Average	Daily Maximum
BOD (5-day @ 20C)	lb/day	1,660	3,000
	kg/day	755	1,360
TSS	lb/day	1,330	2,090
	kg/day	604	947
COD	lb/day	11,620	22,390
	kg/day	5,270	10,160
Oil & Grease	lb/day	484	908
	kg/day	220	412
Phenolic Compounds	lb/day	7.7	22.4
	kg/day	3.5	10.2
Ammonia as N	lb/day	908	1997
	kg/day	412	906
Sulfide	lb/day	8.8	19.7
	kg/day	4.0	8.9
Total Chromium	lb/day	9.0	25.9
	kg/day	4.1	11.8
Hexavalent Chromium	lb/day	0.73	1.66
	kg/day	0.33	0.75
Settleable Solids	ml/l-hr	0.1	0.2
		Running Annual Average[1]	
Selenium	lb/day	1.00	
	kg/day	0.45	
Copper	lb/day	No net increase above influent raw water sources[2]	

[1] Mass emission rate for selenium and copper shall be based on running annual averages. Running annual averages shall be calculated by taking the arithmetic average of the current daily mass loading value, and all of the previous year's values.

[2] The mass discharge rate of copper from Waste 001 shall be less than or equal to the rate of copper from raw water sources influent to the refinery. Influent sampling shall occur at influent sampling station I-001 defined in Part B of the Self-Monitoring Program. If the data do not show compliance with the no net increase limit, the discharger shall comply with a baseline mass loading limit of 86 lb/yr. Compliance with the mass loading limit for copper shall commence one year after the date of adoption of this Order.

2. In addition to the monthly average and daily maximum pollutant weight allowances shown in A.1, allocations for pollutants attributable to storm water runoff discharged as a part of Waste 001 are permitted in accordance with the following schedules:

STORM WATER RUNOFF ALLOCATION

Constituent	Units	Monthly Average	Daily Maximum
BOD (5-day @ 20C)	mg/l	26	48
TSS	mg/l	21	33
COD	mg/l	180	360
Oil & Grease	mg/l	8	15
Phenolic Compounds	mg/l	0.17	0.35
Total Chromium	mg/l	0.21	0.60
Hexavalent Chromium	mg/l	0.028	0.062

BALLAST WATER ALLOCATION

Constituent	Units	Monthly Average	Daily Maximum
BOD	mg/l	26	48
TSS	mg/l	21	33
COD	mg/l	240	470
Oil & Grease	mg/l	8	15
pH	within the range of 6.0 to 9.0		

The total effluent limitation is the sum of the storm water runoff allocation, the ballast water allocation and the mass limits contained in A.1. The discharger shall compute the total effluent limitation (both maximum and average) on a monthly basis as shown in Part B of the Self-Monitoring Program.

3. The discharge of Waste 001 containing constituents in excess of the following concentration limits is prohibited:

Constituent	Units	Monthly Average	Daily Average
Arsenic	µg/l	--	200
Cadmium	µg/l	--	30
Chromium, hexavalent[1]	µg/l	--	110
Copper	µg/l	--	37
Lead	µg/l	--	53
Mercury	µg/l	0.21	1
Nickel	µg/l	--	65
Selenium	µg/l	--	50
Silver	µg/l	--	23
Zinc	µg/l	--	580
Cyanide[2]	µg/l	--	25
TCDD Equivalents[3,4]	µg/l	1.4E-07	--
PAHs[3]	µg/l	0.31	150
Oil & Grease	mg/l	10	20
1,2-dichlorobenzene	mg/l	180	--
1,3-dichlorobenzene	mg/l	26	--
1,4-dichlorobenzene	mg/l	0.64	--
Benzene	mg/l	0.21	--
Chloroform	mg/l	4.8	--
Dichloromethane	mg/l	16	--
Halomethanes[3]	mg/l	4.8	--
Toluene	mg/l	3,000	--
2,4,6-trichlorophenol	µg/l	10	--
Fluoranthene	µg/l	420	--
Hexachlorobenzene	µg/l	--	0.0069
Pentachlorphenol	µg/l	--	79
Phenol	µg/l	500	--
Aldrin	µg/l	0.0014	--
α-BHC	µg/l	0.13	--
β-BHC	µg/l	0.46	--
Chlordane[3]	µg/l	0.00081	0.04
DDT[3]	µg/l	0.006	0.01
Dieldrin	µg/l	0.0014	0.019
Endosulfan[3]	µg/l	--	0.087
Endrin[3]	µg/l	--	0.023
γ-BHC (Lindane)	µg/l	0.62	1.6
Heptachlor	µg/l	0.0017	0.036
Heptachlor Epoxide	µg/l	0.0007	--
Toxaphene	µg/l	--	0.002
PCBs, total[3]	µg/l	0.0007	0.3

[1] The discharger may, at their option, meet the limit for hexavalent chromium as total chromium.

[2] The discharger may, at their option, meet the limit for cyanide as free cyanide, simple alkali metal cyanides, and weakly complexed organometallic cyanides. These forms of cyanide shall be measured using the Weak Acid Dissociable Cyanide method described in the most recent edition of Standard Methods, or another method approved by the Executive Officer.

[3] See Attachment C for definition of terms.

