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California Regional Water Quality Control Board

San Francisco Bay Region

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Arnold Schwarzenegger
Governor

ORDER NO. R2-2006-0070
NPDES NO. CA0005789

The following Discharger is subject to waste discharge requirements as set forth in this Order:

Table 1. Discharger Information

Discharger	Shell Oil Products US and Equilon Enterprises LLC
Name of Facility	Shell Martinez Refinery
Facility Address	3485 Pacheco Blvd
	Martinez, CA 94553
	Contra Costa County

The discharge by the Operator from the discharge points identified below is subject to waste discharge requirements as set forth in this Order:

Table 2. Discharge Location

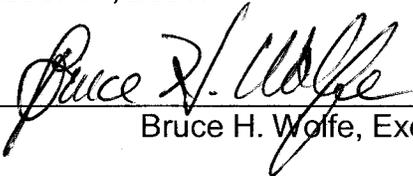
Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
001	Treated Wastewater	38°, 01', 56" N	122°, 07', 44" W	Carquinez Strait
002	Stormwater	38°, 01', 21" N	122°, 06', 38" W	Peyton Slough
004	Stormwater	38°, 00', 54" N	122°, 07', 07" W	Peyton Slough
005	Stormwater	38°, 00', 58" N	122°, 06', 07" W	Peyton Slough
007	Stormwater	38°, 00', 05" N	122°, 06', 07" W	Peyton Slough
008	Stormwater	38°, 00', 40" N	122°, 06', 24" W	Peyton Slough

Table 3. Administrative Information

This Order was adopted by the Regional Water Quality Control Board on:	October 11, 2006
This Order shall become effective on:	January 1, 2007
This Order shall expire on:	October 31, 2011
The U.S. Environmental Protection Agency (USEPA) and the Regional Water Quality Control Board have classified this discharge as a major discharge.	
The Discharger shall file a Report of Waste Discharge in accordance with title 23, California Code of Regulations, not later than 180 days in advance of the Order expiration date, as application for issuance of new waste discharge requirements.	

IT IS HEREBY ORDERED, that Order No. 01-141 is rescinded upon the effective date of this Order except for enforcement purposes, and, in order to meet the provisions contained in division 7 of the Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal Clean Water Act (CWA) and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order.

I, Bruce H. Wolfe, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on October 11, 2006.

A handwritten signature in cursive script, reading "Bruce H. Wolfe". The signature is written in black ink and is positioned above a horizontal line.

Bruce H. Wolfe, Executive Officer

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Attachment H - Form A: Stormwater/Ballast Water Allocation Procedures
Attachment I - The following documents are part of this Permit, but are not physically attached due to volume. They are available on the internet at www.waterboards.ca.gov/sanfranciscobay/

- Standard Provisions and Reporting Requirements, August 1993
- Self-Monitoring Program, Part A, adopted August 1993
- August 6, 2001 Staff Letter: *Requirement for Priority Pollutant Monitoring in Receiving Water and Wastewater Discharges*
- Resolution 74-10: *Policy Regarding Waste Discharger's Responsibilities to Develop and Implement Contingency Plans*
- Staff Report – *Statistical Analysis of Ultraclean Mercury Data from San Francisco Bay Area Refineries* (June 11, 2001)

I. FACILITY INFORMATION

The following Discharger is subject to waste discharge requirements as set forth in this Order:

Table 4. Facility Information

Discharger	Shell Oil Products US and Equilon Enterprises LLC
Name of Facility	Shell Martinez Refinery
Facility Address	3485 Pacheco Blvd
	Martinez, CA 94553
	Contra Costa County
Facility Contact, Title, and Phone	Steven Overman, Senior Staff Engineer, 925-313-3281
Mailing Address	P.O. Box 711, Martinez, CA 94553
Type of Facility	Refinery
Average Facility Flow	5.8 million gallons per day (2005 average flow)

II. FINDINGS

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

A. Background. Equilon Enterprises LLC (facility owner) and Shell Oil Products US (facility operator) are currently discharging pursuant to Order No. 01-141 and National Pollutant Discharge Elimination System (NPDES) Permit No. CA0005789, and are considered the Discharger. The Discharger submitted a Report of Waste Discharge, dated April 25, 2006, and applied for a NPDES permit renewal to discharge treated wastewater from its wastewater treatment plant, hereinafter Facility, to Carquinez Strait. The application was deemed complete on August 2, 2006.

For the purposes of this Order, references to the "discharger" or "permittee" in applicable federal and state laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

B. Facility Description. The Discharger operates a petroleum refinery with an average crude throughput of approximately 148,000 barrels per day. The treatment system consists of three oil-water separators, four dissolved nitrogen flotation units, a number of equalization and diversion tanks, two activated sludge biological treatment systems, a number of ponds, a chemical precipitation unit for the removal of selenium, and a Granular Activated Carbon (GAC) adsorption system for polishing treated wastewater. The hydraulic capacity of the entire effluent treatment plant is approximately 10 mgd. All wastewater is processed through the entire effluent treatment system with the following exceptions: Low Biochemical Oxygen Demand (BOD) streams such as cooling tower blowdown, boiler system blowdown, and noncontact stormwater are first treated in an aerated pond, and then by GAC adsorption units. During large storm events, if the wastewater is not high in oil and/or solids, a portion of the wastewater may bypass the initial treatment units, namely the oil-water separators, and/or nitrogen flotation units. Additionally, a portion of the biologically treated wastewater may bypass the GAC adsorption units during high flow conditions caused by a significant storm event. High flow conditions are generally defined as an effluent discharge rate of 8.6 mgd (5972 gallons per minute) or higher. Wastewater is discharged from Discharge Point 001 to Carquinez Strait, a water of the United States. Attachment B provides a map of the area around the facility. Attachment C provides a flow schematic of the facility.

C. Legal Authorities. This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. Environmental Protection Agency (USEPA) and chapter 5.5, division 7 of the California Water Code (commencing with section 13370). It shall serve as a NPDES permit for point source discharges from this facility to surface waters. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the Water Code (commencing with section 13260).

- D. Background and Rationale for Requirements.** The Regional Water Board developed the requirements in this Order based on information submitted as part of the application, through monitoring and reporting programs, and other available information. The Fact Sheet (Attachment F), which contains background information and rationale for Order requirements, is hereby incorporated into this Order and constitutes part of the Findings for this Order. Attachments A through E and G through I are also incorporated into this Order.
- E. California Environmental Quality Act (CEQA).** Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA, Public Resources Code sections 21100-21177.
- F. Technology-based Effluent Limitations.** Title 40 of the Code of Federal Regulations, at section 122.44(a)¹ requires that permits include applicable technology-based limitations and standards. This Order includes technology-based effluent limitations based on 40 CFR § 419.20 since the refinery is classified as a “cracking refinery” as defined by the USEPA. Therefore, the USEPA Effluent Guidelines and Standards for Petroleum Refining Point Sources (40 CFR § 419 Subpart B) based on Best Available Technology Economically Achievable (BAT), Best Practicable Control Technology (BPT), and/or Best Conventional Pollutant Control technology (BCT), whichever are more stringent, are applicable to the discharge. The application of these guidelines and standards is based on production rates at the refinery. The effluent limitations in this Permit are based on facility production rates from July 2003 through May 2006. A detailed discussion of the technology-based effluent limitations development is included in the Fact Sheet.
- G. Water Quality-based Effluent Limitations.** Section 122.44(d) requires that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, water quality-based effluent limitations (WQBELs) may be established: (1) using USEPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) on an indicator parameter for the pollutant of concern; or (3) using a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state’s narrative criterion, supplemented with other relevant information, as provided in section 122.44(d)(1)(vi).
- H. Water Quality Control Plans.** The Regional Water Board adopted a Water Quality Control Plan for the San Francisco Bay Basin, *Water Quality Control Plan* (revised in 2005), (hereinafter Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. Beneficial uses applicable to Carquinez Strait are as follows:

¹ All further statutory references are to title 40 of the Code of Federal Regulations unless otherwise indicated.

Table 5. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
001	Carquinez Strait	Industrial Service Supply (IND) Navigation (NAV) Water Contact Recreation (REC1) Non-contact Water Recreation (REC2) Ocean Commercial and Sport Fishing (COMM) Wildlife Habitat (WILD) Preservation of Rare and Endangered Species (RARE) Fish Migration (MIGR) Fish Spawning (SPWN), and Estuarine Habitat (EST)
002, 004, 005, 007, and 008	Peyton Slough a tributary to Carquinez Strait	Same as above

Requirements of this Order implement the Basin Plan.

The State Water Board adopted a *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Water and Enclosed Bays and Estuaries of California* (Thermal Plan) on May 18, 1972, and amended this plan on September 18, 1975. This plan contains temperature objectives for surface waters. Requirements of this Order implement the Thermal Plan.

- I. **National Toxics Rule (NTR) and California Toxics Rule (CTR).** USEPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.
- J. **State Implementation Policy.** On March 2, 2000, the State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP became effective on April 28, 2000 with respect to the priority pollutant criteria promulgated for California by the USEPA through the NTR and to the priority pollutant objectives established by the Regional Water Board in the Basin Plan. The SIP became

effective on May 18, 2000 with respect to the priority pollutant criteria promulgated by the USEPA through the CTR. The State Water Board adopted amendments to the SIP on February 24, 2005 that became effective on July 13, 2005. The SIP establishes implementation provisions for priority pollutant criteria and objectives and provisions for chronic toxicity control. Requirements of this Order implement the SIP.

- K. Compliance Schedules and Interim Requirements.** Section 2.1 of the SIP provides that, based on a Discharger's request and demonstration that it is infeasible for an existing Discharger to achieve immediate compliance with an effluent limitation derived from a CTR criterion, compliance schedules may be allowed in an NPDES permit. Unless an exception has been granted under section 5.3 of the SIP, a compliance schedule may not exceed 5 years from the date that the permit is issued or reissued, nor may it extend beyond 10 years from the effective date of the SIP (or May 18, 2010) to establish and comply with CTR criterion-based effluent limitations. Where a compliance schedule for a final effluent limitation exceeds 1 year, the Order must include interim numeric limitations for that constituent or parameter. Where allowed by the Basin Plan, compliance schedules and interim effluent limitations or discharge specifications may also be granted to allow time to implement a new or revised water quality objective. This Order does include compliance schedules and interim effluent limitations. A detailed discussion of the basis for the compliance schedule(s) and interim effluent limitation(s) is included in the Fact Sheet.
- L. Alaska Rule.** On March 30, 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards (WQS) become effective for CWA purposes. (40 C.F.R. § 131.21; 65 Fed. Reg. 24641 (April 27, 2000).) Under the revised regulation (also known as the Alaska rule), new and revised standards submitted to USEPA after May 30, 2000, must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000 may be used for CWA purposes, whether or not approved by USEPA.
- M. Stringency of Requirements for Individual Pollutants.** This Order contains restrictions on individual pollutants that are no more stringent than required by the federal CWA. Individual pollutant restrictions consist of technology-based restrictions and water quality-based effluent limitations. Restrictions on technology-based effluent limitations were specified in federal regulations before May 30, 2000, as discussed in the attached Fact Sheet, Attachment F. The permit's technology-based pollutant restrictions are no more stringent than required by the CWA. Water quality-based effluent limitations have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. To the extent that toxic pollutant water quality-based effluent limitations were derived from the CTR, the CTR is the applicable standard pursuant to section 131.38. The scientific procedures for calculating the individual water quality-based effluent limitations are based on the CTR-SIP, which was approved by USEPA on May 18, 2000. Most beneficial uses and water quality objectives contained in the Basin Plan were approved under state law and submitted to and approved by USEPA prior to May

30, 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to May 30, 2000, but not approved by USEPA before that date, are nonetheless "applicable water quality standards for purposes of the CWA" pursuant to section 131.21(c)(1). The remaining water quality objectives and beneficial uses implemented by this Order (specifically Arsenic, Cadmium, Chromium (VI), Copper (fresh), Lead, Nickel, Silver (CMC), Zinc) were approved by USEPA on January 5, 2005, and are applicable water quality standards pursuant to section 131.21(c)(2). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the technology-based requirements of the CWA and the applicable water quality standards for purposes of the CWA.

- N. Antidegradation Policy.** Section 131.12 requires that the state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the state and federal antidegradation policies. As discussed in detail in the Fact Sheet the permitted discharge is consistent with the antidegradation provision of section 131.12 and State Water Board Resolution No. 68-16.
- O. Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at 40 CFR § 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. Some effluent limitations in the previous Order have been removed. As discussed in detail in the Fact Sheet (**Attachment F**), this removal of effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations.
- P. Monitoring and Reporting.** Section 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorizes the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program (MRP) establishes monitoring and reporting requirements to implement federal and State requirements. This MRP is provided in Attachment E. The MRP may be amended by the Executive Officer pursuant to USEPA regulation 40 CFR 122.62, 122.63, and 124.5
- Q. Standard and Special Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with section 122.41, and additional conditions applicable to specified categories of permits in accordance with section 122.42, are provided in Attachment D. The Discharger must comply with all standard provisions and with those additional conditions that are applicable under section 122.42. The Regional Water Board has also included in this Order special provisions applicable to the Discharger. A rationale for the special provisions contained in this Order is provided in the attached Fact Sheet.

- R. Notification of Interested Parties.** The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe Waste Discharge Requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet of this Order.
- S. Consideration of Public Comment.** The Regional Water Board, in a public meeting, heard and considered all comments pertaining to the discharge. Details of the Public Hearing are provided in the Fact Sheet of this Order.

III. DISCHARGE PROHIBITIONS

- A. Discharge of any wastewater at a location or in a manner different from that described in this Order, is prohibited.
- B. The discharge of Waste 001 at any point at which the wastewaters do not receive an initial dilution of at least 10:1 is prohibited.
- C. The bypass or overflow of untreated or partially treated Waste 001 to waters of the State, either at the treatment plant or from the collection system, as described in Finding B, is prohibited. As described in Finding B, bypassing of GAC adsorption units is permitted only if all of the following conditions are met:
 - a. A significant storm event causes an effluent discharge rate of 8.6 mgd or higher;
 - b. The Discharger monitors for all pollutants, including acute toxicity, that this permit contains effluent limitations; and
 - c. Bypass does not cause or contribute to noncompliance with any effluent limitations, including the acute toxicity limitation.

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Effluent Limitations – Discharge Point 001

1. Final Effluent Limitations – Discharge Point 001

- a. The discharge of treated wastewater shall maintain compliance with the following technology-based effluent limitations at Discharge Point 001, with compliance measured at Monitoring Location E-001 as described in the attached Monitoring and Reporting Program (Attachment E):

Table 6. Technology-Based Effluent Limitations

Parameter	Units	Effluent Limitations			
		Average Monthly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Five-day Biochemical Oxygen Demand	lbs/day	1839	3310		
Total Suspended Solids	lbs/day	1471	2307		
Chemical Oxygen Demand	lbs/day	12837	24738		
Oil & Grease	lbs/day	535	1003		
	mg/L	8	15		
Phenolic Compounds	lbs/day	7.8	25		
Ammonia as N	lbs/day	1003	2206		
Sulfide	lbs/day	9.7	22		
Total Chromium	lbs/day	9.1	26		
Hexavalent Chromium ¹	lbs/day	0.74	1.7		
Settleable Solids	mL/ L-hr	0.1	0.2		
pH ²	standard units			6.0	9.0

¹ The Discharger may, at its option, meet this limitation by the measurement of Total Chromium.

² If the Discharger employs continuous pH monitoring, it shall be in compliance with the pH limitation specified herein, provided that both of the following conditions are satisfied: (a) the total time during which the pH values are outside the required range shall not exceed 7 hours and 26 minutes in any calendar month, and (b) no individual excursion from the required range of pH values shall exceed 60 minutes.

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

Table 7: Stormwater Runoff Allocation

Parameter	Units	Monthly Average	Daily Maximum
BOD	mg/L	26	48
TSS	mg/L	21	33
COD	mg/L	180	360
Oil & Grease	mg/L	8	15
Phenolic Compounds	mg/L	0.17	0.35
Total Chromium	mg/L	0.21	0.60
Hexavalent Chromium	mg/L	0.028	0.062

Table 8: Ballast Water Allocation

Parameter	Units	Monthly Average	Daily Maximum
BOD	mg/L	26	48
TSS	mg/L	21	33
COD	mg/L	280	470
Oil & Grease	mg/L	8	15
pH	Within the range of 6.0 to 9.0		

The total effluent limitation is the sum of the stormwater runoff allocation, the ballast water allocation, and the mass limits contained in A.1a. The Discharger shall compute the total effluent limitation (both maximum and average) on a monthly basis as shown in the Monitoring and Reporting Program, when necessary to show compliance with the concentration and mass limitations contained in A.1a.

2. Water Quality Based Effluent Limits – Discharge Point 001

- a. The discharge of treated wastewater shall maintain compliance with the following water quality based effluent limitations at Discharge Point 001, with compliance measured at Monitoring Location E-001 as described in the attached Monitoring and Reporting Program (Attachment E). These interim effluent limitations shall apply in lieu of the corresponding final effluent limitations specified for the same parameters during the time period indicated in this limitation.

Table 9. Toxic Substances Effluent Limitations ^(1, 5)

Constituent	Water Quality-Based Effluent Limits (WQBELs)		Interim Limits	
	Average Monthly (AMEL) ($\mu\text{g/L}$)	Maximum Daily (MDEL) ($\mu\text{g/L}$)	Maximum Daily ($\mu\text{g/L}$)	Average Monthly ($\mu\text{g/L}$)
Copper	13	23		
Mercury ³	0.014	0.042		0.075
Nickel	43	72		
Selenium ²	4.5	6.8	50	

Constituent	Water Quality-Based Effluent Limits (WQBELs)		Interim Limits	
	Average Monthly (AMEL) (µg/L)	Maximum Daily (MDEL) (µg/L)	Maximum Daily (µg/L)	Average Monthly (µg/L)
Cyanide ^{2,7}	3.5	6.4	25	
Zinc	310	570		
TCDD Equivalents ⁶			1*10 ⁻⁷	
Total PCBs ^{2,4}	0.00017	0.00034	0.5	

Footnotes:

- (1) (a) All analyses shall be performed using current USEPA methods, or equivalent methods approved in writing by the Executive Officer.
 - (b) Limits apply to the average concentration of all samples collected during the averaging period (Daily = 24-hour period; Monthly = calendar month).
- (2) Interim limits shall remain in effect for cyanide and selenium until April 27, 2010, and for total PCBs until May 17, 2010, or until the Board amends the limits based on site-specific objectives or the Waste Load Allocations in the TMDLs.
- (3) Mercury: Effluent mercury monitoring shall be performed by using ultraclean sampling and analysis techniques to the maximum extent practicable, with a minimum level of 0.002 µg/l, or lower. The interim limit for mercury shall remain in effect until April 27, 2010, or until the Board amends the limit based on the Waste Load Allocation in the TMDL for mercury.
- (4) The PCB limit applies to the sum of the following individual PCB compounds: PCB-1016, PCB-1221, PCB-1232, PCB-1242, PCB-1248, PCB-1254, and PCB-1260.
- (5) As outlined in Section 2.4.5 of the SIP, the following are Minimum Levels that the Discharger shall achieve for pollutants with effluent limits. The table below indicates the highest minimum level that the Discharger's laboratory must achieve for calibration purposes.

Constituent	Minimum Level	Units
Copper	2	µg/L
Mercury	0.002	µg/L
Nickel	5	µg/L
Selenium	1	µg/L
Cyanide	5	µg/L
Zinc	20	µg/L
Individual PCBs	0.5	µg/L

- (6) TCDD Equivalents: The SIP does not contain an ML for this constituent, however, the Board requires use of one-half of those published in USEPA Method 1613. This interim limit shall remain effective until November 30, 2011, or until the Board amends the limits based on site-specific objectives or the Waste Load Allocations in the TMDLs.
- (7) Alternative Water Quality Based Effluent Limit for Cyanide
 - a. If a cyanide SSO for the receiving water becomes legally effective, resulting in adjusted saltwater criteria CCC of 2.9 µg/l (based on the assumptions in *Draft Staff Report on Proposed Site-Specific Water Quality Objectives and Effluent Limit Policy for Cyanide for San Francisco Bay*, dated November 10, 2005), upon its effective date, the following limitations shall supercede

those cyanide limitations, above (the rationale for these effluent limitations can be found in the Fact Sheet [**Attachment F**]): MDEL of 39 µg/L, and AMEL of 22 µg/L

If a different cyanide SSO for the receiving water is adopted, the alternate WQBELs based on the SSO will be determined after the SSO effective date.

- b. Whole Effluent Acute Toxicity: Representative samples of the discharge at discharge point 001 shall meet the following limits for acute toxicity. Compliance with these limits shall be achieved in accordance with Provision C.8 of this Order:

The survival of bioassay test organisms in 96-hour bioassays of undiluted effluent shall be:

- (1) An eleven (11)-sample median value of not less than 90 percent survival; and
- (2) An eleven (11)-sample 90th percentile value of not less than 70 percent survival.

These acute toxicity limits are further defined as follows:

- (1) 11-sample median limit:

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

- (2) 90th percentile limit:

Any bioassay test showing survival of 70 percent or greater is not a violation of this limit. A bioassay test showing survival of less than 70 percent represents a violation of this effluent limit, if one or more of the past ten or fewer bioassay tests also show less than 70 percent survival.

- c. Chronic Toxicity:

The survival of bioassay test organisms in the discharge at the discharge point 001 shall be:

- (1) A single-sample value of equal to or less than 10 TUc.

These chronic toxicity limits are defined as follows:

- (1) A test sample showing chronic toxicity greater than 10 TUc represents toxicity and a violation of this limitation.

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

discharge sample based on a comparison of TUC values obtained through concurrent testing of the two species.

3. Total Coliform Bacteria –Discharge Point 001D

The median of 5 consecutive samples where all sanitary wastes are present shall not exceed 240 MPN/100 mL. Any single sample shall not exceed 10,000 MPN/100 mL.

4. Interim Mass Emission Limit – Mercury

Until TMDL and WLA efforts for mercury provide enough information to establish a different WQBEL, the Discharger shall demonstrate that the total mercury mass loading from discharge point 001 to Carquinez Strait has not increased by complying with the following:

- a. Interim mass emission limit: The mass emission limit for mercury is 0.030 kilograms per month (kg/month). The monthly average shall be calculated by taking the arithmetic average of the current daily mass loading value, and all of the previous month's values. Compliance with this limit shall be evaluated using monthly moving averages of total mass load, computed as described below:

12-Month Monthly Moving Average of Total Mass Load = Average of the monthly total mass loads from the past 12 months

- b. The Discharger shall submit a cumulative total of mass loadings for the previous twelve months with each monthly Self-Monitoring Report. Compliance each month will be determined based on the 12-month moving averages over the previous twelve months of monitoring. The Discharger may use monitoring data collected under accelerated schedules (i.e., special studies) to determine compliance. This requirement may be satisfied by the 12-month moving average values calculated by the electronic reporting system (ERS).
- c. The mercury TMDL and WLAs will supersede this mass emission limitation upon their completion. The Clean Water Act's antibacksliding rule, Section 402(o), indicates that this Order may be modified to include a less stringent requirement following completion of the TMDL and WLA, if the requirements for an exception to the rule are met.

5. Interim Mass Emission Limit - Selenium

Until TMDL and WLA efforts for selenium provide enough information to establish a different WQBEL, the Discharger shall demonstrate that the total selenium mass loading from the discharge point 001 to Carquinez Strait has not increased by complying with the following:

- a. Interim mass emission limit: The mass emission limit for selenium is 2.13 lbs/day (running annual average). Running annual averages shall be calculated by taking the arithmetic average of the current daily mass loading value, and all of the previous year's values. The total selenium mass load shall not exceed this limit.

6. Stormwater Limits

The discharge from discharge points 002, 004, 005, 007, and 008 containing constituents in excess or outside of the following limits, is prohibited:

Constituent	Units	Limitation
pH	standard units	Within 6.5 to 8.5
Oil & Grease	mg/L	daily maximum of 15
Total Organic Carbon	mg/L	daily maximum of 110
visible oil	----	none observed
visible color	----	none observed ¹

¹ Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses.

7. Effluent Limit Credit for Recycled Water Use

When the Discharger uses recycled water, credit for influent concentrations for constituents in this Order with mass or concentration based effluent limitations, shall be granted in the discharge according to the following procedure, provided the Discharger satisfies Provision C.6.

- a. The Discharger shall sample and analyze for constituents for which effluent limit credit is sought at least as frequently as is required in the attached Self-Monitoring Program for that constituent. Influent sampling shall occur at influent sampling station I-001 defined in the Self-Monitoring Program.
- b. The Discharger shall determine the time interval between introduction of a given constituent of concern in the influent recycled water and the first appearance of the constituent in the final effluent. This determination is subject to approval by the Executive Officer, and must precede any calculation of effluent limit credit for the constituent.
- c. Credit for constituents listed will be given on a mass and concentration basis.

Concentration Credit

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

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

Step 1: (Influent concentration of recycled water B- influent concentration of potable water B) x (Total Influent Volume of Reclaimed Water for one week) = (Influent mass of B)

Step 2: (Influent mass of B) / (Total Waste 001 discharge volume for one week, Y days after influent week) = (Concentration credit to be subtracted from concentration of constituent in the effluent, valid for that one week period)

Mass Credit

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

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

Step 1: (Influent concentration of reclaimed water B- influent concentration of potable water B) x (Total Influent Volume of Reclaimed Water for one week) = (Influent mass of B)

Step 2: (Influent mass of B) / (The Number of Days in that monitoring interval) = (Mass credit to be subtracted from mass of constituent in the effluent, valid for that one week period)

B. Land Discharge Specifications – Not Applicable

C. Reclamation Specifications – Not Applicable

V. RECEIVING WATER LIMITATIONS

A. Surface Water Limitations

Receiving water limitations are based on water quality objectives contained in the Basin Plan and are a required part of this Order. The discharge shall not cause the following in waters of the State at any place:

1. Floating, suspended, or deposited macroscopic particulate matter or foam.
2. Bottom deposits or aquatic growths to the extent that such deposits or growths cause nuisance or adversely affect beneficial uses.
3. Alteration of temperature, turbidity, or apparent color beyond present 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 will cause deleterious effects on aquatic biota, wildlife, or waterfowl or render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentration.
6. The discharges shall not cause nuisance, or adversely affect the beneficial uses of the receiving water.
7. The discharges shall not cause the following limits to be exceeded in waters of the State at any one place within one foot of the water surface.

a. Dissolved Oxygen: 5.0 mg/L, minimum

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

b. Dissolved Sulfide: 0.1 mg/L, maximum

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

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

e. Nutrients: Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the

extent that such growths cause nuisance or adversely affect beneficial uses.

