STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

STAFF SUMMARY REPORT (Patrick Karinja)
MEETING DATE: October 12, 2017

ITEM: **5A**

SUBJECT: **Shell Oil Products US & Equilon Enterprises LLC, Shell Martinez Refinery, Martinez, Contra Costa County – Reissuance of NPDES Permit**

CHRONOLOGY: June 2012 – NPDES Permit Reissued

DISCUSSION: This Revised Tentative Order (Appendix A) would reissue the NPDES permit for discharges from the wastewater treatment plant and stormwater outfalls at the Shell Martinez Refinery. The Martinez Refinery is one of five petroleum refineries in our Region. It processes about 150,000 barrels per day of crude oil and discharges about 5.9 million gallons per day of treated wastewater to Carquinez Strait via a deepwater diffuser 500 feet offshore. Shell also discharges stormwater associated with industrial activities to Peyton Slough and Peyton Creek.

The reissued permit would require compliance with updated technology-based and water quality-based effluent limits. It would impose new selenium effluent limits based on the North San Francisco Bay Selenium TMDL adopted by the Board in 2015. It would also establish stormwater numeric action levels for total suspended solids consistent with the Industrial Stormwater General Permit the State Water Board adopted in 2014.

We received comments (Appendix B) from San Francisco Baykeeper on a draft permit distributed for public comment. All changes proposed are described in the Response to Comments (Appendix C) and reflected in the Revised Tentative Order. Consistent with its comments on the recently adopted Phillips 66 refinery permit, Baykeeper asserts that North San Francisco Bay fish tissue selenium levels are increasing and TMDL-based selenium limits are insufficient. We contend that available monitoring data show no increasing trend, and the proposed limits, which are based on the TMDL, are sufficient.

Baykeeper also points out that Shell's selenium discharge concentrations are higher than those of other refineries and requests that we develop new technology-based effluent limits. Shell is currently evaluating a more innovative treatment technology, and we added a provision to the Revised Tentative Order that would require Shell to continue its investigation and report its findings.

Lastly, Baykeeper raised concerns that Shell could discharge ballast water that contains invasive species to San Francisco Bay. While Shell has not accepted ballast water in many years and intends only to do so in rare emergency scenarios, we added a provision that would require Shell to obtain approval from the California State Lands Commission prior to accepting ballast water.

We anticipate that this item will remain uncontested.

RECOMMEN-
DATION: Adoption of the Revised Tentative Order

FILE: CW-256695

APPENDICES: A. Revised Tentative Order
B. Comments
C. Response to Comments

Appendix A
Revised Tentative Order

REVISED TENTATIVE ORDER No. R2-2017-00XX
NPDES No. CA0005789

The following discharger is subject to waste discharge requirements (WDRs) set forth in this Order:

Table 1. Discharger Information

Discharger	Shell Oil Products US Equilon Enterprises LLC
Facility Name	Shell Martinez Refinery
Facility Address	3485 Pacheco Blvd. Martinez, CA 94553 Contra Costa County
CIWQS Place ID	256695

Table 2. Discharge Locations

Discharge Point	Effluent Description	Discharge Point Latitude (North)	Discharge Point Longitude (West)	Receiving Water
001	Treated Wastewater	38.0322˚	-122.1289˚	Carquinez Strait
002	Stormwater	38.0225˚	-122.1106˚	Peyton Slough
004	Stormwater	38.0150˚	-122.1186˚	Peyton Creek
005	Stormwater	38.0161˚	-122.1019˚	Peyton Creek
007	Stormwater	38.0014˚	-122.1019˚	Peyton Creek
008	Stormwater	38.0111˚	-122.1067˚	Peyton Creek
009	Stormwater	38.0261˚	-122.1167˚	Peyton Slough

Table 3. Administrative Information

This Order was adopted on:	<Adoption Date>
This Order shall become effective on:	December 1, 2017
This Order shall expire on:	November 30, 2022
CIWQS Regulatory Measure Number:	<Regulatory Number>
The Discharger shall file a Report of Waste Discharge for updated WDRs in accordance with California Code of Regulations, title 23, and as an application for reissuance of a National Pollutant Discharge Elimination System (NPDES) permit no later than:	March 6, 2022
The U.S. Environmental Protection Agency (U.S. EPA) and the California Regional Water Quality Control Board, San Francisco Bay Region, have classified this discharge as follows:	Major

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

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Bruce H. Wolfe**,** Executive Officer

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Tables

Attachments

I. FACILITY INFORMATION

Information describing Shell Oil Products US and Equilon Enterprises LLC's (Discharger's) Shell Martinez Refinery (Facility) is summarized in Table 1 and Fact Sheet (Attachment F) sections I and II.

II. FINDINGS

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

A. Legal Authorities. This Order serves as Waste Discharge Requirements (WDRs) pursuant to California Water Code article 4, chapter 4, division 7 (commencing with § 13260). This Order is also issued pursuant to federal Clean Water Act (CWA) section 402 and implementing regulations adopted by U.S. EPA and Water Code chapter 5.5, division 7 (commencing with § 13370). It shall serve as a National Pollutant Discharge Elimination System (NPDES) permit authorizing the Discharger to discharge into waters of the United States as listed in Table 2 subject to the WDRs in this Order.

B. Background and Rationale for Requirements. The Regional Water Board developed the requirements in this Order based on information the Discharger submitted as part of its application, information obtained through monitoring and reporting programs, and other available information. The Fact Sheet contains background information and rationale for the requirements in this Order and is hereby incorporated into and constitutes findings for this Order. Attachments A through E and G are also incorporated into this Order.

C. Provisions and Requirements Implementing State Law. No provisions and requirements in this Order are included to implement State law only.

D. Notification of Interested Parties. The Regional Water Board notified the Discharger and interested agencies and persons of its intent to prescribe these WDRs and provided an opportunity to submit written comments and recommendations. The Fact Sheet provides details regarding the notification.

E. Consideration of Public Comment. The Regional Water Board, in a public meeting, heard and considered all comments pertaining to the discharge. The Fact Sheet provides details regarding the public hearing.

THEREFORE, IT IS HEREBY ORDERED that Order No. R2-2012-0052 is rescinded upon the effective date of this Order except for enforcement purposes, and, in order to meet the provisions of Water Code division 7 (commencing with § 13000) and regulations adopted thereunder and the provisions of the CWA and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order. This action in no way prevents the Regional Water Board from taking enforcement action for past violations of the previous order.

III. DISCHARGE PROHIBITIONS

A. Discharge of treated or untreated wastewater at a location or in a manner different than described in this Order is prohibited.

B. Discharge at Discharge Point No. 001 is prohibited when treated wastewater does not receive an initial dilution of at least 16:1 (nominal). Compliance shall be achieved by proper operation and maintenance of the discharge outfall to ensure that it (or its replacement, in whole or part) is in good working order and is consistent with or can achieve better mixing than that described in Fact Sheet (Attachment F) section IV.D.4.a. The Discharger shall address measures taken to ensure this in its application for permit reissuance.

C. Bypass of untreated or partially-treated wastewater to waters of the United States is prohibited, except as provided for in Attachment D section I.G.

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Discharge Point No. 001

1. Effluent Limitations. The Discharger shall comply with the following effluent limitations at Discharge Point No. 001, with compliance measured at Monitoring Location EFF-001 as described in the Monitoring and Reporting Program (MRP, Attachment E):

Table 4. Effluent Limitations – Discharge Point No. 001

Parameter	Units	Effluent Limitations	
		Maximum Daily	Average Monthly
Biochemical Oxygen Demand (BOD_5) (5-day @ 20 Degrees Celsius)	lbs/day	3,300	1,800
Total Suspended Solids (TSS)	lbs/day	2,300	1,500
Chemical Oxygen Demand (COD)	lbs/day	25,000	13,000
Oil and Grease	lbs/day	1,000	530
Sulfide, Total	lbs/day	22	9.6
Phenolic Compounds, Total	lbs/day	25	7.6
Ammonia Nitrogen, Total (as N)	mg/L	57	21
	lbs/day	2,200	1,000
Chromium, Total Recoverable	lbs/day	26	8.9
Chromium (VI), Total Recoverable	lbs/day	1.6	0.73
Copper, Total Recoverable	µg/L	120	60
Cyanide, Total	µg/L	38	22
Nickel, Total Recoverable	µg/L	72	43
Selenium, Total Recoverable [1]	kg/day	---	1.1
Dioxin-TEQ	µg/L	2.8×10^{-8}	1.4×10^{-8}
Chronic Toxicity [2]	TU_c	10	---
pH	s.u.	6.0 – 9.0 [3]	

Unit Abbreviations:

lbs/day = pounds per day
mg/L = milligrams per liter
µg/L = micrograms per liter
kg/day = kilograms per day
TU_c = toxicity units
s.u. = standard units

Footnotes:

[1] Compliance shall be evaluated by calculating the arithmetic mean of daily selenium mass discharges for each day of the calendar month. Daily mass discharges shall be calculated based on the total daily flow and the corresponding selenium concentration for each day that selenium is measured. The Discharger shall also report its average annual selenium load as required by Provision VI.C.4.f.

[2] Bioassays shall be conducted in accordance with MRP section IV.B. The maximum daily effluent limitation for chronic toxicity shall be interpreted as the maximum test result for the month.

[3] If the Discharger employs continuous pH monitoring (with exception for necessary calibration and maintenance checks), 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 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.

2. **Acute Toxicity.** Discharges at Discharge Point No. 001 shall comply with the following limitations, with compliance measured at Monitoring Location EFF-001 as described in the MRP:

   a. An 11-sample median value of not less than 90 percent survival; and

   b. An 11-sample 90th percentile value of not less than 70 percent survival.

   These acute toxicity limitations are further defined as follows:

   a. 11-sample median. A bioassay test showing survival of less than 90 percent represents a violation of this effluent limitation if five or more of the past ten or fewer bioassay tests also show less than 90 percent survival.

   b. 11-sample 90th percentile. A bioassay test showing survival of less than 70 percent represents a violation of this effluent limitation if one or more of the past ten or fewer bioassay tests also show less than 70 percent survival.

   If the Discharger can demonstrate that toxicity exceeding the levels cited above is caused by ammonia and that ammonia in the discharge complies with the total ammonia effluent limitations of this Order, then such toxicity does not constitute a violation of this effluent limitation.

3. **Bacteria Limitations.** The Discharger shall comply with the following bacteria limitations at Monitoring Location EFF-001D as described in the MRP:

   a. **Total Coliform.** The median of five consecutive samples shall not have total coliform organisms exceeding 240 most probable number per 100 milliliters (MPN/100 mL). Any single sample shall not exceed 10,000 MPN/100 mL.

   b. **Enterococcus.** The geometric mean enterococcus bacteria concentration of all samples in a calendar month shall not exceed 140 MPN/100 mL.

4. **Additional Contaminated Runoff Effluent Limitation Allocations.** Additional effluent limitation allocations for contaminated runoff commingled with process wastewater are established on top of the process wastewater mass-based limitations in Table 4. When contaminated runoff is discharged through Discharge Point No. 001, an additional effluent limitation allocation may be added to the effluent limitation in Table 4 for each pollutant in Table 5, below. The additional allocation shall be equal to the contaminated runoff flow times the pollutant concentration in Table 5.

Table 5. Additional Contaminated Runoff Effluent Limitation Allocations

Parameter	Units	Pollutant Concentration	
		Maximum Daily	Average Monthly
BOD_5	mg/L	48	26
TSS	mg/L	33	21
COD	mg/L	360	180

Oil and Grease	mg/L	15	8.0
Phenolic Compounds, Total	mg/L	0.35	0.17
Chromium, Total Recoverable	mg/L	0.60	0.21
Chromium (VI), Total Recoverable	mg/L	0.062	0.028

Unit Abbreviation:

mg/L = milligrams per liter

5. **Additional Ballast Water Effluent Limitation Allocations.** Additional effluent limitation allocations for ballast water commingled with process wastewater are established on top of the process wastewater mass-based limitations in Table 4. When ballast water is discharged through Discharge Point No. 001, an additional effluent limitation allocation may be added to the effluent limitation in Table 4 for each pollutant in Table 6, below. The additional allocation shall be equal to the ballast water flow times the pollutant concentration in Table 6.