[4] The discharger shall comply with the limit for TCDD Equivalents in accordance with the tasks and time schedule specified in Provision C.2 of this Order.

4. EFFLUENT LIMIT A.3 CREDIT FOR RECLAIMED WATER USE: When the discharger uses reclaimed water as influent water for cooling tower make-up water, credit for influent concentrations of the constituents listed in A.3 above, shall be granted in the discharge according to the following procedure.

   a. The discharger shall sample and analyze for constituents for which effluent limit credit is sought at least as frequently as is required in Part B of the attached Self-Monitoring Program for that constituent. Influent sampling shall occur at influent sampling station I-002 defined in Section I.C of Part B of the Self-Monitoring Program.

   b. The discharger shall determine the time interval between introduction of a given constituent of concern in the influent reclaimed water and the first appearance of the constituent in the final effluent. This determination is subject to approval by the Executive Officer, and must preceed any calculation of effluent limit credit for the constituent.

   c. Credit for constituents listed in A.3 will be given on a mass basis. Influent concentration multiplied by total influent reclaimed water flow volume for that monitoring interval will yield an influent mass for each constituent, which is valid for that monitoring interval. After the appropriate time lag interval described in b. above, this influent mass of the constituent is then divided by the total effluent flow volume for that monitoring period to give a concentration credit for the effluent which will apply for the monitoring interval. This concentration credit is added to the existing concentration limit. The monitoring interval is the time between sampling days. For example, weekly sampling yields a one week monitoring interval. A schematic example follows:

      ex. Constituent B is monitored weekly. The lag time is Y days.

      Step 1: (Influent conc. of B) X (Total Influent Volume of Reclaimed Water for one week) = (Influent mass of B)

Step 2: (Influent mass of B) ÷ (Total Waste 001 discharge volume for one week, Y days after influent week) = (Concentration credit to be added to existing concentration limit, valid for that one week period)

5. Waste 001 shall not be discharged with a pH outside the range of 6.0 to 9.0.

6. Waste 001 shall not be discharged with a residual chlorine greater than 0.0 mg/l.

7. Waste 001, as discharged, shall meet the following acute toxicity limitation:

   The survival of test fishes[1] in parallel 96-hour flow-through bioassays of Waste 001 as discharged shall be an eleven sample[2] median value of not less than 90 percent survival, and an eleven sample 90 percentile[3] value of not less than 70 percent survival.

   [1] Test fishes as specified by the Executive Officer in the Self-Monitoring Program.

   [2] 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.

   [3] 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 tests shows less than 70 percent survival.

8. Waste 001, as discharged shall meet both of the following chronic toxicity limitations:

   a. an eleven sample median value[1] of 10 TUc[2]; and

   b. a 90 percentile value[3] of 20 TUc[2].

   [1] A test sample showing chronic toxicity greater than 10 TUc represents consistent toxicity and a violation of this limitation, if five or more of the past ten or less tests show toxicity greater than 10 TUc.

   [2] A TUc equals 100/NOEL. The NOEL is the no observable effect level, determined from IC, EC, or NOEC values. These terms and their usage in determining compliance with the limitations are defined in Attachment A of this Order. The NOEL shall be based on a critical life stage test using the most sensitive test species as specified by the Executive Officer. The Executive Officer may specify two compliance species if test data indicate that there is alternating sensitivity between the two species. If two compliance test species are specified, compliance shall be based on the maximum TUc value for that discharge sample based on a comparison of TUc values obtained through concurrent testing of the two species.

[3] A test sample showing chronic toxicity greater than 20 TUc represents consistent toxicity and a violation of this limitation, if one or more of the past ten or less tests shows toxicity greater than 20 TUc.

9. Total coliform bacteria for a median of 5 consecutive samples of Wastes 001-D1 and 001-D2 shall not exceed 240 MPN/100ml. Any single sample shall not exceed 10,000 MPN/100ml when verified by a repeat sample taken within 48 hours. Wastes 001-D1 and 001-D2 are the sanitary sewage wastewater streams, after disinfection, in Tract 1 and Tract 2, respectively.

10. The discharge of Wastes 003, 004, and 005 containing constituents in excess of the following limits is prohibited:

Constituent	Units	Limitation
Oil & Grease	mg/l	daily maximum of 15
TOC	mg/l	daily maximum of 110
pH	standard units	6.5 to 8.5
visible oil	-	none observed
visible color	-	none observed

B. Receiving Water Limitations

1. The discharge of wastes shall not cause the following conditions to exist in waters of the State at any place at levels that cause nuisance or adversely affect beneficial uses:

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

   b. Bottom deposits or aquatic growths;

   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;

   e. Toxic or deleterious substances to be present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife, or waterfowl, 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 in any place within one foot of the water surface:

   a. Dissolved oxygen: 7.0 mg/l minimum. The median dissolved oxygen concentrations for any three consecutive months

shall not be less than 80 percent of the dissolved oxygen content at saturation.

b. Dissolved sulfide: 0.1 mg/l maximum.

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

d. Un-ionized ammonia (as N): 0.025 mg/l Annual Median, and 0.16 mg/l Maximum at any time.