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

B. Groundwater Limitations – Not Applicable

VI. PROVISIONS

A. Standard Provisions

1. The Discharger shall comply with all Standard Provisions included in Attachment D of this Order.
2. Regional Water Board Standard Provisions. The Discharger shall comply with all applicable items of the *Standard Provisions and Reporting Requirements for NPDES Surface Water Discharge Permits, August 1993* (Attachment I), including any amendments thereto. Where provisions or reporting requirements specified in this Order are different from equivalent or related provisions or reporting requirements given in the Standard Provisions, the specifications of this Order shall apply.

B. Monitoring and Reporting Program (MRP) Requirements

The Discharger shall comply with the MRP, and future revisions thereto, in Attachment E of this Order.

C. Special Provisions

1. Reopener Provisions

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

- a. If present or future investigations demonstrate that the discharge(s) governed by this Order will, or cease to, have adverse impacts on water quality and/or beneficial uses of the receiving waters.
- b. As new or revised WQOs come into effect for the San Francisco Bay estuary and contiguous water bodies (whether statewide, regional, or site-specific). In such cases, effluent limitations in this Order will be modified as necessary to reflect updated WQOs.
- c. If translator or other water quality studies provide a basis for determining that a permit condition(s) should be modified.
- d. An administrative or judicial decision on a separate NPDES permit or WDR that addresses requirements similar to this discharge; and
- e. as authorized by law.

2. Permit Compliance and Rescission of Previous Waste Discharge Requirements

The Discharger shall comply with the limitations, prohibitions, and other provisions of this Order on the effective date of this NPDES Permit. Requirements prescribed by this Order supersede the requirements prescribed by Order No. 01-141. Order No. 01-141 is hereby rescinded upon the effective date of this Order.

3. Effluent Characterization for Selected Constituents

The Discharger shall monitor and evaluate the discharge at E-001 for the constituents listed in Enclosure A of the Regional Water Board's August 6, 2001 Letter. Compliance with this requirement shall be achieved in accordance with the specifications stated in the Regional Water Board's August 6, 2001 Letter under Effluent Monitoring for Major Dischargers. The Discharger shall conduct monitoring as specified in the table below:

<u>Constituent type</u>	<u>Sampling Frequency</u>	<u>EPA/SM Method Number</u>
Metals	As specified in SMP (for those not specified in SMP, Semiannual)	As specified in August 6, 2001, letter or SMP
Volatiles	Semiannual	EPA 601 or 624
Semi-volatiles	Semiannual	EPA 604 or 625
Pesticides	Semiannual	EPA 608
PAHs	Semiannual	EPA 610
Dioxin and Furans	As specified in SMP	EPA 1613
Total Solids	Semiannual concurrent with dioxin and furans monitoring	EPA Method 160.3/SM 2540B
Tributyltin	Semiannual	Batelle N-0959-2606
Diazinon	Semiannual	EPA 614

This information shall be included with the annual report required by Part A of the Self-Monitoring Program. The first annual report under this Order is due March 1, 2007. The report shall summarize the data collected to date and describe future monitoring to take place. A final report that presents all the data shall be submitted to the Regional Water Board no later than 180 days prior to the permit expiration date. This final report shall be submitted with the application for permit reissuance. Reporting requirements under this section may be satisfied by: (a) monthly reporting using the electronic reporting system (ERS), or an equivalent electronic system required by the Regional Water Board or State Water Board, and (b) submittal of a complete application for permit reissuance no later than 180 days prior to the permit expiration date.

4. Receiving Water Monitoring

The Discharger shall continue to collect or participate in collecting background ambient receiving water data with other dischargers and/or through the RMP. This information is required to perform RPAs and to calculate effluent limitations. To fulfill this requirement, the Discharger shall submit (or cause to have submitted on its behalf) data sufficient to characterize the concentration of each toxic pollutant listed in the CTR in the ambient receiving water. The data on the conventional water quality parameters (pH, salinity, and hardness) shall also be sufficient to characterize these parameters in the ambient receiving water at a point after the discharge has mixed with the receiving waters.

The sampling frequency and sampling station locations shall be specified in the sampling plan. The frequency of the monitoring shall consider the seasonal variability of the receiving water. It would be acceptable to select stations representative of incoming ocean waters because the combined effluent discharges to the Bay through deepwater diffusers.

5. Pollution Prevention and Minimization Program

- a. The Discharger shall conduct, in a manner acceptable to the Executive Officer, a Pollution Minimization Program to reduce pollutant loadings of mercury, selenium, cyanide, PCBs, and dioxin-TEQ to the treatment plant, and therefore, to the receiving waters.
- b. The Discharger shall submit an annual report, acceptable to the Executive Officer, no later than March 1 of each year. Annual reports shall cover January through December of the preceding year. Annual reports shall include at least the following information.
 - i. A brief description of its treatment facilities and treatment processes.
 - ii. *A discussion of the current pollutants of concern.* Periodically, the Discharger shall analyze its own situation to determine which pollutants are currently a problem and/or which pollutants may be potential future problems. This discussion shall include the reasons why the pollutants were chosen.

- iii. *Identification of sources for the pollutants of concern.* This discussion shall include how the Discharger intends to estimate and identify sources of the pollutants. The Discharger shall also identify sources or potential sources not directly within the ability or authority of the Discharger to control, such as pollutants in the potable water supply and air deposition.
 - iv. *Identification of tasks to reduce the sources of the pollutants of concern.* This discussion shall identify and prioritize tasks to address the Discharger's pollutants of concern. The Discharger may implement tasks itself or participate in group, regional, or national tasks that will address its pollutants of concern. The Discharger is strongly encouraged to participate in group, regional, or national tasks that will address its pollutants of concern whenever it is efficient and appropriate to do so. A time-line shall be included for the implementation of each task.
 - v. *Outreach to employees.* The Discharger shall inform employees about the pollutants of concern, potential sources, and how they might be able to help reduce the discharge of these pollutants of concern into the treatment facilities. The Discharger may provide a forum for employees to provide input to the Program.
 - vi. *Discussion of criteria used to measure the program's and tasks' effectiveness.* The Discharger shall establish criteria to evaluate the effectiveness of its Pollution Minimization Program. This shall also include a discussion of the specific criteria used to measure the effectiveness of each of the tasks in item b. (iii), b. (iv), and b. (v).
 - vii. *Documentation of efforts and progress.* This discussion shall detail all the Discharger's activities in the Pollution Minimization Program during the reporting year.
 - viii. *Evaluation of program's and tasks' effectiveness.* The Discharger shall use the criteria established in b. (vi) to evaluate the Program's and tasks' effectiveness.
 - ix. *Identification of Specific Tasks and Time Schedules for Future Efforts.* Based on the evaluation, the Discharger shall detail how it intends to continue or change its tasks to more effectively reduce the amount of pollutants to the treatment facilities, and subsequently in its effluent.
- c. According to Section 2.4.5 of the SIP, when there is evidence that a priority pollutant is present in the effluent above an effluent limitation and either:
- i. A sample result is reported as detected, but not quantified (less than the ML) and the effluent limitation is less than the reported ML; or

- ii. A sample result is reported as not detected (less than the MDL) and the effluent limitation is less than the MDL;

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

- d. If triggered by the reasons in c. above and notified by the Executive Officer, the Discharger's Pollution Minimization Program shall, within 6 months, also include the following:
 - i. An annual review and semiannual monitoring of potential sources of the reportable priority pollutant(s), which may include fish tissue monitoring and other bio-uptake sampling, or alternative measures approved by the Executive Officer when it is demonstrated that source monitoring is unlikely to produce useful analytical data.
 - ii. Quarterly monitoring for the reportable priority pollutant(s) in the influent to the wastewater treatment system, or alternative measures approved by the Executive Officer when it is demonstrated that influent monitoring is unlikely to produce useful analytical data.
 - iii. Submittal of a control strategy designed to proceed toward the goal of maintaining concentrations of the reportable priority pollutant(s) in the effluent at or below the effluent limitation.
 - iv. Development of appropriate cost-effective control measures for the reportable priority pollutant(s), consistent with the control strategy.
 - v. An annual status report that shall be sent to the Regional Water Board including the following:

- (1) All Pollution Minimization Program monitoring results for the previous year
 - (2) A list of potential sources of the reportable priority pollutant(s)
 - (3) A summary of all actions undertaken pursuant to the control strategy
 - (4) A description of actions to be taken in the following year.
- e. To the extent that the requirements of the Pollution Prevention Program and the Pollutant Minimization Program overlap, the Discharger is allowed to continue, modify, or expand its Pollution Prevention Program to satisfy the Pollutant Minimization Program requirements.
- f. These Pollution Prevention/Pollutant Minimization Program requirements are not intended to fulfill the requirements in the Clean Water Enforcement and Pollution Prevention Act of 1999 (Senate Bill 709).

6. Mass and Concentration Credits

Prior to obtaining mass or concentration credits for using recycled water, the Discharger shall submit a technical report that demonstrates such credits will not cause impairment of beneficial uses in the vicinity of its discharge, such as an acutely toxic zone to aquatic organisms. The demonstration shall include, but not be limited to an assessment of the results of whole effluent toxicity testing, and mass balance calculations that compare the as-discharged effluent concentrations (i.e., before credits) to potential WQBELs for constituent(s) for which credits are sought. The report shall also include one or more examples of how the credit calculations will be performed and reported based on the site-specific conditions of the Discharger. Following receipt of written approval of the technical report from the Executive Officer, this provision shall be considered satisfied.

7. Storm Water Pollution Prevention Plan and Annual Report

The Discharger shall update and submit an updated Storm Water Pollution Prevention Plan (SWPPP) acceptable to the Executive Officer by September 1st of each year. If the Discharger determines that it does not need to update its SWPPP, it shall submit a letter to the Executive Officer that indicates no revisions are necessary and the last year it updated its SWPPP. The Discharger shall implement the SWPPP, and the SWPPP shall comply with the requirements contained in the attached Standard provisions.

The Discharger shall also submit an annual storm water report by July 1 of each year covering data for the previous wet weather season for E-002, E-004, E-005, E-007, and E-008. The annual storm water report shall, at a minimum, include: (a) a tabulated summary of all sampling results and a summary of visual observations taken during the inspections; (b) a comprehensive discussion of the compliance record and any corrective actions taken or planned to ensure compliance with waste discharge requirements; and (c) a comprehensive discussion of source identification and control programs for constituents that do not have effluent limitations (e.g., total suspended solids).

8. Whole Effluent Acute Toxicity

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

From permit adoption date:

(1) Compliance with the acute toxicity effluent limits of this Order shall be evaluated by measuring survival of test organisms exposed to 96-hour flow through bioassays.

(2) Test organism shall be rainbow trout unless specified otherwise in writing by the Executive Officer.

(3) All bioassays shall be performed according to 40 CFR 136, currently the "Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms," 5th Edition, October 2002, EPA Publication Number 821-R-02-012. Exceptions may be granted to the Discharger by the Executive Officer and by a representative of the Department of Health Services who manages the Environmental Laboratory Accreditation Program (ELAP).

9. Chronic Toxicity

The Discharger shall comply with the following tiered approach with trigger values to ensure that potential chronic toxicity is addressed in a timely fashion.

a. The Discharger shall conduct routine chronic toxicity monitoring in accordance with the SMP of this Order.

b. If data from routine monitoring exceeds the evaluation parameter in 9.c. below, then the Discharger shall conduct accelerated chronic toxicity monitoring. Accelerated monitoring shall consist of monthly monitoring.

c. Chronic toxicity evaluation parameter is as follows:

i. A single sample maximum value of equal to or greater than 10 TU_c.

ii. This parameter is defined as follows:

(1) TU_c (chronic toxicity unit): A TU_c equals 100/NOEL (e.g., if NOEL = 100, then toxicity = 1 TU_c). NOEL is the no-observed effect level determined from IC, EC, or NOEC values.

(2) The terms IC, EC, NOEL and NOEC and their use are defined in Attachment A of the SMP.

d. If data from accelerated monitoring tests are found to be in compliance with the evaluation parameter, then routine monitoring shall be resumed.

e. If accelerated monitoring tests continue to exceed the evaluation parameter, then the Discharger shall initiate a chronic TRE.

f. The TRE shall be conducted in accordance with the following:

- i. The Discharger shall prepare and submit to the Regional Water Board for Executive Officer approval a TRE workplan. An initial generic workplan shall be submitted within 120 days of the date of adoption of this Order. The workplan shall be reviewed and updated as necessary in order to remain current and applicable to the discharge and discharge facilities.
- ii. The TRE shall be initiated within 30 days of the date of completion of the accelerated monitoring test observed to exceed either evaluation parameter.
- iii. The TRE shall be conducted in accordance with an approved workplan.
- iv. The TRE needs to be specific to the discharge and Discharger facility, and may be in accordance with current technical guidance and reference materials including USEPA guidance materials. The TRE should be conducted as a tiered evaluation process, such as summarized below:
 - (1) Tier 1 consists of basic data collection (routine and accelerated monitoring).
 - (2) Tier 2 consists of evaluation of optimization of the treatment process including operation practices, and in-plant process chemicals.
 - (3) Tier 3 consists of a toxicity identification evaluation (TIE).
 - (4) Tier 4 consists of an evaluation of options for additional effluent treatment processes.
 - (5) Tier 5 consists of an evaluation of options for modifications of in-plant treatment processes.
 - (6) Tier 6 consists of implementation of selected toxicity control measures, as well as follow-up monitoring and confirmation of implementation success.
- v. The TRE may be ended at any stage if monitoring finds there is no longer consistent toxicity.
- vi. The objective of the TIE shall be to identify the substance or combination of substances causing the observed toxicity. All reasonable efforts using currently available TIE methodologies should be employed.
- vii. As toxic substances are identified or characterized, the Discharger shall continue the TRE by determining the source(s) and evaluating alternative strategies for reducing or eliminating the substances from the discharge. All reasonable steps shall be taken to reduce toxicity to levels consistent with chronic toxicity evaluation parameters.
- viii. Many recommended TRE elements parallel required or recommended efforts of source control, pollution prevention, and storm water control programs. TRE efforts should be coordinated with such efforts. To prevent duplication of efforts, evidence of compliance with requirements or recommended efforts of such programs may be acceptable to comply with TRE requirements.
- ix. The Regional Water Board recognizes that chronic toxicity may be episodic and identification of the causes and reduction of sources of chronic toxicity

may not be successful in all cases. Consideration of enforcement action by the Regional Water Board will be based in part on the Discharger's actions and efforts to identify and control or reduce sources of consistent toxicity.

- g. Chronic Toxicity Monitoring Screening Phase Requirements, Critical Life Stage Toxicity Tests, and definitions of terms used in the chronic toxicity monitoring are identified in Attachment G to this Order. The Discharger shall comply with these requirements as applicable to the discharge.

10. Optional Mass Offset

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

11. Contingency Plan Update

- a. The Discharger shall maintain a Contingency Plan as required by Regional Water Board Resolution 74-10, and as prudent in accordance with current industrial facility emergency planning. The discharge of pollutants in violation of this Order where the Discharger has failed to develop and/or adequately implement a contingency plan will be the basis for considering such discharge a willful and negligent violation of this Order pursuant to Section 13387 of the California Water Code.
- b. The Discharger shall regularly review, and update as necessary, the Contingency Plan in order for the plan to remain useful and relevant to current equipment and operation practices. Reviews shall be conducted annually, and updates shall be completed as necessary.

- c. The Discharger shall provide the Executive Officer, upon his or her request, a report describing the current status of its Contingency Plan review and update. The Discharger shall also include, in each Annual Self-Monitoring Report, a description or summary of review and evaluation procedures, and applicable changes to its Contingency Plan.

12. Collection System Maintenance

Within 120 days of the effective date of this Order, the Discharger shall document (a) current preventative maintenance activities to prevent spills and leaks (e.g., percentage of collection system that it cleans and inspects on an annual basis, how cleaning and inspections occur, and how it determines which portions of the collection system need cleaning, sealing, or replacing), (b) past spills and corrective measures taken to avoid future spills (i.e., document that collection system maintenance is more proactive rather than reactive), and (c) any proposed upgrades to the collection system that will occur within the next five years.

13. Requirement to Support SSO and TMDL, and Assure Compliance with Final Limits

This Order grants compliance schedules for mercury, selenium, cyanide, PCBs, and dioxin-TEQ. Pursuant to Section 2.1 of the SIP and Chapter 4 of the Basin Plan, the Discharger shall (a) conduct pollution minimization in accordance with Provision C.5, (b) participate in and support the development of a TMDL or an SSO for mercury, selenium, cyanide, PCBs, and dioxin-TEQ, and (c) submit an update to the Regional Water Board in the annual self-monitoring report to document its efforts toward development of TMDL(s) or SSO(s). Regional Water Board staff shall review the status of TMDL development. In the event TMDL(s) or SSO(s) are not developed for mercury, selenium, cyanide, or PCBs by July 1, 2009, the Discharger shall submit by July 1, 2009, a schedule that documents how it will further reduce pollutant concentrations to ensure compliance with the final limits specified in Effluent Limitations and Discharge Specifications A.2.

14. Changes in Control and Ownership

- a. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Regional Water Board.
- b. To assume responsibility of and operations under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order (see Standard Provisions & Reporting Requirements, August 1993, Section E.4.). Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code.

VII. COMPLIANCE DETERMINATION

Compliance with the effluent limitations contained in section IV of this Order will be determined as specified below:

A. General.

Compliance with effluent limitations for priority pollutants shall be determined using sample reporting protocols defined in the MRP and Attachment A of this Order. For purposes of reporting and administrative enforcement by the Regional and State Water Boards, the Discharger shall be deemed out of compliance with effluent limitations if the concentration of the priority pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the reporting level (RL).

B. Multiple Sample Data.

When determining compliance with an AMEL, AWEL, or MDEL for priority pollutants and more than one sample result is available, the Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of "Detected, but Not Quantified" (DNQ) or "Not Detected" (ND). In those cases, the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

1. The data set shall be ranked from low to high, ranking the reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.
2. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

C. Average Monthly Effluent Limitation (AMEL).

If the average (or when applicable, the median determined by subsection B above for multiple sample data) of daily discharges over a calendar month exceeds the AMEL for a given parameter, this will represent a single violation, though the Discharger will be considered out of compliance for each day of that month for that parameter (e.g., resulting in 31 days of non-compliance in a 31-day month). If only a single sample is taken during the calendar month and the analytical result for that sample exceeds the AMEL, the Discharger will be considered out of compliance for that calendar month. The Discharger will only be considered out of compliance for days when the discharge occurs. For any one calendar month during which no sample (daily discharge) is taken, no compliance determination can be made for that calendar month.

D. Average Weekly Effluent Limitation (AWEL).

If the average (or when applicable, the median determined by subsection B above for multiple sample data) of daily discharges over a calendar week exceeds the AWEL for a given parameter, this will represent a single violation, though the Discharger will be considered out of compliance for each day of that week for that parameter, resulting in 7 days of non-compliance. If only a single sample is taken during the calendar week and the analytical result for that sample exceeds the AWEL, the Discharger will be considered out of compliance for that calendar week. The Discharger will only be considered out of compliance for days when the discharge occurs. For any one calendar week during which no sample (daily discharge) is taken, no compliance determination can be made for that calendar week.

E. Maximum Daily Effluent Limitation (MDEL).

If a daily discharge (or when applicable, the median determined by subsection B above for multiple sample data of a daily discharge) exceeds the MDEL for a given parameter, the Discharger will be considered out of compliance for that parameter for that 1 day only within the reporting period. For any 1 day during which no sample is taken, no compliance determination can be made for that day.

F. Instantaneous Minimum Effluent Limitation.

If the analytical result of a single grab sample is lower than the instantaneous minimum effluent limitation for a parameter, the Discharger will be considered out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (e.g., the results of two grab samples taken within a calendar day that both are lower than the instantaneous minimum effluent limitation would result in two instances of non-compliance with the instantaneous minimum effluent limitation).

G. Instantaneous Maximum Effluent Limitation.

If the analytical result of a single grab sample is higher than the instantaneous maximum effluent limitation for a parameter, the Discharger will be considered out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (e.g., the results of two grab samples taken within a calendar day that both exceed the instantaneous maximum effluent limitation would result in two instances of non-compliance with the instantaneous maximum effluent limitation).

ATTACHMENT A – DEFINITIONS

Arithmetic Mean (μ), also called the average, is the sum of measured values divided by the number of samples. For ambient water concentrations, the arithmetic mean is calculated as follows:

Arithmetic mean = $\mu = \Sigma x / n$ where: Σx is the sum of the measured ambient water concentrations, and n is the number of samples.

Average Monthly Effluent Limitation (AMEL): the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Average Weekly Effluent Limitation (AWEL): the highest allowable average of daily discharges over a calendar week (Sunday through Saturday), calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Bioaccumulative pollutants are those substances taken up by an organism from its surrounding medium through gill membranes, epithelial tissue, or from food and subsequently concentrated and retained in the body of the organism.

Carcinogenic pollutants are substances that are known to cause cancer in living organisms.

Coefficient of Variation (CV) is a measure of the data variability and is calculated as the estimated standard deviation divided by the arithmetic mean of the observed values.

Daily Discharge: Daily Discharge is defined as either: (1) the total mass of the constituent discharged over the calendar day (12:00 am through 11:59 pm) or any 24-hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g., concentration).

The daily discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day or other 24-hour period defined as a day) or by the arithmetic mean of analytical results from one or more grab samples taken over the course of the day.

For composite sampling, if 1 day is defined as a 24-hour period other than a calendar day, the analytical result for the 24-hour period will be considered as the result for the calendar day in which the 24-hour period ends.

Detected, but Not Quantified (DNQ) are those sample results less than the RL, but greater than or equal to the laboratory's MDL.

Dilution Credit is the amount of dilution granted to a discharge in the calculation of a water quality-based effluent limitation, based on the allowance of a specified mixing zone. It is calculated from the dilution ratio or determined through conducting a mixing zone study or modeling of the discharge and receiving water.

Effluent Concentration Allowance (ECA) is a value derived from the water quality criterion/objective, dilution credit, and ambient background concentration that is used, in conjunction with the coefficient of variation for the effluent monitoring data, to calculate a long-term average (LTA) discharge concentration. The ECA has the same meaning as waste load allocation (WLA) as used in U.S. EPA guidance (Technical Support Document For Water Quality-based Toxics Control, March 1991, second printing, EPA/505/2-90-001).

Enclosed Bays means indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays include, but are not limited to, Humboldt Bay, Bodega Harbor, Tomales Bay, Drake's Estero, San Francisco Bay, Morro Bay, Los Angeles-Long Beach Harbor, Upper and Lower Newport Bay, Mission Bay, and San Diego Bay. Enclosed bays do not include inland surface waters or ocean waters.

Estimated Chemical Concentration is the estimated chemical concentration that results from the confirmed detection of the substance by the analytical method below the ML value.

Estuaries means waters, including coastal lagoons, located at the mouths of streams that serve as areas of mixing for fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and seawater. Estuarine waters included, but are not limited to, the Sacramento-San Joaquin Delta, as defined in Water Code section 12220, Suisun Bay, Carquinez Strait downstream to the Carquinez Bridge, and appropriate areas of the Smith, Mad, Eel, Noyo, Russian, Klamath, San Diego, and Otay rivers. Estuaries do not include inland surface waters or ocean waters.

Inland Surface Waters are all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Instantaneous Maximum Effluent Limitation: the highest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous maximum limitation).

Instantaneous Minimum Effluent Limitation: the lowest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous minimum limitation).

Maximum Daily Effluent Limitation (MDEL) means the highest allowable daily discharge of a pollutant, over a calendar day (or 24-hour period). For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Median is the middle measurement in a set of data. The median of a set of data is found by first arranging the measurements in order of magnitude (either increasing or decreasing order). If the number of measurements (n) is odd, then the median = $X_{(n+1)/2}$. If n is even, then the median = $(X_{n/2} + X_{(n/2)+1})/2$ (i.e., the midpoint between the $n/2$ and $n/2+1$).

Method Detection Limit (MDL) is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, as defined in title 40 of the Code of Federal Regulations, Part 136, Attachment B, revised as of July 3, 1999.

Minimum Level (ML) is the concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed.

Mixing Zone is a limited volume of receiving water that is allocated for mixing with a wastewater discharge where water quality criteria can be exceeded without causing adverse effects to the overall water body.

Not Detected (ND) are those sample results less than the laboratory's MDL.

Ocean Waters are the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Water Board's California Ocean Plan.

Persistent pollutants are substances for which degradation or decomposition in the environment is nonexistent or very slow.

Pollutant Minimization Program (PMP) means waste minimization and pollution prevention actions that include, but are not limited to, product substitution, waste stream recycling, alternative waste management methods, and education of the public and businesses. The goal of the PMP shall be to reduce all potential sources of a priority pollutant(s) through pollutant minimization (control) strategies, including pollution prevention measures as appropriate, to maintain the effluent concentration at or below the water quality-based effluent limitation. Pollution prevention measures may be particularly appropriate for persistent bioaccumulative priority pollutants where there is evidence that beneficial uses are being impacted. The Regional Water Board may consider cost effectiveness when establishing the requirements of a PMP. The completion and implementation of a Pollution Prevention Plan, if required pursuant to Water Code section 13263.3(d), shall be considered to fulfill the PMP requirements.