Table 6. Additional Ballast Water Effluent Limitation Allocations

Parameter	Units	Pollutant Concentration	
		Maximum Daily	Average Monthly
BOD_5	mg/L	48	26
TSS	mg/L	33	21
COD	mg/L	470	240
Oil and Grease	mg/L	15	8.0

Unit Abbreviation:

mg/L = milligrams per liter

6. **Recycled Water Use Effluent Limitation Adjustments**. If the Discharger replaces raw water used in its operations with recycled water and complies with Provision VI.C.4.e, an additional allocation shall be added to mass-based and concentration-based effluent limitations by calculating adjustments as described below and adding them to the effluent limitations in Table 4. All calculations supporting such limitation adjustments shall be described in applicable self-monitoring reports.

   a. **Concentration-based Effluent Limitation Adjustments.** The adjustment for a concentration-based effluent limitation shall be the difference between its recycled water influent mass and raw water influent mass, divided by the effluent volume for the applicable monitoring interval (e.g., seven days for a constituent monitored weekly) and shall be calculated according to the following example in which constituent B is monitored weekly and the lag time is Y days:

      Step 1: Influent mass of B = [(Influent recycled water concentration of B) – (influent raw water concentration of B)] x (Influent recycled water volume)

      Step 2: Effluent volume for monitoring period = Effluent volume at Monitoring Location EFF-001 beginning Y days after influent mass determined through one week later

      Step 3: Effluent limitation adjustment for B = (Influent mass of B) / (Effluent volume for monitoring period)

   b. **Mass-based Effluent Limitation Adjustments.** The adjustment for a mass-based effluent limitation shall be the difference between the recycled water influent mass and raw water influent mass, divided by the number of days in the monitoring period, and

shall be calculated according to the following example for constituent B (lag time is not used for this calculation):

Step 1: Influent mass of B = [(Influent recycled water concentration of B) – (Influent raw water concentration of B)] x (Influent recycled water volume)

Step 2: Effluent limitation adjustment for B = (Influent mass of B) / (Monitoring interval in days)

B. Discharge Point Nos. 002, 004, 005, 007, 008, and 009

1. The Discharger shall comply with the following effluent limitations at Discharge Point Nos. 002, 004, 005, 007, 008, and 009, with compliance measured at Monitoring Locations EFF-002, EFF-004, EFF-005, EFF-007, EFF-008, and EFF-009 as described in the MRP:

Table 7. Effluent Limitations – Discharge Point Nos. 002, 004, 005, 007, 008, and 009

Parameter	Units	Effluent Limitations	
		Maximum Daily	Average Monthly
Total Organic Carbon (TOC)	mg/L	110	---
Oil and Grease	mg/L	15	---
pH	s.u.	6.5 – 8.5 (instantaneous)	
Visible Oil	---	None observed (instantaneous)	
Visible Color	---	None observed (instantaneous)	

Unit Abbreviations:

mg/L = milligrams per liter
s.u. = standard units

2. If a TOC or oil and grease effluent limitation in Table 7 is exceeded at any of Monitoring Locations EFF-002, EFF-004, EFF-005, EFF-007, EFF-008, or EFF-009, the Discharger shall also comply with the following effluent limitations at the same monitoring location as described in the MRP:

Table 8. Effluent Limitations – Discharge Point Nos. 002, 004, 005, 007, 008, and 009 (Supplemental)

Pollutant	Units	Effluent Limitations	
		Maximum Daily	Average Monthly[1]
BOD_5	mg/L	48	26
TSS [2]	mg/L	33	21
COD	mg/L	360	180
Oil and Grease	mg/L	15	8.0
Phenolic Compounds, Total	mg/L	0.35	0.17
Chromium, Total Recoverable	mg/L	0.60	0.21
Chromium (VI), Total Recoverable	mg/L	0.062	0.028

Unit Abbreviation:

mg/L = milligrams per liter

Footnotes:

[1] These limitations shall not apply unless there is sufficient runoff for sampling on at least three days during the month.

[2] As indicated in Provision VI.C.4.c, the numeric actions levels for TSS are an annual average of 100 mg/L and a daily maximum of 400 mg/L.

V. RECEIVING WATER LIMITATIONS

A. The discharge shall not cause the following conditions to exist in receiving waters at any place:

1. Floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses;

2. Alteration of suspended sediment in such a manner as to cause nuisance or adversely affect beneficial uses, or detrimental increase in the concentrations of toxic pollutants in sediments or aquatic life;

3. Suspended material in concentrations that cause nuisance or adversely affect beneficial uses;

4. Bottom deposits or aquatic growths to the extent that such deposits or growths cause nuisance or adversely affect beneficial uses;

5. Alteration of temperature beyond present natural background levels;

6. Changes in turbidity that cause nuisance or adversely affect beneficial uses, or increases from normal background light penetration or turbidity greater than 10 percent in areas where natural turbidity is greater than 50 nephelometric turbidity units;

7. Coloration that causes nuisance or adversely affects beneficial uses;

8. Visible, floating, suspended, or deposited oil or other products of petroleum origin; or

9. Toxic or other deleterious substances in concentrations or quantities that cause deleterious effects on wildlife, waterfowl, or other aquatic biota, or render any of these unfit for human consumption, either at levels created in the receiving waters or as a result of biological concentration.

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

1.	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, the discharge shall not cause further reduction in ambient dissolved oxygen concentrations.
2.	Dissolved Sulfide	Natural background levels
3.	pH	The pH shall not be depressed below 6.5 or raised above 8.5. The discharge shall not cause changes greater than 0.5 pH units in normal ambient pH levels.
4.	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.

C. The discharge shall not cause a violation of any water quality standard for receiving waters adopted by the Regional Water Board or State Water Board as required by the CWA and regulations adopted thereunder. If more stringent water quality standards are promulgated or approved pursuant to CWA section 303, or amendments thereto, the Regional Water Board may revise or modify this Order in accordance with the more stringent standards.

VI. PROVISIONS

A. Standard Provisions

1. The Discharger shall comply with all "Federal Standard Provisions" (Attachment D).

2. The Discharger shall comply with all applicable provisions of "Regional Standard Provisions, and Monitoring and Reporting Requirements (Supplement to Attachment D) for NPDES Wastewater Discharge Permits" (Attachment G), as modified by Attachment E.

B. Monitoring and Reporting

The Discharger shall comply with the MRP (Attachment E) and future revisions thereto and applicable sampling and reporting requirements in Attachments D and G.

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 as allowed by law:

a. If present or future investigations demonstrate that the discharges governed by this Order have or will have, or will cease to have, a reasonable potential to cause or contribute to adverse impacts on water quality or beneficial uses of the receiving waters.

b. If new or revised water quality objectives or total maximum daily loads (TMDLs) come into effect for San Francisco Bay and contiguous water bodies (whether statewide, regional, or site-specific). In such cases, effluent limitations in this Order may be modified as necessary to reflect the updated water quality objectives and wasteload allocations in the TMDLs. Adoption of the effluent limitations in this Order is not intended to restrict in any way future modifications based on legally-adopted water quality objectives or TMDLs or as otherwise permitted under federal regulations governing NPDES permit modifications.

c. If translator, dilution, or other water quality studies provide a basis for determining that a permit condition should be modified.

d. If State Water Board precedential decisions, new policies, new laws, or new regulations are adopted.

e. If an administrative or judicial decision on a separate NPDES permit or WDRs addresses requirements similar to this discharge.

f. Or as otherwise authorized by law.

The Discharger may request a permit modification based on any of the circumstances above. With any such request, the Discharger shall include antidegradation and anti-backsliding analyses.

2. Effluent Characterization Study and Report

a. Study Elements. The Discharger shall continue to characterize and evaluate the discharge from the following discharge points to verify that the "no" or "unknown" reasonable potential analysis conclusions of this Order remain valid and to inform the next permit reissuance. The Discharger shall collect representative samples at Monitoring Locations EFF-001 and, when Discharge Point No. 002 discharges stormwater from upper Lake Slobodnik, EFF-002, as defined in the MRP, at no less than the frequency specified below:

Discharge Point	Monitoring Location	Minimum Frequency
001	EFF-001	2/Year
002	EFF-002	Each Discharge Event

The monitoring at Monitoring Location EFF-002 described above supersedes the additional sampling at upper Lake Slobodnik the Executive Officer required in a letter dated October 24, 2013, pursuant to Water Code section 13267.

The samples shall be analyzed for the priority pollutants listed in Attachment G Table C, except for those priority pollutants with effluent limitations where the MRP already requires more frequent monitoring and except for those pollutants for which there are no water quality criteria (see Fact Sheet Table F-10). Compliance with this requirement shall be achieved in accordance with the specifications of Attachment G sections III.A.1 and III.A.2.

The Discharger shall evaluate on an annual basis if concentrations of any of these pollutants significantly increase over past performance. The Discharger shall investigate the cause of any such increase. The investigation may include, but need not be limited to, an increase in monitoring frequency, monitoring of internal process streams, and monitoring of influent sources. The Discharger shall establish remedial measures addressing any increase resulting in reasonable potential to cause or contribute to an exceedance of applicable water quality objectives. This requirement may be satisfied through identification of the constituent as a "pollutant of concern" in the Discharger's Pollutant Minimization Program, described in Provision VI.C.3.

b. Reporting Requirements

i. Routine Reporting. The Discharger shall report the following in the transmittal letter for the self-monitoring report associated with the month in which the samples were collected:

(a) Indication that a sample for this characterization study was collected; and

(b) Identity of pollutants detected at or above applicable water quality criteria (see Fact Sheet Table F-10 for the criteria) and the detected concentrations of those pollutants.

ii. **Annual Reporting.** The Discharger shall summarize the annual data evaluation and source investigation in the annual self-monitoring report.

iii. **Final Report.** The Discharger shall submit a final report that presents all these data with the application for permit reissuance.

3. Pollutant Minimization Program

a. The Discharger shall continue to improve its existing Pollutant Minimization Program to promote minimization of pollutant loadings to the wastewater treatment plant and therefore to the receiving waters.

b. The Discharger shall submit an annual report no later than February 28 each year. Each annual report shall include at least the following information:

i. **Brief description of the wastewater treatment plant.** The description shall include the treatment plant processes.

ii. **Discussion of current pollutants of concern.** Periodically, the Discharger shall analyze its circumstances to determine which pollutants are currently a problem and which pollutants may be potential future problems. This discussion shall include the reasons for choosing the pollutants.

iii. **Identification of sources for pollutants of concern.** This discussion shall include how the Discharger intends to estimate and identify pollutant sources. The Discharger shall include 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 pollutants of concern.** This discussion shall identify and prioritize tasks to address the Discharger's pollutants of concern. The Discharger may implement the tasks by itself or participate in group, regional, or national tasks that address its pollutants of concern. The Discharger is strongly encouraged to participate in group, regional, or national tasks that address its pollutants of concern whenever it is efficient and appropriate to do so. An implementation timeline shall be included for 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 wastewater treatment plant. The Discharger may provide a forum for employees to provide input.

vi. **Discussion of criteria used to measure Pollutant Minimization Program and task effectiveness.** The Discharger shall establish criteria to evaluate the effectiveness of its Pollutant Minimization Program. This discussion shall identify the specific criteria used to measure the effectiveness of each task in Provisions VI.C.3.b.iii, iv, and v.

vii. **Documentation of efforts and progress.** This discussion shall detail all of the Discharger's Pollutant Minimization Program activities during the reporting year.

viii. Evaluation of Pollutant Minimization Program and task effectiveness. This Discharger shall use the criteria established in Provision VI.C.3.b.vi to evaluate the program and task effectiveness.

ix. Identification of specific tasks and timelines for future efforts. Based on the evaluation, the Discharger shall explain how it intends to continue or change its tasks to more effectively reduce the amount of pollutants flowing to the wastewater treatment plant and subsequently in its effluent.

c. The Discharger shall develop and conduct a Pollutant Minimization Program as further described below when there is evidence that a priority pollutant is present in the effluent above an effluent limitation (e.g., sample results reported as detected but not quantified [DNQ] when the effluent limitation is less than the method detection limit [MDL], sample results from analytical methods more sensitive than those methods required by this Order, presence of toxicity, health advisories for fish consumption, or results of benthic or aquatic organism tissue sampling) and either:

i. A sample result is reported as DNQ and the effluent limitation is less than the Reporting Level (RL); or

ii. A sample result is reported as not detected (ND) and the effluent limitation is less than the MDL using definitions in Attachment A and reporting protocols described in the MRP.

d. If triggered by the reasons set forth in Provision VI.C.3.c, above, the Discharger's Pollutant Minimization Program shall include, but not be limited to, the following actions and submittals:

i. Annual review and semi-annual monitoring of potential sources of the reportable priority pollutants, which may include fish tissue monitoring and other bio-uptake sampling, or alternative measures when source monitoring is unlikely to produce useful analytical data;

ii. Quarterly monitoring for the reportable priority pollutants in the influent to the wastewater treatment plant. The Executive Officer may approve alternative measures when 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 pollutants in the effluent at or below the effluent limitation;

iv. Implementation of appropriate cost-effective control measures for the reportable priority pollutants, consistent with the control strategy; and

v. Inclusion of the following specific items within the annual report required by Provision VI.C.3.b above:

(a) All Pollutant Minimization Program monitoring results for the previous year;
(b) List of potential sources of the reportable priority pollutants;
(c) Summary of all actions undertaken pursuant to the control strategy; and
(d) Description of actions to be taken in the following year.