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

C. Provisions

1. The discharge of Waste 001 shall receive an initial dilution of at least 10:1, except when discharge to the alternate discharge point located in a slough tributary to Suisun Bay is necessary. Discharges to the alternate discharge point, shall occur only when the discharge is necessary to prevent severe damage to treatment facilities or a more adverse effect on the receiving waters. The discharger shall notify the Board prior to each use of this alternate discharge point.

2. TCDD Equivalents Compliance Schedule: The discharger shall comply with the effluent limit specified in A.3 for TCDD equivalents in accordance with the following tasks and time schedule:

Task	Compliance Date
a. Continue with pilot study on the effectiveness and feasibility of activated carbon treatment.	Upon adoption of this Order
b. Submit a technical report acceptable to the Executive Officer summarizing the results of Task 2.a.	November 30, 1993
c. If, based on the results from Task 2.a, activated carbon treatment is feasible,	

	the discharger shall submit a plan and schedule acceptable to the Executive Officer for design and installation of the necessary treatment units.	November 30, 1993
d.	If, based on the results from Task 2.a, carbon treatment is ineffective, the discharger shall submit a study plan acceptable to the Executive Officer outlining the strategy for compliance. The strategy shall consider other treatment technologies, source elimination, and the costs of each option.	November 30, 1993
e.	The discharger shall submit progress reports on work performed pursuant to plans submitted for Tasks 2.c or 2.d. as specified by the Executive Officer.	As specified by E.O.
f.	Achieve full compliance with Effluent Limit A.3 for TCDD equivalents.	June 30, 1995

3. Fate of Selenium in Wastewater Treatment: The discharger shall determine the fate of selenium discharged to the wastewater treatment plant. The study shall include sampling and analysis of the sediment, biota, groundwater, and air. The discharger shall submit a detailed study plan for this work by September 30, 1993, and shall commence with the study within 30 days after approval of the plan by the Executive Officer.

4. Local Effects Monitoring Program: The discharger shall study the potential for accumulation of metallic and organic compounds, and selenium, present in the Waste 001 discharge to San Francisco Bay organisms known or suspected to accumulate these compounds. These compounds should be analyzed in Waste 001 and in the tissue of test organisms exposed to Waste 001 to determine bioconcentration factors that can be exposed to Waste 001 in the receiving water. This study may involve a combination of laboratory and insitu work. This study shall include the water column and sediments adjacent to the diffuser, and shall assess near-field and far-field impacts. The discharger shall submit a study plan for this Local Effects Monitoring by October 30, 1993, and shall commence with the study within 30 days after approval of the plan by the Executive Officer.

5. Storm Water Pollution Prevention Plan: The discharger shall develop and implement a Storm Water Pollution Prevention Plan (SWPPP) acceptable to the Executive Officer. The SWPPP shall cover the entire facility owned and operated by the discharger. It shall describe the management and handling of storm water runoff from the facility, and measures taken to prevent contamination of storm water or discharge of pollutants with the storm water. As part of the SWPPP,

discharger shall 1) identify on a map of appropriate scale the areas which contribute runoff to Waste 005, 2) describe the activities on those areas and the potential for contamination of the runoff, 3) address the feasibility for containment and/or treatment of the storm water, and 4) propose a monitoring plan for the discharge from these areas which includes at a minimum annual sampling and analysis for pH, TSS, conductivity, TOC or Oil & Grease, and other substances which are handled in the area. The discharger shall submit the SWPPP acceptable to the Executive Officer by October 30, 1993. The discharge shall implement the SWPPP within 30 days after approval of the plan by the Executive Officer.

6. TRE for Chronic Toxicity: If there is a violation of the chronic toxicity effluent limitation, the discharger shall conduct a chronic toxicity reduction evaluation (TRE), which shall initially involve a toxicity identification evaluation (TIE). The TIE shall be in accordance with a work plan acceptable to the Executive Officer. The TIE shall be initiated within 30 days of the date of violation. The objective of the TIE shall be to identify the chemical or combination of chemicals that are causing the observed toxicity. Every effort using currently available TIE methodologies shall be employed by the discharger. As toxic constituents are identified or characterized, the discharger shall continue the TRE by determining the source(s) of the toxic constituent(s) and evaluating alternative strategies for reducing or eliminating the constituent(s) from the discharge. All reasonable steps shall be taken to reduce toxicity to the required level. 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.

7. Screening Phase for Chronic Toxicity: The discharger shall conduct screening phase compliance monitoring 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 TIE and/or TRE. 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.

   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 Attachment B of this Order. The purpose of the screening is to determine the most sensitive test species for subsequent routine compliance monitoring for chronic toxicity.

8. The discharger shall conduct monitoring in accordance with the attached Self-Monitoring Program as adopted by the Board. The Self-Monitoring Program may be amended by the Board pursuant to EPA regulations 40 CFR 122.62, 122.63, and 124.5.

9. Pursuant to USEPA regulations 40 CFR 122.44, 122,62, and 124,5, this permit may be modified prior to the expiration date to include effluent limitations for toxic constituents determined to be present in significant amounts in the discharge through a more comprehensive monitoring program included as part of this Order.

10. Pursuant to 40 CFR 122.44, 122.62, and 124.5, the definition of the NOEL contained in Attachment A of this Order may be modified based on guidance issued by the State Board, prior to the Permit expiration date.