Pollution Prevention means any action that causes a net reduction in the use or generation of a hazardous substance or other pollutant that is discharged into water and includes, but is not limited to, input change, operational improvement, production process change, and product reformulation (as defined in Water Code section 13263.3). Pollution prevention does not include actions that merely shift a pollutant in wastewater from one environmental medium to

another environmental medium, unless clear environmental benefits of such an approach are identified to the satisfaction of the State or Regional Water Board.

Reporting Level (RL) is the ML (and its associated analytical method) chosen by the Discharger for reporting and compliance determination from the MLs included in this Order. The MLs included in this Order correspond to approved analytical methods for reporting a sample result that are selected by the Regional Water Board either from Appendix 4 of the SIP in accordance with section 2.4.2 of the SIP or established in accordance with section 2.4.3 of the SIP. The ML is based on the proper application of method-based analytical procedures for sample preparation and the absence of any matrix interferences. Other factors may be applied to the ML depending on the specific sample preparation steps employed. For example, the treatment typically applied in cases where there are matrix-effects is to dilute the sample or sample aliquot by a factor of ten. In such cases, this additional factor must be applied to the ML in the computation of the RL.

Satellite Collection System is the portion, if any, of a sanitary sewer system owned or operated by a different public agency than the agency that owns and operates the wastewater treatment facility that a sanitary sewer system is tributary to.

Source of Drinking Water is any water designated as municipal or domestic supply (MUN) in a Regional Water Board Basin Plan.

Standard Deviation (σ) is a measure of variability that is calculated as follows:

$$\sigma = (\sum[(x - \mu)^2]/(n - 1))^{0.5}$$

where:

x is the observed value;

μ is the arithmetic mean of the observed values; and

n is the number of samples.

Toxicity Reduction Evaluation (TRE) is a study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity.

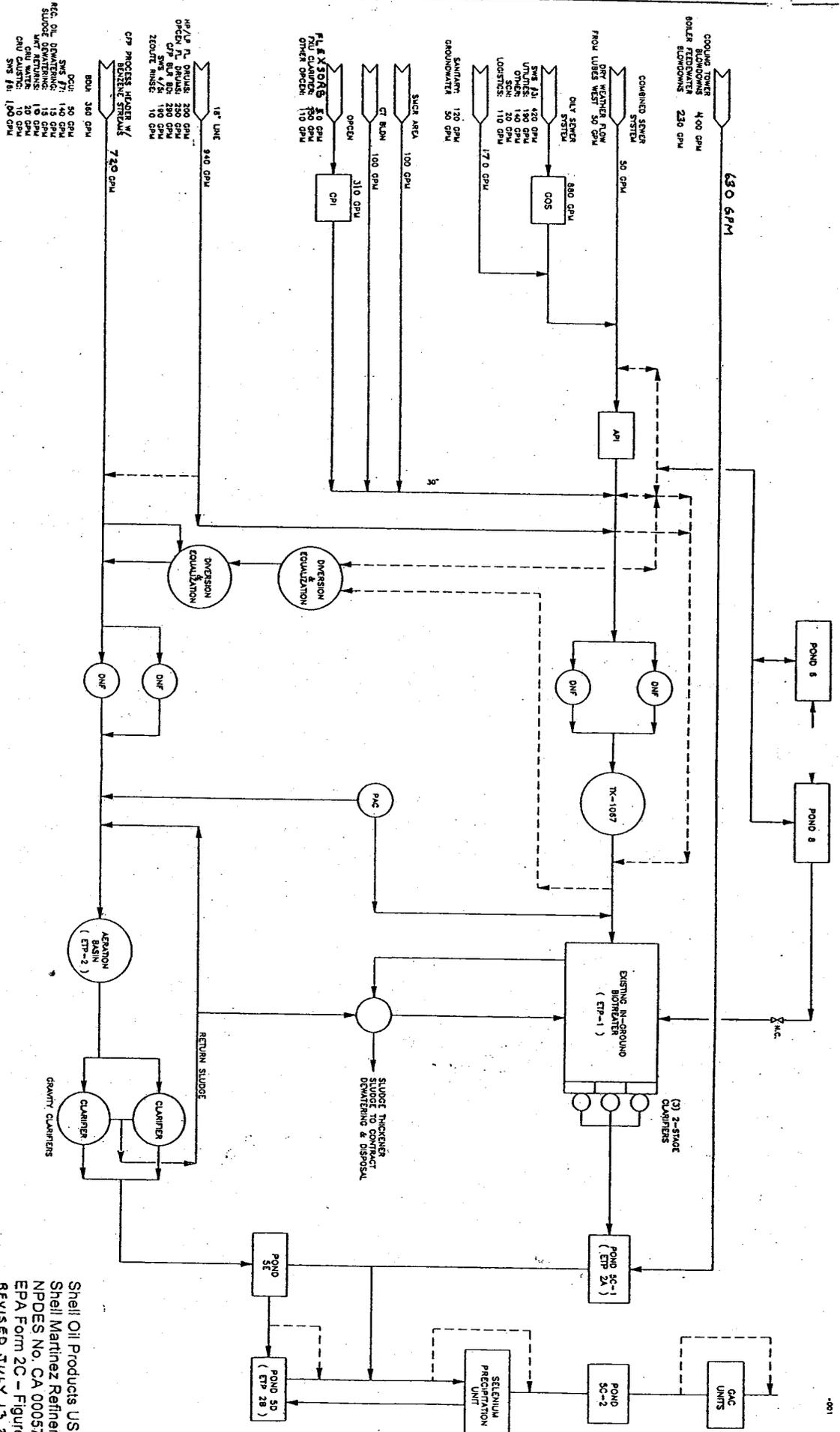
The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate. (A TIE is a set of procedures to identify the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.)

ATTACHMENT B – MAP

ATTACHMENT C – FLOW SCHEMATIC

ATTACHMENT C - FLOW SCHEMATIC

REFERENCE DRAWINGS



COOLING TOWER BLOWDOWNS 400 GPM
 BOILER FEEDWATER BLOWDOWNS 230 GPM
 COMBINED SEWER 50 GPM
 DRY WEATHER FLOW 50 GPM
 DRY STORM 50 GPM
 SANITARY 120 GPM
 GROUNDWATER 50 GPM

IF LINE 340 GPM
 W/P/L 300 GPM
 D/W/D 300 GPM
 S/W 4/5 100 GPM
 ZROUTE RINSE 10 GPM

FILE LOGS 50 GPM
 S/W 4/5 100 GPM
 OTHER OPEN 110 GPM

OPCEM 310 GPM
 S/W 4/5 100 GPM

REVISIONS		REVISED FOR		DATE		BY		CHECKED		DATE		BY	
1	ADD	REVISED FOR	DATE	BY	CHECKED	DATE	BY	CHECKED	DATE	BY	DATE	BY	
2	ADD	REVISED FOR	DATE	BY	CHECKED	DATE	BY	CHECKED	DATE	BY	DATE	BY	
3	ADD	REVISED FOR	DATE	BY	CHECKED	DATE	BY	CHECKED	DATE	BY	DATE	BY	
4	ADD	REVISED FOR	DATE	BY	CHECKED	DATE	BY	CHECKED	DATE	BY	DATE	BY	

ACCOUNT NUMBERS		DATE		BY		CHECKED		DATE		BY	
1	ADD	DATE	BY	CHECKED	DATE	BY	CHECKED	DATE	BY	DATE	BY
2	ADD	DATE	BY	CHECKED	DATE	BY	CHECKED	DATE	BY	DATE	BY
3	ADD	DATE	BY	CHECKED	DATE	BY	CHECKED	DATE	BY	DATE	BY
4	ADD	DATE	BY	CHECKED	DATE	BY	CHECKED	DATE	BY	DATE	BY

PLANT 82-01
 SHELL EFFLUENT TREATMENT PLANT
 PROJECT FILE SHELL/REF/82-01
 DRAWING NO. 640488

MARTINEZ REFINING COMPANY
 Shell Oil Products US
 Shell Martinez Refinery
 NPDES No. CA 0005789
 EPA Form 20 - Figure 1
 REVISED JULY 13, 2006

ATTACHMENT D –STANDARD PROVISIONS

I. STANDARD PROVISIONS – PERMIT COMPLIANCE

A. Duty to Comply

1. The Discharger must comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. (40 C.F.R. § 122.41(a).)
2. The Discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if this Order has not yet been modified to incorporate the requirement. (40 C.F.R. § 122.41(a)(1).)

B. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order. (40 C.F.R. § 122.41(c).)

C. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment. (40 C.F.R. § 122.41(d).)

D. Proper Operation and Maintenance

The Discharger 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 Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by a Discharger only when necessary to achieve compliance with the conditions of this Order. (40 C.F.R. § 122.41(e).)

E. Property Rights

1. This Order does not convey any property rights of any sort or any exclusive privileges. (40 C.F.R. § 122.41(g).)
2. The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations. (40 C.F.R. § 122.5(c).)

F. Inspection and Entry

The Discharger shall allow the Regional Water Board, State Water Board, United States Environmental Protection Agency (USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to (40 C.F.R. § 122.41(i); Wat. Code, § 13383):

1. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order (40 C.F.R. § 122.41(i)(1));
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order (40 C.F.R. § 122.41(i)(2));
3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order (40 C.F.R. § 122.41(i)(3)); and
4. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the Water Code, any substances or parameters at any location. (40 C.F.R. § 122.41(i)(4).)

G. Bypass

1. Definitions
 - a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. (40 C.F.R. § 122.41(m)(1)(i).)
 - b. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. (40 C.F.R. § 122.41(m)(1)(ii).)
2. Bypass not exceeding limitations. The Discharger may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions listed in Standard Provisions – Permit Compliance I.G.3, I.G.4, and I.G.5 below. (40 C.F.R. § 122.41(m)(2).)
3. Prohibition of bypass. Bypass is prohibited, and the Regional Water Board may take enforcement action against a Discharger for bypass, unless (40 C.F.R. § 122.41(m)(4)(i)):

- a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage (40 C.F.R. § 122.41(m)(4)(i)(A));
 - b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance (40 C.F.R. § 122.41(m)(4)(i)(B)); and
 - c. The Discharger submitted notice to the Regional Water Board as required under Standard Provisions – Permit Compliance I.G.5 below. (40 C.F.R. § 122.41(m)(4)(i)(C).)
4. The Regional Water Board may approve an anticipated bypass, after considering its adverse effects, if the Regional Water Board determines that it will meet the three conditions listed in Standard Provisions – Permit Compliance I.G.3 above. (40 C.F.R. § 122.41(m)(4)(ii).)
5. Notice
- a. Anticipated bypass. If the Discharger knows in advance of the need for a bypass, it shall submit a notice, if possible at least 10 days before the date of the bypass. (40 C.F.R. § 122.41(m)(3)(i).)
 - b. Unanticipated bypass. The Discharger shall submit notice of an unanticipated bypass as required in Standard Provisions - Reporting V.E below (24-hour notice). (40 C.F.R. § 122.41(m)(3)(ii).)

H. Upset

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. (40 C.F.R. § 122.41(n)(1).)

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Standard Provisions – Permit Compliance I.H.2 below are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. (40 C.F.R. § 122.41(n)(2).)
2. Conditions necessary for a demonstration of upset. A Discharger who wishes to establish the affirmative defense of upset shall demonstrate, through properly

signed, contemporaneous operating logs or other relevant evidence that (40 C.F.R. § 122.41(n)(3)):

- a. An upset occurred and that the Discharger can identify the cause(s) of the upset (40 C.F.R. § 122.41(n)(3)(i));
 - b. The permitted facility was, at the time, being properly operated (40 C.F.R. § 122.41(n)(3)(ii));
 - c. The Discharger submitted notice of the upset as required in Standard Provisions – Reporting V.E.2.b below (24-hour notice) (40 C.F.R. § 122.41(n)(3)(iii)); and
 - d. The Discharger complied with any remedial measures required under Standard Provisions – Permit Compliance I.C above. (40 C.F.R. § 122.41(n)(3)(iv).)
3. Burden of proof. In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof. (40 C.F.R. § 122.41(n)(4).)

II. STANDARD PROVISIONS – PERMIT ACTION

A. General

This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition. (40 C.F.R. § 122.41(f).)

B. Duty to Reapply

If the Discharger wishes to continue an activity regulated by this Order after the expiration date of this Order, the Discharger must apply for and obtain a new permit. (40 C.F.R. § 122.41(b).)

C. Transfers

This Order is not transferable to any person except after notice to the Regional Water Board. The Regional Water Board may require modification or revocation and reissuance of the Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the Water Code. (40 C.F.R. § 122.41(l)(3); § 122.61.)

III. STANDARD PROVISIONS – MONITORING

- A. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (40 C.F.R. § 122.41(j)(1).)
- B. Monitoring results must be conducted according to test procedures under Part 136 or, in the case of sludge use or disposal, approved under Part 136 unless otherwise specified in Part 503 unless other test procedures have been specified in this Order. (40 C.F.R. § 122.41(j)(4); § 122.44(i)(1)(iv).)

IV. STANDARD PROVISIONS – RECORDS

- A. Except for records of monitoring information required by this Order related to the Discharger's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by Part 503), the Discharger shall retain records of all monitoring information, including all calibration and maintenance records and 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, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Regional Water Board Executive Officer at any time. (40 C.F.R. § 122.41(j)(2).)

B. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements (40 C.F.R. § 122.41(j)(3)(i));
2. The individual(s) who performed the sampling or measurements (40 C.F.R. § 122.41(j)(3)(ii));
3. The date(s) analyses were performed (40 C.F.R. § 122.41(j)(3)(iii));
4. The individual(s) who performed the analyses (40 C.F.R. § 122.41(j)(3)(iv));
5. The analytical techniques or methods used (40 C.F.R. § 122.41(j)(3)(v)); and
6. The results of such analyses. (40 C.F.R. § 122.41(j)(3)(vi).)

C. Claims of confidentiality for the following information will be denied (40 C.F.R. § 122.7(b)):

1. The name and address of any permit applicant or Discharger (40 C.F.R. § 122.7(b)(1)); and
2. Permit applications and attachments, permits and effluent data. (40 C.F.R. § 122.7(b)(2).)

V. STANDARD PROVISIONS – REPORTING

A. Duty to Provide Information

The Discharger shall furnish to the Regional Water Board, State Water Board, or USEPA within a reasonable time, any information which the Regional Water Board, State Water Board, or USEPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Discharger shall also furnish to the Regional Water Board, State Water Board, or USEPA copies of records required to be kept by this Order. (40 C.F.R. § 122.41(h); Wat. Code, § 13267.)

B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the Regional Water Board, State Water Board, and/or USEPA shall be signed and certified in accordance with Standard Provisions – Reporting V.B.2, V.B.3, V.B.4, and V.B.5 below. (40 C.F.R. § 122.41(k).)
2. All permit applications shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures. (40 C.F.R. § 122.22(a)(1).)
3. All reports required by this Order and other information requested by the Regional Water Board, State Water Board, or USEPA shall be signed by a person described in Standard Provisions – Reporting V.B.2 above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:
 - a. The authorization is made in writing by a person described in Standard Provisions – Reporting V.B.2 above (40 C.F.R. § 122.22(b)(1));
 - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative

may thus be either a named individual or any individual occupying a named position.) (40 C.F.R. § 122.22(b)(2)); and

- c. The written authorization is submitted to the Regional Water Board and State Water Board. (40 C.F.R. § 122.22(b)(3).)
4. If an authorization under Standard Provisions – Reporting V.B.3 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting V.B.3 above must be submitted to the Regional Water Board and State Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative. (40 C.F.R. § 122.22(c).)
5. Any person signing a document under Standard Provisions – Reporting V.B.2 or V.B.3 above shall make the following certification:

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.” (40 C.F.R. § 122.22(d).)

C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program (Attachment E) in this Order. (40 C.F.R. § 122.22(l)(4).)
2. Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Regional Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. (40 C.F.R. § 122.41(l)(4)(i).)
3. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under Part 136 or, in the case of sludge use or disposal, approved under Part 136 unless otherwise specified in Part 503, or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Regional Water Board. (40 C.F.R. § 122.41(l)(4)(ii).)
4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order. (40 C.F.R. § 122.41(l)(4)(iii).)

D. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order, shall be submitted no later than 14 days following each schedule date. (40 C.F.R. § 122.41(l)(5).)

E. Twenty-Four Hour Reporting

1. The Discharger shall report any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Discharger becomes aware of the circumstances. A written submission shall also be provided within five (5) days of the time the Discharger becomes 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 reoccurrence of the noncompliance. (40 C.F.R. § 122.41(l)(6)(i).)
2. The following shall be included as information that must be reported within 24 hours under this paragraph (40 C.F.R. § 122.41(l)(6)(ii)):
 - a. Any unanticipated bypass that exceeds any effluent limitation in this Order. (40 C.F.R. § 122.41(l)(6)(ii)(A).)
 - b. Any upset that exceeds any effluent limitation in this Order. (40 C.F.R. § 122.41(l)(6)(ii)(B).)
3. The Regional Water Board may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours. (40 C.F.R. § 122.41(l)(6)(iii).)

F. Planned Changes

The Discharger shall give notice to the Regional Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required under this provision only when (40 C.F.R. § 122.41(l)(1)):

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in section 122.29(b) (40 C.F.R. § 122.41(l)(1)(i)); or
2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are subject neither to effluent limitations in this Order nor to notification requirements under section 122.42(a)(1) (see Additional Provisions—Notification Levels VII.A.1). (40 C.F.R. § 122.41(l)(1)(ii).)
3. The alteration or addition results in a significant change in the Discharger's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing

permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. (40 C.F.R. § 122.41(l)(1)(iii).)

G. Anticipated Noncompliance

The Discharger shall give advance notice to the Regional Water Board or State Water Board of any planned changes in the permitted facility or activity that may result in noncompliance with General Order requirements. (40 C.F.R. § 122.41(l)(2).)

H. Other Noncompliance

The Discharger shall report all instances of noncompliance not reported under Standard Provisions – Reporting V.C, V.D, and V.E above at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting V.E above. (40 C.F.R. § 122.41(l)(7).)

I. Other Information

When the Discharger becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Water Board, State Water Board, or USEPA, the Discharger shall promptly submit such facts or information. (40 C.F.R. § 122.41(l)(8).)

VI. STANDARD PROVISIONS – ENFORCEMENT

- A.** The Regional Water Board is authorized to enforce the terms of this permit under several provisions of the Water Code, including, but not limited to, sections 13385, 13386, and 13387.

VII. ADDITIONAL PROVISIONS – NOTIFICATION LEVELS

A. Non-Municipal Facilities

Existing manufacturing, commercial, mining, and silvicultural Dischargers shall notify the Regional Water Board as soon as they know or have reason to believe (40 C.F.R. § 122.42(a)):

1. That any activity has occurred or will occur that would result in the discharge, on a routine or frequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following "notification levels" (40 C.F.R. § 122.42(a)(1)):
 - a. 100 micrograms per liter ($\mu\text{g/L}$) (40 C.F.R. § 122.42(a)(1)(i));
 - b. 200 $\mu\text{g/L}$ for acrolein and acrylonitrile; 500 $\mu\text{g/L}$ for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol; and 1 milligram per liter (mg/L) for antimony (40 C.F.R. § 122.42(a)(1)(ii));

- c. Five (5) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge (40 C.F.R. § 122.42(a)(1)(iii)); or
 - d. The level established by the Regional Water Board in accordance with section 122.44(f). (40 C.F.R. § 122.42(a)(1)(iv).)
2. That any activity has occurred or will occur that would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following "notification levels" (40 C.F.R. § 122.42(a)(2)):
- a. 500 micrograms per liter ($\mu\text{g/L}$) (40 C.F.R. § 122.42(a)(2)(i));
 - b. 1 milligram per liter (mg/L) for antimony (40 C.F.R. § 122.42(a)(2)(ii));
 - c. Ten (10) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge (40 C.F.R. § 122.42(a)(2)(iii)); or
 - d. The level established by the Regional Water Board in accordance with section 122.44(f). (40 C.F.R. § 122.42(a)(2)(iv).)

ATTACHMENT E – MONITORING AND REPORTING PROGRAM

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ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

The Code of Federal Regulations section 122.48 requires that all NPDES permits specify monitoring and reporting requirements. Water Code Sections 13267 and 13383 also authorize the Regional Water Quality Control Board (Regional Water Board) to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements, which implement the federal and California regulations.

I. GENERAL MONITORING PROVISIONS

- A. The Discharger shall comply with the MRP for this Order as adopted by the Regional Water Board, and with all of the requirements contained in Self-Monitoring Program, Part A, adopted August 1993 (SMP, Attachment I). The MRP and SMP may be amended by the Executive Officer pursuant to USEPA regulations 40 CFR 122.62, 122.63, and 124.5. If any discrepancies exist between the MRP and SMP, the MRP prevails.
- B. Sampling is required during the entire year when discharging. All analyses shall be conducted using current USEPA methods, or that have been approved by the USEPA Regional Administrator pursuant to 40 CFR 136.4 and 40 CFR 136.5, or equivalent methods that are commercially and reasonably available, and that provide quantification of sampling parameters and constituents sufficient to evaluate compliance with applicable effluent limits and to perform reasonable potential analysis. Equivalent methods must be more sensitive than those specified in 40 CFR 136, must be specified in the permit, and must be approved for use by the Executive Officer, following consultation with the State Water Quality Control Board's Quality Assurance Program.
- C. Sampling and analysis of additional constituents is required pursuant to Table 1 of the Regional Water Board's August 6, 2001 Letter titled Requirement for Monitoring of Pollutants in Effluent and Receiving Water to Implement New Statewide Regulations and Policy (Provision C.3).
- D. *Minimum Levels.* For compliance and reasonable potential monitoring, analyses shall be conducted using the commercially available and reasonably achievable detection levels that are lower than the WQOs/WQC or the effluent limitations, whichever is lower. The objective is to provide quantification of constituents sufficient to allow evaluation of observed concentrations with respect to the Minimum Levels given below. All Minimum Levels are expressed as µg/L approximately equal to parts per billion (ppb).

Table 1 lists the test method the Discharger may use for compliance and reasonable potential monitoring for the pollutants with effluent limits.

Table 1. Test Methods and Minimum Levels for Pollutants with Reasonable Potential

CTR #	Constituent	Types of Analytical Methods [a]												
		Minimum Levels (µg/L)												
		GC	GCMS	LC	Color	FAA	GFAA	ICP	ICP MS	SPGF AA	HYD RIDE	CVAA	DCP	
6.	Copper								0.5	2				

CTR #	Constituent	Types of Analytical Methods [a]											
		Minimum Levels (µg/L)											
		GC	GCMS	LC	Color	FAA	GFAA	ICP	ICP MS	SPGF AA	HYD RIDE	CVAA	DCP
8.	Mercury [b]								0.5			0.2	
9.	Nickel						5		1	5			
10.	Selenium										1		
13.	Zinc					20		20	1	10			
14.	Cyanide				5								
119-125.	PCB: Aroclors 1016, 1221,1232, 1242, 1248,1254, 1260	0.5											

Footnotes for Table 1:

[a] Analytical Methods / Laboratory techniques are defined as follows:

- GC = Gas Chromatography;
- GCMS = Gas Chromatography/Mass Spectrometry;
- Color = Colorimetric;
- GFAA = Graphite Furnace Atomic Absorption;
- ICP = Inductively Coupled Plasma
- ICPMS = Inductively Coupled Plasma/Mass Spectrometry;
- SPGFAA = Stabilized Platform Graphite Furnace Atomic Absorption (i.e. EPA 200.9); and
- CVAA = Cold Vapor Atomic Absorption
- HYDRIDE = Gaseous Hydride Atomic Absorption

[b] The Discharger shall use ultra-clean sampling (USEPA 1669), and ultra-clean analytical methods (USEPA 1631) for mercury monitoring.

II. MONITORING LOCATIONS

The Discharger shall establish the following monitoring locations to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements in this Order:

Table 2. Monitoring Station Locations

Discharge Point Name	Monitoring Location Name	Monitoring Location Description (include Latitude and Longitude when available)
Recycled Wastewater	I-001	Located at any point in the pipe which delivers only recycled water to the facility, but upstream of any wastewater treatment unit, blending point, or point of use.
Raw Water	I-002	Located at any point in the pipe which delivers raw water to the facility, but upstream of any water treatment unit, blending point, or point of use.
Treated Wastewater	E-001	At any point in the outfall from the Waste 001 treatment facilities to the discharge point, at which all wastes tributary to the outfall are present.
Treated Wastewater	E-001D	At any point downstream from the disinfection facilities for the refinery sanitary sewage, at which all sewage are present and adequate disinfection is assured.
Stormwater	E-002	At the point of discharge from retention ponds for Waste 002
Stormwater	E-004	At the point of discharge from retention ponds for Waste 004
Stormwater	E-005	At the point of discharge from retention ponds for Waste 005
Stormwater	E-007	At the point of discharge from retention ponds for Waste 007
Stormwater	E-008	At any point representative of stormwater flowing to the outfall for Waste 008
Receiving Water	C-0	At a point in Carquinez Strait, located over the geometric center of the deepwater diffuser for Waste 001

III. INFLUENT MONITORING REQUIREMENTS – Not Applicable

IV. EFFLUENT MONITORING REQUIREMENTS

A. Monitoring Location E-001

1. The Discharger shall monitor treated wastewater at E-001 as follows. If more than one analytical test method is listed for a given parameter, the Discharger must select from the listed methods and corresponding Minimum Level:

Table 3. Effluent Monitoring [1]

Parameter	Units	Sample Type [7]	Minimum Sampling Frequency	Required Analytical Test Method and (Minimum Level, units), respectively
Flow Rate [2]	mgd	Metered	Continuous	
Temperature	°F	Metered	Continuous	
pH	s.u.	Meter	Continuous	
Settleable Solids	mL/ L-hr	Grab	Monthly	
BOD (5-day at 20°C)	mg/L lb/day	24-hour composite	Monthly	
TSS	mg/L lb/day	24-hour composite	Monthly	
Oil & Grease	mg/L lb/day	Composite [3]	Monthly	
Ammonia as N	mg/L lb/day	Grab	Monthly	
Chemical Oxygen	mg/L	24-hour	Monthly	

Parameter	Units	Sample Type [7]	Minimum Sampling Frequency	Required Analytical Test Method and (Minimum Level, units), respectively
Demand	lb/day	Composite		
Total Phenols	mg/L lb/day	Grab	Monthly	
Total Chromium [8]	µg/L lb/day	24-hour composite	Monthly	
Hexavalent Chromium	µg/L lb/day	Grab	Monthly	
Sulfide	mg/L lb/day	Grab	Monthly	
Copper	µg/L	24-hour composite	Monthly	
Mercury	µg/L	[6]	Monthly	
Nickel	µg/L	24-hour composite	Monthly	
Selenium	µg/L	24-hour composite	Weekly	[9]
Cyanide	µg/L	Grab	Monthly	[10]
Zinc	µg/L	24-hour composite	Monthly	
Total PCBs	µg/L	Grab	Twice/Year	[11]
TCDD Equivalents	pg/L	Grab	Twice/Year	[12]
Acute Toxicity [4]	percent survival	Composite	Weekly	
Chronic Toxicity [5]	TU _c	Composite	Quarterly	

[1] Indicates sampling is required during the entire year. The Discharger shall use approved USEPA Methods with the lowest Minimum Levels specified in the SIP and described in footnote 5 of Effluent Limitations A.2, and in the August 6, 2001, letter.