4. Other Special Provisions

a. Copper Action Plan. The Discharger shall implement pretreatment, source control, and pollution prevention for copper in accordance with the following tasks and time schedule:

Table 9. Copper Action Plan

Task	Compliance Date
1. Review Potential Copper Sources Submit an up-to-date inventory of potential copper sources.	With annual pollution prevention report due February 28, 2018
2. Implement Copper Control Program Continue to minimize copper sources, as identified in Discharger's Pollutant Prevention and Minimization Plan – 2012 Annual Report, dated February 27, 2013. Incorporate additional measures as appropriate to address newly identified potential copper sources.	Implementation shall be ongoing
3. Implement Additional Actions If the Regional Water Board notifies the Discharger that the three-year rolling mean dissolved copper concentration in San Pablo Bay exceeds 3.0 µg/L, then within 90 days of the notification, evaluate the effluent copper concentration trend and, if it is increasing, develop and begin implementation of additional measures to control copper discharges. Report the conclusion of the trend analysis and provide a schedule for any new actions to be taken within the next 12 months.	With next annual pollution prevention report due February 28 (at least 90 days following notification)
4. Report Status Submit an annual report documenting copper control program implementation the evaluates the effectiveness of the actions taken, including any additional actions required by Task 2 above, and provide a schedule for actions to be taken within the next 12 months.	With annual pollution prevention report due February 28 each year

b. Cyanide Action Plan. The Discharger shall implement monitoring and surveillance, pretreatment, source control, and pollution prevention for cyanide in accordance with the following tasks and time schedule:

Table 10. Cyanide Action Plan

Task	Compliance Date
1. Review Potential Cyanide Sources Submit an up-to-date inventory of potential cyanide sources.	With annual pollution prevention report due February 28, 2018
2. Implement Cyanide Control Program Continue implementation of control program, as identified Discharger's Pollutant Prevention and Minimization Plan – 2012 Annual Report, dated February 27, 2013, to minimize cyanide discharges. Incorporate additional measures as appropriate to address newly identified potential cyanide sources. The program shall include, at a minimum, the following elements: a. Inspect each potential source to assess the need to include that source in the control program. b. Maintain an emergency monitoring and response plan to be implemented if a significant cyanide discharge occurs.	Implementation shall be ongoing
3. Implement Additional Measures If the Regional Water Board notifies the Discharger that ambient monitoring shows cyanide concentrations are 1.0 µg/L or higher in the main body of San Francisco Bay, then within 90 days of the notification, commence actions to identify and abate cyanide sources responsible for the elevated ambient concentrations, report on the progress and effectiveness of the actions taken, and provide a schedule for actions to be taken within the next 12 months.	With next annual pollution prevention report due February 28 (at least 90 days following notification)

Task	Compliance Date
4. Report Status of Cyanide Control Program Submit an annual report documenting cyanide control program implementation and addressing the effectiveness of actions taken, including any additional cyanide controls required by Task 3 above, and provide a schedule for actions to be taken within the next 12 months.	With annual pollution prevention report due February 28 each year

c. Stormwater Pollution Prevention Plan and Annual Report. By October 1, 2018, the Discharger shall submit and implement an updated Stormwater Pollution Prevention Plan (SWPPP). In subsequent years, the Discharger shall update and submit an updated SWPPP, or a letter stating that no revisions are necessary and the last year it updated its SWPPP, annually by October 1. The Discharger shall implement each SWPPP update.

The SWPPP shall contain the elements listed in Attachment G section I.J and incorporate relevant elements of *General Permit for Storm Water Discharges Associated with Industrial Activities,* NPDES General Permit No. CAS000001 (State Water Board Order No. 2014-0057-DWQ), sections X and XV, including best management practices.

The Discharger shall submit an annual stormwater report by July 30 of each year covering data for the previous wet weather season. The annual stormwater report shall, at a minimum, include the following:

i. tabulated summary of all sampling results and visual observations for all stormwater discharge points;

ii. comprehensive discussion of compliance with effluent limitations and other requirements of this Order and any corrective actions taken or planned; and

iii. comprehensive discussion of source identification and control programs for pollutants of concern, including TSS. If TSS levels at any stormwater discharge point exceed the numeric action levels of an annual average of 100 mg/L or a daily maximum of 400 mg/L, the Discharger shall identify in its next SWPPP update additional best management practices that it will implement to reduce TSS levels below these thresholds.

d. Construction and Development Requirements for Stormwater. In areas where stormwater is not subject to physical treatment, the Discharger shall obtain coverage under *NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities* Order No. 2009-0009-DWQ. These requirements do not apply to stormwater that drains to the Discharger's wastewater treatment plant or stormwater that is treated in earthen basins via physical settling.

e. Conditions for Recycled Water Use Adjustments. Prior to any allocation of recycled water use adjustments to mass-based or concentration-based effluent limitations (see Effluent Limitations and Discharge Specifications section IV.A.6 of this Order), the Discharger shall satisfy the following conditions:

i. The Discharger shall sample and analyze influent recycled water for any constituents for which it seeks adjustments at Monitoring Location INF-001 at least as frequently as the MRP requires for effluent monitoring at Monitoring Location EFF-001.

ii. The Discharger shall sample and analyze influent raw water for any constituents for which it seeks adjustments at Monitoring Location INF-002 at least once per year. The annual average concentration may be used in the calculations described in Effluent Limitations and Discharge Specifications IV.A.6.

iii. The Discharger shall determine the interval between the introduction of a limited constituent in recycled water and the appearance of that constituent in the final effluent.

iv. The Discharger shall submit a technical report demonstrating that proposed adjustments will not impair beneficial uses in the vicinity of the discharge (such as by creating a zone acutely toxic to aquatic organisms). At a minimum, the report shall assess toxicity testing results and compare the effluent concentrations projected when using recycled water to the proposed adjusted effluent limitations.

v. The Discharger shall submit one or more examples of how influent recycled and raw water concentrations, lag time, and effluent limitation adjustments will be calculated in accordance with Effluent Limitations and Discharge Specifications section IV.A.6.

vi. The Dicharger shall obtain written concurrence from the Executive Officer stating that these conditions have been met.

f. Average Annual Selenium Load. The Discharger shall report the average annual selenium load with its application for permit reissuance. The average annual load shall be the arithmetic mean of the annual mass discharges for the previous five calendar years.

g. Innovative Technologies for Selenium Treatment. The Discharger shall continue to investigate the use of innovative technologies for selenium removal upstream of the wastewater treatment plant.

i. Status Report. By December 1, 2019, the Discharger shall submit a report on its findings and propose studies to advance the feasibility of implementing an innovative technology for improved selenium removal.

ii. Feasibility Report. With the next application for permit reissuance, the Discharger shall submit a report evaluating the feasibility of implementing new technologies for improved selenium treatment. At a minimum, the report shall assess the following in accordance with 40 C.F.R. sections 125.3(d)(1) and (3):

(a) The total cost of applying the technology relative to the pollutant reduction benefits to be achieved;

(b) The age of equipment and facilities available for treatment;

(c) The process employed;

(d) The engineering aspects of the control technique;

(e) Necessary process changes; and

(f) Non-water quality environmental impacts, including energy use requirements.

The report shall also assess the potential that the technology will protect or minimize sea level rise and climate change impacts on the Facility. If improved technology can be installed, the Discharger shall provide an implementation schedule. If it cannot be installed, the Discharger shall outline in its report the methods it will employ to ensure and maintain reliable selenium treatment.

h. Acceptance of Ballast Water. Before accepting ballast water at its treatment plant, the Discharger shall obtain approval from the California State Lands Commission and notify the Regional Water Board of that approval.

ATTACHMENT A – DEFINITIONS

Arithmetic Mean (μ)
Also called the average, 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
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
Known to cause cancer in living organisms.

Coefficient of Variation
Measure of data variability calculated as the estimated standard deviation divided by the arithmetic mean of the observed values.

Daily Discharge
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 is considered the result for the calendar day in which the 24-hour period ends.

Detected, but Not Quantified (DNQ)
Sample result less than the RL, but greater than or equal to the laboratory's MDL. Sample results reported as DNQ are estimated concentrations.

Dilution Credit
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 by conducting a mixing zone study or modeling the discharge and receiving water.

Effluent Concentration Allowance (ECA)
Value derived from the water quality criterion/objective, dilution credit, and ambient background concentration that is used, in conjunction with the CV for the effluent monitoring data, to calculate a long-term average (LTA) discharge concentration. The ECA has the same meaning as wasteload 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 Bay
Indentation along the coast that encloses an area of oceanic water within a 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
Concentration that results from the confirmed detection of the substance below the ML value by the analytical method.

Estuaries
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 are considered estuaries. Estuarine waters are 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 include, 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
All surface waters of the state that do not include the ocean, enclosed bays, or estuaries.

Instantaneous Maximum Effluent Limitation
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
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)
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
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 n/2 and n/2+1).

Method Detection Limit (MDL)
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 in 40 C.F.R. part 136, Attachment B, revised as of July 3, 1999.

Minimum Level (ML)
Concentration at which the entire analytical system gives 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
Limited volume of receiving water 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)
Sample results less than the laboratory's MDL.

Persistent Pollutants
Substances for which degradation or decomposition in the environment is nonexistent or very slow.

Pollutant Minimization Program
Program of 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 Pollutant Minimization Program is to reduce all potential sources of a priority pollutant 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. Cost effectiveness may be considered when establishing the requirements of a Pollutant Minimization Program. The completion and implementation of a Pollution Prevention Plan, if required pursuant to Water Code section 13263.3(d), is considered to fulfill Pollutant Minimization Program requirements.

Pollution Prevention
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 Water Board or Regional Water Board.

Reporting Level (RL)
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, including an additional factor if applicable as discussed herein. 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 SIP Appendix 4 in accordance with SIP section 2.4.2 or established in accordance with SIP section 2.4.3. 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
The potion, 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
Any water designated as having a municipal or domestic supply (MUN) beneficial use.