11. All applications, reports, or information submitted to the Board shall be signed and certified pursuant to USEPA regulations 40 CFR 122.41(k).

12. Pursuant to USEPA regulations, 40 CFR 122.41(a), the discharger shall notify the Board as soon as it knows or has reason to believe 1) that they have begun or expect to begin, use or manufacture of a toxic pollutant not reported in the permit application, or 2) a discharge of a toxic pollutant not limited by this permit has occurred, or will occur, in concentrations that exceed the specified limits in 40 CFR 122.42(a).

13. This Order includes all items of the attached "Standard Provisions, Reporting Requirements" dated December 1986.

14. This Order supersedes the requirements of Order Nos. 88-053, 88-108 and 92-102. Order Nos. 88-053, 88-108 and 92-102 are hereby rescinded.

15. This Order expires on July 21, 1998. The discharger must file a Report of Waste Discharge in accordance with Title 23 of the California Code of Regulations, not later than 180 days in advance of such date as application for issuance of new waste discharge requirements.

16. This Order shall serve as National Pollutant Discharge Elimination System permits pursuant to Section 402 of the Federal Water Pollution Control Act, or amendments thereto, and shall become effective on the date of adoption provided the Regional Administrator, Environmental Protection Agency, has no objection. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.

17. The discharger shall comply with all sections of this Order immediately upon adoption.

I, Steven R. Ritchie, Executive Officer do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region on July 21, 1993.

STEVEN R. RITCHIE
Executive Officer

Attachments:

Figure 1 - Facility Map
Attachment A - Definition of NOEL
Attachment B - Chronic Toxicity Screening Phase Monitoring Requirements
Attachment C - Definition of Terms for Chemical Constituents
Standard Provisions & Reporting Requirements, December 1986
Self-Monitoring Program