[2] **Flow Monitoring:** Effluent flow shall be measured continuously at E-001, and recorded daily. For effluent flows, the following information shall also be reported, monthly:

- Daily Flow (MG)
- Average Daily Flow (MGD)
- Maximum Daily Flow (MGD)
- Minimum Daily Flow (MGD)
- Total Flow Volume (MG)

Reporting requirements under this section may be satisfied by monthly reporting using the electronic reporting system (ERS), or an equivalent electronic system required by the Regional Water Board or State Water Board.

[3] Each Oil & Grease sample event shall consist of a composite sample comprised of three grab samples taken at equal intervals during the sampling date, with each grab sample being collected in a glass container. Each glass container used for sample collection or mixing shall be thoroughly rinsed with solvent rinsing as soon as possible after use, and the solvent rinsing shall be added to the composite sample for extraction and analysis.

[4] **Bioassays:** Monitoring of the bioassay water shall include, on a daily basis, the parameters specified in the USEPA-approved method, such as pH, dissolved oxygen, ammonia nitrogen, and temperature. These results shall be kept onsite, and made available upon request. If the fish survival rate in the effluent is less than 70 percent or if the control fish survival rate is less than 90 percent, the bioassay test shall be restarted as soon as practicable with new fish and shall continue back to back until compliance is demonstrated. Acute toxicity

testing shall be performed in accordance with the Acute Toxicity Requirements specified in Section V of the SMP.

- [5] A Critical Life Stage Toxicity Test shall be performed and reported in accordance with the Chronic Toxicity Requirements specified in Sections V of the SMP.
- [6] The Discharger may, at its option, sample effluent mercury either as grab or as 24-hour composite samples. The Discharger must use ultra-clean sampling (USEPA 1669), and ultra-clean analytical methods (USEPA 1631) for mercury monitoring.
- [7] Composite sampling: 24-hour composites may be made up of discrete grabs collected over the course of a day and volumetrically or mathematically flow-weighted. Samples for inorganic pollutants may be combined prior to analysis. Samples for organic pollutants shall be analyzed separately. Samples shall be taken on random weekdays.
- [8] The Discharger may, at its option, comply with the limits for hexavalent chromium by using total chromium results. In this case, analysis for hexavalent chromium is waived.
- [9] Selenium must be analyzed for by ICP/MS, or the atomic absorption gaseous hydride procedure (USEPA Method No. 200.8, or Standard Method No. 3114B or 3114C).
- [10] The Discharger may, at their option, analyze for cyanide as Weak Acid Dissociable Cyanide using protocols specified in Standard Method Part 4500-CN-I, USEPA Method OI 1677, or equivalent alternatives in latest edition. Alternative methods of analysis must be approved by the Executive Officer.
- [11] The latest versions of USEPA Methods 608 (or 8080) shall be used to determine compliance with the limits for Total PCBs. The Discharger shall attempt to achieve the lowest detection limits commercially available using this method and shall instruct its lab to calibrate to the minimum level indicated in footnote 5 of Effluent Limitation A.2.
- [12] Chlorinated dibenzodioxins and chlorinated dibenzofurans shall be analyzed using the latest version of USEPA Method 1613; the analysis shall be capable of achieving one-half of the USEPA MLs and the Discharger shall collect 4-liter samples to lower the detection limits to the greatest extent practicable. Alternative methods of analysis must be approved by the Executive Officer.

B. Monitoring Location E-001D

- 1. The Discharger shall monitor treated wastewater at E-001D as follows:

Table 4. Effluent Monitoring

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method and (Minimum Level, units), respectively
Total Coliform Organisms	MPN/100mL	Grab	Twice/Week	

C. Monitoring Locations E-002, E-004, E-005, E-007, and E-008

- 1. The Discharger shall monitor at E-002, E-004, E-005, E-007, and E-008 as follows:

Table 5: Schedule of Sampling, Analyses, and Observations for Stormwater

Parameter	Units	Sample Type	Minimum Sampling Frequency for E-002, E-004, E-005, E-007	Minimum Sampling Frequency for E-008
Oil & Grease	mg/L	Grab	On each event	Twice per year
TOC	mg/L	Grab	On each event	Twice per year
pH	s.u.	Grab	On each event	Twice per year
TSS	mg/L	Grab	On each event	Twice per year
Specific Conductance	µmhos/cm	Grab	On each event	Twice per year
Visual Observations	---	Visual	On each event	Twice per year

V. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

A. Whole Effluent Acute Toxicity

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

1. Acute toxicity effluent limits shall be evaluated by measuring the survival of test organisms exposed to a 96-hour flow through bioassays.
2. The test organisms shall be rainbow trout unless specified otherwise in writing by the Executive Officer, and
3. All bioassays shall be performed according to 40 CFR Part 136, currently *Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms*, 5th Edition. Exceptions shall be granted by the Executive Officer and a representative of the Department of Health Services who manages the Environmental Laboratory Accreditation Program (ELAP).

B. Chronic Toxicity Monitoring Requirements

1. Sampling. The Discharger shall collect 24-hour composite samples of the treatment facilities' effluent at the compliance point specified in Table 1 of the SMP, for critical life stage toxicity testing as indicated below. For toxicity tests requiring renewals, 24-hour composite samples collected on consecutive days are required.
2. Test Species. Chronic toxicity shall be monitored by using critical life stage test(s) and the most sensitive tests species identified by screening phase testing described in Attachment A of the SMP. The Discharger shall conduct routine monitoring with the species approved by the Executive Officer. The approved species at this time is *Americamysis Bahia* (Gulf Shrimp).

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

3. Conditions for Accelerated Monitoring: The Discharger shall accelerate the frequency of monitoring to monthly, or as otherwise specified by the Executive Officer, after exceeding a single sample maximum of 10 TUc. If data from accelerated monitoring tests are found to be in compliance with the evaluation parameter, then routine monitoring shall be resumed.
4. Methodology: Sample collection, handling and preservation shall be in accordance with USEPA protocols. The test methodology used shall be in accordance with the references cited in the Permit, or as approved by the Executive Officer. A concurrent reference toxicant test shall be performed for each test.
5. Dilution Series: The Discharger shall conduct tests at 100%, 50%, 25%, 10%, and 5%, and 2.5%. The "%" represents percent effluent as discharged.

C. Chronic Toxicity Reporting Requirements

1. Routine Reporting: Toxicity test results for the current reporting period shall include the following, at a minimum, for each test.
 - a. Sample date(s)
 - b. Test initiation date
 - c. Test species
 - d. End point values for each dilution (e.g., number of young, growth rate, percent survival)
 - e. NOEC value(s) in percent effluent
 - f. IC₁₅, IC₂₅, IC₄₀, and IC₅₀ values (or EC₁₅, EC₂₅ ... etc.) in percent effluent
 - g. TUc values (100/NOEC, 100/IC₂₅, and 100/EC₂₅)
 - h. Mean percent mortality (\pm s.d.) after 96 hours in 100% effluent
 - i. NOEC and LOEC values for reference toxicant test(s)
 - j. IC₅₀ or EC₅₀ value(s) for reference toxicant test(s)
 - k. Available water quality measurements for each test (i.e., pH, D.O., temperature, conductivity, hardness, salinity, ammonia)
2. Compliance Summary: The results of the chronic toxicity testing shall be provided in the most recent self-monitoring report and shall include a summary table of chronic toxicity data from at least three of the most recent samples. The information in the table shall include the items listed above under V.1.C, items a, c, e, f (IC₂₅ or EC₂₅), g, and h.

VI. LAND DISCHARGE MONITORING REQUIREMENTS – Not Applicable

VII. RECLAMATION MONITORING REQUIREMENTS – Not Applicable

VIII. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER

A. Monitoring Location C-0

1. The Discharger shall monitor Carquinez Strait at C-0 as follows:

Table 6. Receiving Water Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
pH	s.u.	Grab	Quarterly	
Dissolved Oxygen	mg/L	Grab	Quarterly	
Temperature	°F	Grab	Quarterly	
Sulfides [1]	mg/L	Grab	Quarterly	
Unionized Ammonia	mg/L	Grab	Quarterly	
Total Dissolved Solids	mg/L	Grab	Quarterly	
Salinity	ppt	Grab	Quarterly	
Hardness as CaCO ₃	mg/L	Grab	Quarterly	
Standard Observations	----	----	Quarterly	

[1] Receiving water analysis for sulfides shall be run when dissolved oxygen is less than 2.0 mg/L.

IX. OTHER MONITORING REQUIREMENTS – Not Applicable

X. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The Discharger shall comply with all Standard Provisions (Attachment D) related to monitoring, reporting, and recordkeeping.

B. Self Monitoring Reports (SMRs)

1. At any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit Self-Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (<http://www.waterboards.ca.gov/ciwqs/index.html>). The CIWQS Web site will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal. Until such notification is given, the Discharger shall submit self-monitoring reports in accordance with the requirements below.
2. The Discharger shall report in the SMR the results for all monitoring specified in this MRP. The Discharger shall submit monthly SMRs including the results of all required monitoring using USEPA-approved test methods or other test methods specified in this Order. If the Discharger monitors any pollutant more frequently than required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR.
3. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Table 7. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period Begins On...	Monitoring Period	SMR Due Date
Continuous	Effective date of permit	All	Submit with monthly SMR
Hourly	Effective date of permit	Hourly	Submit with monthly SMR
Daily	Effective date of permit	(Midnight through 11:59 PM) or any 24-hour period that reasonably represents a calendar day for purposes of sampling.	Submit with monthly SMR
Weekly	Effective date of permit	Sunday through Saturday	Submit with monthly SMR
Monthly	Effective date of permit	1 st day of calendar month through last day of calendar month	By the last day of the calendar month following the month of sampling
Quarterly	Effective date of permit	January 1 through March 31 April 1 through June 30 July 1 through September 30 October 1 through December 31	April 30 July 31 October 31 January 31
Semiannually	Effective date of permit	January 1 through June 30 July 1 through December 31	July 31 January 31
Annually	Effective date of permit	January 1 through December 31	February 1

4. Reporting Protocols. The Discharger shall report with each sample result the applicable Reporting Level (RL) and the current Method Detection Limit (MDL), as determined by the procedure in Part 136.

The Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

- a. Sample results greater than or equal to the RL shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).
- b. Sample results less than the RL, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.

For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (\pm a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

- c. Sample results less than the laboratory's MDL shall be reported as "Not Detected," or ND.

- d. Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from *extrapolation* beyond the lowest point of the calibration curve.
5. The Discharger shall submit SMRs in accordance with the following requirements:
- a. The Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the facility is operating in compliance with interim and/or final effluent limitations. The Discharger is not required to duplicate the submittal of data that is entered in a tabular format within CIWQS. When electronic submittal of data is required and CIWQS does not provide for entry into a tabular format within the system, the Discharger shall electronically submit the data in a tabular format as an attachment.
 - b. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify violations of the WDRs; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.
 - c. SMRs must be submitted to the Regional Water Board, signed and certified as required by the Standard Provisions (Attachment D), to the address listed below:

Executive Officer
Attn: NPDES Division
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

C. Discharge Monitoring Reports (DMRs)

1. As described in Section X.B.1 above, at any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit SMRs that will satisfy federal requirements for submittal of Discharge Monitoring Reports (DMRs). Until such notification is given, the Discharger shall submit DMRs in accordance with the requirements described below.
2. DMRs must be signed and certified as required by the standard provisions (Attachment D). The Discharge shall submit the original DMR and one copy of the DMR to the address listed below:

State Water Resources Control Board
Discharge Monitoring Report Processing Center
Post Office Box 671
Sacramento, CA 95812

3. All discharge monitoring results must be reported on the official USEPA pre-printed DMR forms (EPA Form 3320-1). Forms that are self-generated or modified cannot be accepted.

D. Other Reports

1. **Annual Reports.** By February 1st of each year, the Discharger shall submit an annual report to the Regional Water Board covering the previous calendar year. The report shall contain the items described in Standard Provisions and Reporting Requirements, and SMP Part A, August 1993 (Attachment I).
2. The Discharger shall submit a clear and legible sketch showing the locations of all ponds, treatment facilities, and points of waste discharge. The map shall be updated by the Discharger as changes occur.

If the Discharger seeks credit for stormwater runoff/ballast water allocation (daily & monthly) for its discharge, it must use the method described in the attached Form A (Attachment H). To receive such credits, Form A must be submitted with the monthly self-monitoring report and the daily maximum allocation for each day outfall 001 is monitored must be computed.

Ballast water treated and discharged as part of outfall 001 shall be metered and the volume recorded in the attached Form A for each calendar year. The 30-day average shall be the sum of the daily values in a calendar month divided by the number of days in that month. Ballast-water allocations shall be calculated by multiplying the volume of ballast water, determined above by the appropriate volume of ballast water, determined above by the appropriate concentration listed under Effluent Limitation A.1b of this permit.

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ATTACHMENT F – FACT SHEET

As described in section II of this Order, this Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order.

This Order has been prepared under a standardized format to accommodate a broad range of discharge requirements for Dischargers in California. Only those sections or subsections of this Order that are specifically identified as “not applicable” have been determined not to apply to this Discharger. Sections or subsections of this Order not specifically identified as “not applicable” are fully applicable to this Discharger.

I. PERMIT INFORMATION

The following table summarizes administrative information related to the facility.

Table 1. Facility Information

WDID	2 071042001
Discharger	Shell Oil Products US and Equilon Enterprises LLC
Name of Facility	Shell Martinez Refinery
Facility Address	3485 Pacheco Blvd
	Martinez, CA 94553
	Contra Costa County
Facility Contact, Title and Phone	Steven Overman, Senior Staff Engineer, (925) 313-3281
Authorized Person to Sign and Submit Reports	Aamir Farid, Refinery Manager, (925) 313-3000
Mailing Address	P.O. Box 711, Martinez, CA 94553
Billing Address	P.O. Box 711, Martinez, CA 94553
Type of Facility	Refinery
Major or Minor Facility	Major
Threat to Water Quality	1
Complexity	A
Pretreatment Program	No
Reclamation Requirements	Not Applicable
Maximum Recorded Flow	9.5 million gallons per day (E-001 - Daily Maximum from 2001 to 2005)
Average Recorded Flow	5.8 million gallons per day (E-001 - 2005 annual average)
Watershed	San Francisco Bay
Receiving Water	Carquinez Strait
Receiving Water Type	Enclosed bay, Estuarine

- A. Shell Oil Products US (facility operator) and Equilon Enterprises LLC (facility owner) of the Shell Martinez Refinery (hereinafter Facility) are hereinafter collectively referred to as Discharger. The Facility refines crude oil to produce gasoline, diesel, jet fuel,

asphalt, coke, and other petroleum products. The refinery is classified as a "cracking refinery" as defined by the U.S. Environmental Protection Agency (U.S. EPA) in 40 CFR § 419.20. Therefore, the U.S. EPA Effluent Guidelines and Standards for Petroleum Refining Point Sources (40 CFR § 419 Subpart B) based on Best Available Technology Economically Achievable (BAT), Best Practicable Control Technology (BPT), and/or Best Conventional Pollutant Control technology (BCT), whichever are more stringent, are applicable to Shell's discharge. Shell discharges treated process wastewater, treated cooling water, treated domestic wastewater, and stormwater to Carquinez Strait.

For the purposes of this Order, references to the "discharger" or "permittee" in applicable federal and state laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

- B. The Facility discharges wastewater to Carquinez Strait, a water of the United States, and is currently regulated by Order No. 01-141, which was adopted on November 28, 2001, and expires on October 31, 2006. Pursuant to 40 CFR Part 122.6, the terms of Order No. 01-141 were administratively extended by a letter dated August 2, 2006.
- C. The Discharger filed a report of waste discharge and submitted an application for renewal of its Waste Discharge Requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permit on April 25, 2006. Supplemental information was requested on June 14, 2006, and received on July 13, 2006, July 25, 2006, and July 27, 2006.

II. FACILITY DESCRIPTION

A. Description of Wastewater Treatment or Controls

1) Wastewater Sources. The Discharger's wastewater treatment plant receives process water from many sources, including light oil processing units, heavy oil processing units, chemical manufacturing (catalysts), central operations (i.e., demineralization, fluid coking, hydrogen, and sulfur plants), sanitary wastewater, stormwater, ballast water, and groundwater extraction systems. The average dry season flow is 5.5 mgd (average of June through August, 2001-2005), with wet season flows up to about 9.5 mgd with the introduction of processed stormwater.

2) Wastewater Treatment Units. The treatment system consists of three oil-water separators, four dissolved nitrogen flotation units, a number of equalization and diversion tanks, two activated sludge biological treatment systems, a number of ponds, a chemical precipitation unit for the removal of selenium, and a Granular Activated Carbon (GAC) adsorption system for polishing treated wastewater. The hydraulic capacity of the entire effluent treatment plant is approximately 10 mgd. All wastewater is processed through the entire effluent treatment system with the following exceptions: Low Biochemical Oxygen Demand (BOD) streams such as cooling tower blowdown, boiler system blowdown, and noncontact stormwater are first treated in an aerated pond, and then by GAC adsorption units. During large storm events, if the wastewater is not high in oil and/or solids, a portion of the wastewater may bypass the initial treatment units, namely the oil-water separators, and/or nitrogen flotation units.

Additionally, a portion of the biologically treated wastewater may bypass the GAC adsorption units during high flow conditions caused by a significant storm event. High flow conditions are generally defined as an effluent discharge rate of 8.6 mgd (5972 gallons per minute) or higher. Wastewater is discharged from Discharge Point 001 to Carquinez Strait. The discharge point is through a 24-inch multiport diffuser, located 20 feet under the Martinez Refinery Wharf.

3) Description of Stormwater Outfalls

- a. **Discharge Point E-002.** This discharge consists of stormwater runoff from an area of approximately 231 acres, located in the central portion of the facility. This area includes the Light Oil Processing area, tank farms, and many of the units for the Clean Fuels area. The first flush of runoff from the Light Oil processing area and the Clean Fuels area is diverted to the Wastewater Treatment Plant for treatment and discharged as Waste 001. Waste 002 includes the runoff for this area that exceeds diversion pump capacities. This excess stormwater runoff combines with runoff from tank farms and is contained by two ponds in series (commonly referred to as the Lake Slobodnik system). Each pond is equipped with an oil baffle/weir and a valve that is normally kept closed. The Waste 002 discharge is at a point (lat. 38°01'21", long. 122°06'38") 600 feet south of the Marina Vista I-680 southbound on and off ramps into an unnamed earthen drainage course contiguous with Peyton Slough which flows into the Carquinez Strait.
- b. **Discharge Point E-004.** This discharge consists of stormwater runoff from a 234-acre tank farm area. The runoff is collected in two ponds in series which are each equipped with an oil baffle/weir and valve which is normally kept closed. The discharge point from the ponds (lat. 38°00'54", long. 122°07'07") is to an unnamed earthen drainage course at a point about 1500 feet south from the Mt. View Sanitary District treatment plant, then into Peyton Slough which flows into the Carquinez Strait.
- c. **Discharge Point E-005.** This discharge consists of stormwater runoff from a 31-acre area that contains an emergency flare system. This runoff is discharged from a pond equipped with an oil baffle/weir and valve (normally kept closed) into a drainage course at a point (lat. 38°00'58", long. 122°06'07") about 900 feet south of the Mt. View Sanitary District treatment plant, then into Peyton Slough which flows into the Carquinez Strait.
- d. **Discharge Point E-007.** This discharge consists of stormwater runoff from a 7-acre propane/butane storage area. This runoff is discharged from a pond which is equipped with an oil baffle/weir and a valve (normally kept closed) into a drainage course at a point (lat. 38°00'05", long. 122°06'07") about 600 feet south of the Mt. View Sanitary District treatment plant, then into Peyton Slough which flows into the Carquinez Strait.
- e. **Discharge Point E-008.** This discharge consists of stormwater runoff from a 16-acre area that contains maintenance shops and warehouses. This runoff is

discharged to a Contra Costa County storm drain culvert near a point (lat. 38°00'40", long. 122°06'24") where it in turn discharges to an unnamed earthen drainage course and eventually to Peyton Slough which flows into the Carquinez Strait.

B. Discharge Points and Receiving Waters

The location of the deepwater diffuser (E-001), and stormwater outfalls are shown in the table below.

Table 2. Discharge Locations

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
001	Treated Wastewater	38°, 01', 56" N	122°, 07', 44" W	Carquinez Strait
002	Stormwater	38°, 01', 21" N	122°, 06', 38" W	Peyton Slough
004	Stormwater	38°, 00', 54" N	122°, 07', 07" W	Peyton Slough
005	Stormwater	38°, 00', 58" N	122°, 06', 07" W	Peyton Slough
007	Stormwater	38°, 00', 05" N	122°, 06', 07" W	Peyton Slough
008	Stormwater	38°, 00', 40" N	122°, 06', 24" W	Peyton Slough

C. Summary of Existing Requirements and Self-Monitoring Report (SMR) Data

1. Effluent Limitations and Monitoring Data for Treated Wastewater (E-001)

Effluent limitations contained in the existing Order for discharges from Shell's wastewater treatment system (Monitoring Location E-001), and representative monitoring data from the term of the previous Order are as follows:

Table 3. Historic Conventional Substances Effluent Limitations and Monitoring Data

Parameter	Units	Effluent Limitation			Monitoring Data (From 2002- To 2005)		
		Average Monthly	5-day Median	Maximum Daily	Highest Average Monthly Discharge	Highest 5-day Median	Highest Daily Discharge
BOD ₅	lbs/day	2,680		5,271	926		1,591
TSS	lbs/day	2,356		3,681	1,678		3,660
COD	lbs/day	19,436		37,400	5,241		9,408
Oil & Grease	lbs/day	883		1,679	418		418
Oil & Grease	mg/L	8		15	8		8
Phenolic Compounds	lbs/day	10.49		39.2	1.1		4.4
Ammonia as N	lbs/day	1,119		2,444	1,085		1,647
Sulfide	lbs/day	15.6		34.7	<6.17		<6.59
Settleable Solids	mL/L-hr	0.1		0.2	0.05		0.05
Total Chromium	lbs/day	12.24		35.19	0.08		0.09

Parameter	Units	Effluent Limitation			Monitoring Data (From 2002– To 2005)		
		Average Monthly	5-day Median	Maximum Daily	Highest Average Monthly Discharge	Highest 5-day Median	Highest Daily Discharge
Hexavalent Chromium	lbs/day	1.01		2.25	0.12		0.12
Total Coliform Organisms	MPN/100 mL		240	10,000		23	5,400

Table 4. Historic Toxic Substances Effluent Limitations and Monitoring Data

Parameter	Units	Effluent Limitation			Monitoring Data (From 2003– To 2005)		
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly Discharge	Highest Average Weekly	Highest Daily Discharge
Chromium VI	µg/L	58		116	5		5
Copper	µg/L	12.2		24.6	12		12
Lead	µg/L			53	0.78		0.78
Mercury	µg/L	0.075			0.1918		0.28
Nickel	µg/L			65	52		52
Selenium	µg/L			50	47		64
Silver	µg/L	6.31	19.2		4.0		4.0
Zinc	µg/L			580	89		89
Cyanide	µg/L			25	25		25
4,4-DDE	µg/L	0.00059		0.00118	<0.002		<0.002
Dieldrin	µg/L	0.00014		0.00028	<0.002		<0.002
Benzo(a) Anthracene	µg/L	0.049		0.098	<0.02		<0.02
Benzo(a) Pyrene	µg/L	0.049		0.098	<0.02		<0.02
Benzo(b) Fluroanthene	µg/L	0.049		0.098	<0.02		<0.02
Benzo(k) Fluroanthene	µg/L	0.049		0.098	<0.02		<0.02
Chrysene	µg/L	0.049		0.098	<0.02		<0.02
Dibenzo(a,h) Anthracene	µg/L	0.49			<0.03		<0.03
Indeno(1,2,3-cd) Pyrene	µg/L	0.049		0.098	<0.02		<0.02
PCB-1016	µg/L	0.00017		0.00034	<0.03		<0.03
PCB-1221	µg/L	0.00017		0.00034	<0.03		<0.03
PCB-1232	µg/L	0.00017		0.00034	<0.04		<0.04
PCB-1242	µg/L	0.00017		0.00034	<0.04		<0.04
PCB-1248	µg/L	0.00017		0.00034	<0.05		<0.05
PCB-1254	µg/L	0.00017		0.00034	<0.03		<0.03
PCB-1260	µg/L	0.00017		0.00034	<0.04		<0.04

Parameter	Units	Effluent Limitation			Monitoring Data (From 2003– To 2005)		
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly Discharge	Highest Average Weekly	Highest Daily Discharge
TCDD Equivalents	pg/L			0.14	0.0456		0.0456

2. Historic Stormwater Data from Outfalls E-002, E-004, E-005, E-007, and E-008

The following tables include the quality of stormwater runoff from December 2002 to April 2006.

a. Discharge Point E-002

Table 5 – E-002 Monitoring Data

Parameter	Average	Daily Maximum ¹
pH, standard units	7.1 (minimum)	8.4
Conductivity (µmhos/cm)	1233	2460
Total Suspended Solids (mg/L)	10.3	50.1
Total Organic Carbon (mg/L)	24.3	43
Oil and Grease (mg/L)	<5 (median)	3.8

¹ These results are based on 32 samples that Shell collected from December 2002 through April 2006.

b. Discharge Point E-004 Monitoring Data

Table 6 – E-004 Monitoring Data

Parameter	Average	Daily Maximum ¹
pH, standard units	7.3 (minimum)	8.2
Conductivity (µmhos/cm)	1011	1557
Total Suspended Solids (mg/L)	21.9	98
Total Organic Carbon (mg/L)	15.4	26.9
Oil and Grease (mg/L)	<5 (median)	3.9

¹ These results are based on 20 samples that Shell collected from December 2002 through April 2006.

c. Discharge Point E-005 Monitoring Data

Table 7– E-005 Monitoring Data

Parameter	Average	Daily Maximum ¹
pH, standard units	7.0 (minimum)	8.3
Conductivity (µmhos/cm)	492	885
Total Suspended Solids (mg/L)	22.9	166
Total Organic Carbon (mg/L)	12	21
Oil and Grease (mg/L)	<5 (median)	5.4

¹ These results are based on 17 samples that Shell collected from December 2002 through April 2006.

d. Discharge Point E-007 Monitoring Data

Table 8– E-007 Monitoring Data

<u>Parameter</u>	<u>Average</u>	<u>Daily Maximum¹</u>
pH, standard units	6.8 (minimum)	7.8
Conductivity (µmhos/cm)	186	1985
Total Suspended Solids (mg/L)	6.5	30
Total Organic Carbon (mg/L)	17.9	32
Oil and Grease (mg/L)	<5 (median)	1.9

¹ These results are based on 15 samples that Shell collected from December 2002 through April 2006.

e. Discharge Point E-008 Monitoring Data

Table 9– E-008 Monitoring Data

<u>Parameter</u>	<u>Average</u>	<u>Daily Maximum¹</u>
pH, standard units	6.9 (minimum)	7.9
Conductivity (µmhos/cm)	72	380
Total Suspended Solids (mg/L)	102	538
Total Organic Carbon (mg/L)	6.1	12
Oil and Grease (mg/L)	<5 (median)	7.0

¹ These results are based on 8 samples that Shell collected from December 2002 through December 2005.