Standard Deviation (σ)
Measure of variability 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)
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 chemicals responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

ATTACHMENT B – FACILITY MAPS

Figure B-1. Facility Location Map

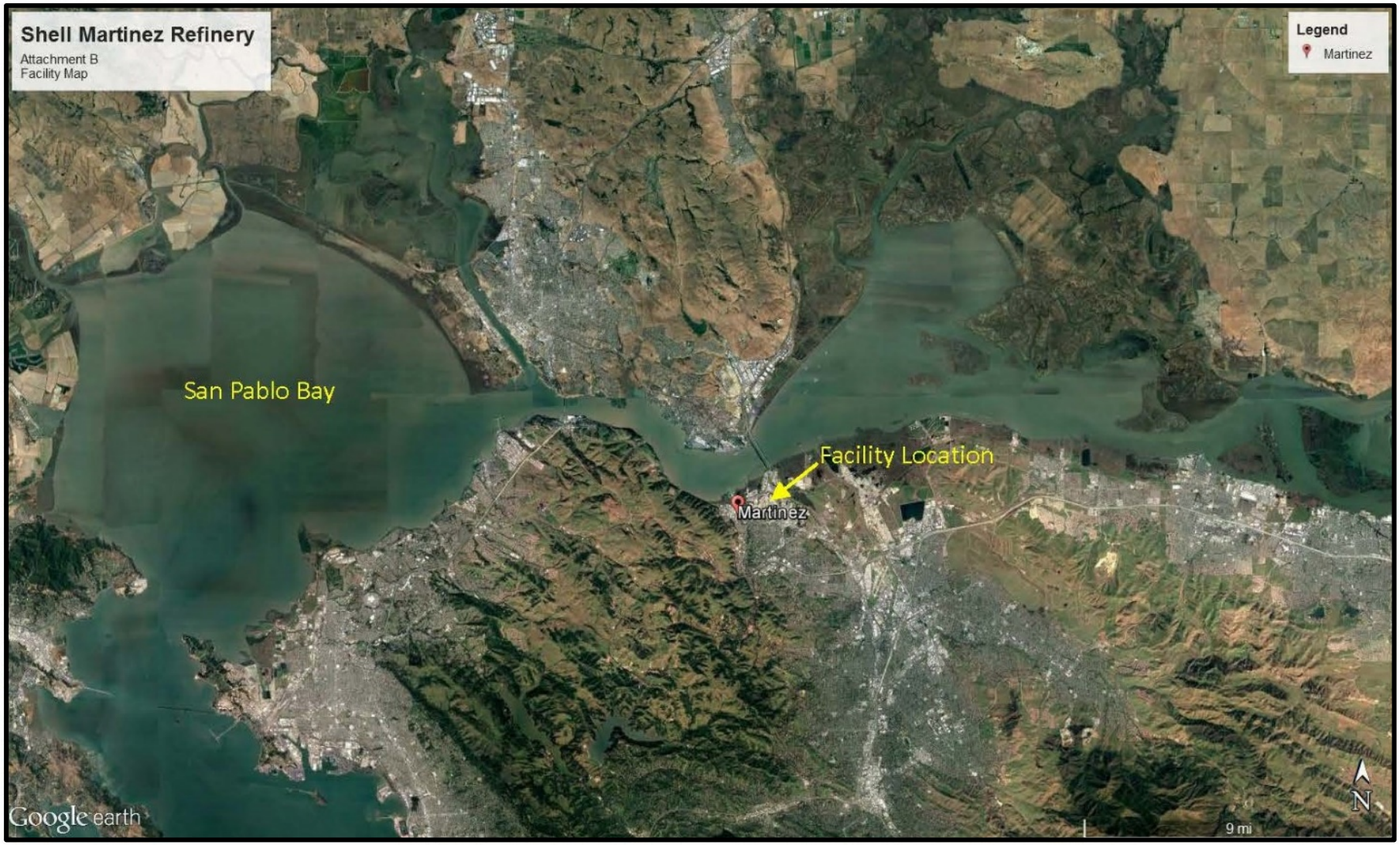
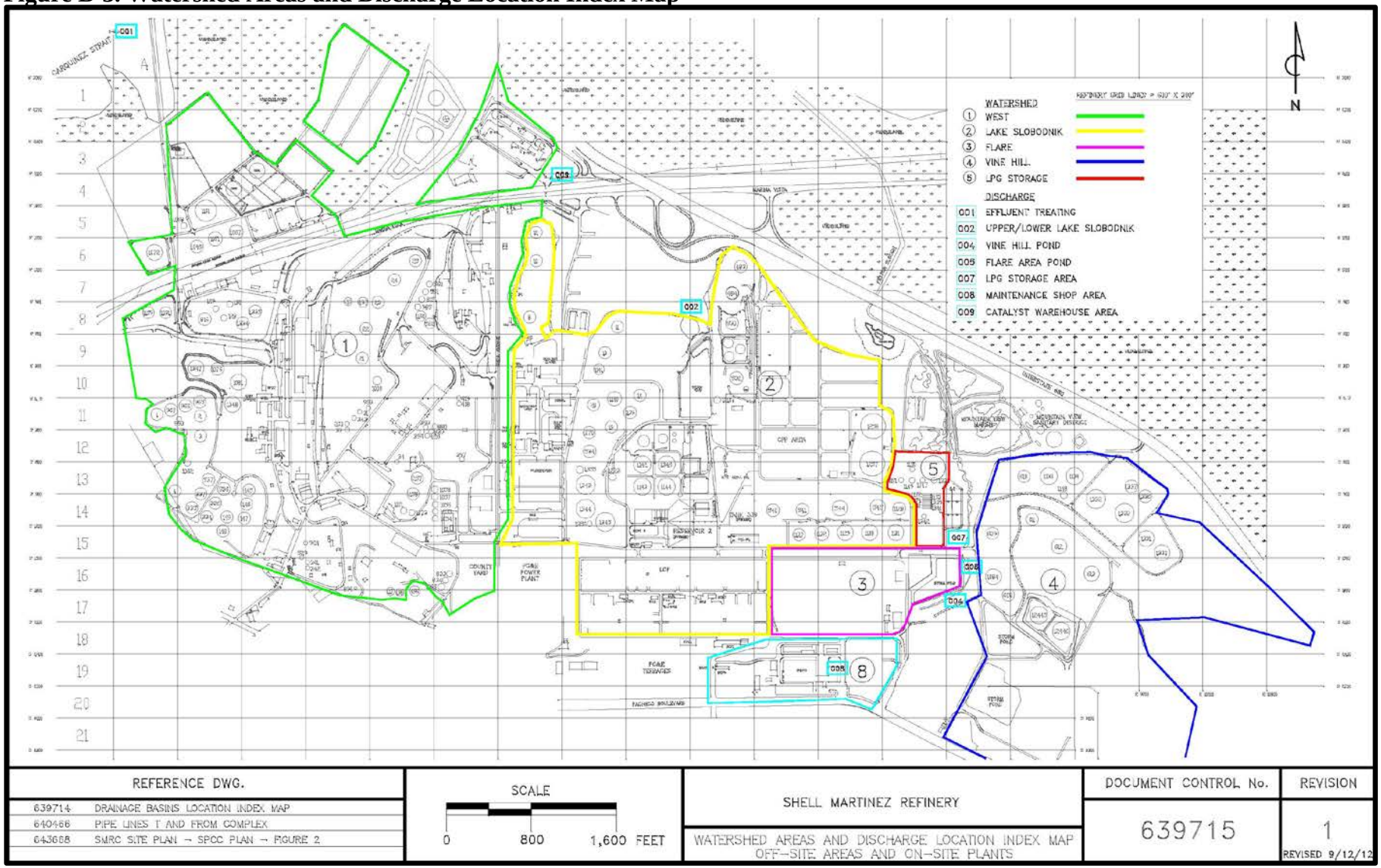
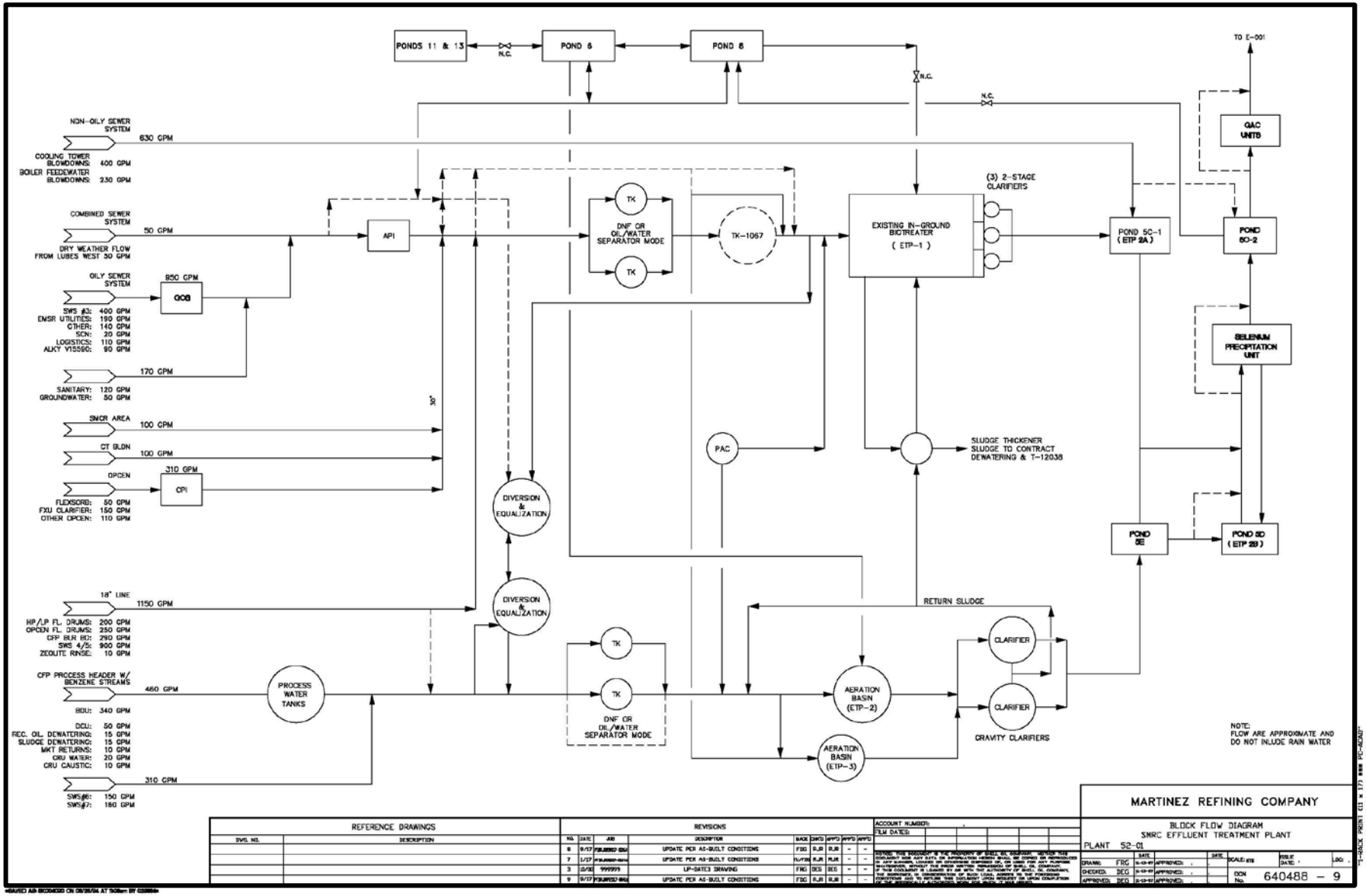


Figure B-2. Facility Map

Figure B-3. Watershed Areas and Discharge Location Index Map



ATTACHMENT C – PROCESS FLOW DIAGRAM



ATTACHMENT D – FEDERAL STANDARD PROVISIONS

I. STANDARD PROVISIONS – PERMIT COMPLIANCE

A. Duty to Comply

1. The Discharger must comply with all of the terms, requirements, and 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; or a combination thereof. (40 C.F.R. § 122.41(a); Wat. Code §§ 13261, 13263, 13265, 13268, 13000, 13001, 13304, 13350, 13385.)