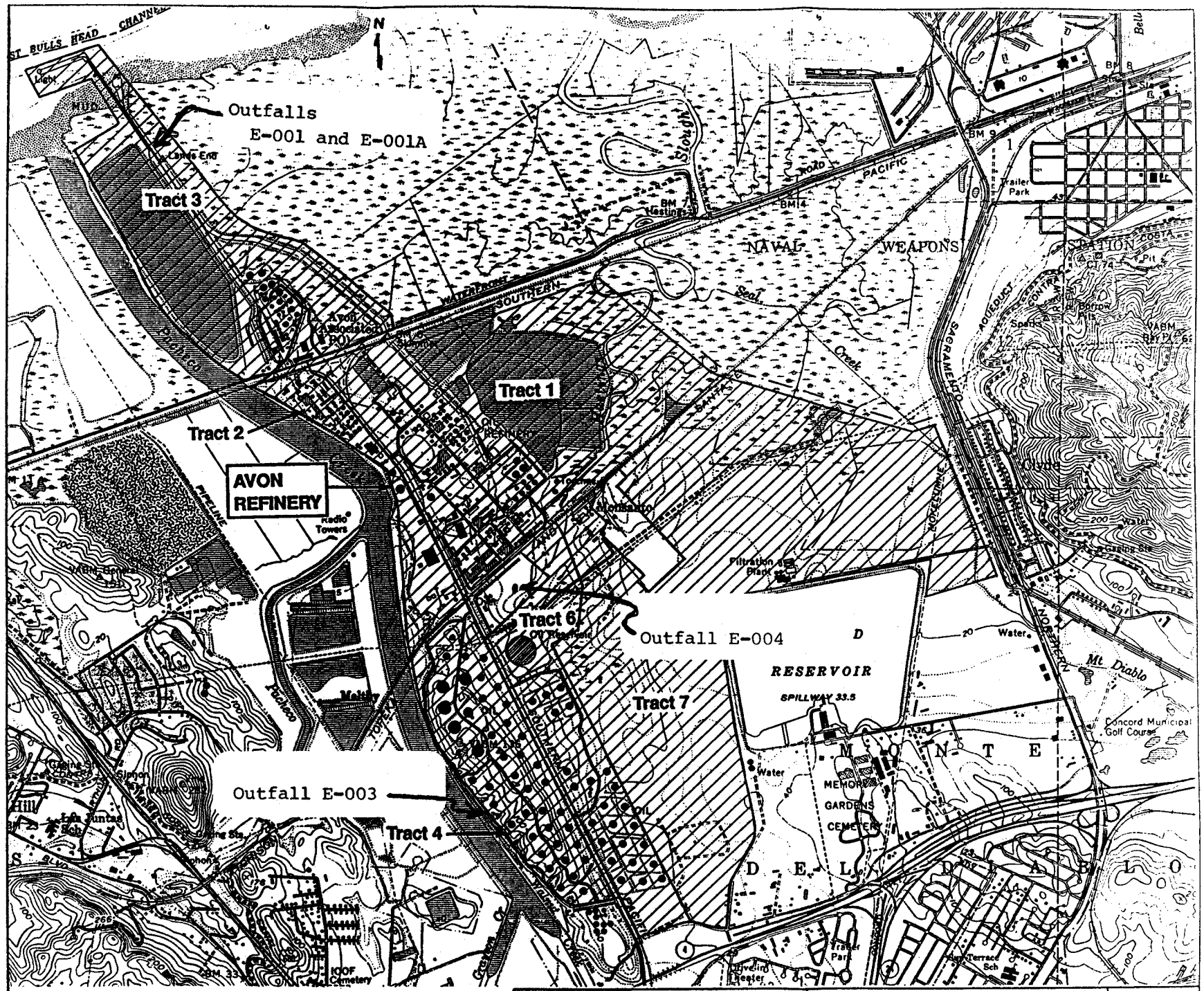

Outfalls
E-001 and E-001A
Tract 3
Tract 1
Tract 2
AVON
REFINERY
Tract 6
Outfall E-004
Tract 7
RESERVOIR
Outfall E-003
Tract 4
NAVAL
WEAPONS
STATION
CONCORD
Mt. Diablo
Concord Municipal
Golf Course
MONTE
DIABLO
Source: USGS Topographic
Quadrangle Vine Hill, CA
0
2000
feet
Revised Form 1, Item XI
TOSCO AVON REFINERY

Figure 1

ATTACHMENT A

DEFINITION OF
NO OBSERVED EFFECT LEVEL

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

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

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

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

SCREENING PHASE MONITORING REQUIREMENTS

A. Screening phase compliance monitoring is required:

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:

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

- Two stages:

  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 B-3 (attached); and

  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.

- Appropriate controls; and

- Concurrent reference toxicant tests.

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

ATTACHMENT C

DEFINITION OF TERMS[1] FOR CHEMICAL CONSTITUENTS

CHLORDANE shall mean the sum of chlordane-alpha, chlordane-gamma, chlordene-alpha, chlordene-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.

DDT shall mean the sum of the p,p^1 and o,p^1 isomers of DDT, DDD (TDE), and DDE.

ENDOSULFAN shall mean the sum of endosulfan-alpha and -beta and endosulfan sulfate.

ENDRIN shall mean the sum of endrin and endrin aldehyde.

HALOMEHTANES shall mean the sum of bromoform, bromomethane (methyl bromide), chloromethane (methyl chloride), chlorodibromomethane, and dichlorobromomethane.

PAHs (polynuclear aromatic hydrocarbons) shall mean the sum of acenaphthylene, anthracene, 1,2-benzanthracene, 3,4-benzofluoranthene, benzo[k]fluoranthene, 1,12-benzoperylene, benzo[a]pyrene, chrysene, dibenzo[ah]anthracene, fluorene, indeno[1,2,3-cd]pyrene, phenanthrene, and pyrene.

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.

TCDD Equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity equivalence factors, as shown in the table below.

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
octa CDD	0.001
2,3,7,8-tetra CDF	0.1
1,2,3,7,8-penta CDF	0.05
2,3,4,7,8-penta CDF	0.5
2,3,7,8-hexa CDFs	0.1
2,3,7,8-hepta CDFs	0.01
octa CDF	0.001

[1] Source: Water Quality Control Plan for Enclosed Bays and Estuaries of California, State Water Resources Control Board, April 1991.

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	5
giant kelp (Macrocystis pyrifera)	percent germination; germ tube length	48 hours	3
abalone (Haliotis rufescens)	abnormal shell development	48 hours	3
oyster (Crassostrea gigas) mussel (Mytilus edulis)	abnormal shell development; percent survival	48 hours	2
Echinoderms (urchins - Strongylocentrotus purpuratus, S. franciscanus); (sand dollar - Dendraster excentricus)	percent fertilization	1 hour	4
shrimp (Mysidopsis bahia)	percent survival; growth; fecundity	7 days	5
silversides (Menidia beryllina)	larval growth rate; percent survival	7 days	5

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. American Society for Testing Materials (ASTM). 1989. Standard Practice for conducting static acute toxicity tests with larvae of four species of bivalve molluscs. Procedure E 724-89. ASTM, Philadelphia, PA.

3. Anderson, B.B. J.W. Hunt, S.L. Turpen, A.R. Coulon, M. Martin, D.L. McKeown, and F.H. Palmer. 1990. Procedures manual for conducting toxicity tests developed by the marine bioassay project. California State Water Resources Control Board, Sacramento.

4. Dinnel, P.J., J. Link, and Q. Stober. 1987. Improved methodology for sea urchin sperm cell bioassay for marine waters. Archives of Environmental Contamination and Toxicology 16:23-32. and S.L. Anderson. September 1, 1989. Technical Memorandum. San Francisco Bay Regional Water Quality Control Board, Oakland, CA.

5. Weber, C.I., W.B. Horning, II, D.J. Klem, T.W. Neiheisel, P.A. Lewis, E.L. Robinson, J. Menkedick, and F. Kessler (eds.). 1988. Short-term methods for estimating the chronic toxicity of effluents and receiving waters to marine and estuarine organisms. EPA-600/4-87/028. National Technical Information Service, Springfield, VA.

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	6
water flea (Ceriodaphnia dubia)	survival; number of young	7 days	6
alga (Selenastrum capricornutum)	cell division rate	4 days	6

TOXICITY TEST REFERENCE

6. Horning, W.B. and C.I. Weber (eds.). 1989. Short-term methods for estimating the chronic toxicity of effluents and receiving waters to freshwater organisms. Second edition. U.S. EPA Environmental Monitoring Systems Laboratory, Cincinnati, Ohio. EPA/600/4-89/001.