D. Compliance Summary

From 2002 through 2005, the Discharger violated effluent limitations contained in Order No. 01-141 on three occasions, as shown in Table 10 below:

Table 10: Summary of Effluent Violations

<u>Date of Violation</u>	<u>Effluent Limitation Described</u>	<u>Effluent Limit</u>	<u>Reported Value</u>
2/28/2003	Mercury, Monthly Average	0.075	0.1918
6/23/2003	Selenium, Daily Maximum	50	58
7/06/2005	Selenium, Daily Maximum	50	64

E. Planned Changes – The Discharger’s ROWD did not include planned changes for this facility. However, there have been some significant changes since the adoption of Order No. 01-141. First, the Discharger no longer manufactures lubricants. Therefore, it is now classified as a “cracking refinery” as defined by USEPA in 40 CFR Part 419.20. Second, the Discharger increased the hydraulic capacity of two treatment units from 5,000 gallons per minute (gpm) to 7,500 gpm by (a) adding a third lamella separator, and (b) replacing modular GAC units. Third, the Discharger installed solar aerators at Pond 6 to help reduce the potential for odors. Fourth, the Discharger implemented a low BOD wastewater processing option. And, fifth, the Discharger has implemented source control projects, as required by the Bay Area Air Quality Management District, to reduce the amount of hydrocarbons that reach its wastewater treatment plant.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in the proposed Order are based on the requirements and authorities described in this section.

A. Legal Authorities

This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. Environmental Protection Agency (USEPA) and chapter 5.5, division 7 of the California Water Code (commencing with section 13370). It shall serve as a NPDES permit for point source discharges from this facility to surface waters. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the Water Code (commencing with section 13260).

B. California Environmental Quality Act (CEQA)

Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA, Public Resources Code sections 21100 through 21177.

C. State and Federal Regulations, Policies, and Plans

1. Water Quality Control Plans. The Regional Water Quality Control Board (Regional Water Board) adopted a Water Quality Control Plan for the San Francisco Bay Basin, *Water Quality Control Plan* (revised in 2005), (hereinafter Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. On page 2-5, the Basin Plan states that the beneficial uses of any specifically identified water body generally apply to its tributary streams. Peyton Slough is a tributary to Carquinez Strait. While the Basin Plan does not specifically identify beneficial uses for Peyton Slough, it does identify beneficial uses for Carquinez Strait. Beneficial uses applicable to Carquinez Strait are as follows:

Table 11. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
001	Carquinez Strait	Industrial Service Supply (IND) Navigation (NAV) Water Contact Recreation (REC1) Non-contact Water Recreation (REC2) Ocean Commercial and Sport Fishing (COMM) Wildlife Habitat (WILD) Preservation of Rare and Endangered Species (RARE) Fish Migration (MIGR) Fish Spawning (SPWN), and Estuarine Habitat (EST)
002, 004, 005, 007, and 008	Peyton Slough a tributary to Carquinez Strait	Same as above

Requirements of this Order implement the Basin Plan.

2. **Thermal Plan.** The State Water Board adopted a *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Water and Enclosed Bays and Estuaries of California* (Thermal Plan) on May 18, 1972, and amended this plan on September 18, 1975. This plan contains temperature objectives for inland surface waters.
3. **National Toxics Rule (NTR) and California Toxics Rule (CTR).** USEPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.
4. **State Implementation Policy.** On March 2, 2000, the State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP became effective on April 28, 2000 with respect to the priority pollutant criteria promulgated for California by the USEPA through the NTR and to the priority pollutant objectives established by the Regional Water Board in the Basin Plan. The SIP became effective on May 18, 2000 with respect to the priority pollutant criteria promulgated by the USEPA through the CTR. The State Water Board adopted amendments to the SIP on February 24, 2005 that became effective on July 13, 2005. The SIP establishes implementation provisions for priority pollutant criteria and objectives and provisions for chronic toxicity control. Requirements of this Order implement the SIP.
5. **Alaska Rule.** On March 30, 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards (WQS) become effective for CWA purposes (40 C.F.R. § 131.21, 65 Fed. Reg. 24641 (April 27, 2000)). Under the revised regulation (also known as the Alaska rule), new and revised standards submitted to USEPA after May 30, 2000, must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000, may be used for CWA purposes, whether or not approved by USEPA.
6. **Stringency of Requirements for Individual Pollutants.** This Order contains restrictions on individual pollutants that are no more stringent than required by the federal CWA. Individual pollutant restrictions consist of technology-based restrictions and water quality-based effluent limitations. Restrictions on technology-based effluent limitations were specified in federal regulations before May 30, 2000, as discussed in the attached Fact Sheet, Attachment F. The permit's technology-based pollutant restrictions are no more stringent than required by the CWA. Water quality-based effluent limitations have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the

water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. To the extent that toxic pollutant water quality-based effluent limitations were derived from the CTR, the CTR is the applicable standard pursuant to section 131.38. The scientific procedures for calculating the individual water quality-based effluent limitations are based on the CTR-SIP, which was approved by USEPA on May 18, 2000. Most beneficial uses and water quality objectives contained in the Basin Plan were approved under state law and submitted to and approved by USEPA prior to May 30, 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to May 30, 2000, but not approved by USEPA before that date, are nonetheless "applicable water quality standards for purposes of the CWA" pursuant to section 131.21(c)(1). The remaining water quality objectives and beneficial uses implemented by this Order (specifically Arsenic, Cadmium, Chromium (VI), Copper (fresh), Lead, Nickel, Silver (CMC), Zinc) were approved by USEPA on January 5, 2005, and are applicable water quality standards pursuant to section 131.21(c)(2). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the technology-based requirements of the CWA and the applicable water quality standards for purposes of the CWA.

- 7. Antidegradation Policy.** Section 131.12 requires that the state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. The permitted discharge is consistent with the antidegradation provision of section 131.12 and State Water Board Resolution No. 68-16.
- 8. Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at title 40, Code of Federal Regulations section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed. All effluent limitations in this Order are at least as stringent as the effluent limitations in the previous Order.

D. Impaired Water Bodies on CWA 303(d) List

On June 6, 2003, the USEPA approved a revised list of impaired water bodies prepared by the State (hereinafter referred to as the 303(d) list), prepared pursuant to provisions of Section 303(d) of the Federal CWA requiring identification of specific water bodies where it is expected that water quality standards will not be met after implementation of technology-based effluent limitations on point sources. Carquinez Strait is listed as an impaired waterbody. The pollutants impairing Carquinez Strait include chlordane, DDT, diazinon, dieldrin, dioxin compounds, exotic species, furan compounds, mercury, PCBs, dioxin-like PCBs, and selenium. The SIP requires final effluent limitations for all 303(d)-listed pollutants to be based on total maximum daily loads and associated waste load allocations.

1. Total Maximum Daily Loads

The Regional Water Board plans to adopt Total Maximum Daily Loads (TMDLs) for pollutants on the 303(d) list in Carquinez Strait in the next ten years. Future review of the 303(d)-list for Carquinez Strait may result in revision of the schedules or provide schedules for other pollutants.

2. Waste Load Allocations

The TMDLs will establish waste load allocations (WLAs) for point sources and load allocations (LAs) for non-point sources, and will result in achieving the water quality standards for the waterbodies. Final WQBELs for 303(d)-listed pollutants in this discharge will be based on WLAs contained in the respective TMDLs.

3. Implementation Strategy

The Regional Water Board's strategy to collect water quality data and to develop TMDLs is summarized below:

- a. Data Collection.** The Regional Water Board has given the dischargers the option to collectively assist in developing and implementing analytical techniques capable of detecting 303(d)-listed pollutants to at least their respective levels of concern or WQOs/WQC. This collective effort may include development of sample concentration techniques for approval by the USEPA. The Regional Water Board will require dischargers to characterize the pollutant loads from their facilities into the water-quality limited waterbodies. The results will be used in the development of TMDLs, and may be used to update or revise the 303(d) list or change the WQOs/WQC for the impaired waterbodies including Carquinez Strait.

- b. Funding Mechanism.** The Regional Water Board has received, and anticipates continuing to receive, resources from Federal and State agencies for TMDL development. To ensure timely development of TMDLs, the Regional Water Board intends to supplement these resources by allocating development costs among dischargers through the RMP or other appropriate funding mechanisms.

E. Other Plans, Polices and Regulations – Not Applicable

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

The CWA requires point source dischargers to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations in the Code of Federal Regulations: section 122.44(a) requires that permits include applicable technology-based limitations and standards; and section 122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, water quality-based effluent limitations (WQBELs) may be established: (1) using USEPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) on an indicator parameter for the pollutant of concern; or (3) using a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided in section 122.44(d)(1)(vi).

A. Discharge Prohibitions

- 1. Prohibition III.A (No discharge other than that described in this Order).** This prohibition is the same as in the previous permit and is based on California Water Code (CWC) Section 13260 that requires filing of a ROWD before a permit to discharge can be granted. The Discharger submitted a ROWD, dated April 25, 2006, for permission to discharge as specified in this permit, thus any discharges other than as described in this Order are prohibited.
- 2. Prohibition III.B (10:1 Dilution).** The basis for this prohibition is two fold. First, the Basin Plan prohibits discharges with constituents of concern not receiving a minimum 10:1 initial dilution (Chapter 4, Discharge Prohibition No. 1). Second, this Order grants a 10:1 dilution credit to the discharge (see later sections). Some effluent limits are calculated based on this credit. As such, these limits would not be protective if the discharge did not achieve 10:1 dilution, therefore necessitating the prohibition.
- 3. Prohibition III.C (no bypass or overflow).** This prohibition is based on the Basin Plan. The Basin Plan prohibits the discharge of partially treated and untreated wastes (Chapter 4, Discharge Prohibition No.15). As described in Finding B, bypassing the Granular Activated Carbon (GAC) adsorption units with a portion of biologically treated wastewater is permitted only when a significant storm event causes a high

flow condition to exist (effluent discharge rate of 8.6 mgd or higher). The Discharger indicates that bypassing under such conditions is necessary to avoid flooding of the wastewater treatment plant, and damage to equipment and ponds, which could result in uncontrolled releases of untreated wastewater to Carquinez Strait. Should the Discharger initiate a partial bypass of its GAC adsorption units, it must monitor for all pollutants, including acute toxicity, and document compliance with effluent limits. During bypass events, the Discharger is not required to conduct chronic toxicity monitoring due to the complicated nature of this test (i.e., availability of test organisms, and laboratory setup time).

B. Technology-Based Effluent Limitations

1. Scope and Authority

The CWA requires that technology-based effluent limitations be established based on several levels of controls:

- Best practicable treatment control technology (BPT) represents the average of the best performance by plants within an industrial category or subcategory. BPT standards apply to toxic, conventional, and non-conventional pollutants.
- Best available technology economically achievable (BAT) represents the best existing performance of treatment technologies that are economically achievable within an industrial point source category. BAT standards apply to toxic and non-conventional pollutants.
- Best conventional pollutant control technology (BCT) represents the control from existing industrial point sources of conventional pollutants including BOD, TSS, fecal coliform, pH, and oil and grease. The BCT standard is established after considering the "cost reasonableness" of the relationship between the cost of attaining a reduction in effluent discharge and the benefits that would result, and also the cost effectiveness of additional industrial treatment beyond BPT.
- New source performance standards (NSPS) represent the best available demonstrated control technology standards. The intent of NSPS guidelines is to set limitations that represent state-of-the-art treatment technology for new sources.

The CWA requires USEPA to develop effluent limitations, guidelines and standards (ELGs) representing application of BPT, BAT, BCT, and NSPS. Section 402(a)(1) of the CWA and section 125.3 of the Code of Federal Regulations authorize the use of best professional judgment (BPJ) to derive technology-based effluent limitations on a case-by-case basis where ELGs are not available for certain industrial categories and/or pollutants of concern. Where BPJ is used, the permit writer must consider specific factors outlined in section 125.3.

a. Effluent Limitations A.1a: The refinery is classified as a "cracking refinery" as defined by the USEPA in 40 CFR § 419.20. Therefore, the USEPA Effluent

Guidelines and Standards for Petroleum Refining Point Sources (40 CFR § 419 Subpart B) based on Best Available Technology Economically Achievable (BAT), Best Practicable Control Technology (BPT), and/or Best Conventional Pollutant Control technology (BCT), whichever are more stringent, are applicable to the Discharger.

This section contains production-based mass emission limits for the following constituents: Biochemical oxygen demand (BOD), total suspended solids (TSS), chemical oxygen demand (COD), oil & grease, phenolic compounds, ammonia (expressed as nitrogen), sulfide, and total and hexavalent chromium based on 40 CFR § 419 Subpart B. The application of these guidelines and standards is based on production rates at the refinery. In calculating currently applicable effluent limitations, Board staff used annual facility production rate from November 2004 to October 2005. A detailed description of the methodology and data used to calculate the technology-based effluent limitations is included in Attachment 1.

The effluent limits for pH are a standard secondary treatment requirement and are unchanged from the existing permit. The limit is based on the Basin Plan (Chapter 4, Table 4-2), which is derived from federal requirements (40 CFR 133.102). This is an existing permit effluent limitation and compliance has been demonstrated by existing plant performance.

The limits for settleable solids are based on existing limits and the Basin Plan, and the concentration limits for oil and grease are based on existing limits and BPJ.

b. Effluent Limitations A.1b: Concentration limits for pollutants contained in storm water and ballast water are based on existing limits, which were developed from the requirements in 40 CFR Part 419.22(e)(2), 419.23(f)(2), and 419.22(c). The Order retains the requirement that the Discharger record storm water and ballast flow on a daily basis and report daily maximum and monthly average flows. These flows are then used along with the above concentration limits to calculate the mass allowances that are added to the mass limits included in A.1a.

c. Effluent Limitations A.3: This effluent limit requires that the Most Probable Number (MPN) of Total Coliform Organisms in any five (5) consecutive samples shall not exceed 240 MPN/100ml; and any single sample shall not exceed 10,000 MPN/100ml. It is based on the existing permit and the Basin Plan (Chapter 4, Table 4-2).

2. Applicable Technology-Based Effluent Limitations

Summary of Technology-based Effluent Limitations Discharge Point 001

Table 12. Summary of Technology-based Effluent Limitations

Parameter	Units	Effluent Limitations			
		Average Monthly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Five-day Biochemical Oxygen Demand	lbs/day	1839	3310		
Total Suspended Solids	lbs/day	1471	2307		
Chemical Oxygen Demand	lbs/day	12837	24738		
Oil & Grease	lbs/day	535	1003		
	mg/L	8	15		
Phenolic Compounds	lbs/day	7.8	25		
Ammonia as N	lbs/day	1003	2206		
Sulfide	lbs/day	9.7	22		
Total Chromium	lbs/day	9.1	26		
Hexavalent Chromium	lbs/day	0.74	1.7		
Settleable Solids	mL/ L-hr	0.1	0.2		
pH ¹	standard units			6.0	9.0

¹ If the Discharger employs continuous pH monitoring, it shall be in compliance with the pH limitation specified herein, provided that both of the following conditions are satisfied: (a) the total time during which the pH values are outside the required range shall not exceed 7 hours and 26 minutes in any calendar month, and (b) no individual excursion from the required range of pH values shall exceed 60 minutes.

C. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

a. As specified in section 122.44(d)(1)(i), permits are required to include WQBELs for pollutants (including toxicity) that are or may be discharged at levels that cause, have reasonable potential to cause, or contribute to an excursion above any state water quality standard. WQBELs in this Order are revised and updated from the limitations in the previous permit, and their presence in this Order is based on an evaluation of the Discharger's data as described below under the Reasonable Potential Analysis. Under State Law (SIP) numeric WQBELs are required for all constituents that have a reasonable potential to cause or contribute to an excursion above any State water quality standard. Reasonable potential is determined and final WQBELs are developed using the methodology outlined in the SIP. If the Discharger demonstrates that the final limitations will be infeasible to meet and provides justification for a compliance schedule, then interim limitations are established, with a compliance schedule to achieve the final limits.

b. Maximum Daily Effluent Limitations (MDELs) are used in this permit to protect against acute water quality effects. It is impracticable to use weekly average limitations to guard against acute effects. Although weekly averages are effective for monitoring the performance of biological wastewater treatment plants, the MDELs are necessary for preventing fish kills or mortality to aquatic organisms, as further explained in subsection c, below.

c. NPDES regulations, the SIP, and USEPA's Technical Support Document (TSD) provide the basis to establish MDELs. NPDES regulations at 40 CFR §122.45(d) state:

"For continuous discharges all permit effluent limitations, standards, and prohibitions, including those necessary to achieve water quality standards, shall *unless impracticable* be stated as:

(1) Maximum daily and average monthly discharge limitations for all discharges other than publicly owned treatment works; and

(2) Average weekly and average monthly discharge limitations for POTWs."

2. **Applicable Beneficial Uses and Water Quality Criteria and Objectives**

The WQC and WQOs applicable to the receiving waters for this discharge are from the Basin Plan, the USEPA's May 18, 2000 Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California (the California Toxics Rule, or the CTR), and the USEPA's National Toxics Rule (the NTR).

a. **Basin Plan.** The Basin Plan specifies numeric WQOs for 10 priority toxic pollutants, as well as narrative WQOs for toxicity and bioaccumulation in order to protect beneficial uses. The pollutants for which the Basin Plan specifies numeric objectives are arsenic, cadmium, chromium (VI), copper in freshwater, lead, mercury, nickel, silver, zinc, and cyanide (see also c., below). The narrative toxicity objective states in part "[a]ll waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce other detrimental responses in aquatic organisms." The bioaccumulation objective states in part "[c]ontrollable water quality factors shall not cause a detrimental increase in concentrations of toxic substances found in bottom sediments or aquatic life. Effects on aquatic organisms, wildlife, and human health will be considered." Effluent limitations and provisions contained in this Order are designed to implement these objectives, based on available information.

b. **CTR.** The CTR specifies numeric aquatic life criteria for 23 priority toxic pollutants and numeric human health criteria for 57 priority toxic pollutants. These criteria apply to inland surface waters and enclosed bays and estuaries such as here, except that where the Basin Plan's Tables 3-3 and 3-4 specify numeric objectives for certain of these priority toxic pollutants, the Basin Plan's numeric objectives apply over the CTR (except in the South Bay south of the Dumbarton Bridge).

c. **NTR.** The NTR established numeric aquatic life criteria for selenium, numeric aquatic life and human health criteria for cyanide, and numeric human health criteria for 34 toxic organic pollutants for waters of San Francisco Bay upstream to, and including, Suisun Bay and the Delta. This includes the receiving water for this Discharger.

d. Technical Support Document for Water Quality-Based Toxics Controls.

Where numeric objectives have not been established or updated in the Basin Plan, 40 CFR Part 122.44(d) specifies that WQBELs may be set based on USEPA criteria, supplemented where necessary by other relevant information, to attain and maintain narrative WQOs to fully protect designated beneficial uses. Regional Water Board staff used best professional judgment (BPJ) to determine the WQOs, WQCs, WQBELs, and calculations contained in this Order as defined by USEPA's March 1991 Technical Support Document for Water Quality-Based Toxics Control (the TSD).

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

1) Receiving Water Salinity. The receiving water for discharges from the Shell Martinez Refinery is Carquinez Strait within northern San Francisco Bay - a tidally influenced waterbody with fresh water inflows. Salinity data for the period of March 1993 through August 2001 for the nearest receiving water station within the Clean Estuary Institutes's Regional Monitoring Program (RMP) are from Pacheco Creek. During this time period, in 15 of 46 samples (33 percent) the salinity was less than one ppt, and in 6 of 46 samples (13 percent) the salinity was greater than ten ppt; and therefore, the receiving water is viewed as an estuarine environment for purposes of determining the need for and establishing WQBELs. In these circumstances, the more stringent of the marine and fresh water WQOs/WQC from the Basin Plan, the CTR, and the NTR are applicable to discharges from the Shell Martinez Refinery.

2) Hardness. Some fresh water WQOs/WQC for metals are hardness dependent. Hardness data collected through the RMP are available for water bodies in the San Francisco Bay Region. In determining the WQOs and WQC for this Order, the Regional Water Board used a hardness of 46 mg/L, which is the minimum hardness at the Pacheco Creek Station observed from 1995-2001. This represents the best available information for hardness of the receiving water after it has mixed with the discharge.

3. Determining the Need for WQBELs

Title 40 CFR Part 122.44(d) (1) (i) requires permits to include WQBELs for all pollutants (non-priority or priority) "which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any narrative or numeric criteria within a State water quality standard" (have Reasonable Potential). Thus, assessing whether a pollutant has Reasonable

Potential is the fundamental step in determining whether or not a WQBEL is required. For priority pollutants, Regional Water Board staff used the methods prescribed in Section 1.3 of the SIP to determine if the discharge from Discharge Point 001 demonstrates Reasonable Potential as described in Sections 3a through 3h below.

a. Reasonable Potential Analysis

Using the methods prescribed in Section 1.3 of the SIP, Regional Water Board staff analyzed the effluent data to determine if the discharge from E-001 demonstrates Reasonable Potential. The Reasonable Potential Analysis (RPA) compares the effluent data with numeric and narrative WQOs in the Basin Plan and numeric WQC from the USEPA, the NTR, and the CTR.

b. Reasonable Potential Methodology

Using the methods and procedures prescribed in Section 1.3 of the SIP, Regional Water Board staff analyzed the effluent and background data and the nature of facility operations to determine if the discharge has reasonable potential to cause or contribute to exceedances of applicable SSOs or WQC.

The RPA identifies the observed MEC in the effluent for each pollutant, based on effluent concentration data. There are three triggers in determining Reasonable Potential:

- 1) The first trigger is activated if the MEC is greater than the lowest applicable WQO ($MEC \geq WQO$), which has been adjusted, if appropriate, for pH, hardness, and translator data. If the MEC is greater than the adjusted WQO, then that pollutant has reasonable potential, and a WQBEL is required.
- 2) The second trigger is activated if the observed maximum ambient background concentration (B) is greater than the adjusted WQO ($B > WQO$) and the pollutant was detected in any of the effluent samples.
- 3) The third trigger is activated if a review of other information determines that a WQBEL is required to protect beneficial uses, even though both MEC and B are less than the WQO/WQC. A limitation may be required under certain circumstances to protect beneficial uses.

c. Effluent Data

The Regional Water Board's August 6, 2001 letter titled *Requirement for Monitoring of Pollutants in Effluent and Receiving Water to Implement New Statewide Regulations and Policy* (hereinafter referred to as the Regional Water Board's August 6, 2001 Letter) to all permittees, formally required the Discharger (pursuant to Section 13267 of the CWC) to initiate or continue to monitor for the priority pollutants using analytical methods that provide the best detection limits reasonably feasible. Regional Water Board staff analyzed this effluent data to determine if the discharge has Reasonable Potential. The RPA was based on the effluent monitoring data collected by the Discharger from February 2003 through February 2006.

d. Ambient Background Data

For the RPA, ambient background concentrations are the observed maximum water column concentrations. The SIP allows background to be determined on a discharge-by-discharge or water body-by-water body basis (SIP section 1.4.3). Consistent with the SIP, Regional Water Board staff has chosen to use a water body-by-water body basis because of the uncertainties inherent in accurately characterizing ambient background in a complex estuarine system on a discharge-by-discharge basis.