2. The Discharger shall comply with effluent standards or prohibitions established under CWA section 307(a) for toxic pollutants 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 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, U.S. EPA, 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 (33 U.S.C. § 1318(a)(4)(B); 40 C.F.R. § 122.41(i); Wat. Code, §§ 13267, 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 (33 U.S.C. § 1318(a)(4)(B)(i); 40 C.F.R. § 122.41(i)(1); Wat. Code, §§ 13267, 13383);

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order (33 U.S.C. § 1318(a)(4)(B)(ii); 40 C.F.R. § 122.41(i)(2); Wat. Code, §§ 13267, 13383);

3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order (33 U.S.C. § 1318(a)(4)(B)(ii); 40 C.F.R. § 122.41(i)(3); Wat. Code, §§ 13267, 13383); 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. (33 U.S.C. § 1318(a)(4)(B); 40 C.F.R. § 122.41(i)(4); Wat. Code, 13267, 13383.)

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. Approval. 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 prior notice, if possible at least 10 days before the date of the bypass. The notice shall be sent to the Regional Water Board. As of December 21, 2020, a notice shall also be submitted electronically to the initial recipient defined in Standard Provisions – Reporting V.J below. Notices shall comply with 40 C.F.R. part 3, 40 C.F.R. section 122.22, and 40 C.F.R. part 127. (40 C.F.R. § 122.41(m)(3)(i).)

b. Unanticipated bypass. The Discharger shall submit a notice of an unanticipated bypass as required in Standard Provisions - Reporting V.E below (24-hour notice). The notice shall be sent to the Regional Water Board. As of December 21, 2020, a notice shall also be submitted electronically to the initial recipient defined in Standard Provisions – Reporting V.J below. Notices shall comply with 40 C.F.R. part 3, 40 C.F.R. section 122.22, and 40 C.F.R. part 127. (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 must be conducted according to test procedures approved under 40 C.F.R. part 136 for the analyses of pollutants unless another method is required under 40 C.F.R. chapter 1, subchapters N. Monitoring must be conducted according to sufficiently sensitive test methods approved under 40 C.F.R. part 136 for the analysis of pollutants or pollutant parameters or required under 40 C.F.R. chapter 1, subchapter N. For the purposes of this paragraph, a method is sufficiently sensitive when:

1. The method minimum level (ML) is at or below the level of the effluent limitation established in the permit for the measured pollutant or pollutant parameter, and either (a) the method ML is at or below the level of the applicable water quality criterion for the measured pollutant or pollutant parameter, or (b) the method ML is above the applicable water quality criterion but the amount of the pollutant or pollutant parameter in a facility's discharge is

high enough that the method detects and quantifies the level of the pollutant or pollutant parameter in the discharge; or

2. The method has the lowest ML of the analytical methods approved under 40 C.F.R. part 136 or required under 40 C.F.R. chapter 1, subchapter N, for the measured pollutant or pollutant parameter.

In the case of pollutants or pollutant parameters for which there are no approved methods under 40 C.F.R. part 136 or otherwise required under 40 C.F.R. chapter 1, subchapters N or O, monitoring must be conducted according to a test procedure specified in this Order for such pollutants or pollutant parameters. (40 C.F.R. §§ 122.21(e)(3), 122.41(j)(4), 122.44(i)(1)(iv).)

IV. STANDARD PROVISIONS – RECORDS

A. 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 the following:

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) the 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 U.S. EPA within a reasonable time, any information which the Regional Water Board, State Water Board, or U.S. EPA 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 U.S. EPA copies of records required to be kept by this Order. (40 C.F.R. § 122.41(h); Wat. Code, §§ 13267, 13383.)

B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the Regional Water Board, State Water Board, and/or U.S. EPA shall be signed and certified in accordance with Standard Provisions – Reporting V.B.2, V.B.3, V.B.4, V.B.5, and V.B.6 below. (40 C.F.R. § 122.41(k).)

2. For a corporation, 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).)

For a partnership or sole proprietorship, all permit applications shall be signed by a general partner or the proprietor, respectively. (40 C.F.R. § 122.22(a)(2).)

For a municipality, State, federal, or other public agency, all permit applications shall be signed by either a principal executive officer or ranking elected official. For purposes of this provision, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of U.S. EPA). (40 C.F.R. § 122.22(a)(3).).

3. All reports required by this Order and other information requested by the Regional Water Board, State Water Board, or U.S. EPA 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).)

6. Any person providing the electronic signature for documents described in Standard Provisions – V.B.1, V.B.2, or V.B.3 that are submitted electronically shall meet all relevant requirements of Standard Provisions – Reporting V.B, and shall ensure that all relevant requirements of 40 C.F.R. part 3 (Cross-Media Electronic Reporting) and 40 C.F.R. part 127 (NPDES Electronic Reporting Requirements) are met for that submission. (40 C.F.R § 122.22(e).)

C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program 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. As of December 21, 2016, all reports and forms must be submitted electronically to the initial recipient defined in Standard Provisions – Reporting V.J and comply with 40 C.F.R. part 3, 40 C.F.R. section 122.22, and 40 C.F.R. part 127. (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 40 C.F.R. part 136, or another method required for an industry-specific waste stream under 40 C.F.R. chapter 1, subchapter N, the results of such 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 or State 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 report shall also be provided within five (5) days of the time the Discharger becomes aware of the circumstances. The report 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.

For noncompliance related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports must include the data described above (with the exception of time of discovery) as well as the type of event (i.e., combined sewer overflow, sanitary sewer overflow, or bypass event), type of overflow structure (e.g., manhole, combined sewer overflow outfall), discharge volume untreated by the treatment works treating domestic sewage, types of human health and environmental impacts of the event, and whether the noncompliance was related to wet weather.

As of December 21, 2020, all reports related to combined sewer overflows, sanitary sewer overflows, or bypass events must be submitted to the Regional Water Board and must be submitted electronically to the initial recipient defined in Standard Provisions – Reporting V.J. The reports shall comply with 40 C.F.R. part 3, 40 C.F.R. section 122.22, and 40 C.F.R. part 127. The Regional Water Board may also require the Discharger to electronically submit reports not related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section. (40 C.F.R. § 122.41(l)(6)(i).)

2. The following shall be included as information that must be reported within 24 hours:

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 40 C.F.R. 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 not subject to effluent limitations in this Order. (Alternatively, for an existing manufacturing, commercial, mining, or silvicultural discharge as referenced in 40 C.F.R. section 122.42(a), this notification applies to pollutants that are subject neither to effluent limitations in this Order nor to notification requirements under 40 C.F.R. section 122.42(a)(1) (see Additional Provisions – Notification Levels VII.A.1).) (40 C.F.R. § 122.41(l)(1)(ii).)

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 this Order's 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. For noncompliance related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports shall contain the information described in Standard Provision – Reporting V.E and the applicable required data in appendix A to 40 C.F.R. part 127. The Regional Water Board may also require the Discharger to electronically submit reports not related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section. (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 U.S. EPA, the Discharger shall promptly submit such facts or information. (40 C.F.R. § 122.41(l)(8).)

J. Initial Recipient for Electronic Reporting Data

The owner, operator, or duly authorized representative is required to electronically submit NPDES information specified in appendix A to 40 C.F.R. part 127 to the initial recipient defined in 40 C.F.R. section 127.2(b). U.S. EPA will identify and publish the list of initial recipients on its website and in the Federal Register, by state and by NPDES data group [see 40 C.F.R. § 127.2(c)]. U.S. EPA will update and maintain this list. (40 C.F.R. § 122.41(l)(9).)

VI. STANDARD PROVISIONS – ENFORCEMENT

A. The Regional Water Board is authorized to enforce the terms of this Order under several provisions of the Water Code, including, but not limited to, sections 13268, 13350, 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 (µg/L) (40 C.F.R. § 122.42(a)(1)(i));
    b. 200 µg/L for acrolein and acrylonitrile; 500 µg/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 (µg/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).)

B. Publicly-Owned Treatment Works (POTWs)

All POTWs shall provide adequate notice to the Regional Water Board of the following (40 C.F.R. § 122.42(b)):

1. Any new introduction of pollutants into the POTW from an indirect discharger that would be subject to CWA sections 301 or 306 if it were directly discharging those pollutants (40 C.F.R. § 122.42(b)(1)); and

2. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of adoption of this Order. (40 C.F.R. § 122.42(b)(2).)

3. Adequate notice shall include information on the quality and quantity of effluent introduced into the POTW as well as any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW. (40 C.F.R. § 122.42(b)(3).)

ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

Contents

Tables

ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

Clean Water Act section 308 and 40 C.F.R. sections 122.41(h), 122.41(j)-(l), 122.44(i), and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Water Code sections 13267 and 13383 also authorize the Regional Water Board to establish monitoring, inspection, entry, reporting, and recordkeeping requirements. This MRP establishes monitoring, reporting, and recordkeeping requirements that implement State and federal laws and regulations.

I. GENERAL MONITORING PROVISIONS

A. The Discharger shall comply with this MRP. The Executive Officer may amend this MRP pursuant to 40 C.F.R. sections 122.62, 122.63, and 124.5. If any discrepancies exist between this MRP and the "Regional Standard Provisions, and Monitoring and Reporting Requirements (Supplement to Attachment D) for NPDES Wastewater Discharge Permits" (Attachment G), this MRP shall prevail.

B. The Discharger shall conduct all monitoring in accordance with Attachment D, section III, as supplemented by Attachment G. Equivalent test methods must be more sensitive than those specified in 40 C.F.R. section 136 and must be specified in this permit.

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 E-1. Monitoring Locations

Monitoring Location Type	Monitoring Location Name	Monitoring Location Description
Recycled Water	INF-001	Any point in the Facility's recycled water supply pipe upstream of any water treatment unit, blending point, or point of use.
Raw Water	INF-002	Any point in the Facility's raw water supply pipe upstream of any water treatment unit, blending point, or point of use.
Treated Wastewater	EFF-001	Any point in the discharge line from the treatment facilities, at which samples are representative of treated wastewater discharged at Discharge Point No. 001.
Treated Wastewater	EFF-001D	Any point downstream from the disinfection facilities for the Facility's sanitary sewage, at which all sewage is present and adequate disinfection is assured.
Stormwater	EFF-002	The point of discharge from retention ponds for Discharge Point No. 002.
Stormwater	EFF-004	The point of discharge from retention ponds for Discharge Point No. 004.
Stormwater	EFF-005	The point of discharge from retention ponds for Discharge Point No. 005.
Stormwater	EFF-007	The point of discharge from retention ponds for Discharge Point No. 007.
Stormwater	EFF-008	Any point where representative samples of the stormwater discharge for the drainage area for Discharge Point No. 008 can be obtained prior to discharge.
Stormwater	EFF-009	Any point where representative samples of the stormwater discharge for the drainage area for Discharge Point No. 009 can be obtained prior to discharge.

III. INFLUENT MONITORING REQUIREMENTS

A. Monitoring Location INF-001 (Recycled Water Intake)

Monitoring recycled water at Monitoring Location INF-001 is only required if the Discharger chooses to apply for recycled water adjustments in accordance with Effluent Limitations and Discharge Specifications section IV.A.6 of this Order. The Discharger need monitor only those parameters for which it seeks effluent limitation adjustments; monitoring others is optional.

Table E-2. Influent Monitoring—Monitoring Location INF-001

Parameter	Units	Sample Type	Minimum Sampling Frequency
Recycled Water Flow [1]	MGD	Continuous	Continuous
Biochemical Oxygen Demand (BOD_5) (5-day @ 20 degrees Celsius)	mg/L	C-24	1/Month
Total Suspended Solids (TSS)	mg/L	C-24	1/Week or 3/Week [2]
Chemical Oxygen Demand (COD)	mg/L	C-24	1/Month
Oil and Grease	mg/L	Grab	1/Month
Sulfide, Total	mg/L	Grab	1/Month
Phenolic Compounds, Total	mg/L	C-24	1/Month
Ammonia Nitrogen, Total (as N)	mg/L	C-24	1/Month
Chromium, Total Recoverable	mg/L	C-24	1/Month
Chromium (VI), Total Recoverable [3]	mg/L	Grab	1/Month
Copper, Total Recoverable	µg/L	C-24	1/Month
Cyanide, Total [4]	µg/L	Grab	1/Month
Nickel, Total Recoverable	µg/L	C-24	1/Month
Selenium, Total Recoverable [5]	µg/L	C-24	1/Week
Dioxin-TEQ	ρg/L	C-24	2/Year

Unit Abbreviations:

MGD = million gallons per day
mg/L = milligrams per liter
µg/L = micrograms per liter
ρg/L = picograms per liter

Sample Types and Frequencies:

Continuous = measured continuously, and recorded and reported daily
C-24 = 24-hour composite sample
Grab = grab sample
1/Week = once per week
3/Week = three times per week
1/Month = once per month
2/Year = twice per year

Footnotes:

[1] For influent flows, the following information shall also be monitored and reported in the monthly self-monitoring reports:
- Daily Average Flow (MGD)
- Total Monthly Flow Volume (MG)

[2] From April 1 through November 30, the TSS monitoring frequency at Monitoring Location EFF-001 is once per week. From December 1 through March 31, the TSS monitoring frequency at Monitoring Location EFF-001 is three times per week. In accordance with Provision VI.c.4.e of this Order, the Discharger is to sample and analyze TSS at Monitoring Location INF-001 at least as frequently as the MRP requires for monitoring at Monitoring Location EFF-001.