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

REQUIREMENTS	RECEIVING WATER CHARACTERISTICS		
	DISCHARGES TO COAST	DISCHARGES TO SAN FRANCISCO BAY‡	
	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†	0	1 or 2	3
Marine	4	3 or 4	0
Total number of tests	4	5	3

† The fresh water species may be substituted with marine species if:

1) the salinity of the effluent is above 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.

‡ 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.

Date	Rainfall (Inches)	Storm Runoff Flow (Inches x Runoff Factor) = Gallons	Ballast Flow in gallons
1-2			
2-3			
3-4			
4-5			
5-6			
6-7			
7-8			
8-9			
9-10			
10-11			
11-12			
12-13			
13-14			
14-15			
15-16			
16-17			
17-18			
18-19			
19-20			
20-21			
21-22			
22-23			
23-24			
24-25			
25-26			
26-27			
27-28			
28-29			
29-30			
30-31			
31-1			
Total			
Monthly Average			

YEAR:

Monthly Average Allocation
Storm Runoff+Ballast Water Flow Factor
(expressed in thousand Gals/day x (kg /1000 Gals.) = (kg /day)

A.1. + Effluent Limits (kg /day) = Total Effluent Limit (Kg/day)

30-Day Average Limitation (Kg/day)							
	BOD_5	x	0.098	=	+		=
	TSS	x	0.079	=	+		=
	TOC	x	0.22	=	+		=
	COD	x	0.68	=	+		=
	O&G	x	0.03	=	+		=
	PHENOL	x	0.00064	=	+		=
	TOTAL CHROME	x	0.00079	=	+		=
	HEX CHROME	x	0.00011	=	+		=

STORMWATER/BALLAST WATER ALLOCATION PROCEDURE

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
	Rainfall (in.)	Stormwater Runoff (MGal/D)	Effluent Flow (MGal/D)	Dry Weather Effluent Flow (MGal/D)	Estimated Processed Stormwater (MGal/D)	Stormwater Bankbook (MGal)	Actual Processed Stormwater (MGal/D)	Ballast Water (MGal/D)
				Previous Month's Bankbook=				
1								
2								
3								
.								
.								
.								
30								
TOTAL								
AVERAGE								
MAXIMUM								

Column (B) = Column (A) X Runoff Factor

Column (E) = Column (C) - Column (D) - Column (H).

Column (F): Column (F) = Column (F)(Previous Day) + Column (B) - Column (E).
Column (F) = 0 if Column (F) <0.

Column (G): If Column (F) >0, then Column (G) = Column (E).
If Column (F) = 0, then Column (G) = Column (B) + Column (F) previous day.

COLUMN (D)= (Dry-Weather Effluent Flow)
+
(Documented Process Water Increment)

DATE	MAXIMUM DAILY LIMITS						
	BOD (KG/D)	TSS (KG/D)	(KG/D)	O&G (KG/D)	PHENOL (KG/D)	TOTAL CHROME (KG/D)	HEX. CHROME (KG/D)

Maximum Daily Limit = Effluent Limit A.1. (Daily Max in kg/day) + Stormwater Allocation (Daily Max)

Stormwater Allocation= Effluent Limit A.2. (Daily Max in mg/l) x Daily Processed Stormwater (in mgd) x 3.785 l/gal

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM

FOR

TOSCO CORPORATION
AVON REFINERY
CONTRA COSTA COUNTY

NPDES NO. CA0004961
ORDER NO. 93-068

CONSISTS OF

PART A dated 12/86, and
PART B Adopted: July 21, 1993
Revised: July 23, 1993

PART B

I. DESCRIPTION OF SAMPLING STATIONS

A. EFFLUENT

Station	Description
E-001	At any point in the outfall leading to the deepwater diffuser, where all wastes tributary thereto are present and well mixed.
E-001-D1	At any point in the Tract 1 sanitary sewer where adequate disinfection is assured.
E-001-D2	At any point in the Tract 2 sanitary sewer where adequate disinfection is assured.
E-003	At any point in the outfall from the Waste 003 separating sump.
E-004	At any point in the outfall from the Waste 004 separating sump.
E-005	To be determined.

B. RECEIVING WATERS

Station	Description
C-10	At a point in Suisun Bay, located over the geometric center of the deepwater diffuser for Waste 001.
C-40	An arc in the drainage channel which receives Waste 003, not more than 10 feet from the point of discharge of Waste 003.
C-50	An arc in the drainage channel which receives Waste 004, not more than 10 feet from the point of discharge of Waste 004.

C. INFLUENT WATERS

Station	Description
I-001	Located at any point in the pipe which delivers raw water to the facility, prior to any point of use. The raw water sources are water from onsite wells and Contra Costa Canal. If more than one pipe is involved in

	supplying raw water, the influent sample shall consists of a flow proportioned composite from each of the sources.
I-002	Located at any point in the pipe which delivers only reclaimed water to the facility, but upstream of any water treatment unit, blending point or point of use.

