

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION**

**ORDER NO. 99-083**

**UPDATED WASTE DISCHARGE REQUIREMENTS AND RESCISSION OF ORDER  
NO. 92-078**

**TOSCO REFINING COMPANY AND TOSCO CORPORATION, PHILLIPS  
PETROLEUM COMPANY, AND TEXACO REFINING AND MARKETING, INC.  
SAN FRANCISCO AREA REFINERY AT AVON  
CONTRA COSTA COUNTY**

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

**FACILITY DESCRIPTION**

1. Tosco Refining Company, a division of Tosco Corporation, (hereinafter called Tosco) owns and operates the Avon Refinery (hereinafter called the facility) with an approximate daily throughput capacity of 145,000 barrels of petroleum crude oil and produces primarily gasoline and diesel fuels. Other products are liquid petroleum gas, heating oil, jet fuel, and petroleum coke. The facility has been operating since 1913 and has been owned by Tosco since 1976. Phillips Petroleum (hereinafter called the Phillips), Texaco Refining and Marketing, Inc., (hereinafter called the Texaco) as successor in interest to Tidewater Oil Company, and Associated Oil Companies were the previous owners of the facility. Tosco, Phillips, and Texaco are hereinafter referred to as the Dischargers.
2. Tosco, Phillips, and Texaco (formerly called Tidewater Oil Company) formed a confidential Joint Investigation and Remediation Agreement in July 1993, which covers the facility area and the majority of concerns addressed in this Order. Tosco has agreed to provide reasonable facility access to Texaco, and Phillips in order to perform and complete their responsibilities. Additionally, Tosco has agreed to work with Phillips and Texaco in cleaning up the facility. Tasks required to be completed exclusively by Tosco are defined within this Order.
3. The 2,100-acre facility is about 3 miles east of the City of Martinez on the southern shore of Suisun Bay in Contra Costa County. The facility is bounded on the west by Pacheco Creek and Walnut Creek, on the north by wetlands and Suisun Bay, on the south by Highway 4, and on the east by Memory Gardens cemetery, Mallard Reservoir, Hastings Slough and wetlands. The facility also includes an approximately 100-acre loading/unloading terminal known as the Amorco Terminal, which is located about 2-miles west of the refinery (Figure 1).

### **PURPOSE OF ORDER**

4. The purpose of this order is to define the requirements of existing orders into one order, rescind previous orders, and update the Dischargers' Self-Monitoring Program. The Order also requires the installation of aboveground petroleum tank leak detection systems, and the remediation of various petroleum impacted groundwater sites located at the refinery.

### **RELATED ORDERS**

5. The Board adopted Resolution 576 on July 16, 1964 to regulate the Tidewater Oil Company's discharge of various wastes to surface waters and onto land.
6. The Board adopted Resolution No. 67-31 on June 13, 1967 prescribing Waste Discharge Requirements for Phillips Petroleum.
7. On June 20, 1990, the Board adopted Waste Discharge Requirements Order No. 90-083, which required Tosco to conduct soil borings and install additional monitoring wells for further characterization of waste management units at the facility.
8. On June 20, 1990, the Board adopted Site Cleanup Requirements Order No. 90-088 related to the free phase liquid hydrocarbon (FPLH) recovery activities.
9. On July 15, 1992, the Board adopted Waste Discharge Requirements Order No. 92-078, which required a work plan, specifying corrective actions to be taken to bring fourteen waste management units into compliance with California Code of Regulations, Title 22, Chapter 15 requirements. Order No. 92-078 amends Order No. 90-083
10. On July 21, 1993, the Board adopted Site Cleanup Requirements (SCR) Order No. 93-079 related to specified FPLH recovery activities. Order No. 93-079 names Tosco, Phillips Petroleum Company, and Tidewater Oil Company as Dischargers and rescinds Order No. 90-088. Order No. 93-079 remains an active order in force and is used in conjunction with this Order to regulate discharges to soil and groundwater at the facility.
11. The Board also adopted Waste Discharge Requirements Order No. 88-053, National Pollutant Discharge Permit No. CA0004961 as amended on December 12, 1990, to regulate the discharge of treated wastewater to Suisun Bay.

### **GEOLOGIC SETTING OF THE SITE**

12. The Concord fault is an active fault that runs through the western side of the facility. Special studies along the Concord fault delineated a zone of concern that encompasses the western portion of the facility.
13. A portion of the facility was built on marshlands or wetlands. Fill is the first subsurface material encountered in much of the flat portions of the facility. The

second subsurface material generally encountered is Bay Mud. Interbedded with the Bay Mud are the Bay Peat, and sandy units. The Bay Peat is composed primarily of black or brown organic matter derived from vegetation deposited in marshes. The Bay Mud ranges in thickness from zero to forty feet throughout the region.

14. There are four offsite drinking water wells located in the southern portion of the facility approximately 3,000 feet from Mallard Reservoir. Groundwater in parts of the facility is a potential drinking water source, however the shallow groundwater within the major northern portion of the facility closer to the Bay exceeds 3,000 mg/l total dissolved solids, and thus does not meet the State Board definition of a potential drinking water source. Groundwater and surface water from the facility flows toward nearby wetlands and Suisun Bay.

#### **REFERENCE TO REGULATIONS**

15. Effective July 18, 1997 many provisions for non-hazardous waste of Division 3, Chapter 15 were moved into Title 27, Division 2, of the California Code of Regulations (CCR) (Title 27). Where applicable the new regulatory citations have been incorporated in this Order.

#### **REPORT OF WASTE DISCHARGE**

16. Tosco submitted a January 1988 "Report of Waste Discharge", and a Solid Waste Assessment Test (SWAT) report dated June 30, 1989 and its January 12, 1990 addendum. The SWAT reports identified several waste disposal sites that received petroleum hydrocarbon based refinery wastes. Based on the SWAT findings Tosco proposed to further characterize the waste disposal sites and to assess the impact the waste disposal sites may be having on the environment.

#### **GENERAL REQUIREMENTS FOR THE GROUNDWATER PROTECTION PROGRAM**

17. The Facility contains several commingled contaminated soil and groundwater areas that were caused by leakage of solid waste disposal sites, spills, piping leaks, and other discharges to land during the facility's operation. Waste management units and areas of concern, to an extent, have been influenced by discharges that are not directly attributable to polluted areas of concern or waste management unit leakage. To effectively monitor releases to groundwater that has been impacted by numerous pollutant sources, general groundwater corrective action implementation requirements for the facility are defined as follows:
  - a. The Dischargers will monitor each waste management unit's downgradient perimeter for increasing concentration trends of the unit's Constituents of Concern. The Executive Officer may require the implementation of corrective action on any unit where monitoring data indicates an increasing threat of pollution. If the unit is determined by the Board's Executive Officer to be a significant pollution source, corrective action systems at the unit will be required to be installed and operated.

- b. **Perimeter Monitoring:**  
The Facility's perimeter has been divided into 16 perimeter segments (Figure 3). The area monitored by each perimeter segment may contain waste disposal units, spill areas, or other contaminated areas. Each perimeter segment contains constituents of concern and hydrogeologic parameters that are unique to the particular perimeter segment and area tributary to each perimeter segment. The Dischargers will monitor the perimeter of the Facility for Constituents of Concern, which are derived from each unit and within each perimeter segment tributary area. If established Trigger Levels (Table 4) are exceeded at the perimeter, resampling and analysis will be performed. If resampling and analysis validates an exceedance of a Trigger Level, corrective action at the perimeter may be required. The final determination of the need for corrective action will be made by the Board's Executive Officer.
- c. The Dischargers will reduce the mass of free phase petroleum hydrocarbon source areas at the facility where hydrocarbons may be present in recoverable quantities.
- d. The Dischargers will prevent discharges to soil or groundwater from aboveground petroleum storage tanks by complying with State and Federal aboveground petroleum tank laws.

#### **ABOVEGROUND PETROLEUM STORAGE TANKS**

- 18. Tosco operates approximately 108 aboveground petroleum storage tanks at the facility. Additionally, several active petroleum tanks that are associated with the refinery's Amorco Terminal are located near the south end of the Benicia-Martinez Bridge but are not currently included in any refinery tank monitoring or upgrade program. Aboveground petroleum storage tanks are required to comply with the requirements of Chapter 6.67 Section 25270 of the Health and Safety Code, and with Part 112, Title 40 of the Federal Code of Regulations. In part, the regulations require Tosco to install and utilize a leak detection system for each regulated tank. Tosco has proposed to monitor 75 aboveground tanks quarterly for leakage with 35 groundwater monitoring wells, 29 tanks are equipped with double bottoms, and three tanks are monitored for leaks using Tracer Technology.
- 19. Staff has reviewed the leak detection monitoring systems for the Facility's petroleum tanks. The Board finds that a majority of the 35 groundwater wells that monitor 75 tanks are not capable of detecting early releases from the tanks.
- 20. Aboveground petroleum storage tank facilities are required to have secondary spill containment for capture of sudden releases from an aboveground petroleum tank. The facility utilizes several different types of soil berms, spill collection ponds and channels located in the vicinity of an aboveground petroleum tank for

containment of petroleum hydrocarbon releases. Some of the spill collection areas are located far from the tank area where the spill may occur, and because of this a large surface area may be impacted by a petroleum spill.

### **WASTE MANAGEMENT UNITS**

21. Tosco and /or previous owners of the facility have utilized a number of on-site waste management units for the treatment, storage, or disposal of wastes from the refinery. The waste management units (WMU) identified below contain primarily non-hazardous waste, but may contain CCR Title 22 hazardous levels of certain pollutants. Most of the units ceased accepting waste prior to Tosco's acquisition of the facility in 1976. None of the units comply with the construction standards of Title 27 or Chapter 15. Below is a brief description of each unit.
- a. **WMU-1 (EPA No. 4.17) Tetraethyl Lead (TEL) Landfill** is an inactive unlined, approximately one-acre landfill, with a period of disposal from 1947-1971. This unit reportedly contains tetraethyl lead sludge from leaded gasoline tank bottoms and oil soaked wood. Depth to groundwater is about 72 feet below ground surface (bgs).  
Contamination  
The unit's waste contains petroleum hydrocarbon, metals (i.e. lead) and various organic compounds.
  - b. **WMU-2 (EPA No. 4.18) Arsenic Trioxide Landfill** is an inactive unlined approximately 0.46-acre landfill, with a period of disposal from 1973 to 1974. Arsenic trioxide was disposed in this area, either in drums or dumped directly onto the ground. Waste is not exposed at the surface of the unit. Depth to groundwater ranges from 25 to 47 feet bgs.  
Contamination  
The unit's waste contains petroleum hydrocarbon, metals (i.e. lead and arsenic) and various organic compounds. Groundwater monitoring in the vicinity of the unit has detected lead and arsenic.
  - c. **WMU-3 (EPA No. 4.19) Tetraethyl Lead and Arsenic Trioxide Landfill** is an inactive unlined, 0.11 acre landfill, with a period of disposal from 1949-1965. Waste is not exposed at the surface of the unit. The area consists of more than 29 burial cells, containing gasoline tank bottom sludges, including TEL sludge, arsenic waste and aluminum chloride waste. It has been documented that 47 drums were buried in Cells 2, 15, and 22. Depth to groundwater ranges from 20 to 25 feet bgs.  
Contamination  
The unit's waste contains petroleum hydrocarbon, metals (i.e. lead and arsenic) and various organic compounds. Groundwater monitoring in the vicinity of the unit has detected lead, arsenic, chromium VI, and petroleum hydrocarbons.