[3] The Discharger may, at its option, comply with the hexavalent chromium limitations by using total chromium results. In this case, analysis for hexavalent chromium shall be waived.

[4] The Discharger may, at its option, analyze for cyanide as weak acid dissociable cyanide using protocols specified in Standard Method Part 4500-CN-I, U.S. EPA Method OI 1677, or an equivalent method in the latest edition.

[5] The Dischargers shall analyze selenium using U.S. EPA Method No. 200.8 or Standard Method No. 3114B or 3114C.

B. Monitoring Location INF-002 (Raw Water Intake)

Monitoring raw water at Monitoring Location INF-002 is only required if the Discharger chooses to apply for recycled water adjustments in accordance with Effluent Limitations and Discharge Specifications section IV.A.6 of this Order. The Discharger need monitor only those parameters for which it seeks effluent limitation adjustments; monitoring others is optional.

Table E-3. Influent Monitoring—Monitoring Location INF-002

Parameter	Units	Sample Type	Minimum Sampling Frequency
BOD_5	mg/L	C-24	1/Year [1]
TSS	mg/L	C-24	1/Year [1]
COD	mg/L	C-24	1/Year [1]
Oil and Grease	mg/L	Grab	1/Year [1]
Sulfide, Total	mg/L	Grab	1/Year [1]
Phenolic Compounds, Total	mg/L	C-24	1/Year [1]
Ammonia Nitrogen, Total (as N)	mg/L	C-24	1/Year [1]
Chromium, Total Recoverable	mg/L	C-24	1/Year [1]
Chromium (VI), Total Recoverable [2]	mg/L	Grab	1/Year [1]
Copper, Total Recoverable	µg/L	C-24	1/Year [1]
Cyanide, Total [3]	µg/L	Grab	1/Year [1]
Nickel, Total Recoverable	µg/L	C-24	1/Year [1]
Selenium, Total Recoverable [4]	µg/L	C-24	1/Year [1]
Dioxin-TEQ	ρg/L	C-24	1/Year [1]

Unit Abbreviations:

MGD = million gallons per day
mg/L = milligrams per liter
µg/L = micrograms per liter
ρg/L = picograms per liter

Sample Types and Frequency:

C-24 = 24-hour composite sample
Grab = grab sample
1/Year = once per year

Footnotes:

[1] As described in Provision VI.C.4.e of this Order, the Discharger shall sample and analyze influent raw water at least once per year at Monitoring Location INF-001 for any constituents for which it seeks recycled water use adjustments. The annual average concentration may be used in the calculations described in Effluent Limitations and Discharge Specifications section IV.A.6 of this Order.

[2] The Discharger may, at its option, comply with the hexavalent chromium limitations by using total chromium results. In this case, analysis for hexavalent chromium shall be waived.

[3] The Discharger may, at its option, analyze for cyanide as weak acid dissociable cyanide using protocols specified in Standard Method Part 4500-CN-I, U.S. EPA Method OI 1677, or an equivalent method in the latest edition.

[4] The Discharger shall analyze selenium using U.S. EPA Method No. 200.8 or Standard Method No. 3114B or 3114C.

IV. EFFLUENT MONITORING REQUIREMENTS

A. Monitoring Location EFF-001 (Discharge Point No. 001)

The Discharger shall monitor treated wastewater at Monitoring Location EFF-001 as follows:

Table E-4. Effluent Monitoring—Monitoring Location EFF-001

Parameter	Units	Sample Type	Minimum Sampling Frequency
Flow [1]	MGD	Continuous	Continuous
pH [2]	s.u.	Continuous	Continuous
Temperature	˚F	Continuous	Continuous
BOD_5	mg/L	C-24	1/Month
TSS	mg/L	C-24	1/Week or 3/Week [3]
COD	mg/L	C-24	1/Month
Oil and Grease	mg/L	Grab	1/Month
Sulfide, Total	mg/L	Grab	1/Month
Phenolic Compounds, Total	mg/L	C-24	1/Month
Ammonia Nitrogen, Total (as N)	mg/L	C-24	1/Month
Chromium, Total Recoverable	µg/L	C-24	1/Month
Chromium (VI), Total Recoverable [4]	µg/L	Grab	1/Month
Copper, Total Recoverable	µg/L	C-24	1/Month
Cyanide, Total [5]	µg/L	Grab	1/Month
Nickel, Total Recoverable	µg/L	C-24	1/Month
Selenium, Total Recoverable [6]	µg/L	C-24	1/Week
Dioxin-TEQ	ρg/L	C-24	2/Year
Acute Toxicity [7]	% survival	C-24	1/Week
Chronic Toxicity [8]	TU_c	C-24	1/Quarter

Unit Abbreviations:

MGD = million gallons per day
s.u. = standard units
˚F = degrees Fahrenheit
mg/L = milligrams per liter
µg/L = micrograms per liter
ρg/L = picograms per liter
% survival = percent survival
TU_c = chronic toxicity units

Sample Types and Frequencies:

Continuous = measured continuously, and recorded and reported daily
C-24 = 24-hour composite sample
Grab = grab sample
1/Day = once per day
3/Week = three times per week
1/Week = once per week
1/Month = once per month
1/Quarter = once per quarter
2/Year = twice per year

Footnotes:

[1] For effluent flows, the following information shall also be monitored and reported in the monthly self-monitoring reports:
- Daily Average Flow (MGD)
- Total Monthly Flow Volume (MG)

[2] If pH is monitored continuously, the minimum and maximum pH values for the month shall be reported in the monthly self-monitoring reports.

[3] From April 1 through November 30, the TSS monitoring frequency at Monitoring Location EFF-001 is once per week. From December 1 through March 31, the TSS monitoring frequency at Monitoring Location EFF-001 is three times per week.

[4] The Discharger may, at its option, comply with the hexavalent chromium limitations by using total chromium results. In this case, analysis for hexavalent chromium shall be waived.

[5] The Discharger may, at its option, analyze for cyanide as weak acid dissociable cyanide using protocols specified in Standard Method Part 4500-CN-I, U.S. EPA Method OI 1677, or an equivalent method in the latest edition.

[6] The Discharger shall analyze selenium using U.S. EPA Method No. 200.8 or Standard Method No. 3114B or 3114C.

[7] The Discharger shall perform acute bioassay tests in accordance with MRP section IV.A.

[8] The Discharger shall perform chronic toxicity tests in accordance with MRP section IV.B.

B. Monitoring Location EFF-001D (Discharge Point No. 001)

The Discharger shall monitor treated wastewater at Monitoring Location EFF-001D as follows:

Table E-5. Effluent Monitoring—Monitoring Location EFF-001D

Parameter	Units	Sample Type	Minimum Sampling Frequency
Total Coliform	MPN/100 mL [1]	Grab	1/Week
Enterococcus	MPN/100 mL [1]	Grab	1/Month

Unit Abbreviation:

MPN/100 mL = most probable number per 100 milliliters

Sample Type and Frequencies:

Grab = grab sample
1/Week = once per week
1/Month = once per month

Footnote:

[1] Results may be reported as Colony Forming Units (CFU)/100 mL if the laboratory method used provides results in CFU/100 mL.

C. Monitoring Locations EFF-002, EFF-004, EFF-005, and EFF-007 (Discharge Point Nos. 002, 004, 005, and 007)

The Discharger shall monitor stormwater at Monitoring Locations EFF-002, EFF-004, EFF-005, and EFF-007 as follows:

Table E-6. Effluent Monitoring—Monitoring Locations EFF-002, EFF-004, EFF-005, and EFF-007

Parameter	Units	Sample Type	Minimum Sampling Frequency
TOC	mg/L	Grab	Each Discharge Event
Oil and Grease	mg/L	Grab	Each Discharge Event
TSS	mg/L	Grab	Each Discharge Event
pH	s.u.	Grab	Each Discharge Event
Specific Conductance	µmhos/cm	Grab	Each Discharge Event
BOD_5	mg/L	Grab	Each Discharge Event [1]
COD	mg/L	Grab	Each Discharge Event [1]
Phenolic Compounds, Total	mg/L	Grab	Each Discharge Event [1]
Chromium, Total Recoverable	mg/L	Grab	Each Discharge Event [1]
Chromium (VI), Total Recoverable	mg/L	Grab	Each Discharge Event [1]
Standard Observations [2]	--	Visual	Each Discharge Event

Unit Abbreviations:

mg/L = milligrams per liter
s.u. = standard units
µmhos/cm = micromhos per centimeter

Sample Type:

Grab = grab sample

Footnotes:

[1] If and when supplemental effluent limitations for the pollutants in Table 8 of this Order become effective, the Discharger shall begin monitoring at outfalls where the limitations are in effect. The Discharger shall continue monitoring each discharge event until two consecutive samples show compliance with the TOC and oil and grease limitations in Table 7 of this Order.

[2] Standard observations are specified in Attachment G section III.C.2.

D. Monitoring Locations EFF-008 and EFF-009 (Discharge Point Nos. 008 and 009)

The Discharger shall monitor stormwater at Monitoring Locations EFF-008 and EFF-009 as follows:

Table E-7. Effluent Monitoring—Monitoring Locations EFF-008 and EFF-009

Parameter	Units	Sample Type	Minimum Sampling Frequency [1]
TOC	mg/L	Grab [2]	2/Wet Weather Season or 1/Day [3]
Oil and Grease	mg/L	Grab [2]	2/Wet Weather Season or 1/Day [3]
TSS	mg/L	Grab [2]	2/Wet Weather Season or 4/Year or 1/Day [3, 4]
pH	s.u.	Grab [2]	2/Wet Weather Season or 1/Day [3]
Specific Conductance	µmhos/cm	Grab [2]	2/Wet Weather Season or 1/Day [3]
BOD_5	mg/L	Grab [2]	2/Wet Weather Season [5]
COD	mg/L	Grab [2]	2/Wet Weather Season [5]
Phenolic Compounds, Total	mg/L	Grab [2]	2/Wet Weather Season [5]
Chromium, Total Recoverable	mg/L	Grab [2]	2/Wet Weather Season [5]
Chromium (VI), Total Recoverable	mg/L	Grab [2]	2/Wet Weather Season [5]
Standard Observations [6]	--	Visual	2/Wet Weather Season or 1/Day [3]

Unit Abbreviations:

mg/L = milligrams per liter
s.u. = standard units
µmhos/cm = micromhos per centimeter

Sample Type and Frequencies:

Grab = grab sample
1/Day = once per day
2/Wet Weather Season = twice per wet weather season

Footnotes:

[1] The Discharger shall conduct monitoring during periods when the laboratory is normally staffed.

[2] The Discharger shall collect at least one grab sample within the first 30 minutes of significant flow during the storm event.

[3] If and when supplemental effluent limitations for the pollutants in Table 8 of this Order become effective, the Discharger shall increase the monitoring frequency at outfalls where the limitations are in effect to daily during each storm. The Discharger shall continue daily monitoring until two consecutive samples show compliance with the TOC and oil and grease limitations in Table 7 of this Order.