II. SCHEDULE OF SAMPLING AND ANALYSIS

A. The schedule of sampling and analysis shall be that given in Table 1 (attached).

B. Sample collection, storage, and analyses shall be performed according to requirements in the latest 40 CFR 136, in the Permit, or as specified by the Executive Officer.

III. MODIFICATIONS TO PART A

A. Exclude paragraphs D.3, E.4, and F.3.

B. Paragraph D.2.a. is modified as follows:

Composite samples of effluent shall be collected on random weekdays and on any day when substantial changes in flow occur during dry weather conditions.

IV. CHRONIC TOXICITY MONITORING REQUIREMENT

A. Test Species and Frequency: The discharger shall collect 24-hour composite samples at E-001 on consecutive days for critical life stage toxicity testing as indicated below:

Test Species	Frequency[1]
Menidia beryllina	Once each calendar quarter

B. Conditions for Accelerated Monitoring: The discharger shall accelerate the frequency of monitoring to monthly (or as otherwise specified by the Executive Officer) when there is an exceedance of either of the following conditions:

1. three sample median value of 10 TUc, or
2. single sample maximum value of 20 TUc

[1] 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.

C. Methodology: Sample collection, handling and preservation shall be in accordance with EPA 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%, 25%, 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.

V. CHRONIC TOXICITY REPORTING REQUIREMENTS

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

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

B. Compliance Summary: Each self-monitoring report shall include a summary table of chronic toxicity data from at least eleven of the most recent samples. The information in the table shall include the items listed above under Section A item numbers 1, 3, 5, 6(IC_{25} or EC_{25}), 7, and 8.

C. Reporting Raw Data in Electronic Format: On a quarterly basis, by February 15, May 15, August 15, and December 15 of each year, the discharger shall report all chronic toxicity data for the previous calendar quarter in the format specified in "Suggested Standardized Reporting Requirements for Monitoring Chronic Toxicity," February 1993, SWRCB. The data shall be submitted in either high or low density, double sided 3.5-inch floppy diskettes.

VI. MISCELLANEOUS REPORTING

A. The discharger shall record the rainfall on each day of the month.

B. The discharger shall determine the stormwater runoff/ballast water allocation (daily & monthly) for its discharge using the method described in attached Form A. Form A shall be submitted with the monthly self-monitoring report. The daily maximum allocation must be computed for each day Waste 001 is monitored.

C. 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.

D. The discharger shall submit in the monthly self-monitoring report the metallic & organic test results together with the detection limits (including unidentified peaks). All unidentified (non-Priority Pollutant) peaks detected in the EPA 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.

E. Ballast water treated and discharged as part of Waste 001 shall be metered and the volume recorded in attached Form A for each calendar day. The 30-day average shall be the sum of the daily values in a calendar month divided by the number of days in that month. Ballast-water allocations shall be calculated by multiplying the volume of ballast water, determined above by the appropriate volume of ballast water, determined above by the appropriate concentration listed under Effluent Limitation A.2. in the permit.

I, Steven R. Ritchie, 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 Order No. 93-068.

2. Is effective on the date shown below.

3. 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, pursuant to 40 CFR 122.62 and 124.4.

STEVEN R. RITCHIE
Executive Officer

Effective Date: 7/21/93

Attachments:

Table 1 - Schedule of Sampling, Measurement and Analysis
Form A - Storm Water/Ballast Water Allocation Procedure

TABLE 1

SCHEDULE OF SAMPLING, MEASUREMENTS, AND ANALYSIS

Station	Constituent	Unit	Sample Type	Frequency of Analysis
E-001	Flow	MGD	Continuous	Continuous
	BOD_5	mg/l kg/day	Composite	Monthly
	TSS	mg/l kg/day	Composite	Monthly
	COD	"	Composite	Monthly
	Oil & Grease	"	Grab [1,2]	Monthly
	Phenolic Compounds	"	Composite	Monthly
	Ammonia as N	mg/l kg/day	Composite	Monthly
	Settleable Matter	ml/l/hr	Grab [2]	Monthly
	Total Sulfides	mg/l	Grab [2]	Monthly
	pH [3]	-	Continuous	Continuous
	Temperature	Celsius	Continuous	Continuous
	Chlorine Residual	mg/l	Grab	Weekly
	Acute Fish Toxicity [4]	%Surv	Composite	Weekly
	Crit. Life Stage Tox. Test [5]	[5]	Composites	Quarterly [5]
	Cadmium	mg/l kg/day	Composite	Quarterly
	Silver	"	"	Quarterly
	Cobalt	"	"	Quarterly
	Aluminum	"	Composite	Monthly
	Arsenic [6]	"	"	"
	Chromium			
	Total	"	"	"
	Hexavalent	"	"	"
	Lead	"	"	"
	Mercury	"	"	"
	Vanadium	"	"	"
	Zinc	"	"	Monthly
	Copper	"	"	Weekly [18]
	Nickel	"	"	"
	Selenium [7]	"	"	"
	Cyanide [8]	mg/l kg/day	Composite	Weekly
	PAH's [9]	µg/l	Composite [9]	Monthly
	Tributyltin [10]	"	Grab [2]	Yearly