- d. **WMU-4 (EPA No. 4.20) Acid and Caustic Wastewater Pond** is an inactive unlined landfill east of the Cardox Canal with a period of disposal from 1950 through the 1960s. The unit received liquid and sludge waste, residue from handling caustic cleaning solution, acidic wastes, tetraethyl lead sludge, oily coke, kerosene residues, solvents, and catalytic reformer bottoms. The unit's fill varies from 3 to 10 feet thick. Depth to groundwater ranges from 1 to 4 feet bgs.

Contamination

The unit's waste contains petroleum hydrocarbon, metals (i.e. lead and arsenic), organic lead, and various organic compounds.

- e. **WMU-5 (EPA No. 4.21) Oily Waste landfill** is an inactive unlined, 8.8-acre landfill, with a period of disposal from the late 1950's to early 1970's. The unit was used for disposal of about 40,000 cubic yard of spent catalysts, tetraethyl lead sludge, aluminum chloride, solvents, and oily coke. The unit's fill varies from 0 to 7 feet thick. Depth to groundwater ranges from 1 to 8 feet bgs and generally flows toward Hasting Slough.

Contamination

The unit's waste contains petroleum hydrocarbon, metals (i.e. lead, arsenic, and nickel) and various organic compounds. Groundwater monitoring in the vicinity of the unit has detected lead, arsenic, chromium and petroleum hydrocarbons.

- f. **WMU-6 (EPA No. 4.22) Oily Sewer Outfall** is an inactive unlined 2.8-acre unit, with a period of disposal from the 1950s to 1960s. The unit was previously known as the refinery's Oily Sewer Outfall and received oily waste. It is reported that oily material was excavated from WMU-6 and moved to WMU-8 during the construction of the Iso-cracker Unit in 1961. In 1982, approximately 2,900 cubic yards of arsenic contaminated soil at concentrations greater than the TTLC value of 500 mg/kg was excavated from WMU-6 and disposed of at an offsite Class I facility. The Dischargers reported that the presence of high concentrations of arsenic within the unit are not related to the oily material the unit received, but rather from Iso-cracker discharges. Depth to groundwater ranges from 6-9 feet bgs. The area is currently covered by an active process unit and asphalt.

Contamination

The unit's waste contains petroleum hydrocarbon, metals (i.e. arsenic, and zinc) and various organic compounds. Groundwater monitoring in the vicinity of the unit has detected lead, arsenic, chromium, benzene and other petroleum hydrocarbons.

- g. **WMU-7** was reportedly a tetraethyl landfill that is currently occupied by the Alkylation Plant and No.2 Catalytic Reformer Plant. Historical aerial photographs indicated that an oily pond and stained soil existed on the area now occupied by the Alkylation Plant. Investigations of the unit found little evidence of a former waste disposal site. The Dischargers requested

in the April 1997 Phase II RFI that since no waste has been found WMU-7 should not be classified as a waste unit. Board staff have reviewed the information related to WMU-7 and concur with the Dischargers that WMU-7 does not exist.

- h. **WMU-8 (EPA No. 4.23) Oily Sludge Landfill** is an unlined inactive 3.4-acre landfill, east of the Oily Canal with a period of disposal from 1957 to the 1960's. The unit reportedly received catalyst fines, aluminum chloride waste, oily waste excavated from WMU-6 in 1961, and litharge (a lead-based compound). The unit's fill varies from 5 to 10 feet thick. Depth to groundwater ranges from 1-10 feet bgs.
- Contamination  
The unit's waste contains petroleum hydrocarbon, metals (i.e. lead and arsenic) and various organic compounds. Groundwater monitoring in the vicinity of the unit has detected lead, arsenic, chromium VI, and petroleum hydrocarbons.
- i. **WMU-9 (EPA No. 4.24) Antimony Trichloride Landfill** is an unlined inactive, 2.5 acre landfill, with a period of disposal from the late 1940's to the mid 1950's. The unit reportedly received antimony trichloride waste, spent catalyst, and miscellaneous construction and demolition waste. Depth to groundwater ranges from 3 to 15 feet bgs.
- Contamination  
The unit's waste contains petroleum hydrocarbon, metals (i.e. lead, and antimony), organic lead, and various organic compounds. Groundwater monitoring in the vicinity of the unit has detected lead, arsenic, antimony, nickel, benzene and other petroleum hydrocarbons.
- j. **WMU-10 (EPA No. 4.25) Oily Sludge Land Farm** is an unlined inactive, 10.4 acre land-farm made up of two cells that operated from 1966-1976. The land treatment unit received approximately 10,600 cubic yards of oily wastes, and waste from the API Separator and DAF units. The unit is located in the 100-year flood plain, and is protected from flooding by 3 to 4 foot high dikes constructed around the perimeter. However, during the wet season, ponded water can be found on the unit. Depth to ground water beneath the unit ranges from 1 to 7 feet bgs.
- Contamination  
The unit's waste contains petroleum hydrocarbon, metals (i.e. lead, and chromium), organic lead, and various organic compounds. Groundwater monitoring in the vicinity of the unit has detected lead, arsenic, and petroleum hydrocarbons.
- k. **WMU-11 (EPA No. 4.25) Oily Sludge Land Farm** is an unlined inactive, 7.2-acre landfarm, with a period of disposal from 1966-1976. The land treatment unit received oily wastes, petroleum sludges, and waste from the API Separator and DAF units. This unit is located in the 100-year flood

plain, and is protected from flooding by the dikes constructed around the perimeter. However, during the wet season the unit may contain ponded water.

Contamination

The unit's waste contains petroleum hydrocarbon, metals (i.e. lead, and chromium), organic lead, and various organic compounds. Groundwater monitoring in the vicinity of the unit has detected lead, chromium, arsenic, and petroleum hydrocarbons.

- i. **WMU-13 (EPA No. 4.26) Acid-Sludge Landfill** is an unlined inactive, 6-acre former pond waste unit system, with a period of disposal from 1957 to 1969. The unit received approximately 1 million cubic yards of oily acidic petroleum sludges.

Contamination

The unit's waste contains petroleum hydrocarbon, metals (i.e. lead), organic lead, low pH soils, and various organic compounds. Groundwater monitoring in the vicinity of the unit has detected lead, chromium, benzene, and other petroleum hydrocarbons. Free product is also found within the vicinity of the unit.

- m. **WMU-14 (EPA No. 4.13) Oily Sludge Landfarm** is an unlined inactive, 9.1-acre pond system that was constructed over the western portion of WMU-10 in 1976. The unit is made up of four sludge drying beds that received sludge until the late 1970's from biologically treated refinery wastewater. This unit is located in the 100-year flood plain, and is protected from flooding by 2 to 5 foot high dikes constructed around the perimeter of the unit. However, during the wet season the unit may contain ponded water.

Contamination

The unit's waste contains petroleum hydrocarbon, metals (i.e. lead, selenium, and chromium), organic lead, and various organic compounds. Groundwater monitoring in the vicinity of the unit has detected arsenic, lead, chromium, hexavalent chromium, and petroleum hydrocarbons.

- n. **WMU 15 (Surge Pond 1 and Surge Pond 2)** consist of two active unlined surface impoundments that receive refinery wastewater. Specifically effluent from the API Separator, Ammonia Recovery unit, foul water stripper, sulfur plant, coke storage pile, and cooling towers are treated in the unit. The ponds, which were constructed in about 1967, consist of Surge Pond 1 that covers 14-acres and Surge Pond 2 that covers 6-acres. It has been estimated that approximately 74,000 cubic yards of sediment remain in the two ponds.

Contamination

The unit's waste contains petroleum hydrocarbon, metals (i.e. lead), low pH soils, and various organic compounds. Groundwater monitoring in the

vicinity of the unit has detected lead, nickel, chromium, zinc, low pH water, and petroleum hydrocarbons.

- o. **WMU 16 (Bio-Oxidation Pond)** is a single unlined active refinery wastewater storage and treatment pond. The 108-acre pond began operation in 1966 and receives partially treated wastewater from Surge Pond No. 2 and storm water. Effluent from the pond flows to the treatment plant where it is discharged into the Clean Water Canal. Several aerators are located in the southern end of the pond. Sediment contained within the pond varies in thickness from zero to 5 feet. Sediment samples collected from the pond indicated the sediments are only marginally contaminated. However, groundwater near unit contains metals and petroleum hydrocarbons. The Dischargers reported that the groundwater contamination around the pond may be the result of nearby historic discharges.

Contamination

The unit's waste contains petroleum hydrocarbon, metals, and various organic compounds. Groundwater monitoring in the vicinity of the unit has detected arsenic, lead, chromium, nickel, benzene, and other petroleum hydrocarbons.

- p. **WMU 17 Oily Waste Impoundments** was closed in December 1988. The unit, which consisted of two cells received oily waste, including API Separator sludge, dissolved air floatation float, unleaded and crude tank bottom sludge, and slop oil emulsion solids from 1976 to 1983. Closure of the unit consisted of the removal of liquid and oily waste from the unit, installation of a synthetic liner and leachate collection system, and capping the site with a vegetated soil cover. The closure was performed under a workplan approved by USEPA and DTSC. A post-closure permit was issued July 30, 1998, pursuant to Section 25200 of the California Health and Safety Code.
- q. **WMU-20** was initially identified in the 1988 RCRA Facility Assessment Report. The unit was described as an inactive landfill located near WMU-1 that received weathered tetraethyl lead sludge. The Dischargers reported in the January 1993, Draft Corrective Action Plan Report that no evidence of the unit was located and further investigation for the unit would not be productive. Board Staff have reviewed the Dischargers' information and concur that no evidence presented indicated the existence of the reported unit. Board staff have reviewed the information related to WMU-20 and concur with the Dischargers that WMU-20 does not exist.
- r. **WMU-31 (EPA No. 4.29) Oil Sludge Landfill** is an approximately 21 acre unlined inactive landfill, with a period of disposal from the 1950s to 1960s. A tetraethyl lead blending facility was reportedly located on the west side of the unit, and may have impacted the unit. Adjacent to the site is a

former drum storage area and oily skim ponds. The unit received oily wastes, and dredge spoils from the former Oily Water Canal. This unit is underlain by up to 6.5 feet of oily sludge and is partially underlain by free phase petroleum hydrocarbons. Waste is not exposed at the unit's surface. During wet weather portions of the unit may pond.

Contamination

The unit's waste contains petroleum hydrocarbon, metals (i.e. lead), organic lead, and various organic compounds. Groundwater monitoring in the vicinity of the unit has detected lead, chromium, zinc, and petroleum hydrocarbons.

- s. **WMU-32 (EPA No. 4.16)** is a 10.7-acre area located adjacent to WMU-16. The unit is currently under additional investigation. There are impacts to the area that may indicate releases have occurred, however the Dischargers reported that there are no records of waste being disposed of in the designated area nor was there a drum washing area in the area. However, a drum reconditioning facility was located 700 feet east of the unit where aerial photographs reveal thousands of drums were located. The unit's area at one time contained north and south trending drainage canals, which may have received oily and contaminated water. The unit is partially underlain by an FPLH pool of which the source is likely the Tract 3 tank farm. The unit has recently been the subject of further investigation, and interim corrective measures are being evaluated.