[4] If TSS exceeds one or both of the numeric action levels included in Provision VI.C.4.c of this Order during the previous wet weather season, the Discharger shall increase the monitoring frequency at outfalls where a numeric action level exceedance occurred to four times per year. The Discharger shall continue monitoring TSS four times per year until TSS levels for an entire wet weather season are below the numeric action levels.

[5] If and when supplemental effluent limitations for the pollutants in Table 8 of this Order become effective, the Discharger shall begin monitoring at outfalls where the limitations are in effect. The Discharger shall continue monitoring each storm event until two consecutive samples show compliance with the TOC and oil and grease limitations in Table 7 of this Order.

[6] Standard observations are specified in Attachment G section III.C.2.

V. TOXICITY TESTING REQUIREMENTS

A. Acute Toxicity

1. Compliance with the acute toxicity effluent limitations shall be evaluated at Monitoring Location EFF-001 by measuring survival of test organisms exposed to 96-hour continuous flow-through bioassays.

2. Test organisms shall be rainbow trout (*Onchorhynchus mykiss*) unless the Executive Officer specifies otherwise in writing.

3. All bioassays shall be performed according to the most up-to-date protocols in 40 C.F.R. part 136, currently *Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms,* 5th Edition (EPA-821-R-02-012).

4. Bioassay water monitoring shall include, on a daily basis, pH, dissolved oxygen, ammonia (if toxicity is observed), temperature, hardness, and alkalinity. These results shall be reported. If final or intermediate results of an acute bioassay test indicate a violation or threatened violation (e.g., the percentage of surviving test organisms is less than 70 percent), the Discharger shall initiate a new test as soon as practical and shall investigate the cause of the mortalities and report its findings in the next self-monitoring report. The Discharger shall repeat the test until a test fish survival rate of 90 percent or greater is observed. If the control fish survival rate is less than 90 percent, the bioassay test shall be restarted with new fish and shall continue as soon as practical until an acceptable test is completed (i.e., control fish survival rate is 90 percent or greater).

B. Chronic Toxicity

1. Monitoring Requirements

a. *Sampling.* The Discharger shall collect 24-hour composite samples of the effluent at Monitoring Location EFF-001 for critical life stage toxicity testing as indicated below. For toxicity tests requiring renewals, 24-hour composite samples shall be collected on consecutive or alternating days.

b. *Test Species.* The test species shall be mysid shrimp (*Americamysis bahia*) unless a more sensitive species is identified.

The Discharger shall conduct a chronic toxicity screening test as described in Appendix E-1 of this Order or as described in applicable State Water Board plan provisions that become effective after adoption of this Order, or following any significant change in the nature of the effluent. If there is no significant change in the nature of the effluent, the Discharger shall conduct a screening test and submit the results with its application for permit reissuance.

c. *Frequency*. Chronic toxicity monitoring shall be as specified below:

i. The Discharger shall monitor routinely once per quarter.

ii. The Discharger shall accelerate monitoring to monthly if it exceeds a single-sample maximum of 10 TU_c. Based on the TU_c results, the Executive Officer may specify a different frequency for accelerated monitoring to ensure that accelerated monitoring provides useful information.

iii. The Discharger shall return to routine monitoring if accelerated monitoring does not exceed the trigger in ii, above.

iv. If accelerated monitoring confirms consistent toxicity in excess of the trigger in ii, above, the Discharger shall continue accelerated monitoring and initiate toxicity reduction evaluation (TRE) procedures in accordance with section IV.B.3, below.

v. The Discharger shall return to routine monitoring after implementing appropriate elements of the TRE and either the toxicity drops below the trigger in ii, above, or, based on the TRE results, the Executive Officer determines that accelerated monitoring would no longer provide useful information.

vi. Monitoring conducted pursuant to a TRE shall satisfy the requirements for routine and accelerated monitoring while the TRE is underway.

d. *Methodology.* Sample collection, handling, and preservation shall be in accordance with U.S. EPA protocols. In addition, bioassays shall be conducted in compliance with the most recently promulgated test methods, as shown in MRP Appendix E-2. These are *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*, currently third edition (EPA-821-R-02-014). If these protocols prove unworkable, the Executive Officer and the Environmental Laboratory Accreditation Program may grant exceptions in writing upon the Discharger's request with justification. If the Discharger demonstrates that specific identifiable substances in the discharge are rapidly rendered harmless upon discharge to the receiving water, compliance with the chronic toxicity limit may be determined after test samples are adjusted to remove the influence of those substances. Written acknowledgement that the Executive Officer concurs with the Discharger's demonstration and that the adjustment will not remove the influence of other substances must be obtained prior to any such adjustment.

e. *Dilution Series.* The Discharger shall conduct tests at 100%, 50%, 25%, 10%, 5%, and 2.5%. The "%" represents percent effluent as discharged. Test sample pH may be controlled to the level of the effluent sample as received prior to being salted up.

2. Reporting Requirements

The Discharger shall provide toxicity test results for the current reporting period in the self-monitoring report and shall include the following, at a minimum, for each test:

a. Sample dates

b. Test initiation date

c. Test species

d. End point values for each dilution (e.g., number of young, growth rate, percent survival)

e. No Observable Effect Level (NOEL) values in percent effluent. The NOEL shall equal the IC_{25} or EC_{25} (see MRP Appendix E-1). If the IC_{25} or EC_{25} cannot be statistically determined, the NOEL shall equal to the No Observable Effect Concentration (NOEC) derived using hypothesis testing. The NOEC is the maximum percent effluent concentration that causes no observable effect on test organisms based on a critical life stage toxicity test.

f. IC_{15}, IC_{25}, IC_{40}, and IC_{50} values (or EC_{15}, EC_{25} … etc.) as percent effluent

g. TU_c values (100/NOEL and upper and lower confidence intervals)

h. Mean percent mortality (±s.d.) after 96 hours in 100% effluent (if applicable)

i. IC_{50} or EC_{50} values for reference toxicant tests

j. Available water quality measurements for each test (pH, dissolved oxygen, temperature, conductivity, hardness, salinity, ammonia)

3. Toxicity Reduction Evaluation (TRE)

a. The Discharger shall prepare a generic TRE work plan within 90 days of the effective date of this Order to be ready to respond to toxicity events. The Discharger shall review and update the work plan as necessary so that it remains current and applicable to the discharge and discharge facilities.

b. Within 30 days of exceeding the chronic toxicity effluent limit, the Discharger shall submit a TRE work plan, which shall be the generic work plan revised as appropriate for this toxicity event after consideration of available discharge data.

c. Within 30 days of completing an accelerated monitoring test observed to exceed the chronic toxicity limit, the Discharger shall initiate a TRE in accordance with a TRE work plan that incorporates any and all comments from the Executive Officer.

d. The TRE shall be specific to the discharge and be prepared in accordance with current technical guidance and reference materials, including U.S. EPA guidance materials. The TRE shall be conducted as a tiered evaluation process, as summarized below:

i. Tier 1 shall consist of basic data collection (routine and accelerated monitoring).

ii. Tier 2 shall consist of evaluation of optimization of the treatment process, including operation practices and in-plant process chemicals.

iii. Tier 3 shall consist of a toxicity identification evaluation (TIE).

iv. Tier 4 shall consist of a toxicity source evaluation.

v. Tier 5 shall consist of a toxicity control evaluation, including options for modifications of in-plant treatment processes.

vi. Tier 6 shall consist of implementation of selected toxicity control measures and followup monitoring and confirmation of implementation success.

e. The TIE or TRE may be ended at any stage if monitoring finds there is no longer consistent toxicity (complying with requirements of section IV.A.1 of this Order).

f. The objective of the TIE shall be to identify the substance or combination of substances causing the observed toxicity. The Discharger shall employ all reasonable efforts using currently available TIE methodologies.

g. As toxic substances are identified or characterized, the Discharger shall continue the TRE by determining the sources and evaluating alternative strategies for reducing or eliminating the toxic substances from the discharge. The Discharger shall take all reasonable steps to reduce toxicity to levels below the chronic toxicity limit.

h. Many recommended TRE elements parallel required or recommended efforts related to source control, pollution prevention, and stormwater control programs. TRE efforts should be coordinated with such efforts. To prevent duplication of efforts, evidence of complying with requirements or recommended efforts of such programs may be acceptable to demonstrate compliance with TRE requirements.

VI. RECEIVING WATER MONITORING REQUIREMENTS

The Discharger shall continue to participate in the Regional Monitoring Program, which collects data on pollutants and toxicity in San Francisco Bay water, sediment, and biota.

VII. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

The Discharger shall comply with all standard provisions (Attachments D and G) related to monitoring, reporting, and recordkeeping, with modifications shown in section IX, below.

B. Self-Monitoring Reports (SMRs)

1. **SMR Format.** The Discharger shall electronically submit SMRs using the State Water Board's California Integrated Water Quality System (CIWQS) website (http://www.waterboards.ca.gov/water_issues/programs/ciwqs). The CIWQS website will provide additional information for SMR submittal in the event of a planned service interruption for electronic submittal.

2. **SMR Due Dates and Contents.** The Discharger shall submit SMRs by the due dates, and with the contents, specified below:

a. Monthly SMRs — Monthly SMRs shall be due 30 days after the end of each calendar month, covering that calendar month. The monthly SMR shall contain the applicable items described in sections V.B and V.C of both Attachments D and G of this Order. See also Provision VI.C.2 (Effluent Characterization Study and Report) of this Order for information that must also be reported with the monthly SMR.

b. Annual SMR — Annual SMRs shall be due February 1 each year, covering the previous calendar year. The annual SMR shall contain the items described in section V.C.1.f of Attachment G. See also Provision VI.C.2 (Effluent Characterization Study and Report) of this Order for requirements to submit reports with the annual SMR.

3. Specifications for Submitting SMRs to CIWQS. The Discharger shall submit analytical results and other information using one of the following methods:

Table E-8. CIWQS Reporting

Parameter	Method of Reporting	
	EDF/CDF data upload or manual entry	**Attached File**
All parameters identified in influent, effluent, and receiving water monitoring tables (except Dissolved Oxygen and Temperature)	Required for all results	
Dissolved Oxygen Temperature	Required for monthly maximum and minimum results only [1]	Discharger may use this method for all results or keep records
Antimony Arsenic Beryllium Cadmium Chromium Copper Cyanide Lead Mercury Nickel Selenium Silver Thallium Zinc Dioxins and Furans (by U.S. EPA Method 1613) Other Pollutants (by U.S. EPA methods 601, 602, 608, 610, 614, 624, and 625)	Required for all results [2]	
Analytical Method	Not required (Discharger may select "data unavailable") [1]	
Collection Time Analysis Time	Not required (Discharger may select "0:00") [1]	

Footnotes:

[1] The Discharger shall continue to monitor at the minimum frequency specified in this MRP, keep records of the measurements, and make the records available upon request.

[2] These parameters require EDF/CDF data upload or manual entry regardless of whether monitoring is required by this MRP or other provisions of this Order (except for biosolids, sludge, or ash provisions).

The Discharger shall arrange all reported data in a tabular format and summarize data to clearly illustrate whether the Facility is operating in compliance with effluent limitations. The Discharger is not required to duplicate the submittal of data 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, the Discharger shall electronically submit the data in a tabular format as an attachment.

4. **Monitoring Periods.** Monitoring periods for all required monitoring shall be as set forth below unless otherwise specified:

Table E-9. Monitoring Periods

Sampling Frequency	Monitoring Period Begins On…	Monitoring Period
Continuous	Order effective date	All times
1/Day	Order effective date	Daily, 12:00 a.m. through 11:59 p.m., or any 24-hour period that reasonably represents a calendar day for purposes of sampling
3/Week	Sunday following (or on) Order effective date	Sunday through Saturday
1/Week	Sunday following (or on) Order effective date	Sunday through Saturday
1/Month	First day of calendar month following (or on) Order effective date	First day of calendar month through last day of calendar month
1/Quarter	Closest of January 1, April 1, July 1, or October 1 before or after Order effective date [1]	January 1 through March 31 April 1 through June 30 July 1 through September 30 October 1 through December 31
1/Year	Closest January 1 before or after Order effective date [1]	January 1 through December 31
2/Year	Closest January 1 or July 1 before or after Order effective date [1]	January 1 through June 30 July 1 through December 31
2/Wet Weather Season	Closest November 1 before or after Order effective date [1]	November 1 through April 30
Each Discharge Event	As soon as possible after Discharger becomes aware of the event	Any time when sampling can characterize the discharge event

Footnote:

[1] Monitoring conducted during the term of the previous order may be used to satisfy monitoring required by this Order.