Station	Constituent	Unit	Sample Type	Frequency of Analysis
E-001 (cont.)	EPA 608 [11]	µg/l	Grab [2]	Yearly
	EPA 624 [12]	"	Grab [2]	"
	EPA 625 [13]	"	Grab [2]	"
	EPA 1613 [14]	pg/l	Grab [2]	Quarterly [14]
	Standard Observations	--	--	Daily
E-001-D1 & E-001-D2	Coliforms [15]	MPN/ 100ml	Grab	Weekly
E-003 & E-004	Oil & Grease	mg/l	Grab [2]	On each occurrence
	pH	-	"	"
	TOC	mg/l	"	"
	Specific Conductance	µmhos/cm	Grab [2]	"
	TSS	mg/l	Grab [2]	"
	Standard Observations	-	--	"
	TPH [16]	mg/l	Grab [2]	First two events [16]
E-005	To be determined			
C-10	pH	-	Grab [2]	Quarterly
	D.O.	mg/l	"	"
	Temperature	Celsius	"	"
	Sulfides [17]	mg/l	"	"
	Unionized Ammonia	mg/l	"	"
	TDS	mg/l	"	"
	Standard Observations	-	--	"
C-40 & C-50	Same list as for C-10	"	Grab [2]	Coincident with each discharge from E-003 or E-004
I-001	Copper	mg/l kg/day	Grab [18]	Weekly [18]
I-002	In accordance with Effluent Limitation A.4.			

Notes for Table 1:

1. Sampling for Oil and Grease shall consist of 3 grab samples taken at 2 hour intervals during the sampling day, with each 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 rinsings as soon as possible after use, and the solvent rinsings shall be added to the composite wastewater sample for extraction and analysis.

2. 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.

3. Daily minimum and maximum for pH shall be reported.

4. Rainbow trout and three-spine stickleback are to be tested to pursuant to Effluent limitation A.6. The tests shall be parallel 96-hour flow through bioassays. The discharger shall perform the tests according to protocols approved by the USEPA, State Board, published by the American society for Testing and Materials (ASTM), or American Public Health Association.

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

6. Arsenic must be analyzed for only by the atomic absorption, gaseous hydride procedure (EPA Method 206.3/ Standard Method No. 303E).

7. Selenium must be analyzed for only by the atomic absorption, gaseous hydride procedure (EPA Method No. 270.3/ Standard Method No. 303E).

8. The discharger may, at their option, analyze for cyanide as Weak Acid Dissociable Cyanide using protocols specified in Standard Method No. 4500-CN-I, latest edition.

9. Polynuclear aromatic hydrocarbons shall be analyzed using EPA Method 610 of the July, 1982, Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057. 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 3-hour intervals. The analytical laboratory shall remove flow-proportioned volumes from each sample vial or container for the analysis.

10. To determine tributyltin, the discharger shall use a USEPA approved method, or a method which is capable of speciating organotins, and is capable of low method detection limits on the order of 5 nanograms per liter (ng/l).

11. Organochlorine and other Organohalide Pesticides and Polychlorinated Biphenyl Toxic Pollutants shall be analyzed using EPA Method 608 as specified in 40 CFR 136.

12. Volatile Organic Toxic Pollutants shall be analyzed using EPA Method 624 as specified in 40 CFR 136 (Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057, July 1982).

13. Acid and Base/Neutral Extractable Organic Toxic Pollutants shall be analyzed using EPA Method 625 as specified in 40 CFR 136 (Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057, July 1982).

14. Chlorinated Dibenzodioxins and Chlorinated Dibenzofurans shall be analyzed using EPA Method 1613. The discharger may request a reduction to the frequency of sampling and analysis subsequent to a demonstration that source control has been effective. This request must also be based on at least one year of data showing no detectable levels of dioxins and furans.

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

16. Total Petroleum Hydrocarbons for gasoline and diesel, shall be analyzed and characterized by GCFID with fused capillary column. The samples are to be prepared by using EPA Methods 5030 and 3510. Storm water discharge samples shall be collected for TPH analysis from the first and second discharge events following adoption of this permit, from each station.

17. Receiving water analysis for sulfides should be run when dissolved oxygen is less than 5.0 mg/l.

18. The I-001 sample shall consist of a flow weighted composite of four grab samples, taken at 6-hour intervals, from each raw water influent source to the refinery. The discharger may request a reduction in the frequency of analysis for copper at stations E-001 and I-001 after at least one year of data subsequent to adoption of this permit.

FORM A

STORMWATER/BALLAST WATER ALLOCATION PROCEDURE

This procedure uses a bankbook to inventory stormwater. Any stormwater in excess of the estimated processed stormwater is inventoried. Stormwater allocations are calculated using the actual processed stormwater developed in the attached table.

Definitions:

Dry Weather Season - The months of June to September exclusive of a one-week period following any rainstorm.

Estimated Dry Weather Process Wastewater Flow - The average effluent flowrate during the previous dry weather season.

Stormwater Runoff - The product of the inches of rainfall and the runoff factor.

Estimated Processed Stormwater - The difference between the actual effluent flowrate and the ballast water plus dry weather flowrate.

Stormwater Bankbook - Calculated inventoried stormwater.

Actual Process Stormwater - If the stormwater bankbook is not zero, the actual processed stormwater equals the estimated flow. If the bankbook is zero, the actual processed stormwater is equal to the stormwater runoff for that day plus the bankbook for the previous day.