Contamination

The unit's waste contains petroleum hydrocarbon, metals (i.e. lead), organic lead, low pH soil, and various organic compounds. Groundwater monitoring in the vicinity of the unit has detected arsenic, nickel, chromium, zinc, benzene, and other petroleum hydrocarbons. Low pH water has also been reported in groundwater beneath the unit.

**AREAS OF CONCERN**

22. The following areas are not considered waste units but are considered areas of concern due to their operational history and/or their location to contaminated areas.

- a. **Hastings Slough** is a tidally influenced surface water channel that originates near WMU-5 and the Cardox Reservoir and ultimately discharges into Suisun Bay. A portion of the slough flows past the refinery's outer coke pond. The slough varies from approximately 30 to 75 feet wide and is tidally influenced.

Contamination

Sediment samples collected along the bank of the slough were below USEPA action levels. However, groundwater and porewater samples collected along the slough banks contained metals (arsenic and lead) and petroleum hydrocarbons.

- b. **Pacheco Slough** is located along the western boundary of the site. Walnut and Grayson Creeks converge near Track 4 to form Pacheco (Creek) Slough. The slough is up to 500 feet wide, is tidally influenced and eventually flows into Suisun Bay. Several waste disposal facilities and the Central Contra Costa County Sanitation District facility are located near the west bank of the slough.
- Contamination  
Sediment and pore samples collected along the eastern bank of the slough did not indicate significant impacts have occurred. However, groundwater and pore water samples collected near the slough contained metals (chromium, lead, nickel, and zinc), and petroleum hydrocarbons.
- c. **The Outer Coke Pond** is a bermed area of approximately 48 acres to the east of the Coke Storage Pile and Inner Pond. The Coke Storage Pile and Inner Pond makeup the active coke storage area and are changing, due to coke production and sales, on a daily basis. The outer pond periodically takes overflow from the inner coke pond. Water in the ponds is treated waste water used to sluice coke from the coker. This water is treated to below the NPDES permit limit requirements. The Outer Pond receives seasonal rainfall, and will dry out periodically during the summer. The Outer Coke Pond is adjacent to undeveloped land to the northeast and a portion of Hastings Slough to the east. The Outer Pond is being investigated as a part of the Human Health and Ecological Risk Assessment.
- d. **Deacon's Stormwater Impoundment** is an active unlined 2.35-acre stormwater collection basin located within Tract 4. The pond has operated as a stormwater collection pond since the 1920's. The Dischargers reported that the pond was not used for the storage of waste, however historical petroleum hydrocarbon spills from the tank farm may have periodically entered the pond.
- e. **Tract 6 Stormwater Impoundment** is an active unlined stormwater retention basin located in Tract 6 that collects storm water from the majority of the Tract 6 tankfarm, and the eastern drainages of Tract 4. The impoundment also serves as secondary containment for aboveground tank petroleum spills that may occur within portions of Tract 4 and Tract 6. The impoundment consists of an unlined: retention pond, canal, and a reservoir. Water flows from the Tract 6 drainage channel into the retention pond, then through the launders, and finally into the Cardox Reservoir. Launders located at the east-end of the reservoir control reservoir overflow. The launders then discharge water to a marshy area near the head of Hastings Slough in accordance with the refinery's NPDES permit.
- f. **Oily Wastewater Canal** is an unlined 2,300 foot long drainage canal that was used until 1990 to transport partially treated refinery wastewater. Prior

to 1952 the canal extended from WMU-6 to Suisun Bay. During this period several oil skimmers and skim pits were located along the alignment which is now occupied by a portion of the Clean Water Canal. Currently, the canal receives approximately 100 gallons per minute of wastewater from the surge ponds (WMU-15), where the water is recirculated through the canal to control odors.

Contamination

The unit's waste contains petroleum hydrocarbons, metals, and various organic compounds. Groundwater monitoring in the vicinity of the unit has detected arsenic, nickel, benzene, other petroleum hydrocarbons and free-phase petroleum product. Corrective action consisting of treating sediments and surface water has been implemented on a 200-foot section of the canal.

- g. **Clean Water Canal and Skim Pond** was constructed in 1957 and is currently located east of the Oily Water Canal. However, prior to 1952 the Oily Water Canal discharged oily wastewater through the present day Clean Water Canal. The portion of the Clean Water Canal that is an area of concern, as defined by the USEPA, is that portion located north of Waterfront Road. This portion of the canal is the subject of a Human Health and Ecological Risk Assessment.

**FREE PRODUCT RECOVERY PROGRAM**

- 23. The Dischargers have removed over 3.2 million gallons of free phase liquid hydrocarbon (FPLH) from the petroleum hydrocarbon pools beneath Tracts 1, 2, and 3. The history of annual FPLH removal rates is as follows:

Year	Recovered FPLH in 1000s of Gallons
1984	6
1985	219
1986	467
1987	508
1988	254
1989	226
1990	134
1991	80
1992	12
1993	51
1994	168
1995	242
1996	258
1997	301
1998	324
<b>TOTAL</b>	<b>3,250</b>

Currently, three types of systems are used for free product removal: active skimming systems, passive recovery systems (in situ canisters), and periodic free product recovery by vacuum truck. Board Staff noted in 1999 that several wells within the refinery contain product thickness greater than 0.1-foot but are not part of the current FPLH recovery program.

### **SOILS MANAGEMENT PLAN**

24. The Dischargers have submitted a November 1998 technical report entitled Facility Wide Soils Management Plan, and a July 1999 Technical Memorandum which addresses the reuse of low-level petroleum hydrocarbon contaminated soils at the refinery.

### **BASIN PLAN**

25. The Regional 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 and the Office of Administrative Law on July 20 and November 13, respectively, of 1995. A summary of regulatory provisions is contained in Title 23 of the California Code of Regulations at Section 3912. The Basin Plan defines beneficial uses and water quality objectives for waters of the State, including surface waters and groundwaters.

### **BENEFICIAL USES**

26. The existing and potential beneficial uses of the ground water in the area are:
- a. Drinking water;
  - b. Municipal Supply;
  - c. Industrial Process and Service Supply; and,
  - d. Agricultural Supply.
27. The existing and potential beneficial uses of the Suisun Bay are:
- a. Industrial Process and Service Supply;
  - b. Navigation;
  - c. Water Contact Recreation;
  - d. Non-Contact Recreation;
  - e. Ocean Commercial and Sport Fishing;
  - f. Wildlife Habitat;
  - g. Preservation of Rare and Endangered Species;
  - h. Fish Migration and Spawning; and,
  - i. Estuary Habitat.

### **CALIFORNIA ENVIRONMENTAL QUALITY ACT**

28. This action is exempt from the provisions of the California Environmental Quality Act pursuant to Section 15301, Title 14 of the California Code of Regulations.
29. All existing waste management units listed in this Order are subject to this Order.

## **NOTIFICATIONS AND MEETING**

30. The Board notified the Dischargers and interested agencies and persons of its intent to prescribe waste discharge requirements for discharges from the site and has provided them with an opportunity for a public meeting and an opportunity to submit their written views and recommendations.
31. The Board in a public meeting heard and considered all comments pertaining to the discharge.

**IT IS HEREBY ORDERED** that the Dischargers, their agents, successors and assigns shall meet the applicable provisions contained in Title 27, Division 2, of the California Code of Regulations and Division 7 of the California Water Code, and shall comply with the following:

### **A. PROHIBITIONS**

1. Migration of pollutants through subsurface transport to waters of the State is prohibited.
2. There shall be no discharge of wastes to surface waters except as permitted under the National Pollutant Discharge Elimination System.
3. The treatment, discharge or storage of materials which may impact the beneficial uses of ground or surface water shall not be allowed to create a condition of pollution or nuisance as defined in Sections 13050 (l) and (m), respectively, of the California Water Code.
4. The discharge of hazardous waste at the Facility is prohibited. For the purpose of this Order, the term hazardous waste is as defined in Title 23, Article 2 of Chapter 15.
5. The disposal of any wastes or waste contaminated fill/materials placed into or on top of any solid waste management unit (SWMU) is prohibited.
6. Activities associated with subsurface investigations and cleanup that will cause significant adverse migration of pollutants are prohibited.
7. The creation of any new waste management unit is prohibited without prior approval by the Regional Board.
8. The Dischargers shall not cause the following conditions to exist in waters of the State at any place outside the waste management facility:
  - a. Surface Waters
    1. Floating, suspended, or deposited macroscopic particulate matter or foam.

2. Bottom deposits or aquatic growth.
3. Alteration of temperature, turbidity, or apparent color beyond natural background levels.
4. Visible, floating, suspended or deposited oil or other products of petroleum origin.
5. Toxic or other deleterious substances to be present in concentrations or quantities which may 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 concentrations.

b. Groundwater

1. The groundwater shall not be degraded as a result of the waste disposal operation.

B. **SPECIFICATIONS**

1. The Dischargers shall maintain the waste units to prevent discharges, such that the units do not constitute a significant pollution source.
2. The Dischargers shall cleanup pollution at the site in accordance with any approved cleanup plan required by this Order.
3. The Dischargers shall install reasonable additional groundwater devices required to fulfill the terms of any Discharge Monitoring Program required by the Executive Officer.
4. This Board considers the property owner and site operator to have continuing responsibility for correcting any problems, which arise in the future as a result of waste discharge or related operations or site use.
5. The Dischargers shall maintain groundwater or remediation devices or design features installed in accordance with this Order such that they continue to operate as intended without interruption, with the exception of periodic maintenance.
6. The Dischargers shall conduct monitoring activities as specified in this Order. Should monitoring results show evidence of plume migration, additional plume characterization of pollutant extent may be required.

7. All reports pursuant to this Order shall be prepared under the supervision of a registered civil engineer, a California registered geologist, or certified engineering geologist.
8. The Dischargers shall comply with all applicable provisions of Title 27 and/or Chapter 15.
9. The Dischargers shall install, maintain in good working order, and operate efficiently any facility, alarm, groundwater extraction system, or hydraulic/contaminant migration control system necessary to assure compliance with these Waste Discharge Requirements.
10. The Dischargers shall not excavate within or reconfigure any waste management unit without prior approval from the Regional Board Executive Officer. Additionally, waste shall not be exposed at the surface of any SWMU.
11. The units shall be graded and slope maintained in order to promote lateral runoff of precipitation and to prevent ponding on the unit with the exception of the active portions of the wastewater treatment plant and ponding that occurs intermittently on units that do not contribute to the degradation of the beneficial uses of State waters.
12. Installation and operation of groundwater remediation systems at any unit shall be implemented where the unit is identified as a significant pollution source.
13. The Dischargers shall **annually demonstrate** (include in Annual Report) that all installed groundwater remedial systems including, but not limited to; groundwater containment, treatment, and/or extraction systems are functioning as intended and designed. (See Provision D.5 for details)
14. Any waste management unit, which the Dischargers propose to close, shall be closed according to a closure plan prepared according to all applicable requirements of Title 27, and approved by the Executive Officer.