The RMP station at Yerba Buena Island, located in the Central Bay, has been monitored for most of the inorganic (CTR constituent numbers 1–15) and some of the organic (CTR constituent numbers 16–126) toxic pollutants, and this data from the RMP, for the period March 1993 through August 2003, was used as background data in performing the RPA for this Discharger.

e. RPA Determinations

The MECs, WQOs/WQC, bases for the WQOs/WQC, background concentrations used, and Reasonable Potential conclusions from the RPA for Discharge Point 001 are listed in the following table for all constituents analyzed. Some of the constituents in the CTR were not determined because of the lack of an objective/criteria or effluent data. Based on the RPA methodology in the SIP, some constituents did not demonstrate Reasonable Potential. The RPA results are shown below and Attachment 2 of this Fact Sheet. The pollutants that exhibit Reasonable Potential in discharges from Discharge Point 001 are copper; mercury; nickel; selenium; zinc; cyanide; PCBs; and 2,3,7,8-TCDD TEQ.

Table 13 – RPA Results

CTR #	PRIORITY POLLUTANTS (µg/L)	MEC or Minimum DL ¹	Governing WQO/WQC	Maximum Background or Minimum DL ^{1,2}	RPA Results ³
1	Antimony	0.6	4300	1.8	No
2	Arsenic	5.4	36	2.46	No
3	Beryllium	< 0.06	No Criteria	0.215	Undetermined
4	Cadmium	0.3	0.6	0.1268	No
5a	Chromium (III or Total)	2.0	110	Not Available	No
5b	Chromium (VI)	5.0	11.4	4.4	No
6	Copper	12	3.7	2.45	Yes
7	Lead	0.78	1.2	0.804	No
8	Mercury	0.28	0.025	0.0086	Yes
9	Nickel	52	8.3	3.73	Yes
10	Selenium	64	5.0	0.39	Yes
11	Silver	0.8	1.1	0.052	No
12	Thallium	Not available	6.3	0.21	No
13	Zinc	89	62.1	4.4	Yes
14	Cyanide	25	1.0	< 0.4	Yes
16	2,3,7,8-TCDD (Dioxin)	< 6.30 x 10 ⁻⁷	1.4 x 10 ⁻⁸	Not Available	No
16-TEQ	2,3,7,8-TCDD TEQ	4.56 x 10 ⁻⁸	1.4 x 10 ⁻⁸	7.1 x 10 ⁻⁸	Yes
17	Acrolein	< 0.56	780	< 0.5	No
18	Acrylonitrile	< 0.33	0.66	0.03	No
19	Benzene	< 0.06	71	< 0.05	No
20	Bromoform	< 0.07	360	< 0.5	No
21	Carbon Tetrachloride	< 0.06	4.4	0.06	No
22	Chlorobenzene	< 0.06	21000	< 0.5	No
23	Chlorodibromomethane	0.2	34	< 0.05	Yes
24	Chloroethane	< 0.07	No Criteria	< 0.5	Undetermined
25	2-Chloroethylvinyl Ether	< 0.1	No Criteria	< 0.5	Undetermined
26	Chloroform	2.4	No Criteria	< 0.5	Undetermined

CTR #	PRIORITY POLLUTANTS (µg/L)	MEC or Minimum DL ¹	Governing WQO/WQC	Maximum Background or Minimum DL ^{1,2}	RPA Results ³
27	Dichlorobromomethane	0.2	46	< 0.05	No
28	1,1-Dichloroethane	< 0.05	No Criteria	< 0.05	Undetermined
29	1,2-Dichloroethane	< 0.06	99	0.04	No
30	1,1-Dichloroethylene	< 0.06	3.2	< 0.5	No
31	1,2-Dichloropropane	< 0.05	39	< 0.05	No
32	1,3-Dichloropropylene	< 0.05	1700	Not Available	No
33	Ethylbenzene	< 0.06	29000	< 0.5	No
34	Methyl Bromide	< 0.05	4000	< 0.5	No
35	Methyl Chloride	0.5	No Criteria	< 0.5	Undetermined
36	Methylene Chloride	0.09	1600	0.5	No
37	1,1,2,2-Tetrachloroethane	< 0.06	11	< 0.05	No
38	Tetrachloroethylene	0.1	8.85	< 0.05	No
39	Toluene	< 0.06	200000	< 0.3	No
40	1,2-Trans-Dichloroethylene	< 0.05	140000	< 0.5	No
41	1,1,1-Trichloroethane	< 0.06	No Criteria	< 0.5	Undetermined
42	1,1,2-Trichloroethane	< 0.07	42	< 0.05	No
43	Trichloroethylene	< 0.06	81	< 0.5	No
44	Vinyl Chloride	< 0.05	525	< 0.5	No
45	2-Chlorophenol	< 0.6	400	< 1.2	No
46	2,4-Dichlorophenol	< 0.7	790	< 1.3	No
47	2,4-Dimethylphenol	< 0.9	2300	< 1.3	No
48	2-Methyl-4,6-Dinitrophenol	< 0.9	765	< 1.2	No
49	2,4-Dinitrophenol	< 0.6	14000	< 0.7	No
50	2-Nitrophenol	< 0.7	No Criteria	< 1.3	Undetermined
51	4-Nitrophenol	< 0.6	No Criteria	< 1.6	Undetermined
52	3-Methyl-4-Chlorophenol	< 0.5	No Criteria	< 1.1	Undetermined
53	Pentachlorophenol	< 0.9	7.9	< 1.0	No
54	Phenol	75	4600000	< 1.3	No
55	2,4,6-Trichlorophenol	< 0.6	6.5	< 1.3	No
56	Acenaphthene	0.3	2700	0.0015	No
57	Acenaphthylene	< 0.02	No Criteria	0.00053	Undetermined
58	Anthracene	< 0.03	110000	0.0005	No
59	Benzidine	< 1.0	0.00054	< 0.0015	No
60	Benzo(a)Anthracene	< 0.02	0.049	0.0053	No
61	Benzo(a)Pyrene	< 0.02	0.049	0.00029	No
62	Benzo(b)Fluoranthene	< 0.02	0.049	0.0046	No
63	Benzo(ghi)Perylene	< 0.02	No Criteria	0.0027	Undetermined
64	Benzo(k)Fluoranthene	< 0.02	0.049	0.0015	No
65	Bis(2-Chloroethoxy)Methane	< 0.8	No Criteria	< 0.3	Undetermined
66	Bis(2-Chloroethyl)Ether	< 0.7	1.4	< 0.3	No
67	Bis(2-Chloroisopropyl)Ether	< 0.6	170000	Not Available	No
68	Bis(2-Ethylhexyl)Phthalate	3.0	59	< 0.5	No
69	4-Bromophenyl Phenyl Ether	< 0.4	No Criteria	< 0.23	Undetermined
70	Butylbenzyl Phthalate	< 0.8	5200	< 0.52	No
71	2-Chloronaphthalene	< 0.5	4300	< 0.3	No
72	4-Chlorophenyl Phenyl Ether	< 0.5	No Criteria	< 0.3	Undetermined
73	Chrysene	< 0.02	0.049	0.0024	No
74	Dibenzo(a,h)Anthracene	< 0.03	0.049	0.00064	No
75	1,2 Dichlorobenzene	< 0.05	17000	< 0.8	No
76	1,3 Dichlorobenzene	< 0.07	2600	< 0.8	No
77	1,4 Dichlorobenzene	< 0.3	2600	< 0.8	No
78	3,3-Dichlorobenzidine	< 0.3	0.077	< 0.001	No
79	Diethyl Phthalate	< 0.7	120000	< 0.24	No
80	Dimethyl Phthalate	< 0.6	2900000	< 0.24	No
81	Di-n-Butyl Phthalate	< 0.6	12000	< 0.5	No
82	2,4-Dinitrotoluene	< 0.6	9.1	< 0.27	No
83	2,6-Dinitrotoluene	< 0.5	No Criteria	< 0.29	Undetermined
84	Di-n-Octyl Phthalate	< 0.7	No Criteria	< 0.38	Undetermined
85	1,2-Diphenylhydrazine	< 0.6	0.54	0.0037	No

CTR #	PRIORITY POLLUTANTS (µg/L)	MEC or Minimum DL ¹	Governing WQO/WQC	Maximum Background or Minimum DL ^{1,2}	RPA Results ³
86	Fluoranthene	< 0.03	370	0.011	No
87	Fluorene	< 0.02	14000	0.00208	No
88	Hexachlorobenzene	< 0.4	0.00077	0.0000202	No
89	Hexachlorobutadiene	< 0.7	50	< 0.3	No
90	Hexachlorocyclopentadiene	< 0.4	17000	< 0.31	No
91	Hexachloroethane	< 0.6	8.9	< 0.2	No
92	Indeno(1,2,3-cd) Pyrene	< 0.02	0.049	0.004	No
93	Isophorone	1.0	600	< 0.3	No
94	Naphthalene	< 0.02	No Criteria	0.0023	Undetermined
95	Nitrobenzene	< 0.7	1900	< 0.25	No
96	N-Nitrosodimethylamine	< 0.6	8.1	< 0.3	No
97	N-Nitrosodi-n-Propylamine	< 0.8	1.4	< 0.001	No
98	N-Nitrosodiphenylamine	< 0.6	16	< 0.001	No
99	Phenanthrene	< 0.02	No Criteria	0.0061	Undetermined
100	Pyrene	< 0.02	11000	0.0051	No
101	1,2,4-Trichlorobenzene	< 0.6	No Criteria	< 0.3	Undetermined
102	Aldrin	< 0.002	0.00014	Not Available	No
103	alpha-BHC	< 0.003	0.013	0.000496	No
104	beta-BHC	< 0.003	0.046	0.000413	No
105	gamma-BHC	< 0.002	0.063	0.0007034	No
106	delta-BHC	< 0.002	No Criteria	0.000042	Undetermined
107	Chlordane	< 0.005	0.00059	0.00018	No
108	4,4'-DDT	< 0.002	0.00059	0.000066	No
109	4,4'-DDE	< 0.002	0.00059	0.000693	No
110	4,4'-DDD	< 0.002	0.00084	0.000313	No
111	Dieldrin	< 0.002	0.00014	0.000264	No
112	alpha-Endosulfan	< 0.002	0.0087	0.000031	No
113	beta-Endosulfan	< 0.002	0.0087	0.000069	No
114	Endosulfan Sulfate	< 0.002	240	0.0000819	No
115	Endrin	< 0.002	0.0023	0.000036	No
116	Endrin Aldehyde	< 0.002	0.81	Not Available	Undetermined
117	Heptachlor	< 0.003	0.00021	0.000019	No
118	Heptachlor Epoxide	< 0.002	0.00011	0.00002458	No
119-125	PCBs sum	0.000281 [4]	0.00017	0.001462	Yes
126	Toxaphene	< 0.15	0.0002	Not Available	Undetermined
	Tributyltin	Not Available	0.01	< 0.001	No
	Total PAHs	0.3	15	0.26	No

[1] Concentration in bold is the actual detected maximum concentration, otherwise the concentration shown is the maximum detection level.

[2] Maximum Background = Not Available, if there is not monitoring data for this constituent.

[3] RPA Results = Yes, if MEC > WQO/WQC,
 = No, if MEC or all effluent concentration non-detect < WQO/WQC,
 = Undetermined, if no objective promulgated, and
 = Cannot be determined due to lack of data.

[4] Derived from *Polychlorinated Biphenyls in Northern San Francisco Estuary Refinery Effluents*, prepared by the San Francisco Estuary Institute (September 10, 2002).

f. Pollutants that no Longer Trigger Reasonable Potential

WQBELs are not included in this Order for constituents that do not demonstrate Reasonable Potential; however, monitoring for those pollutants is still required. If concentrations of these constituents are found to have increased significantly, the Discharger will be required to investigate the source(s) of the increase(s). Remedial measures are required if the increases pose a threat to water quality in the receiving water.

The previous permit (Order No. 01-141) included WQBELs for hexavalent chromium; lead; silver; 4,4 DDE; dieldrin; benzo(a)anthracene; benzo(a)pyrene;

benzo(b)fluoranthene; benzo(k)fluoranthene; chrysene; dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene; however, because the reasonable potential analysis showed that discharges from the Shell Martinez Refinery no longer demonstrate a reasonable potential to cause or contribute to exceedances of applicable water quality criteria for these pollutants, limitations from the previous permit are not retained and new limitations are not included in this Order. This finding is consistent with State Water Resources Control Board Order WQO 2002-0011, which remanded an NPDES permit to the Regional Water Board where there had been insufficient "other information" to draw a conclusion of reasonable potential, when the subject pollutants were not detected in plant effluent.

4. Dilution and Assimilative Capacity

a. Dilution. Based on a study entitled *Water Quality and Dye Dilution Studies, Martinez Manufacturing Complex, Shell Oil Company*, dated October 1987, and prepared by Brown and Caldwell, the Discharger indicates that the diffuser achieves a probable minimum initial dilution of at least 16:1. Additionally, the Discharger indicates that a study conducted by Flow Science Incorporated, dated October 31, 2001, shows that the far-field long-term average dilution from the Shell Martinez Refinery outfall exceeds 3000:1. To address uncertainties with mixing (discussed below) and to protect beneficial uses of the Carquinez Strait, this Order limits the dilution credit for Waste 001 for nonbioaccumulative constituents to 10:1

The Board believes a conservative 10:1 dilution credit for discharges of non-bioaccumulative pollutants to San Francisco Bay is necessary for protection of beneficial uses. The basis for limiting the dilution credit is based on SIP provisions in Section 1.4.2. The following outlines the basis for limiting the dilution credit:

- (1) A far-field background station is appropriate because the San Francisco Bay watershed, including the receiving waters, is a very complex estuarine system with highly variable and seasonal upstream freshwater inflows and diurnal tidal saltwater inputs.
- (2) Due to the complex hydrology of the San Francisco Bay watershed, a mixing zone cannot be accurately established.
- (3) Previous dilution studies do not fully account for the cumulative effects of other wastewater discharges to the system.
- (4) The SIP allows limiting a mixing zone and dilution credit for persistent pollutants (e.g., copper and nickel).

The main justification for limiting dilution credit is uncertainty in accurately determining ambient background and uncertainty in accurately determining the mixing zone in a complex estuarine system with multiple wastewater discharges. The basis for using 10:1 is that it was granted in the previous permit. This 10:1 limit is also based on the Basin Plan's prohibition number 1, which prohibits discharges like Waste 001 with less than 10:1. The following gives more detailed rationale.

(1) Complex Estuarine System Necessitates Far-Field Background - The SIP allows background to be determined on a discharge-by-discharge or water body-by-water body basis (SIP section 1.4.3). Consistent with the SIP, Board staff has chosen to use a

water body-by-water body basis because of the uncertainties inherent in accurately characterizing ambient background in a complex estuarine system on a discharge-by-discharge basis.

With this in mind, the Yerba Buena Island Station fits the guidance for ambient background in the SIP compared to other stations in the RMP. The SIP states that background data are applicable if they are "representative of the ambient receiving water column that will mix with the discharge." Board Staff believe that data from this station are representative of water that will mix with the discharge from Outfalls E-001. Although this station is located near the Golden Gate, it would represent the typical water flushing in and out in the Bay Area each tidal cycle. For most of the Bay Area, the waters represented by this station make up a large part of the receiving water that will mix with the discharge.

(2) Uncertainties Prevent Accurate Mixing Zones in Complex Estuarine Systems -

There are uncertainties in accurately determining the mixing zones for each discharge. The models that have been used by dischargers to predict dilution have not considered the three-dimensional nature of the currents in the estuary resulting from the interaction of tidal flushes and seasonal fresh water outflows. Saltwater is heavier than fresh water. Colder saltwater from the ocean flushes in twice a day generally under the warmer fresh river waters that flow out annually. When these waters mix and interact, complex circulation patterns occur due to the different densities of these waters. These complex patterns occur throughout the estuary but are most prevalent in the San Pablo Bay, Carquinez Strait, and Suisun Bay areas. The locations change depending on the strength of each tide and the variable rate of delta outflow. Additionally, sediment loads to the Bay from the Central Valley also change on a longer-term basis. These changes can result in changes to the depths of different parts of the Bay making some areas more shallow and/or other areas more deep. These changes affect flow patterns that in turn can affect the initial dilution achieved by a discharger's diffuser.

(3) Dye studies do not account for cumulative effects from other discharges - The tracer and dye studies conducted are often not long enough in duration to fully assess the long residence time of a portion of the discharge that is not flushed out of the system. In other words, some of the discharge, albeit a small portion, makes up part of the dilution water. So unless the dye studies are of long enough duration, the diluting effect on the dye measures only the initial dilution with "clean" dilution water rather than the actual dilution with "clean" dilution water plus some amount of original discharge that resides in the system. Furthermore, both models and dye studies that have been conducted have not considered the effects of discharges from other nearby discharge sources, nor the cumulative effect of discharges from over 20 other major dischargers to San Francisco Bay system. While it can be argued the effects from other discharges are accounted for by factoring in the local background concentration in calculating the limitations, accurate characterization of local background levels are also subject to uncertainties resulting from the interaction of tidal flushing and seasonal fresh water outflows described above.

(4) Mixing Zone Is Further Limited for Persistent Pollutants - Discharges to the Bay Area waters are not completely-mixed discharges as defined by the SIP. Thus, the dilution credit should be determined using site-specific information for incompletely-mixed discharges. The SIP in section 1.4.2.2 specifies that the Regional Board

“significantly limit a mixing zone and dilution credit as necessary... For example, in determining the extent of a mixing zone or dilution credit, the RWQCB shall consider the presence of pollutants in the discharge that are ... persistent.” The SIP defines persistent pollutants to be “substances for which degradation or decomposition in the environment is nonexistent or very slow.” The pollutants at issue here are persistent pollutants (e.g., copper, lead, nickel, silver, and zinc). The dilution studies that estimate actual dilution do not address the effects of these persistent pollutants in the Bay environment, such as their long-term effects on sediment concentrations.

b. Assimilative Capacity. In response to the SWRCB’s Order No. 2001-06, Board staff has evaluated the assimilative capacity of the receiving water for 303(d) listed pollutants for which the Discharger has reasonable potential in its discharges. The evaluation included a review of RMP data (local and Central Bay stations), effluent data, and WQOs/WQC. From this evaluation, it is determined that the assimilative capacity is highly variable due to the complex hydrology of the receiving water. Therefore, there is uncertainty associated with the representative nature of the appropriate ambient background data to conclusively quantify the assimilative capacity of the receiving water. Pursuant to Section 1.4.2.1 of the SIP, “dilution credit may be limited or denied on a pollutant-by-pollutant basis...”

For certain bioaccumulative pollutants, based on BPJ, dilution credit is not included in calculating the final WQBELs. This determination is based on available data on concentrations of these pollutants in aquatic organisms, sediment, and the water column. The Board placed selenium, mercury, and PCBs on the CWA Section 303(d) list. The USEPA added dioxins and furans compounds on the CWA Section 303(d) list. Dilution credit is not included for the following pollutants: mercury, selenium, PCBs, and dioxins and furans. The following factors suggest that there is no more assimilative capacity in the Bay for these pollutants.

(1) San Francisco Bay fish tissue data shows that these pollutants, except for selenium, exceed screening levels. The fish tissue data are contained in "Contaminant Concentrations in Fish from San Francisco Bay 1997" May 1997. Denial of dilution credits for these pollutants is further justified by fish advisories to the San Francisco Bay. The Office of Environmental Health and Hazard Assessment (OEHHA) performed a preliminary review of the data from the 1994 San Francisco Bay pilot study, "Contaminated Levels in Fish Tissue from San Francisco Bay." The results of the study showed elevated levels of chemical contaminants in the fish tissues. Based on these results, OEHHA issued an interim consumption advisory covering certain fish species from the bay in December 1994. This interim consumption advice was issued and is still in effect due to health concerns based on exposure to sport fish from the bay contaminated with mercury, PCBs, dioxins, and pesticides.

(2) For selenium, the denial of dilution credits is based on Bay waterfowl tissue data presented in the California Department of Fish and Game’s Selenium Verification Study (1986-1990). These data show elevated levels of selenium in the livers of waterfowl that feed on bottom dwelling organisms such as clams. Additionally, in 1987 the Office of Environmental Health Hazard Assessment issued an advisory for the consumption of two species of diving ducks in the north bay found to have high tissue levels of selenium. This advisory is still in effect.

5. WQBEL Calculations

WQBELs were developed for the toxic and priority pollutants that were determined to have reasonable potential to cause or contribute to exceedances of the WQOs or WQC. The WQBELs were calculated based on appropriate WQOs/WQC and the appropriate procedures specified in Section 1.4 of the SIP. The WQOs or WQC used for each pollutant with Reasonable Potential is discussed below:

a. Copper

- i. *Copper WQC.* The saltwater criteria for copper in the adopted CTR are 3.1 µg/L for chronic protection and 4.8 µg/L for acute protection. Included in the CTR are translator values to convert the dissolved criteria to total criteria. The Discharger may also perform a translator study to determine a more site-specific translator. The SIP, Section 1.4.1, and the June 1996 USEPA guidance document, entitled *The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion*, describe this process and provide guidance on how to establish a site-specific translator. Using the CTR translator, translated criteria of 3.7 µg/L for chronic protection and 5.8 µg/L for acute protection were used to calculate effluent limitations.
 - ii. *RPA Results.* This Order establishes effluent limitations for copper because the 12 µg/L MEC exceeds the governing WQC of 3.7 µg/L, demonstrating Reasonable Potential by Trigger 1, above.
 - iii. *Water Quality Based Effluent Limitations.* The copper WQBELs calculated according to SIP procedures are 23 µg/L as the MDEL, and 13 µg/L as the AMEL.
 - iv. *Discharge Performance and Attainability.* During the period from February 2003 through February 2006, all effluent concentrations were below the 13 µg/L AMEL; therefore, it is expected that the Discharger can comply with final WQBELs for copper.
 - v. *Antibacksliding/Antidegradation.* Antibacksliding and antidegradation requirements are satisfied because the calculated WQBELs are statistically as stringent as the previous permit. Though the previous limit included an AMEL of 12.2, it also included a MDEL of 24.6. The pair of AMEL/MDEL in this Order of 13 and 23 is statistically as stringent because the same SIP methodology was followed in calculating WQBELs, and could be more stringent because the MDEL is more stringent than the previous permit MDEL.
- ### b. Mercury
- i. *Mercury WQOs/WQC.* Both the Basin Plan and the CTR include objectives and criteria that govern mercury in the receiving water. The Basin Plan specifies objectives for the protection of aquatic life of 0.025 µg/L as a 4-day average and 2.1 µg/L as a 1-hour average. The CTR specifies a long-term average criterion for protection of human health of 0.051 µg/L.

- ii. *RPA Results.* This Order establishes effluent limitations for mercury because the 0.28 µg/L MEC exceeds the governing WQO of 0.025 µg/L, demonstrating Reasonable Potential by Trigger 1, above.
- iii. *WQBELs.* The mercury WQBELs calculated according to SIP procedures are 0.042 µg/L as the MDEL and 0.014 µg/L as the AMEL.
- iv. *Immediate Compliance Infeasible.* The Discharger's Infeasibility Study asserts the Discharger cannot immediately comply with the mercury WQBELs. Board staff statistically analyzed the Discharger's effluent data from February 2003 through February 2006. Based on this analysis, the Board determines that the assertion of infeasibility is substantiated for mercury.
- v. *IPBEL.* Because it is infeasible for the Discharger to immediately comply with the mercury WQBELs, an interim limitation is required. In light of the similarities between refineries regarding the nature of their process wastes and treatment technologies involved, in 2001 Board staff pooled ultraclean mercury data from the refineries to enable a statistical approach to setting an interim limit based on best available information and performance. Statistical analysis from this pooled data set results in an interim performance-based monthly average mercury effluent limit of 0.075 µg/L that is applicable to refinery discharges. This interim limit is carried over from the previous permit.
- vi. *Interim Mercury Mass Emission Limitation.* In addition to the concentration-based mercury IPBEL, this Order includes an interim 12-month moving average mercury mass-based effluent limitation of 0.030 kg/month. This is based on the previous permit. This mass-based effluent limitation maintains current loadings until a TMDL is established. The final mass-based effluent limitation will be based on the WLA derived from the mercury TMDL.
- vii. *Discharger's Performance and Attainability.* During the period from February 2003 through February 2006, the Discharger's effluent concentrations were below the monthly average interim limitation of 0.075 µg/L in all months except one; therefore, it is expected that the Discharger can comply with the interim limitation for mercury.
- viii. *Term of IPBEL.* The mercury IPBEL shall remain in effect until April 27, 2010 or until the Board amends the limitations based on additional data, SSOs, or the WLA in the TMDL. During the next permit reissuance, Board staff may reevaluate the mercury IPBEL.
- ix. *Mercury Source Control Strategy.* As a prerequisite to being granted the compliance schedule and interim limits described above, the Discharger must implement mercury source control strategies, as required by Provision C.5 of this Order.
- x. *Expected Final Mercury Limitations.* The final mercury WQBELs and the interim mass limitation will be revised to be consistent with the WLA assigned in the adopted mercury TMDL. In order to maintain current ambient receiving water conditions while the TMDL is being developed, the Discharger must comply with

performance-based mercury concentration and mass-based limitations contained in this Order.