Photo Documentation

15. Tosco shall submit photographic documentation of any soil or groundwater corrective action features installed at the Facility, and of any petroleum spill which is required to be reported. A map shall be provided which identifies the location of any petroleum spill. (Also see Provision D.10)

#### Surface Impoundments

16. If it is determined by the Executive Officer that a surface impoundment is degrading beneficial uses, there shall be no discharges to a surface impoundment, and residual liquids and sludges shall be removed expeditiously.
17. The impoundments will be operated such that scouring at points of discharge and by wave action at the water line will not degrade the pond containment features.
18. The pipeline discharge to surface impoundments shall be either equipped with devices, or fail-safe operating procedures, to prevent overflowing. The surface impoundments shall always maintain at least 2 feet of freeboard.
19. Tosco shall operate the surface impoundments according to a detailed operating and contingency plan, which will include at a minimum, procedures for routine inspection of the surface impoundments, discharge into a pond, discharge out of a pond, contingency measures if problems with the containment structures are found, and notification of agencies.

#### Free Phase Liquid Hydrocarbon Recovery Program

20. The Dischargers shall extract FPLH in accordance with Table 3 of the SMR&P, from beneath the Facility including FPLH originating from any waste management unit. Dissolved pollutants shall be removed where concentrations are determined to be a threat to the beneficial uses of State waters.

#### Aboveground Petroleum Storage Tanks

21. Tosco shall comply with the requirements of Chapter 6.67 Section 25270 of the Health and Safety Code, and with Part 112, Title 40 of the Federal Code of Regulations.
22. **Leak Detection Systems:** All regulated tanks shall be monitored to assure that petroleum products will not discharge to surface and subsurface waters of the State. All tanks shall be fitted with leak detection bottoms, leak prevention systems, or with a tank leak detection monitoring system/method approved by the Executive Officer.
23. **Internal Tank Inspections:** All regulated tanks shall have their tank bottoms tested (using API Standard 653 or the most current industry or regulatory approved standard) for integrity and thickness. The inspection time interval shall be no more than 20 years and the interval will be dependant on the likelihood of tank bottom corrosion and the age of the tank. A summary of inspection results shall be reported to the Board annually.

C. General Monitoring Specifications

1. Tosco shall operate each active waste management unit so as not to cause a degradation of the beneficial uses of State waters.
2. All monitoring wells shall be constructed in a manner that maintains the integrity of the drill hole, prevents cross-contamination of saturated zones, and produces representative groundwater samples from discrete zones within the groundwater zone each well is intended to monitor.
3. All borings for monitoring wells shall be continuously cored. The drill holes shall be logged during drilling under the direct supervision of a registered geologist whose signature appears on the corresponding well log. Logs of monitoring wells shall be filed with the Department of Water Resources. All information used to construct the wells shall be submitted to the Board upon completion of the wells.
4. All soil and groundwater samples shall be analyzed by State certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All Laboratories shall maintain quality assurance/control records for the Board staff to review.
5. The groundwater sampling and analysis program shall ensure that groundwater quality data are representative of the groundwater in the area which is monitored.
6. The Dischargers will monitor the perimeter of the Facility for Constituents of Concern which are derived from each unit and within each perimeter area segment. If established Trigger Levels are exceeded at the perimeter, corrective action at the perimeter must be evaluated. Trigger Levels for the Facility may be re-evaluated in the future based on the outcome of ongoing USEPA investigations and risk assessments for the site.
7. The Dischargers shall monitor for all Constituents of Potential Concern (COPC) **once every five years** and for each Constituent of Concern at intervals determined in the SM&RP.
8. In the event of a release of a Constituent Of Concern (COC) at a concentration greater than the Trigger Levels beyond the Perimeter Compliance Point (Perimeter Segment) the Dischargers shall evaluate the need for corrective action.
9. If it is determined by the Executive Officer, based on groundwater monitoring information, that water quality impairment immediately outside the boundary of any waste management unit continues to degrade, the

Dischargers will be required to submit and implement a site specific groundwater corrective action proposals.

10. Additional Monitoring Points and Actions If the Executive Officer determines the existence of an imminent threat to the beneficial uses of surface or subsurface waters of the State, the Dischargers may be required to install additional groundwater monitoring wells and/or undertake corrective action measures.

D. **PROVISIONS**

All technical and monitoring reports required to be submitted pursuant to this Order are being requested pursuant to Section 13267 of the California Water Code. Failure to submit reports in accordance with schedules established by this Order or failure to submit a report of sufficient technical quality to be acceptable to the Executive Officer may subject the Dischargers to enforcement action pursuant to Section 13268 of the California Water Code.

1. The Dischargers shall comply with all Prohibitions, Specifications and Provisions of this Order, immediately upon adoption of this Order or as provided below. All report submittals must be acceptable to the Executive Officer.
2. Technical reports/plans, submitted by the Dischargers, in compliance with the Prohibitions, Specifications, and Provisions of this Order shall be submitted to the Board on the schedule specified herein. These reports/plans shall consist of a letter report that includes the following:
  - a. Identification of any obstacles which may threaten compliance with the schedule;
  - b. In the event of non-compliance with any Prohibition, Specification or Provision of this Order, written notification which clarifies the reasons for non-compliance and which proposes specific measures and a schedule to achieve compliance. This written notification shall identify work not completed that was projected for completion, and shall identify the impact of non-compliance on achieving compliance with the remaining requirements of this Order; and,
  - c. In the self-monitoring reports (See attached SM&RP), an evaluation of the current groundwater monitoring system and a proposal for modifications as appropriate.
3. For each Perimeter Segment (Figure 3) subject to this Order, Trigger Levels shall be established for the associated constituents of concern (COCs). Trigger Levels, updated COCs, and methods for validating data and statistically evaluating whether a Trigger Level exceedance is significant shall be proposed by the Dischargers for approval by the Executive Officer.

The Dischargers shall meet the requirements of this provision according to the following schedule.

- a. The Dischargers shall prepare a list that identifies updated COCs, for each perimeter segment (Segments 1-16)  
**PROPOSED COCs DUE: April 20, 2000**
  - b. The Dischargers shall submit for approval by the Executive Officer, Trigger Levels for each Perimeter Segment Area COCs (Segments 1-16). Approved Trigger Levels shall be attached to the SM&RP and identified as Table 4. The Dischargers shall also propose methods for validating data and statistically evaluating whether an exceedance of a Trigger Level concentration in a perimeter groundwater monitoring well is significant.  
**REPORT DUE: April 20, 2000**
4. Several solid inactive waste management units including WMU 10, WMU 11, and WMU-14 periodically store ponded water. The Dischargers shall identify all WMUs where ponded water occurs and submit a plan and schedule to eliminate ponding on top of the waste units. This Provision does not apply to active portions of the wastewater treatment plant and ponding that occurs intermittently on units that do not contribute to the degradation of the beneficial uses of State waters.  
**PLAN AND SCHEDULE DUE: September 30, 2000**
5. The Dischargers shall include in the annual report a **Groundwater and FPLH Collection and Control System Performance Evaluation Report**. This report shall include future groundwater extraction or FPLH recovery or treatment systems. The report shall include the following components:
- a. For all recovery systems installed after adoption of this Order, include as-built construction designs or shop drawings for each recovery system, which includes detailed cross sectional drawings or well logs, as appropriate.
  - b. An extraction/treatment system operation plan, maintenance plan, and maintenance schedule for each recovery system.
  - c. System Performance: The Dischargers shall periodically demonstrate that all groundwater quality control and extraction/treatment systems are effectively controlling groundwater quality at the Perimeter Segements. The system performance evaluation shall include an establishment of flow capture zones by modeling, or field measurements, pump performance, and presentation of chemical monitoring data, to demonstrate containment, capture, and removal of pollutants. The report shall also detail extraction system influences to groundwater or surface water levels in adjacent marsh/wetlands.

**REPORT DUE: December 30, 2000**  
**PERIODIC SYSTEM PERFORMANCE REPORT DUE:**  
**thereafter, every year by December 30<sup>th</sup>.**

**Aboveground Petroleum Storage Tanks**

- 6a. Leak Detection: Tosco shall submit a leak detection plan and schedule for each regulated aboveground petroleum tanks which are not equipped with leak detection systems or utilize groundwater wells for petroleum tank leak detection systems. All regulated tanks must be fully upgraded with approved leak detection systems by November 2020. A summary of upgraded tanks shall be reported to the Board annually

**PLAN AND SCHEDULE DUE: June 30, 2000**

**FIRST ANNUAL SUBMITTAL DUE: December 30, 2000**

**Thereafter every December 30<sup>th</sup>.**

- 6b. Tank Bottom Testing: All regulated tanks shall have their bottoms tested (using API Standard 653 or the most current regulatory approved standard) for integrity and thickness. The inspection time interval shall be no more than 20 years and the interval will be dependent on the likelihood of tank bottom corrosion and the age of the tank. A report shall be submitted that identifies all regulated aboveground petroleum storage tanks at the facility. The report shall also include: tank age, tank contents, type of tank bottom, date of last internal integrity and thickness test, tanks which have not had internal integrity and thickness tests within the last 20 years, and a schedule for tank integrity and thickness testing for all regulated tanks. A summary of inspection results shall be reported to the Board annually.

**REPORT DUE: June 30, 2000**

**ANNUAL SUBMITTAL DUE: December 30<sup>th</sup>**

- 6c. Secondary Containment: Tosco shall submit a technical report, which includes a detailed map identifying all tanks regulated under Chapter 6.67, Section 25270 of the Health and Safety Code, and Part 112 of the Federal Code Of Regulations. Secondary containment features for all regulated storage tanks shall be identified on the map. Arrows identifying the direction of petroleum flow from a regulated tank to the containment area shall be drawn on the map unless the secondary containment consists of berms that immediately surround the tank.

Tosco shall identify in the report tanks where sudden petroleum releases may impact large areas (soil and/or surface water) within the refinery, or along the perimeter of the refinery. Tosco shall document in the report any deficiencies in the regulated tank's secondary containment features and include recommendations for improving secondary aboveground tank containment features.

**REPORT DUE: August 30, 2000**

- 6d. Amorco Terminal (Martinez Bridge area) Tanks: Tosco shall comply with Provisions 6a, 6b, and 6c above for all active Amorco Terminal aboveground petroleum storage tanks. Additionally, Tosco shall prepare a technical submittal that includes the following:
- Identification of past releases and a summary of soil and groundwater investigations within the Amorco tank area.
  - Based on petroleum hydrocarbon impacts to soil or groundwater within the vicinity of tank area Tosco shall evaluate the need for additional investigations and/or corrective action within the tank area.

**SUBMITTAL DUE: October 30, 2000**

**Free Phase Liquid Hydrocarbons**

- 7a. The Dischargers shall submit a report and map that identifies all wells within the Facility that contain free phase liquid hydrocarbons (FPLH). The report and map shall identify the following: location of wells where FPLH is recovered and a description of the type of FPLH recovery method, recent FPLH thickness, and frequency of FPLH recovery. The report shall identify wells that contain FPLH with apparent FPLH, but that are not part of an FPLH recovery program.

**REPORT AND MAP DUE: April 30, 2000**

- 7b. The Dischargers shall submit a plan and schedule for a FPLH recovery program for all wells that contain FPLH. A table shall be included in the plan and shall summarize all wells where FPLH is present, and the FPLH recovery method. Table 3 will be attached to the SM&RP and updated annually by the Dischargers. A detailed performance summary of the FPLH recovery program shall be reported to the Board annually and shall include: tabulated recovery volume data, graphical representations of monthly production and cumulative production data for each active FPLH recovery well, description of operation limitations and corrective actions or repairs made, and plans for modification of the system over the following year.

**PLAN AND SCHEDULE DUE: July 30, 2000**

**ANNUAL SUMMARY DUE: December 30<sup>th</sup>**

- 7c. Wells containing FPLH shall not be sampled for groundwater analyses. A map showing the location of these wells shall be combined with the well location map, which must accompany the monitoring reports.

8. The Dischargers shall submit a report which evaluates the benefits of installing additional downgradient groundwater monitoring wells along the perimeter of WMU-10, and along Perimeter Segments 1, 7, 11, and 15 where current well spacing may not detect offsite releases.

**EVALUATION DUE: November 30, 2000**

9. The Dischargers shall implement any Discharge Monitoring Program (SM&RP) issued by the Executive Officer.
10. Tosco shall notify this Board of any reportable quantity, (42 gallons or more), of oil or petroleum product spilled or leaked from the facility to any ground surface not protected by a non-permeable barrier. Verbal notification to the Regional Water Quality Control Board of the spillage shall be within one working day of knowledge of the spill and shall be followed up with a written description of the spill to include: the nature and volume of spillage, total area and/or soil volume affected, location map of spillage, and a before-cleanup and after-cleanup photograph of the spill site.  
**REPORT DUE: Effective upon adoption of this Order and Within 14 calendar days from occurrence of the spill**
11. The Dischargers shall obtain and maintain a **Financial Assurance Instrument** acceptable to the Executive Officer until the end of the Post-Closure Maintenance Period for any classified waste management unit subject to the California Code of Regulations Title 27, Chapter 6, Subdivision 1, Division 2. The Dischargers shall submit a report every five years that either validates the Instrument's ongoing viability or proposes and substantiates any needed changes (e.g., a documented increase in the monitoring systems' ability to provide reliable early detection of a release can cause a decrease in the Instrument's financial coverage). For the purposes of planning the amount of the fund, The Dischargers shall assume a post-closure period of at least 30 years. However, the post-closure maintenance period shall extend as long as the wastes pose a threat to water quality.  
**INITIAL REPORT DUE DATE: May 20, 2000 and every five years thereafter.**
12. Tosco shall submit a detailed **Post Earthquake Inspection Report** acceptable to the Executive Officer, in the event of any earthquake generating ground shaking of Richter Magnitude 7 or greater at or within 30 miles of the Facility. The report shall describe the containment features, groundwater monitoring, and control facilities potentially impacted by the static and seismic deformations of any waste management unit. Damage to any waste containment facility which may impact State waters must be reported immediately to the Executive Officer.  
**REPORT DUE: Within 2 weeks of Earthquake**
13. **CHANGE IN OWNERSHIP**  
In the event of any change in control or ownership of the facility presently owned or controlled by Tosco , Tosco shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be

immediately forwarded to this office. To assume operation of this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of this Order within 30 days of the change of ownership. 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. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code.

14. **DUTY TO COMPLY**

The Dischargers must comply with all conditions of these waste discharge requirements. Violations may result in enforcement actions, including Regional Board orders or court orders requiring corrective action or imposing civil monetary liability, or in modification or revocation of these waste discharge requirements by the Regional Board. [CWC Section 13261, 13263, 13265, 13268, 13300, 13301, 13304, 13340, 13350].

15. **GENERAL PROHIBITION**

Neither the treatment nor the discharge of waste shall create a pollution, contamination or nuisance, as defined by Section 13050 of the California Water Code (CWC). [H & SC Section 5411, CWC Section 13263]

16. **AVAILABILITY**

A copy of these waste discharge requirements shall be maintained at the discharge facility and be available at all times to operating personnel. [CWC Section 13263]

17. **CHANGE IN DISCHARGE**

In the event of a material change in the character, location, or volume of a discharge, the Dischargers shall file with this Regional Board a new Report of Waste Discharge. [CWC Section 13260(c)]. A material change includes, but is not limited to, the following:

- (a) Addition of a major industrial waste discharge to discharge of essentially domestic sewage, or the addition of a new process or product by an industrial facility resulting in a change in the character of the waste.
- (b) Significant change in disposal method, e.g., change from a land disposal to a direct discharge to water, or change in the method of treatment which would significantly alter the characteristics of the waste.
- (c) Significant change in the disposal area, e.g., moving the discharge to another drainage area, to a different water body, or to a disposal area significantly removed from the original area potentially causing different water quality or nuisance problems.

- (d) Increase in flow beyond that specified in the waste discharge requirements.
  - (e) Increase in area or depth to be used for solid waste disposal beyond that specified in the waste discharge requirements [CCR Title 23 Section 2210]
18. **REVISION**  
These waste discharge requirements are subject to review and revision by the Regional Board. [CCR Section 13263]
19. **TERMINATION**  
Where the Dischargers become aware that it failed to submit any relevant facts in a Report of Waste Discharge or submitted incorrect information in a Report of Waste Discharge or in any report to the Regional Board, it shall promptly submit such facts or information.[CWC Sections 13260 and 13267]
20. **VESTED RIGHTS**  
This Order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, do not protect the Dischargers from his liability under Federal, State or local laws, nor do they create a vested right for the Dischargers to continue the waste discharge. [CWC Section 13263(g)]
21. **SEVERABILITY**  
Provisions of these waste discharge requirements are severable. If any provision of these requirements are found invalid, the remainder of these requirements shall not be affected. [CWC 9213]
22. **OPERATION AND MAINTENANCE**  
The Dischargers shall, at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Dischargers to achieve compliance with conditions of this Order. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls including appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this order.[CWC Section 13263(f)]

23. **RELEASES**

Except for a discharge which is in compliance with these waste discharge requirements, any person who, without regard to intent or negligence, causes or permits any hazardous substance or sewage to be discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, shall, as soon as (a) that person has knowledge of the discharge, (b) notification is possible, and (c) notification can be provided without substantially impeding cleanup or other emergency measures, immediately notify the office of Emergency Services of the discharge in accordance with the spill reporting provision of the state toxic disaster contingency plan adopted pursuant to Article 3.7 (commencing with Section 8574.7) of Chapter 7 of Division 1 of Title 2 of the Government Code, and immediately notify the State Board or the appropriate Regional Board of the discharge. This provision does not require reporting of any discharge of less than a reportable quantity as provided for under subdivisions (f) and (g) of Section 13271 of the Water Code unless the Dischargers are in violation of a prohibition in the applicable water Quality Control Plan. [CWC Section 13271(a)]

24. **PETROLEUM RELEASES**

Except for a discharge which is in compliance with these waste discharge requirements, any person who without regard to intent or negligence, causes or permits any oil or petroleum product to be discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, shall, as soon as (a) such person has knowledge of the discharge, (b) notification is possible, and (c) notification can be provided without substantially impeding cleanup or other emergency measures, immediately notify the Office of Emergency Services of the discharge in accordance with the spill reporting provision of the State oil spill contingency plan adopted pursuant to Article 3.5 (commencing with Section 8574.1) of Chapter 7 of Division 1 of Title 2 of the Government Code. This provision does not require reporting of any discharge of less than 42 gallons unless the discharge is also required to be reported pursuant to Section 311 of the Clean Water Act or the discharge is in violation of a prohibition in the applicable Water Quality Control Plan. (CWC Section 13272]

25. **ENTRY AND INSPECTION**

Tosco shall allow the Regional Board, or an authorized representative upon the presentation of credentials and other documents as may be required by law, to:

- (a) Enter upon Tosco's premises, in accordance with Tosco's health and safety procedures, where a regulated facility or activity is

located or conducted, or where records must be kept under the conditions of this order;

- (b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this order;
- (c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and
- (d) Sample or monitor at reasonable times, for the purposes of assuring compliance with this order or as otherwise authorized by the California Water Code, any substances or parameters at any location. [CWC Section 13267]

26. **MONITORING DEVICES**

All monitoring instruments and devices used by the Dischargers to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy. All flow measurements devices shall be calibrated at least once per year, or more frequently, to ensure continued accuracy of the devices. Annually, the Dischargers shall submit to the Executive Officer a written statement signed by a registered professional engineer certifying that all flow measurement devices have been calibrated and will reliably achieve the accuracy required.

Unless otherwise permitted by the Regional Board Executive officer, all analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services. The Regional Board Executive Officer may allow use of an uncertified laboratory under exceptional circumstances, such as when the closest laboratory to the monitoring location is outside the State boundaries and therefore not subject to certification. All analyses shall be required to be conducted in accordance with the latest edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants" (40 CFR Part 136] promulgated by the U.S. Environmental Protection Agency. [CCR Title 23, Section 2230]

27. **ENDANGERMENT OF HEALTH AND ENVIRONMENT**

The Dischargers shall report any noncompliance which may endanger health or the environment. Any such information shall be provided orally to the Executive officer within 24 hours from the time the Dischargers become aware of the circumstances. A written submission shall also be provided within five days of the time the Dischargers become aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected;

the anticipated time it is expected to continue and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. The Executive Officer, or an authorized representative, may waive the written report on a case-by case basis if the oral report has been received within 24 hours. The following occurrences must be reported to the Executive Officer within 24 hours;

- (a) Any bypass from any portion of the treatment facility.
- b) Any discharge of treated or untreated wastewater resulting from sewer line breaks, obstruction, surcharge or any other circumstances.
- (c) Any treatment plant upset which causes the effluent limitation of this Order to be exceeded. [CWC Sections 13263 and 13267]

28. **MAINTENANCE OF RECORDS**

The Dischargers shall retain records of all monitoring information including all calibration and maintenance records, all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this order. Records shall be maintained for a minimum of three years from the date of the sample, measurement, report, or application. This period may be extended during the course of any unresolved litigation regarding this discharge or when requested by the Regional Board Executive officer.

Records of monitoring information shall include:

- (a) The date, exact place, and time of sampling or measurements;
  - (b) The individuals who performed the sampling or measurements;
  - (c) The date(s) analyses were performed.
  - (d) The individuals who performed the analyses;
  - (e) The analytical techniques or method used; and
  - (f) The results of such analyses.
29. (a) All application reports or information to be submitted to the Executive officer shall be signed and certified as follows:
- (1) For a corporation -- by a principal executive officer or the level of vice president.
  - (2) For a partnership or sole proprietorship -- by a general partner or the proprietor, respectively.
  - (3) For a municipality, state, federal, or other public agency -- by either a principal executive officer or ranking elected official.

(b) A duly authorized representative of a person designated in paragraph (a) of this provision may sign documents if:

- (1) The authorization is made in writing by a person described in paragraph (a) of this provision.
- (2) The authorization specifies either an individual or position having responsibility for the overall operation of the regulated facility or activity; and
- (3) The written authorization is submitted to the Executive Officer.

Any person signing a document under this Section shall make the following certification: "I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. [CWC Sections 13263, 13267, and 13268]

30. Order No. 92-078 is herewith rescinded.

31. This Order is subject to Board review and updating, as necessary, to comply with changing State or Federal laws, regulations or policies, or guidelines; changes in the Boards Basin Plan; or changes in discharge characteristics.