- x. *Antibacksliding/Antidegradation*. Antibacksliding and antidegradation requirements are satisfied, since the interim and final effluent limitations are both as stringent as the previous permit.

c. Nickel

- i. *Nickel WQOs*. The saltwater criteria for nickel in the adopted CTR are 8.2 µg/L for chronic protection and 74 µg/L for acute protection. Included in the CTR are translator values to convert the dissolved criteria to total criteria. The Discharger may also perform a translator study to determine a more site-specific translator. The SIP, Section 1.4.1, and the June 1996 USEPA guidance document, entitled *The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion*, describe this process and provide guidance on how to establish a site-specific translator. Using the CTR translator, translated criteria of 8.3 µg/L for chronic protection and 75 µg/L for acute protection were used to calculate effluent limitations.
- ii. *RPA Results*. This Order establishes effluent limitations for nickel because the 52 µg/L MEC exceeds the governing WQO of 8.3 µg/L, demonstrating Reasonable Potential by Trigger 1, above.
- iii. *WQBELs*. The nickel WQBELs calculated according to SIP procedures are 72 µg/L as the MDEL and 43 µg/L as the AMEL.
- iv. *Discharger Performance and Attainability*. During the period from February 2003 through February 2006, all effluent nickel concentrations, except one, were below the 43 µg/L AMEL; therefore, it is expected that the Discharger can comply with final WQBELs for nickel.
- vi. *Antibacksliding/Antidegradation*. Antibacksliding and antidegradation requirements are satisfied because the calculated WQBELs are more stringent than the previous permit. Though the previous limit of 65 µg/L is numerically more stringent than the calculated MDEL of 72 µg/L, the pair of AMEL/MDEL is more stringent than the single daily maximum limit. This is because the AMEL will limit the discharge to a lower long-term average level than the previous permit limitation, which only limits the daily average concentration of the effluent, and as a result, the Discharger could practically discharge an effluent with long-term average at the previous daily average level.

d. Selenium

- i. *Selenium WQC*. Selenium WQC were promulgated in the NTR for specific waters, which include Carquinez Strait. The NTR established a Criterion Chronic Concentration (CCC) for the protection of aquatic life of 5 µg/L and a Criterion Maximum Concentration (CMC) for the protection of aquatic life of 20 µg/L.

- ii. *RPA Results.* The 64 $\mu\text{g/L}$ MEC exceeds the governing WQC of 5 $\mu\text{g/L}$, demonstrating Reasonable Potential by Trigger 1, above.
- iii. *Concentration-based WQBELs.* The WQBELs calculated according to SIP procedures are 6.8 $\mu\text{g/L}$ as the MDEL and 4.5 $\mu\text{g/L}$ as the AMEL.
- iv. *Immediate Compliance Infeasible.* The Discharger's Infeasibility Study asserts the Discharger cannot immediately comply with these WQBELs. Board staff statistically analyzed the Discharger's effluent data from February 2003 through February 2006. Based on this analysis, the Board determines that the assertion of infeasibility is substantiated for selenium.
- v. *IPBEL.* Because it is infeasible for the Discharger to immediately comply with the selenium WQBELs, an interim limitation is required. Board staff conducted a statistical analysis of recent effluent data. Historically, interim performance-based effluent limitations (IPBELs) have been referenced to the 99.87th percentile value of recent effluent data. Statistical analysis indicates that the 99.87th percentile of the recent selenium effluent data is 70 $\mu\text{g/L}$. The previous permit included an interim limit of 50 $\mu\text{g/L}$ as a daily maximum, which is more stringent than the 99.87th percentile of the recent effluent data. Therefore, a permit limitation of 50 $\mu\text{g/L}$ is established in this Order as the interim limitation, expressed as a daily maximum limitation.
- vi. *Development of Previous Permit Limitation.* On February 20, 1991, and June 19, 1991, the Board adopted Order Nos. 91-026 and 91-099, respectively, amending the NPDES permits for all six refineries in the region, including the Discharger, to add concentration and mass emission limitations for selenium. Order No. 91-026 specified a limit of 50 $\mu\text{g/L}$ as a daily maximum limit. Order No. 91-099 specified a limit of 2.13 lbs/day as a running annual average by December 12, 1993. On October 16, 1992, the Western States Petroleum Association (WSPA) filed a Petition with the Superior Court for the County of Solano on behalf of the six oil refineries seeking to set aside Order Nos. 91-026 and 91-099. On January 19, 1994, the Board adopted Resolution No. 94-016, which approved a Settlement Agreement between WSPA and the Board. The Settlement Agreement adopted the limits included in Orders 91-026 and 91-099. The previous Order includes the daily maximum concentration limit of 50 $\mu\text{g/L}$ and a more stringent annual average mass emission limit of 2.13 lbs/day.
- vii. *Discharger's Performance and Attainability.* During the period February 2003 through February 2006, the Discharger's effluent concentrations were below the interim limitation of 50 $\mu\text{g/L}$, except on two occasions; therefore, it is expected that the Discharger can comply with the interim limitation for selenium.
- viii. *Term of IPBEL.* The selenium interim limitation shall remain in effect until April 27, 2010, or until the Board amends the limitations based on additional data, SSOs, or the WLA in the TMDL.
- ix. *Selenium Source Control Strategy.* As a prerequisite to being granted the compliance schedule and interim limits described above, the Discharger must

implement selenium source control strategies, as required by Provision C.5 of this Order.

- x. *Expected Final Selenium Limitations.* The final selenium WQBELs will be revised to be consistent with the WLA assigned in the adopted selenium TMDL. While the TMDL is being developed, the Discharger will comply with the performance-based selenium concentration limitation to cooperate in maintaining current ambient receiving water conditions.
- xi. *Antibacksliding/Antidegradation.* Antibacksliding and antidegradation requirements are satisfied, since the interim limit is the same as the previous permit, and final effluent limitations are more stringent.

e. Cyanide

- i. *Cyanide WQC.* Cyanide WQC were promulgated in the NTR for specific waters, which include Carquinez Strait. The NTR established a Criterion Chronic Concentration (CCC) and a Criterion Maximum Concentration (CMC) for the protection of aquatic life of 1 µg/L.
- ii. *RPA Results.* The 25 µg/L MEC exceeds the governing WQC of 1 µg/L, demonstrating Reasonable Potential by Trigger 1, above.
- iii. *Concentration-based WQBELs.* The WQBELs calculated according to SIP procedures are 6.4 µg/L as the MDEL and 3.5 µg/L as the AMEL.
- iv. *Immediate Compliance Infeasible.* The Discharger's Infeasibility Study asserts the Discharger cannot immediately comply with these WQBELs. Board staff statistically analyzed the Discharger's effluent data from February 2003 through February 2006. Based on this analysis, the Board determines that the assertion of infeasibility is substantiated for cyanide.
- v. *Alternative Limit for Cyanide.* As described in *Draft Staff Report on Proposed Site-Specific Water Quality Objectives and Effluent Limit Policy for Cyanide for San Francisco Bay*, dated November 10, 2005, the Regional Water Board is proposing to develop site-specific criteria for cyanide. In this report, the proposed site-specific criteria for marine waters are 2.9 µg/L as a four-day average, and 9.4 µg/L as a one-hour average. Based on these assumption, and the Dischargers current cyanide data (coefficient of variation of 0.48), final water quality based effluent limits for cyanide will be 39 µg/L as a MDEL, and 22 µg/L as an AMEL. These alternative limits will become effective only if the site-specific objective adopted for cyanide contains the same assumptions in the staff report, dated November 10, 2005.
- vi. *IPBEL.* Because it is infeasible for the Discharger to immediately comply with the cyanide WQBELs, an interim limitation is required. The Board considered self-monitoring data from February 2003 through February 2006 (cyanide concentrations ranged from 5 µg/L to 25 µg/L) to develop an interim performance based limit. Historically, interim performance-based effluent limitations (IPBELs) have been referenced to the 99.87th percentile value of recent effluent data. Statistical analysis

indicates that the 99.87th percentile of the recent cyanide effluent data is 31 $\mu\text{g/L}$. The previous permit included an interim limit of 25 $\mu\text{g/L}$ as a daily maximum, which is more stringent than the 99.87th percentile of the recent effluent data. Therefore, a permit limitation of 25 $\mu\text{g/L}$ is established in this Order as the interim limitation, expressed as a daily maximum limitation.

- vii. *Discharger's Performance and Attainability.* During the period February 2003 through February 2006, the Discharger's effluent concentrations were at or below the interim limitation of 25 $\mu\text{g/L}$; therefore, it is expected that the Discharger can comply with the interim limitation for cyanide.
- viii. *Term of IPBEL.* The cyanide interim limitation shall remain in effect until April 27, 2010, or until the Board amends the limitations based on additional data or site-specific objectives (SSOs).
- ix. *Cyanide Source Control Strategy.* As a prerequisite to being granted the compliance schedule and interim limits described above, the Discharger must implement cyanide source control strategies, as required by Provision C.5 of this Order.
- x. *Antibacksliding/Antidegradation.* Antibacksliding and antidegradation requirements are satisfied, since the interim effluent limitation is based on the previous permit limitation, and the final limits are more stringent.

f. Zinc

- i. *Zinc WQOs.* The freshwater criteria for zinc in the adopted CTR, based on a hardness of 46 mg/L, are 62 $\mu\text{g/L}$ for chronic protection and 62 $\mu\text{g/L}$ for acute protection.
- ii. *RPA Results.* This Order establishes effluent limitations for zinc because the 89 $\mu\text{g/L}$ MEC exceeds the governing WQO of 62 $\mu\text{g/L}$, demonstrating Reasonable Potential by Trigger 1, above.
- iii. *WQBELs.* The zinc WQBELs calculated according to SIP procedures are 570 $\mu\text{g/L}$ as the MDEL and 310 $\mu\text{g/L}$ as the AMEL.
- iv. *Discharger Performance and Attainability.* During the period from February 2003 through February 2006, all effluent zinc concentrations were below the 310 $\mu\text{g/L}$ AMEL; therefore, it is expected that the Discharger can comply with final WQBELs for zinc.
- v. *Antibacksliding/Antidegradation.* Antibacksliding and antidegradation requirements are satisfied because the calculated WQBELs are more stringent than the previous permit.

g. TCDD Equivalentents

- i. *Dioxin TEQ WQC.* The CTR establishes a numeric human health WQC of 0.014 pg/L for 2,3,7,8-TCDD based on consumption of organisms. The preamble of the

CTR states that California NPDES permits should use TEQs where dioxin-like compounds have Reasonable Potential with respect to narrative criteria. The preamble further states that USEPA intends to use the 1998 World Health Organization TEF scheme in the future and encourages California to use this scheme in State programs. In addition, the CTR preamble states USEPA's intent to adopt revised WQC guidance subsequent to their health reassessment for dioxin-like compounds. The Board used TEQs to translate the narrative WQOs to numeric WQOs for the other 16 congeners.

- ii. *RPA Results*. This Order establishes effluent limitations for Dioxin-TEQ because the 4.56×10^{-8} $\mu\text{g/L}$ MEC exceeds the governing WQO of 1.4×10^{-8} $\mu\text{g/L}$, demonstrating Reasonable Potential by Trigger 1, above.
- iii. *Dioxin TEQ Effluent Limits*. The TCDD Equivalents WQBELs calculated according to SIP procedures are 0.028 pg/L as the MDEL and 0.014 pg/L as the AMEL. As the compliance schedule for dioxin-TEQ exceeds the length of the permit, these values are included in the Fact Sheet as a point of reference.
- iv. *Immediate Compliance Infeasible*. Compliance with the final WQBELs cannot be demonstrated at this time as the MLs for TCDD Equivalents are higher than the final calculated WQBELs.
- v. *IPBEL*. Because it is infeasible for the Discharger to immediately comply with the TCDD Equivalents WQBELs, an interim limitation is required. Historically, interim performance-based effluent limitations (IPBELs) have been referenced to the 99.87th percentile value of recent effluent data. In this case, a statistical analysis is not possible due to the number of nondetects. The previous permit included a maximum daily interim limitation of 0.1 pg/L. Therefore, the previous permit limitation is established in this Order, as an interim limitation.
- vi. *Discharger's Performance and Attainability*. Self-monitoring effluent data from 2002 through 2006 indicate that all TCDD Equivalents were below the interim limit of 0.1 pg/L; therefore, it is expected that the Discharger can comply with interim limits provided non-detect is considered zero in TEQ calculations, which is consistent with the SIP.
- vii. *Term of IPBEL*. The TCDD Equivalents interim limitation shall remain in effect until November 30, 2011, or until the Board amends the limitations based on additional data, SSOs, or the WLA in the TMDL.
- viii. *Dioxin TEQ Source Control Strategy*. As a prerequisite to being granted the compliance schedule and interim limits described above, the Discharger must implement dioxin TEQ source control strategies, as required by Provision C.5 of this Order.
- ix. *Expected Final Dioxin TEQ Limitations*. The final TCDD Equivalent WQBELs will be revised to be consistent with the WLA assigned in the adopted dioxin TEQ TMDL. While the TMDL is being developed, the Discharger will comply with the performance-based TCDD Equivalent concentration limitation to cooperate in

maintaining current ambient receiving water conditions. Municipal and industrial sources are very small contributors of the dioxins and furans load to the Bay, and the dominant sources are from current and historical air emissions. Because of this, it is unlikely that the TMDL will require reduction efforts beyond the controls required by this permit.

h. PCBs

- i. *PCBs WQC.* The CTR contains a numeric water quality criterion of 0.00017 $\mu\text{g/L}$ for the sum of seven individual PCB compounds for the protection of human health based on the consumption of aquatic organisms.
- ii. *RPA Results.* The 0.000281 pg/L MEC exceeds the governing WQC of 0.00017 pg/L , demonstrating Reasonable Potential by Trigger 1, above.
- iii. *PCB Effluent Limits.* The WQBELs calculated according to SIP procedures are 0.00034 $\mu\text{g/L}$ as the MDEL and 0.00017 $\mu\text{g/L}$ as the AMEL for the sum of seven individual PCB compounds. The previous Order includes limits for each of the seven individual PCBs of 0.00017 $\mu\text{g/L}$ (monthly average) and 0.00034 $\mu\text{g/L}$ (daily average).
- iv. *Immediate Compliance Infeasible.* Compliance with the final WQBELs cannot be determined at this time as the MLs of 0.5 $\mu\text{g/L}$ (for each PCB using U.S. EPA approved methods) identified in Appendix 4 of the SIP, are higher than the final calculated WQBELs. However, non-EPA approved methods generated a MEC of 0.000281 $\mu\text{g/L}$ suggesting that the Discharger may not be able to immediately comply.
- v. *Interim Effluent Limitations.* Interim limitations are established at the respective MLs. The Discharger may demonstrate compliance by showing no detection of any PCBs above the SIP ML of 0.5 $\mu\text{g/L}$.
- vi. *Discharger's Performance and Attainability.* Self-monitoring effluent data from February 2003 through February 2006 indicate that PCBs were not detected in the effluent in any of the samples using USEPA approved protocols. However, the Discharger did detect PCBs using more sensitive analytical techniques. In support of the Board's TMDL development for PCBs, the San Francisco Estuary Institute measured PCB congeners in Bay Area refinery discharges using sensitive analytical techniques with large sample volumes to achieve low detection limits. It published the results of these analyses in *Polychlorinated Biphenyls in Northern San Francisco Estuary Refinery Effluents*, dated September 10, 2002, which indicates that Shell's effluent contained total PCBs ranging from 150 to 281 pg/L . As the MEC of PCBs in the Discharger's effluent exceeds the WQC for protecting human health, the discharge has a reasonable potential to cause exceedances of the WQC for PCBs. However, the methodology described above has not been approved by USEPA, and therefore, cannot be used for compliance purposes. As such, the Discharger should be able to comply with the effluent limitations contained in this Order.

- vii. *Term of Interim Effluent Limitations.* PCBs interim effluent limitations shall remain in effect until May 17, 2010, or until the Regional Water Board amends the limitations based on additional data, SSOs, or the WLA in the TMDL.
- viii. *Antibacksliding/Antidegradation.* Antibacksliding and antidegradation requirements are satisfied, since final limits are more stringent than the previous permit. This is because values of a sum of 7 compounds are more stringent than the same values for each compound.

**Summary of Water Quality-based Effluent Limitations
 Discharge Point 001**

Table 14. Summary of Water Quality-based Effluent Limitations

Parameter	Units	Final Effluent Limits		Interim Effluent Limits		
		Daily Maximum (MDEL)	Monthly Average (AMEL)	Daily	Maximum	Monthly Average
Copper	µg/L	23	13			
Mercury	µg/L	0.042	0.014			0.075
Nickel	µg/L	72	43			
Selenium	µg/L	6.8	4.5	50		
Cyanide	µg/L	6.4	3.5	25		
Zinc	µg/L	570	310			
TCDD Equivalents	µg/L			1*10 ⁻⁷		
Total PCBs ¹	µg/L	0.00017	0.00034	0.5		

¹ The PCB limit applies to the sum of the following individual PCB compounds: PCB-1016, PCB-1221, PCB-1232, PCB-1242, PCB-1248, PCB-1254, and PCB-1260.

6. Feasibility Evaluation and Compliance Schedules

- a. **Feasibility Evaluation.** The Discharger submitted infeasibility to comply reports on July 27, 2006, for mercury, selenium, cyanide, nickel, PCBs, and TCDD Equivalents. For constituents that Board staff could perform a meaningful statistical analysis (i.e., selenium, cyanide, and nickel), it used self-monitoring data from February 2003 to February 2006 to compare the median, 95th percentile, and 99th percentile with the long-term average (LTA), AMEL, and MDEL to confirm if it is feasible for the Discharger to comply with WQBELs. If the LTA, AMEL, and MDEL all exceed the median, 95th percentile, and 99th percentile, it is feasible for the Discharger to comply with WQBELs. Table 15 below shows these comparisons in µg/L.

Table 15 - Summary of Feasibility Analysis

	Median / LTA	95 th / AMEL	99 th / MDEL	Feasible to Comply
Selenium	30.2 > 3.6	47.7 > 4.5	57.7 > 6.8	No
Cyanide	11.9 > 2.5	22.4 > 3.5	26.5 > 6.4	No
Nickel	19.6 < 31.6	34.5 < 43	43.6 < 72	Yes

On mercury, the data could not be transformed to fit a normal distribution, and therefore, it was not possible to perform a statistical analysis with the comparisons shown in Table 15. The observed maximum effluent concentration of mercury between February 2003 and February 2006 was 0.28 µg/L, which exceeds the AMEL calculated in accordance with the SIP. Therefore, it is infeasible for the Discharger to immediately comply with final WQBELs for mercury.

For PCBs, and TCDD Equivalents, it was not possible to statistically analyze the data due to the number of nondetects. On TCDD Equivalents, the observed maximum effluent concentration of 4.56×10^{-8} µg/L exceeds the AMEL calculated in accordance with the SIP. Therefore, it is infeasible for the Discharger to immediately comply with final WQBELs for TCDD Equivalents. For PCBs, all data from February 2003 through February 2006 has been nondetect, and the minimum levels are too high to evaluate compliance with the final WQBELs.

- b. Compliance Schedules.** This permit establishes compliance schedules until May 17, 2010, for PCBs; and until April 27, 2010 for mercury, cyanide, and selenium. Since these compliance schedules are within the effective date of the permit, this Order includes final WQBELs. For TCDD-TEQ, this permit established a compliance schedule until November 30, 2011, which exceeds the length of the permit.

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

i. Total PCBs. For total PCBs, the previous permit did not grant an interim limit. As it is not possible for the Discharger to document compliance because U.S. EPA approved analytical methods cannot quantify total PCBs at low enough levels, it is not possible to determine compliance with final limits. Because SIP §2.1 provides for a maximum five-year compliance schedule, and the Discharger has not been previously granted such a schedule under §2.1, the Discharger qualifies for such a §2.1 schedule up to the maximum statutory date (May 17, 2010), which is ten years from the effective date of the CTR/SIP. The basis for this compliance schedule is the CTR/SIP.

ii. Mercury. For mercury, the previous permit included an interim limit that was to remain effective until March 31, 2010. However, this was in error. The compliance schedule for final mercury limits should be based on the Basin Plan and SIP (i.e., 10 years from the effective date of the SIP). Therefore, in this Order, compliance with final mercury limits must be achieved by no later than April 28, 2010.

iii. Cyanide. For cyanide, the Regional Water Board granted, in the previous permit, a compliance schedule pursuant to the 2000 SIP §2.2.2, Interim Requirements for Providing Data (note 2005 SIP amendment deleted this section as it is not applicable to permits effective after May 18, 2003). This was to allow collection of ambient data, because the Regional Monitoring Program data were not complete primarily due to inadequate detection limits. The Discharger, thru BACWA and WSPA, helped fund an effort to collect these data as part of the collaborative

receiving water monitoring for other CTR pollutants. The Regional Water Board has received these data, which form the basis for current permits. However, the use of the SIP to grant a compliance schedule for cyanide in the previous permit was incorrect. The NTR promulgated water quality objectives for cyanide, with the Basin Plan as the implementation tool, and therefore, the compliance schedule provisions in the SIP are not applicable. This is because SIP compliance schedules apply only to "...CTR criterion-based effluent limitations..." The Basin Plan provides for a 10-year compliance schedule for implementation of measures to comply with new standards as of the effective date of those standards. This provision has been construed to authorize compliance schedules for new interpretations of existing standards, if the new interpretations result in more stringent limits than in the previous permit. As the SIP methodology for calculating water quality based effluent limits results in more stringent limits, the Basin Plan provides for a 10-year compliance schedule from the effective date of the SIP. Therefore, in this Order, compliance with final cyanide limits must be achieved by no later than April 28, 2010.

iv. Selenium. For selenium, the Regional Water Board included an interim limit that was to remain effective until November 30, 2006 based on the CTR and SIP. The National Toxics Rule promulgated water quality objectives for selenium, and therefore, this CTR/SIP compliance schedule was incorrect. In the case of NTR pollutants (as stated for cyanide), the compliance schedule provisions in the SIP do not apply because §2.1 of the SIP applies only to "...CTR criterion-based effluent limitations..." As with cyanide, the SIP methodology for calculating water quality based effluent limits results in more stringent limits. Therefore, the Basin Plan provides for a 10-year compliance schedule from the effective date of this SIP. Therefore, in this Order, compliance with final selenium limits must be achieved by no later than April 28, 2010.

v. TCDD Equivalents. For TCDD Equivalents, the previous permit included an interim limits that was to remain effective until November 30, 2011. This Order carries over the compliance schedule from the previous permit.

7. Whole Effluent Toxicity (WET)

a. Acute Toxicity - Effluent Limitation A.2c: The Basin Plan specifies a narrative objective for toxicity, requiring that all waters shall be maintained free of toxic substances in concentrations that are lethal to or produce other detrimental response on aquatic organisms. Detrimental response includes but is not limited to decreased growth rate, decreased reproductive success of resident or indicator species, and/or significant alternations in population, community ecology, or receiving water biota. These effluent toxicity limits are necessary to ensure that this objective is protected. The acute toxicity limit is consistent with the previous permit and is based on the Basin Plan Table 4-2, page 4-69.

b. Chronic Toxicity - Effluent Limitation A.2d: The chronic toxicity limit is based on the Basin Plan's narrative toxicity definition on page 3-4.

8. Interim Mass Limits

- a. Mercury Interim Mass Limit - Effluent Limitation A.4:** This Order establishes a running average mercury, mass-based effluent limitation of 0.030 kilograms per month. This limit is based on the previous permit. This mass-based effluent limitation maintains current loadings until a TMDL is established and is consistent with state and federal antidegradation and antibacksliding requirements. The final mass based effluent limitation will be based on the WLA derived from the mercury TMDL.
- b. Selenium Interim Mass Limit - Effluent Limitation A.5:** This Order includes an interim mass emission limit for selenium of 2.13 lbs/day. This limitation is based on a Settlement Agreement between WSPA and the Board.
- 9. Stormwater Limits – Effluent Limitation A.6:** These limits are based on 40 CFR § 419 Subpart B
- 10. Credit for Recycled Water Use - Effluent Limitation A.7:** This credit is to encourage the Discharger to use recycled water provided it will not cause toxicity to aquatic life.

D. Final Effluent Limitations – see above

E. Interim Effluent Limitations – see above

F. Land Discharge Specifications – Not Applicable

G. Reclamation Specifications – Not Applicable

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

A. Surface Water

- 1. Receiving water limitations V.A.1 through V.A.7 (conditions to be avoided):**
These limits are based on the previous Order and the narrative/numerical objectives contained in Chapter 3 of the Basin Plan, page 3-2 – 3-5. Standard Observations are sufficient to document compliance with Receiving Water Limitation V.A.7.e for biostimulatory substances.
- 2. Receiving water limitation V.A.8 (compliance with State Law):** This requirement is in the previous permit, requires compliance with Federal and State law, and is self-explanatory.

B. Groundwater – Not Applicable

VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

Section 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorizes the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program (MRP), Attachment E of this Order, establishes monitoring and reporting requirements to implement federal and state requirements. The following provides the rationale for the monitoring and reporting requirements contained in the MRP for this facility.

A. Influent Monitoring

This Order does not require the Discharger to conduct influent monitoring. However, it does provide the Discharger with the opportunity to receive credits for the use of recycled water. In such cases, the Discharger will need to conduct monitoring for such pollutants at I-001.

B. Effluent Monitoring

This Order requires monitoring at E-001 for conventional, non-conventional, and toxic pollutants. For conventional pollutants, this Order requires monthly monitoring, which is necessary for evaluating compliance for a major discharger that has daily and monthly loading limits that are based on concentration and flow. For one constituent that the Water Board has granted interim limits (selenium), this Order requires weekly monitoring. The exceptions to this requirement are cyanide, mercury, TCDD Equivalents, and PCBs. Additional cost and effort is required for ultra-clean mercury monitoring, thus this Order requires monthly monitoring. For cyanide, this Order requires monthly monitoring since the Discharger did not violate the interim limit for this pollutant during the last permit cycle. For TCDD Equivalents, and PCBs due to the considerable costs and the non-detects the Discharger has found, this Order requires twice yearly monitoring, which is also consistent with the SIP. Further, this Order requires monthly monitoring of copper, nickel, and zinc to demonstrate compliance with final effluent limitations.

C. Whole Effluent Toxicity Testing Requirements

This Order requires weekly monitoring for acute toxicity, and quarterly monitoring for chronic toxicity. Additionally, this Order requires that the Discharger conduct screening phase monitoring for chronic toxicity to ensure that it continues to monitor the most sensitive species. Whole effluent toxicity monitoring is necessary to ensure that unmonitored pollutants, or pollutants that may have synergistic effects will not have adverse impacts to aquatic life.

D. Receiving Water Monitoring

1. Surface Water: This Order requires monitoring at location C-001 for conventional pollutants that are unchanged from the previous permit. For toxic pollutants, this Order allows the Discharger to participate in collaborative receiving water monitoring with other dischargers under the provisions of the August 6, 2001 letter, and the RMP, in lieu of near field discharge specific ambient monitoring.

2. Groundwater – Not Applicable

E. Other Monitoring Requirements - Stormwater

This Order includes monitoring at locations E-002, E-004, E-005, E-007, and E-008 for oil and grease, total organic carbon, pH, total suspended solids and specific conductance. This monitoring is necessary to evaluate compliance with effluent limitations, and ensure the Discharger is implementing best management practices.

VII. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with section 122.41, and additional conditions applicable to specified categories of permits in accordance with section 122.42, are provided in Attachment D. The discharger must comply with all standard provisions and with those additional conditions that are applicable under section 122.42.

Section 122.41(a)(1) and (b) through (n) establish conditions that apply to all State-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the Order. Section 123.25(a)(12) allows the state to omit or modify conditions to impose more stringent requirements. In accordance with section 123.25, this Order omits federal conditions that address enforcement authority specified in sections 122.41(j)(5) and (k)(2) because the enforcement authority under the Water Code is more stringent. In lieu of these conditions, this Order incorporates by reference Water Code section 13387(e).

B. Special Provisions

1. Reopener Provisions

These provisions are based on 40 CFR 123 and allow future modification of this Order and its effluent limitations as necessary in response to updated WQOs that may be established in the future.

2. Permit Compliance and Rescission of Previous Waste Discharge Requirements

Time of compliance is based on 40 CFR 122. The basis of this Order superseding and rescinding the previous permit is based on 40 CFR 122.46.

3. Effluent Characterization for Selected Constituents

This provision establishes monitoring requirements as stated in the Board's August 6, 2001 Letter under Effluent Monitoring for major dischargers. Interim and final reports shall be submitted to the Board in accordance with the schedule specified in the August 6, 2001 Letter. This provision is based on the Basin Plan and the SIP.

4. Receiving Water Monitoring

This provision, which requires the Discharger to continue to conduct receiving water monitoring is based on the previous Order and the Basin Plan.

5. Pollutant Prevention and Minimization Program

This provision is based on the Basin Plan, page 4-25 – 4-28, and the SIP, Section 2.1, Compliance Schedules. Until March 1, 2007, the Discharger's Infeasibility to Comply Analyses, and Request for Compliance Schedules, dated July 27, 2006, satisfies the intent of this provision.

6. Mass and Concentration Credits

This provision is necessary to protect beneficial uses identified in the Basin Plan (the Discharger must ensure that granting it pollutant credits for the use of recycled water will not cause acute toxicity).

7. Stormwater Pollution Prevention Plan and Annual Report

This provision is based on and consistent with Basin Plan objectives, statewide storm water requirements for industrial facilities, and applicable USEPA regulations.

8. Whole Effluent Toxicity

This provision establishes conditions by which compliance with permit effluent limits for acute toxicity will be demonstrated. Conditions include the use of flow through bioassays with rainbow trout, in accordance with *Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms*, 5th Edition. These conditions are based on the effluent limits for acute toxicity given in the Basin Plan, Chapter 4, and BPJ.

9. Chronic Toxicity

This provision establishes conditions and protocol by which compliance with the Basin Plan narrative WQO for toxicity will be demonstrated. Regional Water Board staff has determined that the chronic toxicity requirements in this permit should be revised. Part of the rationale for adopting these revised requirements was based on staff's review of the Discharger's chronic toxicity monitoring data that shows the Discharger's ability to meet these revised requirements. Regional Water Board staff further recognizes that the Discharger's ability to comply with these revised requirements is based on the current test species used in the approved monitoring program. If the Regional Water Board revises the test methodology for demonstrating compliance with the chronic toxicity requirements relative to the appropriate test species, the Regional Water Board will regard such revision as a new permit requirement, or a new interpretation of an existing permit requirement. Conditions include required monitoring and evaluation of the effluent for chronic toxicity and numerical values for chronic toxicity evaluation to be used as 'triggers' for initiating accelerated monitoring and toxicity reduction evaluation(s). These

conditions apply to the discharges to San Francisco Bay and the numerical values for chronic toxicity evaluation are based on a minimum initial dilution ratio of 10:1. This provision also requires the Discharger to conduct a screening phase monitoring requirement and implement toxicity identification and reduction evaluations when there is consistent chronic toxicity in the discharge. New testing species and/or test methodology may be available before the next permit renewal. Characteristics, and thus toxicity, of the process wastewater may also have been changed during the life of the permit. This screening phase monitoring is important to help determine which test species is most sensitive to the toxicity of the effluent for future compliance monitoring. The proposed conditions in the draft permit for chronic toxicity are based on the Basin Plan narrative WQO for toxicity, Basin Plan effluent limitations for chronic toxicity (Basin Plan, Chapter 4), U.S. EPA and SWRCB Task Force guidance, applicable federal regulations [40 CFR 122.44(d)(1)(v)], and BPJ.

10. Optional Mass Offset

This option is provided to encourage the Discharger to implement aggressive reduction of mass loads to Carquinez Strait.

11. Contingency Plan Update

This provision is based on the requirements stipulated in Board Resolution No. 74-10.

12. Collection System Maintenance

This provision, based on the Basin Plan, is necessary to document that the Discharger implements appropriate operation and maintenance of its collection system to avoid spills to the maximum extent feasible. The Basin Plan prohibits the discharge of oil or any residuary product of petroleum to the waters of the State, except in accordance with waste discharge requirements or other Provisions of Division 7 of the California Water Code. As any discharge from Shell's collection system would be unpermitted, it is appropriate to have Shell document that it properly maintains its collection system to show that all wastewater generated onsite reaches its treatment plant.

13. Requirements to Support SSO and TMDL, and Assure Compliance with Final Limits

This provision, based on the SIP, requires that the Discharger participate in the development of a TMDL or SSO for mercury, cyanide, selenium, PCBs, and dioxin-TEQ. In accordance with Section 2.1 of the SIP, and Chapter 4 of the Basin Plan, for the Board to authorize compliance schedules in a permit the Discharger must, in part, propose a schedule for additional or future source control measures, pollution minimization actions, or waste treatment. In the case of mercury, cyanide, selenium, PCBs, and dioxin-TEQ, the Discharger indicates that it proposes to achieve compliance with final limits through the SSO or TMDL process. Therefore, annual reporting on Discharger's efforts to facilitate SSO or TMDL development along with implementation of its Pollution Minimization Plan (required by Provision C.5) satisfy the intent of Section 2.1 of the SIP. In the event TMDL(s) or SSO(s) are not developed for mercury, selenium, cyanide, or PCBs by July 1, 2009, this provision also requires the Discharger to submit a schedule that documents how it will further reduce pollutant concentrations to ensure compliance with the final limits.

14. Changes in Control and Ownership

This provision is based on 40 CFR 122.61.

VIII. PUBLIC PARTICIPATION

The California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board) is considering the issuance of waste discharge requirements (WDRs) that will serve as a National Pollutant Discharge Elimination System (NPDES) permit for the Shell Martinez Refinery. As a step in the WDR adoption process, the Regional Water Board staff has developed tentative WDRs. The Regional Water Board encourages public participation in the WDR adoption process.

A. Notification of Interested Parties

The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Notification was provided through the following: (a) paper and electronic copies of this Order were relayed to the Discharger, and (b) the Martinez News Gazette published a notice that this item would appear before the Board on October 11, 2006.

B. Written Comments

The staff determinations are tentative. Interested persons are invited to submit written comments concerning these tentative WDRs. Comments must be submitted either in person or by mail to the Executive Office at the Regional Water Board at the address above on the cover page of this Order.

To be fully responded to by staff and considered by the Regional Water Board, written comments should be received at the Regional Water Board offices by 5:00 p.m. on September 14, 2006.

C. Public Hearing

The Regional Water Board will hold a public hearing on the tentative WDRs during its regular Board meeting on the following date and time and at the following location:

Date: October 11, 2006
Time: 9:00 am
Location: Elihu Harris State Office Building
1515 Clay Street, 1st Floor Auditorium
Oakland, CA 94612

Interested persons are invited to attend. At the public hearing, the Regional Water Board will hear testimony, if any, pertinent to the discharge, WDRs, and permit. Oral testimony will be heard; however, for accuracy of the record, important testimony should be in writing.

Please be aware that dates and venues may change. Our Web address is www.waterboards.ca.gov/sanfranciscobay where you can access the current agenda for changes in dates and locations.

D. Waste Discharge Requirements Petitions

Any aggrieved person may petition the State Water Resources Control Board to review the decision of the Regional Water Board regarding the final WDRs. The petition must be submitted within 30 days of the Regional Water Board's action to the following address:

State Water Resources Control Board
Office of Chief Counsel
P.O. Box 100, 1001 I Street
Sacramento, CA 95812-0100

E. Information and Copying

The Report of Waste Discharge (RWD), related documents, tentative effluent limitations and special provisions, comments received, and other information are on file and may be inspected at the address above at any time between 8:30 a.m. and 4:45 p.m., Monday through Friday, except from noon to 1:00. Copying of documents may be arranged through the Regional Water Board by calling (510) 622-2300.

F. Register of Interested Persons

Any person interested in being placed on the mailing list for information regarding the WDRs and NPDES permit should contact the Regional Water Board, reference this facility, and provide a name, address, and phone number.

G. Additional Information

Requests for additional information or questions regarding this order should be directed to Robert Schlipf at (510) 622-2478.

Attachment 1: Calculations for Production-Based Effluent Limitations

Attachment 2: RPA Results for Priority Pollutants at E-001

Attachment 3: Calculation of Final WQBELs at E-001

ATTACHMENT 1

CALCULATIONS FOR PRODUCTION-BASED
BPT, BCT, AND BAT EFFLUENT LIMITATIONS
FOR
SHELL MARTINEZ REFINERY

References:

- 1) 40 CFR § 419 Subpart B Effluent Limitations Guidelines and New Source Performance Standards for the Petroleum Refining Point Source Category (Cracking Subcategory)
- 2) Development Document for Effluent Limitations Guidelines and New Source Performance Standards for the Petroleum Refining Point Source Category
- 3) Guide for the Application of Effluent Limitations Guidelines for the Petroleum Refining Industry
- 4) NPDES Application for Permit Reissuance (April 2006)
- 5) Refinery Production Data July 2003 – May 2006, provided by the facility (Data from November 2004 – October 2005 was selected as the high year based on average production rates and was used in calculations)

Production-Based Effluent Limitations

STEP 1: Determine the size factor based on the refinery feedstock rate. Based on 40 CFR § 419 Subpart B, a total refinery throughput of 148.3 kbb/d results in a

SIZE FACTOR = 1.35

STEP 2: Determine the process configuration based on the process rates:

Process	Process Feedstock Rate (kbb/d)	Fraction of Total Throughput	Weight Factor	Process Configuration
Total Refinery Throughput = 135 kbb/d				
CRUDE:				
Atmospheric Distillation	148.3	1		
Vacuum Crude Distillation	93.0	0.627		
Desalting	148.3	1		
TOTAL	389.6	2.627	1	2.627
CRACKING & COKING:				
Hydrocracking	35.2	0.237		
Delayed Coking	26.4	0.178		
Fluid Catalytic Cracking	65.6	0.442		
Fluid Coking	21.4	0.144		
TOTAL	148.6	1.002	6	6.012
ASPHALT				
Asphalt Production	2.5	0.0169		
TOTAL	2.5	0.0169	12	0.202
TOTAL PROCESS CONFIGURATION =				8.841

(kbb/d = Thousand Barrels per day)

STEP 3: Determine the process factor. Based on 40 CFR § 419 Subpart B, a total process configuration of 8.841 results in a

PROCESS FACTOR = 1.67

STEP 4: Based on 40 CFR § 419.22(a), 419.23(a), and 419.24(a), the BPT/BAT/BCT effluent limit is equal to

(THROUGHPUT) X (SIZE FACTOR) X (PROCESS FACTOR) X (EFFLUENT LIMIT FACTOR)

$$\text{EFFLUENT LIMIT} = (148.3)(1.35)(1.67)(\text{Effluent Limit Factor})$$

$$= (334.3)(\text{Effluent Limit Factor})$$

Pollutant	Effluent Limit in 40 CFR 419B						Multi-plier	Final Limit Calculated						Final Limit	
	BPT		BAT		BCT			BPT		BAT		BCT			
	Daily Max	30-d Avg	Daily Max	30-d Avg	Daily Max	30-d Avg		Daily Max	30-d Avg	Daily Max	30-d Avg	Daily Max	30-d Avg	Daily Max	30-d Avg
	lb/kbbl	lb/kbbl	lb/kbbl	lb/kbbl	lb/kbbl	lb/kbbl		lb/d	lb/d	lb/d	lb/d	lb/d	lb/d	lb/d	lb/d
BOD ₅	9.9	5.5			9.9	5.5	334.3	3310	1839			3310	1839	3310	1839
TSS	6.9	4.4			6.9	4.4	334.3	2307	1471			2307	1471	2307	1471
COD	74	38.4	74	38.4			334.3	24738	12837	24738	12837			24738	12837
O&G	3	1.6			3	1.6	334.3	1003	535			1003	535	1003	535
Phenols (4AAP)*	0.074	0.036					334.3	24.7	12.0					24.7	12.0
NH ₃ -N	6.6	3	6.6	3			334.3	2206	1003	2206	1003			2206	1003
Sulfide	0.065	0.029	0.065	0.029			334.3	21.7	9.7	21.7	9.7			21.7	9.7
Total Cr	0.15	0.088					334.3	50.1	29.4					50.1	29.4
Hex Cr	0.012	0.0056					334.3	4.01	1.87					4.01	1.87

*The BPT limits for these constituents are applicable only if they are more stringent than BAT limits (see STEP 5) below).

STEP 5: Calculate Amended BAT limits pursuant to 40 CFR § 419.43, for phenolic compounds (4AAP), total and hexavalent chromium. The effluent limit is equal to the sum of the products of each effluent limitation factor times the applicable process feedstock rate.

Pollutant	Process Category	BAT Effluent Limit Factors (lb/kbbl)		Feedstock (kbbl/d)	Effluent Limitation (lb/d)	
		Daily Max.	30-d Average		Daily Max.	30-d Average
Phenolic Compounds (4AAP)	Crude	0.013	0.003	389.6	5.06	1.17
	Cracking & Coking	0.147	0.036	148.6	21.84	5.35
	Asphalt	0.079	0.019	2.5	0.20	0.048
	Reforming & Alkylation	0.132	0.032	37.5	4.95	1.2
	TOTAL				32.05	7.77
Total Chromium	Crude	0.011	0.004	389.6	4.29	1.56
	Cracking & Coking	0.119	0.041	148.6	17.68	6.09
	Asphalt	0.064	0.022	2.5	0.16	0.055
	Reforming & Alkylation	0.107	0.037	37.5	4.01	1.39
	TOTAL				26.14	9.10
Hexavalent Chromium	Crude	0.0007	0.0003	389.6	0.273	0.117
	Cracking & Coking	0.0076	0.0034	148.6	1.129	0.505
	Asphalt	0.0041	0.0019	2.5	0.010	0.005
	Reforming & Alkylation	0.0069	0.0031	37.5	0.259	0.116
	TOTAL				1.671	0.743

STEP 6: Compare Amended BAT limitations for phenolic compounds (4AAP), total chromium, and hexavalent chromium with BPT limitations.

Except for daily maximum limitation for phenolic compounds, the above BAT limits are more stringent than the BPT limits calculated in STEP 4. Therefore, for these constituents, the above BAT limits, the BPT limit for phenolic compounds are considered for inclusion in the permit.

Shell Martinez Refinery
Attachment 3
WQBEL Calculations

PRIORITY POLLUTANTS Units	Copper ug/L	Mercury ug/L	Nickel ug/L	Selenium ug/L	Zinc ug/L	Cyanide ug/L	2,3,7,8-TCDD TEQ ug/L	PCBs sum ug/L
Basis and Criteria type	BP & CTR SW Aq Life	BP FW Aq Life	BP & CTR SW Aq Life	NTR Criterion for the Bay	BP & CTR FW Aq Life	NTR Criterion for the Bay	BP HH	BP HH
Lowest WQO	3.73	0.025	8.3	5.0	62.05	1.0	1.40E-08	1.70E-04
Translators								
Dilution Factor (D) (if applicable)	9	0	9	0	9	9	0	0
No. of samples per month	4	4	4	4	4	4	4	4
Aquatic life criteria analysis required? (Y/N)	Y	Y	Y	Y	Y	Y	N	Y
HH criteria analysis required? (Y/N)	N	Y	Y	N	N	Y	Y	Y
Applicable Acute WQO	5.78	2.10	74.75	20.00	62.05	1		
Applicable Chronic WQO	3.73	0.025	8.28	5.00	62.05	1		1.40E-02
HH criteria	-----	0.05	4.600	-----	-----	220,000	1.40E-08	1.70E-04
Background (Max Conc for Aq. Life calc)	2.45	0.0086	3.73	0.39	5.1	0.4	7.10E-08	1.46E-03
Background (Ave Conc for HH calc)	-----	0.0022	-----	-----	-----	-----	5.00E-08	4.37E-04
Is pollutant Bioaccumulative (Y/N)?	N	Y	N	Y	N	N	Y	Y
ECA acute	36	2.1	714	20	575	6		No. Acute WQO
ECA chronic	15	0.03	49	5	575	6		1.40E-02
ECA HH		0.051	4600			220000	1.40E-08	1.70E-04
No. of data points <10 or at least 80% of data reported non detect? (Y/N)	N	N	N	N	N	N	Y	Y
Avg of effluent data points	4.931	0.030	20.889	31.370	32.722	12.5389		
Std Dev of effluent data points	2.254	0.068	8.420	9.346	16.428	6.0231		
CV calculated	0.46	2.25	0.40	0.30	0.50	0.48	N/A	N/A
CV (Selected) - Final	0.46	2.25	0.40	0.30	0.50	0.48	0.60	0.60
ECA acute mult99	0.40	0.11	0.44	0.53	0.37	0.38		0.32
ECA chronic mult99	0.61	0.18	0.64	0.72	0.58	0.59		0.53
LTA acute	14.28	0.23	312.15	10.59	213.44	2.46		
LTA chronic	9.28	0.005	31.59	3.58	333.40	3.79		0.01
minimum of LTAs	9.28	0.005	31.59	3.58	213.44	2.46		0.01
AMEL mult95	1.41	2.94	1.36	1.26	1.46	1.44	1.55	1.55
MDEL mult99	2.51	9.21	2.29	1.89	2.69	2.60	3.11	3.11
AMEL (aq life)	13.12	0.01	43.00	4.52	310.90	3.53		0.01
MDEL (aq life)	23.26	0.04	72.25	6.76	574.64	6.40		0.02
MDEL/AMEL Multiplier	1.77	3.13	1.68	1.50	1.85	1.81	2.01	2.01
AMEL (human hith)		0.051	4600			220000	1.40E-08	1.70E-04
MDEL (human hith)		0.160	7729			398670	2.81E-08	3.41E-04
minimum of AMEL for Aq. life vs HH	13.12	0.01	43.00	4.52	311	3.53	1.40E-08	1.70E-04
minimum of MDEL for Aq. Life vs HH	23.26	0.04	72.25	6.76	575	6.40	2.81E-08	3.41E-04
Current limit in permit (30-day average)	12.2 (final)	0.075 (interim)	N/A	N/A	N/A	N/A	N/A	
Current limit in permit (daily)	24.6 (final)	N/A	65 (interim)	50 (interim)	580 (interim)	25 (interim)	1.4E-07 (interim)	
Final limit - AMEL	13	0.014	43	4.5	310	3.5	1.4E-08	1.70E-04
Final limit - MDEL	23	0.042	72	6.8	570	6.4	2.8E-08	3.40E-04
Max Effi Conc (MEC)	12	0.28	52	64	89	25	4.56E-08	2.81E-04

ATTACHMENT G – CHRONIC TOXICITY – DEFINITIONS OF TERMS AND SCREENING PHASE REQUIREMENTS

CHRONIC TOXICITY

DEFINITION OF TERMS & SCREENING PHASE REQUIREMENTS

I. Definition of Terms

- A. No observed effect level (NOEL) for compliance determination is equal to IC_{25} or EC_{25} . If the IC_{25} or EC_{25} cannot be statistically determined, the NOEL shall be equal to the NOEC derived using hypothesis testing.
- B. Effective concentration (EC) is a point estimate of the toxicant concentration that would cause an adverse effect on a quantal, "all or nothing," response (such as death, immobilization, or serious incapacitation) in a given percent of the test organisms. If the effect is death or immobility, the term lethal concentration (LC) may be used. EC values may be calculated using point estimation techniques such as probit, logit, and Spearman-Kärber. EC_{25} is the concentration of toxicant (in percent effluent) that causes a response in 25% of the test organisms.
- C. Inhibition Concentration (IC) is a point estimate of the toxicant concentration that would cause a given percent reduction in a non-lethal, non-quantal biological measurement, such as growth. For example, an IC_{25} is the estimated concentration of toxicant that would cause a 25% reduction in average young per female or growth. IC values may be calculated using a linear interpolation method such as USEPA's Bootstrap Procedure.
- D. No observed effect concentration (NOEC) is the highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specific time of observation. It is determined using hypothesis testing.

II. Chronic Toxicity Screening Phase Requirements

- A. The Discharger shall perform screening phase monitoring:
1. Subsequent to any significant change in the nature of the effluent discharged through changes in sources or treatment, except those changes resulting from reductions in pollutant concentrations attributable to source control efforts, or
 2. Prior to Permit reissuance. Screening phase monitoring data shall be included in the NPDES Permit application for reissuance. The information shall be as recent as possible, but may be based on screening phase monitoring conducted within 5 years before the permit expiration date.
- B. Design of the screening phase shall, at a minimum, consist of the following elements:
1. Use of test species specified in Tables 1 and 2 (attached), and use of the protocols referenced in those tables, or as approved by the Executive Officer;
 2. Two stages:

- a. Stage 1 shall consist of a minimum of one battery of tests conducted concurrently. Selection of the type of test species and minimum number of tests shall be based on Table 3 (attached); and
 - b. Stage 2 shall consist of a minimum of two test batteries conducted at a monthly frequency using the three most sensitive species based on the Stage 1 test results and as approved by the Executive Officer.
3. Appropriate controls; and
 4. Concurrent reference toxicant tests.
- C. The Discharger shall submit a screening phase proposal to the Executive Officer for approval. The proposal shall address each of the elements listed above.

**TABLE 1
CRITICAL LIFE STAGE TOXICITY TESTS FOR ESTUARINE WATERS**

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

Toxicity Test References:

1. American Society for Testing Materials (ASTM). 1990. Standard Guide for conducting static 96-hour toxicity tests with microalgae. Procedure E 1218-90. ASTM Philadelphia, PA.
2. Short-term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to West Coast Marine and Estuarine Organisms. USEPA/600/R-95/136. August 1995
3. Short-term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to Marine and Estuarine Organisms as specified in 40CFR 136. Currently, this is USEPA/600/4-90/003, July 1994. Later editions may replace this version.

**TABLE 2
 CRITICAL LIFE STAGE TOXICITY TESTS FOR FRESH WATERS**

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

Toxicity Test Reference:

4. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms as specified in 40CFR 136. Currently, this is the third edition, USEPA/600/4-91/002, July 1994. Later editions may replace this version.

TABLE 3

TOXICITY TEST REQUIREMENTS FOR STAGE ONE SCREENING PHASE

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

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

- 1) The salinity of the effluent is above 1 parts per thousand (ppt) greater than 95% of the time, or
- 2) The ionic strength (TDS or conductivity) of the effluent at the test concentration used to determine compliance is documented to be toxic to the test species.

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

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

Attachment H – Form A

STORMWATER/BALLAST WATER ALLOCATION PROCEDURE

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

Definitions:

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

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

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

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

Stormwater Bankbook - Calculated inventoried stormwater.

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

TABLE FOR RECORDS OF RAINFALL, STORMWATER RUNOFF, AND BALLAST FLOW

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

Attachment H - Form A

STORMWATER/BALLAST WATER ALLOCATION PROCEDURE

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
Rainfall (inch)	Stormwater Runoff (MGD)	Effluent Flow (MGD)	Dry Weather Effluent Flow (MGD)	Estimated Processed Stormwater (MGD)	Stormwater Bankbook (MGD)	Actual Processed Stormwater (MGD)	Ballast Water (MGD)
1							
2							
3							
.							
.							
.							
.							
30							
Total							
Average							
Maximum							

Previous Month's Bankbook =

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

Column (D) = Dry Weather Effluent Flow + Documented Process Water Increment.

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

Column (F):

Column (F) = Column (E) + Column (B) - Column (E);

Column (F) = 0, if Column (E) < 0.

Column (G):

Column (G) = Column (E), if Column (E) > 0;

Column (G) = Column (B) + Column (F) + Column (F) previous day, if Column (E) = 0.

Attachment H – Form A

CALCULATION OF STORMWATER AND BALLAST WATER ALLOCATIONS

Year:				
30-Day Average Limitation (kg /day)	Monthly Average Storm Runoff + Ballast Water Flow (expressed in 1000 gallons/day)	Allocation Factor (kg /1000 gallons) = (kg /day)	A.I Effluent Limits (kg /day)	Total Effluent Limit (kg /day)
BOD ₅	x	0.098	+	=
TSS	x	0.079	+	=
TOC	x	0.22	+	=
COD	x	0.68	+	=
O&G	x	0.03	+	=
Phenol	x	0.00064	+	=
Chrome Hex	x	0.00079	+	=
Chrome	x	0.00011	+	=

Attachment H – Form A

REPORT FORMAT FOR ADJUSTED EFFLUENT LIMITATIONS

MAXIMUM DAILY LIMITS							
DATE	BOD (kg/day)	TSS (kg/day)	COD (kg/day)	O&G (kg/day)	PHENOL (kg/day)	TOTAL CHROME (kg/day)	HEX CHROME (kg/day)

Maximum Daily Limit = Effluent Limit B.5 + Stormwater Allocation
 (kg/day) (Daily Max in kg/day) (Daily Max in kg/day)

Stormwater Allocation = Effluent Limit B.6 x Daily Processed Stormwater x 3.785 liters/gal
 (kg/day) (Daily Max in mg/l) (in MGD)