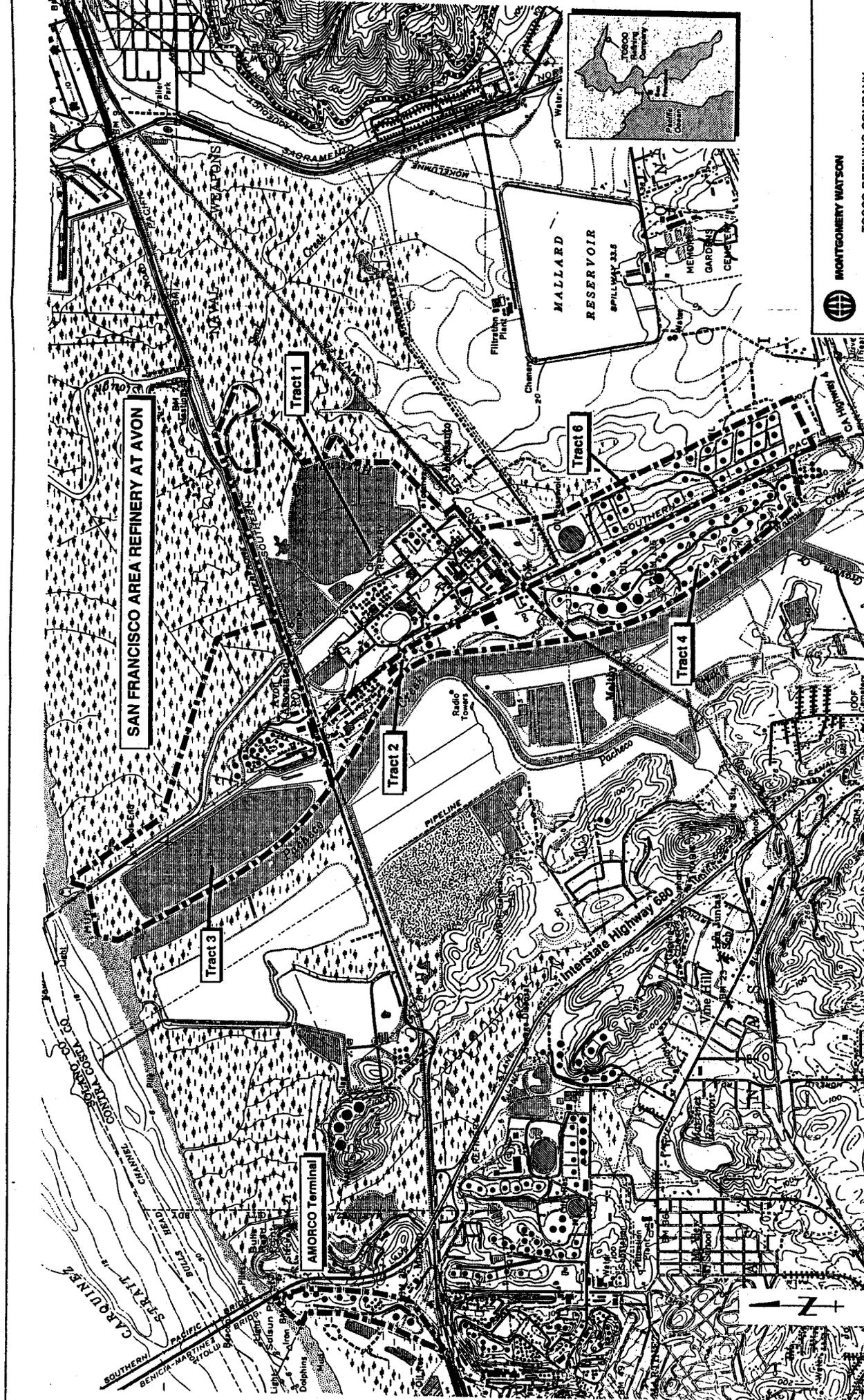
I, Lawrence P. Kolb, Assistant Executive Officer, do hereby certify that the foregoing is a full, complete, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on October 20, 1999.



Lawrence P. Kolb  
Assistant Executive Officer

Attachments:

1. Figure 1: Site Location and Tract Plan Map
2. Figure 2: Waste Unit Location Map
3. Figure 3: Perimeter Segment Map
4. Attachment 1: Self-Monitoring and Reporting Program (SM&RP)



SAN FRANCISCO AREA REFINERY AT AVON

Tract 1

Tract 2

Tract 6

Tract 4

AMORCIO Terminal

MALLARD RESERVOIR

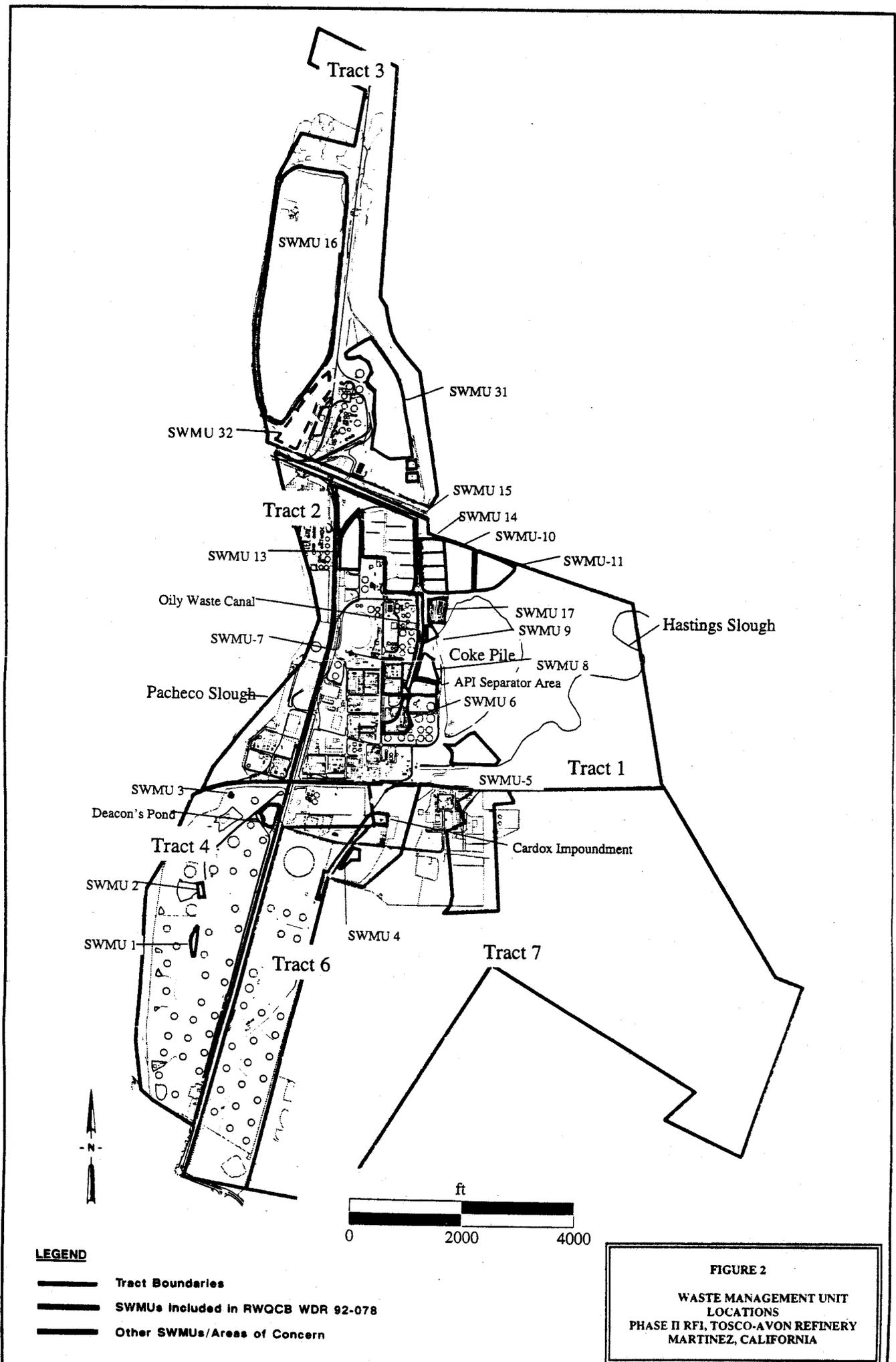
MONTGOMERY WATSON

TOSCO REFINING COMPANY  
SAN FRANCISCO AREA REFINERY AT AVON  
SITE LOCATION AND TRACT PLAN MAP



USGS Topographic Map 7.5', Vine Hill CA Quad., 1980.

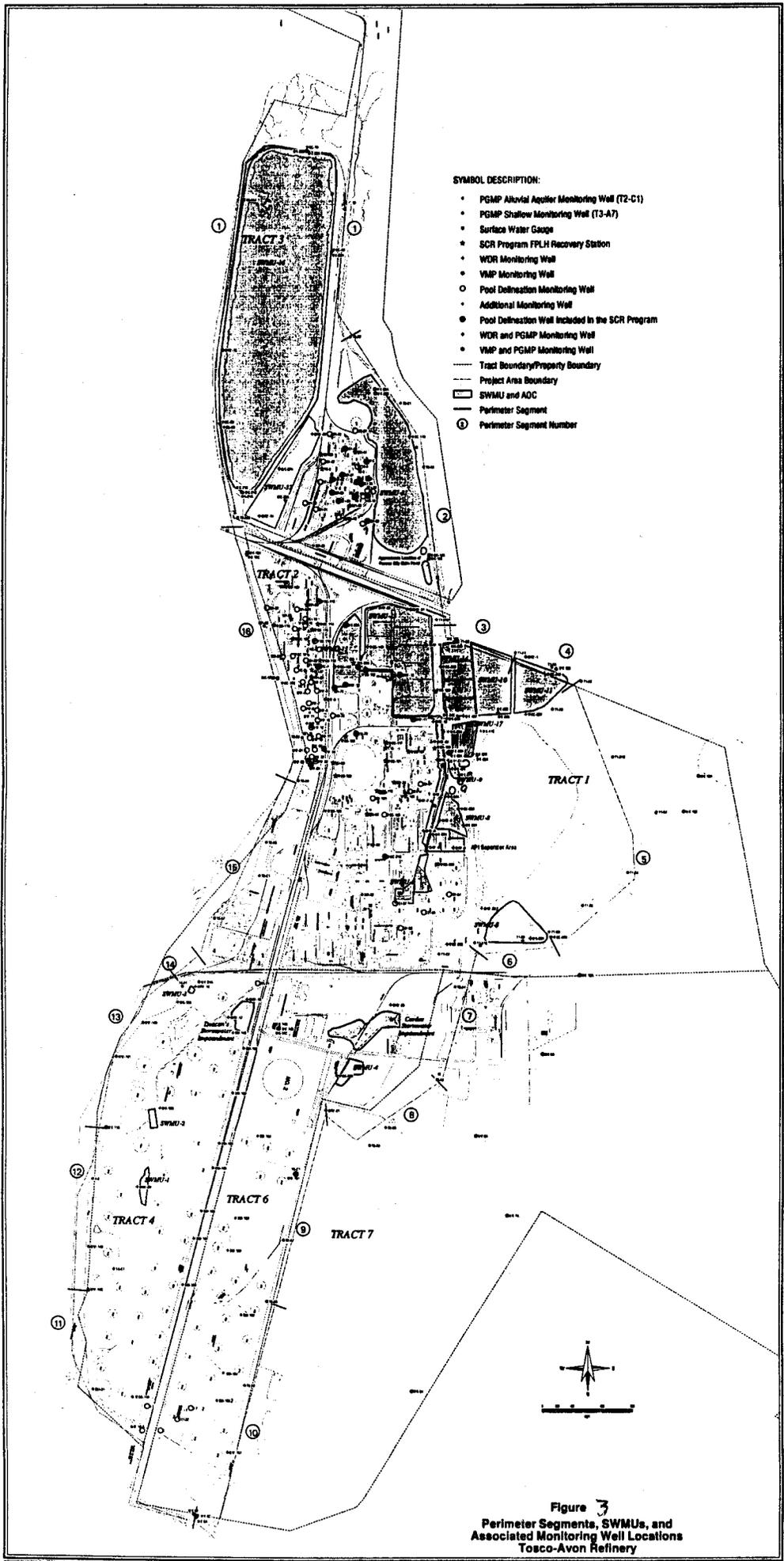
FIGURE 1



**LEGEND**

-  Tract Boundaries
-  SWMUs Included in RWQCB WDR 92-078
-  Other SWMUs/ Areas of Concern

**FIGURE 2**  
 WASTE MANAGEMENT UNIT  
 LOCATIONS  
 PHASE II RFI, TOSCO-AVON REFINERY  
 MARTINEZ, CALIFORNIA



**Figure 3**  
**Perimeter Segments, SWMUs, and**  
**Associated Monitoring Well Locations**  
**Tosco-Avon Refinery**

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD**

**SAN FRANCISCO BAY REGION**

**SELF MONITORING AND REPORTING PROGRAM**

**FOR**

**TOSCO REFINING COMPANY AND TOSCO CORPORATION PHILLIPS  
PETROLEUM COMPANY, AND TEXACO REFINING AND MARKETING INC.**

**SAN FRANCISCO AREA REFINERY AT AVON**

**CONTRA COSTA COUNTY**

**ORDER NO. 99-083**

**CONSIST OF**

**PART A**

**AND**

**PART B**

## PART A

### A. GENERAL

Reporting responsibilities of waste dischargers are specified in Sections 13225(a), 13267(b), 13383, and 13387(b) of the California Water Code and this Regional Board's Resolution No.73-16. This Self-Monitoring Program is issued in accordance with Section D.9 of Regional Board Order No. 99-083.

The principal purposes of a self-monitoring program by a waste discharger are:

- (1) to document compliance with waste discharge requirements and prohibitions established by the Board,
- (2) to facilitate self-policing by the waste discharger in the prevention and abatement of pollution arising from waste discharge,
- (3) to develop or assist in the development of effluent standards of performance, pretreatment and toxicity standards, and other standards, and (4) to prepare water and wastewater quality inventories,
- (4) to assist the discharger in complying with the requirements of Title 27.

### B. SAMPLING AND ANALYTICAL METHODS

#### Sampling

Sample collection, storage, and analyses shall be performed according to most recent version of EPA Standard Methods for the Analysis of Wastewater and in accordance with an approved sampling and analysis plan.

Water and wastewater analysis shall be performed by a laboratory approved for these analyses by the State of California. The director of the laboratory whose name appears on the certification shall supervise all analytic work in his/her laboratory and he/she or their authorized representative shall sign all reports of such work submitted to the Regional Board.

All monitoring instruments and equipment shall be properly calibrated and maintained to ensure accuracy of measurements.

### C. DEFINITION OF TERMS

1. A grab sample is a discrete sample collected at any time.
2. A composite sample is a sample composed of individual grab samples mixed in proportions varying not more than plus or minus five percent from the instantaneous rate of waste flow corresponding to each grab sample collected at regular intervals not greater than one hour, or collected by the use of continuous automatic sampling devices capable of attaining the

proportional accuracy stipulated above throughout the period of discharge or 24 consecutive hours, whichever is shorter.

3. Receiving waters refers to any water which actually or potentially receives surface or groundwater which pass into, through, or under the waste management units or contaminated soils. The receiving waters are the groundwater beneath and adjacent to the waste management units, the surface runoff from the site, and the drainage ditches surrounding the site. San Francisco Bay or it's subbasins or nearby streams into which water from the unit discharges are considered receiving waters.
4. Standard observations refer to:
  - a. Receiving Waters
    - 1) Floating and suspended materials of waste origin: presence or absence, source, and distance of travel.
    - 2) Discoloration and turbidity: description of color, source, and nature of material.
    - 3) Evidence of algal or other unusual growth presence or absence.
    - 4) Evidence of odors, presence or absence, characterization, source, and distance of travel from source.
    - 5) Evidence of beneficial use: presence of water associated wildlife.
    - 6) Flow rate.
    - 7) Weather conditions: wind direction and estimated velocity, total precipitation during previous five days and day of observations.
  - b. Perimeter of the waste management unit.
    - 1) Evidence of liquid leaving or entering the waste management unit, estimated size of affected area. (Show affected area on map)
    - 2) Evidence of algal or other unusual growth, presence or absence, characterization, mineral or salt deposition.
    - 3) Evidence of erosion and/or daylighted waste material.

- c. The waste management unit.
  - 1) Evidence of algal or other unusual growth. Precipitation of sludge or minerals, quantity, nature and chemical composition.
  - 2) Evidence of erosion and/or daylighted waste material.
  - 3) Evidence of odors, presence or absence, characterization, source and distance of travel from source.

#### **D. SCHEDULE OF SAMPLING, ANALYSIS, AND OBSERVATIONS**

The Dischargers' are required to perform sampling, analysis, and observations according to the schedule specified in Part B, and the sampling and analysis plan, in the following media:

- 1. Groundwater per Title 27, Section 20415(b)
- 2. Surface water per Title 27, Section 20415(c)
- 3. Per the general requirements specified in Title 27, Section 20415(e)

#### **E. RECORDS TO BE MAINTAINED**

Written detection monitoring reports shall be maintained by the Dischargers or laboratory and shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or when requested by the Board. Such records shall show the following for each sample:

- 1. Identity of sample and sample station number.
- 2. Date and time of sampling.
- 3. Date and time that analyses are started and completed, and name of the personnel performing the analyses.
- 4. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used. A reference to a specific section of standard EPA methods.
- 5. Calculation of results.
- 6. Results of analyses, and detection limits for each analyses.

## F. REPORTS TO BE FILED WITH THE BOARD

1. The **semi-annual self-monitoring reports** shall be filed on **June 30th and December 30th**. The semi-annual reports shall be comprised of at least the following:

- a. Letter of Transmittal

A letter transmitting the essential points in each report should accompany each submittal. Such a letter shall include a discussion of **any requirement violations** found during the last report period, and actions taken or planned for correcting the violations. If the Dischargers have previously submitted a detailed time schedule for correcting requirement violations, a reference to the correspondence transmitting such schedule will be satisfactory. If no violations have occurred in the last report period this shall be stated in the letter of transmittal. Monitoring reports and the letter transmitting the monitoring reports shall be signed by a principal executive officer at the level of vice president or his duly authorized representative, if such representative is responsible for the overall operation of the Facility from which the discharge originates. The letter shall contain a statement by the official, under penalty of perjury, that to the best of the signer's knowledge the report is true, complete, and correct.

- b. Each semi-annual monitoring report shall include a compliance evaluation summary. The summary shall contain but not be limited to:

- 1) Groundwater flow and direction: A facility wide groundwater contour map based upon the past and present water level elevations and pertinent visual observations.
- 2) The method and time of water level measurement, the type of pump used for purging, pump placement in the well; method of purging, pumping rate, equipment and methods used to monitor field pH, temperature, and conductivity during purging, calibration of the field equipment, results of the pH, temperature, and conductivity testing, and method of disposing of the purge water.
- 3) A written discussion of the groundwater analyses indicating any change in the quality of the groundwater. Increasing pollutant concentration trends in any Waste Management Unit shall be noted

and flagged, and any exceedance of Trigger Levels within any perimeter segment well shall be noted and flagged.

- 4) Type of pump used, pump placement for sampling, a detailed description of the sampling procedure; number and description of equipment, field and travel blanks; number and description of duplicate samples; type of sample containers and preservatives used, the date and time of sampling, the name and qualifications of the person actually taking the samples, and any other observations.
  - 5) A description of aboveground petroleum storage tanks that have received leak detection upgrades or internal integrity inspections during the prior reporting period, and identification of aboveground petroleum storage tanks that are scheduled for leak detection upgrades or internal integrity inspections during the reporting period.
  - 6) A summary of upcoming work scheduled during a six-month period related to remediation or investigations at the site.
- c. A comprehensive discussion of the compliance record, and the corrective actions taken or planned which may be needed to bring the Dischargers into full compliance with the waste discharge requirements.
  - d. A map or aerial photograph shall accompany each report showing observation and monitoring station locations.
  - e. Laboratory analytical results must be included in each report. In accordance with the Executive Officer's November 5, 1996 letter, laboratory statements and other raw data are not required to be submitted, however; the data must be retained by the Dischargers for a minimum of six years after origination and the data must be made available for Board staff upon request. The director of the laboratory whose name appears on the laboratory certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Board.
    - 1) The methods of analyses and detection limits must be appropriate for the expected concentrations. Specific methods of analyses must be identified. If methods

other than EPA Methods or Standard Methods are used, the exact methodology must be submitted for review and approved by the Executive Officer prior to use.

- 2) In addition to the results of the analyses, the laboratory QA/QC information should include the method, equipment and analytical reporting limits; the recovery rates; an explanation for any recovery rate that is less than 80% or greater than 120%; the results of equipment and method blanks; the results of spiked and surrogate samples; the frequency of quality control analysis; and the name and qualifications of the person(s) performing the analyses.
  - f. An evaluation of the effectiveness of the leachate/groundwater collection, monitoring, control, and removal facilities, which includes a summary of fluid volumes removed, and a discussion of the disposal/treatment methods utilized.
  - g. A summary of the FPLH recovery program.
  - h. A summary and certification of completion of all standard observations for the waste management unit, the perimeter of the waste management unit, and the receiving waters.
  - i. Tabular and graphical summaries of the monitoring data obtained during the previous year; the report should be accompanied by a 3<sup>1</sup>/<sub>2</sub>" computer data disk, MS-DOS ASCII format, tabulating the year's data.
2. The **Annual Monitoring Report** shall be submitted to the Board covering the previous monitoring year. The Annual Self-Monitoring shall be filed by **December 30th**. The annual report can be combined with the Dischargers' summer/fall semiannual report. The report shall contain:
- a. A Graphical Presentation of selected analytical data for selected Monitoring Points, submit in graphical format the laboratory analytical data for selected samples taken. Each such graph shall plot the concentration of one or more constituents over time for a given Monitoring Point, at a scale appropriate to show trends or variations in water quality. On the basis of aberrations noted in the plotted data, the Executive Officer may direct the Dischargers to carry

out a preliminary investigation, the results of which will determine whether or not a release is indicated;

- b. A tabular summary of all the monitoring data obtained during the previous year;
- c. A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned which may be needed to bring the Dischargers into full compliance with the waste discharge requirements;
- d. A map showing the area, if any, in which fill has been completed during the previous calendar year; and
- e. A written summary of the groundwater analysis from the previous year indicating any change in the quality of the groundwater; and,
- f. An evaluation of the effectiveness of the FPLH and groundwater collection and monitoring/control facilities. The evaluation shall include a summary of the volumes of extracted FPLH and groundwater, and a discussion of the disposal methods for each.

#### **G. CONTINGENCY REPORTING**

- a. The Dischargers shall report by telephone, immediately after it is discovered, evidence of a significant release at the point of compliance or at a unit, that may pose a threat to surface or subsurface waters of the State. A written report shall be filed with the Board within seven days, containing at least the following information:
  - 1) A map showing the location(s) of discharge;
  - 2) Approximate flow rate;
  - 3) Nature of effects; i.e. all pertinent observations and analyses; and
  - 4) Corrective measures underway or proposed.
- b. Should the monitoring data indicate, for any Constituent of Concern, that the Trigger Levels at the Perimeter Compliance Point have been exceeded, the Dischargers shall notify the Regional Board verbally as to the Monitoring Point(s) and constituent(s) involved, shall provide written notification by certified mail within seven days of such determination, and shall carry out the requirements below (in part c.). In any case, the Dischargers shall inform the Regional Board of the outcome of the retest as soon after the results are available, following up with written results submitted by certified mail within seven days of completing the retest. If

resampling and analysis indicate that any COC is above the Trigger Levels and is valid and statistically significant, the Dischargers shall evaluate the need for corrective action.

**PLAN DUE DATE: Within 120 days of confirmation of exceedance of Trigger Levels.**

- c. If the Dischargers conclude that Trigger Levels have been exceeded at the Perimeter Compliance Point, then the Dischargers shall, within thirty days, sample for all Constituents of Concern at all immediately adjacent Perimeter Monitoring Points and submit them for laboratory analysis. Within seven days of receiving the laboratory analytical results, the Dischargers shall notify the Regional Board, by certified mail, of the concentration of all Constituents of Concern at each Monitoring Point.
- d. If it is determined that a waste management unit is an ongoing source of pollution which is likely to degrade State waters, the Dischargers shall immediately notify the Regional Board verbally as to the Monitoring Point(s) and constituent(s) involved, shall provide written notification by certified mail within seven days of such determination.

#### H. **WELL LOGS**

A boring log and any new monitoring well construction log shall be submitted for each sampling well established for this monitoring program, as well as a report of inspection or certification that each well has been constructed in accordance with the construction standards of the Department of Water Resources. These shall be submitted within 30 days after well installation.

## PART B

### DESCRIPTION OF OBSERVATION STATIONS AND SCHEDULE OF OBSERVATIONS

#### A. GROUNDWATER MONITORING

For Each Self-Monitoring Report the Dischargers shall:

1. Collect groundwater samples at each WMU and Perimeter Segment compliance points.
2. Prepare a map showing all compliance points and WMUs.
3. Prepare a potentiometric surface map for the Facility's Water Table.
4. Groundwater wells that have floating petroleum product (FPLH) shall not be sampled or analyzed, but shall be identified and product thickness recorded.
5. Comply with the groundwater monitoring requirements in accordance with Title 27.

#### B. GROUNDWATER MONITORING HYDROSTRATIGRAPHIC UNITS

Groundwater samples shall be collected **semiannually (summer/fall and winter/spring)** and sampled in accordance with Table 1 and Table 2.

Groundwater analysis shall include the following field measurements: pH, temperature, specific conductance, water level, volume purged, and number of casing volumes purged.

#### C. SURFACE WATER MONITORING STATIONS

Surface water samples shall be collected in accordance with the facility's NPDES Permit.

#### D. FACILITIES MONITORING - Report semiannually with monitoring report schedule identified below

The Dischargers shall inspect all facilities to ensure proper and safe operation.

**E. MONITORING REPORT DUE DATES**

Groundwater Reports: Samples shall be collected near the middle of the sample period.

<b>Report</b>	<b>Period Covered</b>	<b>Period That Samples Are to be Collected</b>	<b>Report Due Date</b>
Winter/Spring	January 1 to June 30	March 1 to April 30	June 30 <sup>th</sup>
Summer/Fall	July 1 to December 31	September 1 to October 31	December 30 <sup>th</sup>
Annual	January 1 To December 31	-	December 30 <sup>th</sup>

Note: The annual report can be combined with the Dischargers' summer/fall semiannual report.

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

1. Has been developed in accordance with the procedures set forth in this Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in this Board's Order No. 99-083.
2. Is effective on the date shown below.
3. May be reviewed or modified at any time subsequent to the effective date, upon written notice from the Executive Officer.

Date Ordered: October 20, 1999



Lawrence P. Kolb  
Assistant Executive Officer

Attachments:

- Table 1: Waste Management Unit and Areas of Concern Monitoring Wells and List of Analytical Parameters
- Table 2: Perimeter Segment and Areas of Concern Monitoring Wells and List of Analytical Parameters (To be developed in accordance with Provision 3a)
- Table 3: Current Wells Undergoing FPLH Recovery (To be prepared by Dischargers and updated annually)
- Table 4: Perimeter Segment Trigger Levels (To be developed in accordance with Provision 3b)

Table 1 - Interior Wells

Well ID.		SWMU/AOC	ANALYTICAL PARAMETERS
CHW-23	WDR (RFI Phase I)	SWMU-1	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-12A	WDR (RWOCB)	SWMU-2	As, Cr, Cr+6, Pb, bhex, TPH(C4-C12), TPH(C13-C22)
MK-13A	WDR (RWOCB)	SWMU-3	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
CHW-19	WDR (RFI Phase I)	SWMU-3	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
WCC-36S	WDR (RWOCB)	SWMU-4	As, Cr, Cr+6, Pb, Hg, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
CHW-22	WDR (RFI Phase I)	SWMU-5	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
WCC-34S	WDR (RWOCB)	SWMU-5	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
WCC-30S	WDR (VMP)	SWMU-6	Sb, As, Cr, Cr+6, Pb, Hg, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
WCC-31S		SWMU-6	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
CHW-2	WDR (RFI Phase I)	SWMU-8	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-29S	WDR (RWOCB)	SWMU-8	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-35A	WDR (RWOCB)	SWMU-8	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
WCC-28S	WDR (RWOCB)	SWMU-8	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-34A	WDR (RWOCB)	SWMU-8	Sb, As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-28S	WDR (RWOCB)	SWMU-10 & 14	As, Cr, Cr+6, Pb, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-16S	WDR (RWOCB)	SWMU-11	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
WCC-26S	WDR (RWOCB)	SWMU-11	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
CHW-13		SWMU-13	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-32A		SWMU-13	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-33A		SWMU-13	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
WCC-16S		SWMU-13	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
WCC-14M	WDR (RWOCB)	SWMU-14	As, Cr, Cr+6, Pb, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
WCC-19M	WDR (RWOCB)	SWMU-14	As, Cr, Cr+6, Pb, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
WCC-20S	WDR (RWOCB)	SWMU-14	As, Cr, Cr+6, Pb, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
CHW-11		SWMU-15	As, Cr, Cr+6, Pb, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
CHW-16		SWMU-15	As, Cr, Cr+6, Pb, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
CHW-24	WDR (RFI Phase I)	SWMU-15	As, Cr, Cr+6, Pb, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
CHW-25		SWMU-15	As, Cr, Cr+6, Pb, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-24A	WDR (RWOCB)	SWMU-17	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-25A	WDR (RWOCB)	SWMU-17	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-25K	WDR (RWOCB)	SWMU-17	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-26A	WDR (RWOCB)	SWMU-17	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-27K	WDR (RWOCB)	SWMU-17	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-28A	WDR (RWOCB)	SWMU-17	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-29K	WDR (RWOCB)	SWMU-17	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-30A	WDR (RWOCB)	SWMU-17	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-41K	WDR (RWOCB)	SWMU-17	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-42K	WDR (RWOCB)	SWMU-17	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-24K	WDR (RWOCB)	SWMU-17	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-21E	WDR (RWOCB)	SWMU-16	As, Cr, Cr+6, Pb, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
WCC-1M	WDR (RWOCB)	SWMU-16	As, Cr, Cr+6, Pb, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
WCC-4M	WDR (RWOCB)	SWMU-16	As, Cr, Cr+6, Pb, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
WCC-5M	WDR (RWOCB)	SWMU-16	As, Cr, Cr+6, Pb, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-19B	WDR (VMP)	SWMU-31	Sb, As, Cr, Cr+6, Pb, Hg, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-20B	WDR (VMP)	SWMU-31	Sb, As, Cr, Cr+6, Pb, Hg, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
CHW-14		SWMU-32	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
CHW-26		SWMU-32	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-36A		SWMU-32	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-37A		SWMU-32	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
CHW-17	WDR (RFI Phase I)	Deacon's Pond	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
CHW-18	WDR (RFI Phase I)	Deacon's Pond	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
CHW-20	WDR (RFI Phase I)	Cardox	As, Cr, Cr+6, Pb, Ni, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
CHW-4	WDR (RFI Phase I)	API	As, Cr, Cr+6, Pb, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-15A	WDR (VMP)	Hastings Slough	Sb, As, Cr, Cr+6, Pb, Hg, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-15B	WDR (VMP)	Hastings Slough	Sb, As, Cr, Cr+6, Pb, Hg, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
CHW-5		FPLH Pool	As, Cr, Cr+6, Pb, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
CHW-7		FPLH Pool	As, Cr, Cr+6, Pb, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
CHW-3		OWC	As, Cr, Cr+6, Pb, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
CHW-8		OWC	As, Cr, Cr+6, Pb, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
CHW-10	WDR (RFI Phase I)	OWC	As, Cr, Cr+6, Pb, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-5B	WDR (VMP)	Tract 6 North	Sb, As, Cr, Cr+6, Pb, Hg, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-14A	WDR (VMP)	Tract 6 South	Sb, As, Cr, Cr+6, Pb, Hg, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-14B	WDR (VMP)	Tract 6 South	Sb, As, Cr, Cr+6, Pb, Hg, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-10A	WDR (VMP)	Tract 7	Sb, As, Cr, Cr+6, Pb, Hg, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-6A	WDR (VMP)	Tract 7	Sb, As, Cr, Cr+6, Pb, Hg, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-7A	WDR (VMP)	Tract 7	Sb, As, Cr, Cr+6, Pb, Hg, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-8A	WDR (VMP)	Tract 7	Sb, As, Cr, Cr+6, Pb, Hg, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)
MK-8A	WDR (VMP)	Tract 7	Sb, As, Cr, Cr+6, Pb, Hg, Ni, Se, Zn, bhex, TPH(C4-C12), TPH(C13-C22)





Table 3 - Recovery Wells

Tract	Well ID.
1	CHW-13
1	EEl-33R
1	EEl-79
1	EEl-80
1	EEl-82
1	ESI-1
1	WCC-100
1	WCC-101
1	WCC-102
1	WCC-108
1	WCC-117
1	WCC-118R
2	EEl-18R
2	EEl-35R
2	EEl-55
2	EEl-57
2	EEl-59
2	EEl-69R
2	MW-9R
2	MW-21R
2	MW-25
2	WCC-110
2	WCC-122
3	EEl-40R
3	EEl-42
3	EEl-44R
3	EEl-46R
3	EEl-48
3	TS-3
3	TS-4
3	TS-5
3	TS-6
3	TS-8
3	TS-9

**Table 4**

**TRIGGER LEVELS**

**(This table is to be developed in accordance with Provision D.3.b)**