5. **RL and MDL Reporting.** The Discharger shall report with each sample result the Reporting Level (RL) and Method Detection Limit (MDL) as determined by the procedure in 40 C.F.R. 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 purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ. 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 (+/- a percentage of the reported value), numerical ranges (low to high), or any other means the laboratory considers appropriate.

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

d. The Discharger shall instruct laboratories to establish calibration standards so that the minimum level (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.

6. Compliance Determination. Compliance with effluent limitations for priority pollutants shall be determined using sample reporting protocols defined above and in the Fact Sheet and Attachments A, D, and G. For purposes of reporting and administrative enforcement by the Regional Water Board and State Water Board, 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 RL.

C. Discharge Monitoring Reports (DMRs)

DMRs are U.S. EPA reporting requirements. The Discharger shall electronically certify and submit DMRs together with SMRs using the Electronic Self-Monitoring Reports module eSMR 2.5 or the latest upgraded version. Electronic DMR submittal shall be in addition to electronic SMR submittal. Information about electronic DMR submittal is available at the DMR website at http://www.waterboards.ca.gov/water_issues/programs/discharge_monitoring.

VIII. BYPASS REQUIREMENTS

If the Discharger bypasses any of its treatment units under the conditions stated in section I.G.2 of Attachment D, it shall monitor flows and collect samples daily at affected discharge points for all constituents with effluent limitations (except chronic toxicity, total coliform, and enterococcus) for the duration of the bypass (including acute toxicity using static renewals). Because such discharges may result in noncompliance that may endanger health or the environment, the Discharger shall follow the reporting requirements of Attachment D section V.E.1.

IX. MODIFICATIONS TO ATTACHMENT G

This MRP modifies Attachment G as indicated below:

A. Attachment G section V.C.1.c.2 is revised as follows:

2) When determining compliance with an average monthly or maximum daily effluent limitation, 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 nondetect (ND). In those cases, the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

i. The data set shall be ranked from low to high, reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

ii. 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.

If a sample result, or the arithmetic mean or median of multiple sample results, is below the reporting limit, and there is evidence that the priority pollutant is present in the effluent above an effluent limitation and the Discharger conducts a Pollutant Minimization Program, the Discharger shall not be deemed out of compliance.

B. Attachment G sections V.C.1.f and V.C.1.g are revised as follows, and section V.C.1.h (Reporting data in electronic format) is deleted:

f. Annual self-monitoring report requirements

By the date specified in the MRP, the Discharger shall submit an annual report to the Regional Water Board covering the previous calendar year. The report shall contain the following:

1) Annual compliance summary table of treatment plant performance, including documentation of any blending events (this summary table is not required if the Discharger has submitted the year's monitoring results to CIWQS in electronic reporting format by EDF/CDF upload or manual entry);

2) Comprehensive discussion of treatment plant performance and compliance with the permit (This discussion shall include any corrective actions taken or planned, such as changes to facility equipment or operation practices that may be needed to achieve compliance, and any other actions taken or planned that are intended to improve performance and reliability of the Discharger's wastewater collection, treatment, or disposal practices.);

3) Both tabular and graphical summaries of the monitoring data for the previous year if parameters are monitored at a frequency of monthly or greater (this item is not required if the Discharger has submitted the year's monitoring results to CIWQS in electronic reporting format by EDF/CDF upload or manual entry);

4) List of approved analyses, including the following:

(i) List of analyses for which the Discharger is certified;

(ii) List of analyses performed for the Discharger by a separate certified laboratory (copies of reports signed by the laboratory director of that laboratory shall not be submitted but be retained onsite); and

(iii) List of "waived" analyses, as approved;

5) Plan view drawing or map showing the Discharger's facility, flow routing, and sampling and observation station locations;

6) Results of annual facility inspection to verify that all elements of the SWPP Plan are accurate and up to date (only required if the Discharger does not route all stormwater to the headworks of its wastewater treatment plant); and

7) Results of facility report reviews (The Discharger shall regularly review, revise, and update, as necessary, the O&M Manual, the Contingency Plan, the Spill Prevention Plan, and Wastewater Facilities Status Report so that these documents remain useful and relevant to current practices. At a minimum, reviews shall be conducted annually. The Discharger shall include, in each Annual Report, a description or summary of review and evaluation procedures, recommended or planned actions, and an estimated time schedule for implementing these actions. The Discharger shall complete changes to these documents to ensure they are up-to-date).

g. Report submittal

The Discharger shall submit SMRs addressed as follows, unless the Discharger submits SMRs electronically to CIWQS:

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

h. Reporting data in electronic format – *Deleted*

APPENDIX E-1
CHRONIC TOXICITY
DEFINITION OF TERMS AND 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-Karber. EC_{25} is the concentration of toxicant (in percent effluent) that causes a response in 25 percent 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 nonlethal, nonquantal biological measurement, such as growth. For example, an IC_{25} is the estimated concentration of toxicant that would cause a 25 percent reduction in average young per female or growth. IC values may be calculated using a linear interpolation method such as U.S. EPA's Bootstrap Procedure.

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

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 five years before the permit expiration date.

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

1. Use of test species specified in Appendix E-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 Appendix E-2 (attached).

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.

4. Concurrent reference toxicant tests.

5. Dilution series 100%, 50%, 25%, 10%, 5%, 0 %, where "%" is percent effluent as discharged, or as otherwise approved the Executive Officer.

C. The Discharger shall submit a screening phase proposal acceptable to the Executive Officer. The proposal shall address each of the elements listed above. If within 30 days, the Executive Officer does not comment, the Discharger shall commence with screening phase monitoring.

APPENDIX E-2
SUMMARY OF TOXICITY TEST SPECIES REQUIREMENTS

Table AE-1. Critical Life Stage Toxicity Tests for Estuarine Waters

Species	(Scientific Name)	Effect	Test Duration	Reference
Alga	*(Skeletonema costatum)* *(Thalassiosira pseudonana)*	Growth rate	4 days	1
Red alga	*(Champia parvula)*	Number of cystocarps	7–9 days	3
Giant kelp	*(Macrocystis pyrifera)*	Percent germination; germ tube length	48 hours	2
Abalone	*(Haliotis rufescens)*	Abnormal shell development	48 hours	2
Oyster Mussel	*(Crassostrea gigas)* *(Mytilus edulis)*	Abnormal shell development; percent survival	48 hours	2
Echinoderms - Urchins Sand dollar	*(Strongylocentrotus purpuratus, S. franciscanus)* *(Dendraster excentricus)*	Percent fertilization or larval development	1 hour or 72 hours	2
Shrimp	*(Americamysis bahia)*	Percent survival; growth	7 days	3
Shrimp	*(Holmesimysis costata)*	Percent survival; growth	7 days	2
Topsmelt	*(Atherinops affinis)*	Percent survival; growth	7 days	2
Silversides	*(Menidia beryllina)*	Larval growth rate; percent survival	7 days	3

Toxicity Test References:

1. American Society for Testing Materials (ASTM). 1990. Standard Guide for Conducting Static 96-Hour Toxicity Tests with Microalgae. Procedure E 1218-90. ASTM, Philadelphia, PA.

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

3. Short-term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to Marine and Estuarine Organisms. EPA/821/R-02/014. October 2002.

Table AE-2. Critical Life Stage Toxicity Tests for Fresh Waters

Species	(Scientific Name)	Effect	Test Duration	Reference
Fathead minnow	*(Pimephales promelas)*	Survival; growth rate	7 days	4
Water flea	*(Ceriodaphnia dubia)*	Survival; number of young	7 days	4
Alga	*(Selenastrum capricornutum)*	Final cell density	4 days	4

Toxicity Test Reference:

1. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, fourth Edition Chronic manual (EPA-821-R-02-013, October 2002).

Table AE-3. Toxicity Test Requirements for Stage One Screening Phase

Requirements	Receiving Water Characteristics		
	Discharges to Coast	Discharges to San Francisco Bay [1]	
	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 [2] Marine/Estuarine	 0 4	 1 or 2 3 or 4	 3 0
Total number of tests	4	5	3

Footnotes:

[1] (a) Marine refers to receiving water salinities greater than 10 part per thousand (ppt) at least 95 percent of the time during a normal water year.

(b) Freshwater refers to receiving water with salinities less than 1 ppt at least 95 percent of the time during a normal water year.

(c) Estuarine refers to receiving water salinities that fall between those of marine and freshwater, as described above.

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

(a) The salinity of the effluent is above 1 ppt greater than 95 percent of the time, or

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

ATTACHMENT F - FACT SHEET

Contents

Tables

ATTACHMENT F – FACT SHEET

This Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order. As described in section II.B of this Order, the Regional Water Board incorporates this Fact Sheet as findings supporting the issuance of this Order.

I. PERMIT INFORMATION

The following table summarizes administrative information related to the Facility:

Table F-1. Facility Information

WDID	2 071042001
CIWQS Place ID	256695
Discharger	Shell Oil Products US Equilon Enterprises LLC
Facility Name	Shell Martinez Refinery
Facility Address	3485 Pacheco Blvd. Martinez, CA 94553 Contra Costa County
Facility Contact, Title, Phone	Ann Vorderbrueggen, Staff Engineer (925) 313-5161 ann.vorderbrueggen@shell.com
Authorized Person to Sign and Submit Reports	Thomas Rizzo, General Manager (925) 313-3000 tom.rizzo@shell.com
Mailing Address	Same as Facility Address
Billing Address	Same as Facility Address
Facility Type	Petroleum Refinery
Major or Minor Facility	Major
Threat to Water Quality	1
Complexity	A
Pretreatment Program	No
Reclamation Requirements	Not Applicable
Mercury and PCBs Requirements	NPDES Permit No. CA0038849
Permitted Flow	10 MGD (hydraulic capacity) 9.5 MGD (maximum reported daily flow at Discharge Point No. 001) [1]
Average Flow	5.9 MGD (long-term average flow at Discharge Point No. 001) [1]
Watershed	San Francisco Bay
Receiving Water	Carquinez Strait
Receiving Water Type	Estuarine

Unit Abbreviation:

MGD = million gallons per day

Footnote:

[1] Flows are based on data from August 2012 through April 2017.

A. Shell Oil Products US operates and Equilon Enterprises LLC owns the Shell Martinez Refinery (Facility). For the purposes of this Order, Shell Oil Products US and Equilon Enterprises LLC, collectively, are the Discharger. References to the "Discharger" or "Permittee" in applicable State and federal laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

The Discharger is authorized to discharge subject to waste discharge requirements (WDRs) in this Order at the discharge locations described in Table 2 of this Order. Regulations at 40 C.F.R. section 122.46 limit the duration of NPDES permits to a fixed term not to exceed five years. Accordingly, Table 3 of this Order limits the effective period for the discharge authorization. Pursuant to California Code of Regulations, title 23, section 2235.4, the terms and conditions of an expired permit are automatically continued pending reissuance of the permit if the Discharger complies with all federal NPDES regulation requirements for continuation of expired permits.

B. The Discharger is regulated pursuant to National Pollutant Discharge Elimination System (NPDES) Permit No. CA0005789. It was previously subject to Order No. R2-2012-0052 (previous order).

The discharge is also regulated pursuant to NPDES Permit No. CA0038849, which establishes mercury and polychlorinated biphenyls (PCBs) requirements for wastewater discharges to San Francisco Bay. This Order does not affect that permit.

C. The Discharger filed a Report of Waste Discharge and submitted an application for reissuance of its WDRs and NPDES permit on January 31, 2017.

II. FACILITY DESCRIPTION

The Facility processes an average crude oil throughput of 147,400 barrels per day, producing a broad range of petroleum products. The Facility discharges to Carquinez Strait, Peyton Slough, and Peyton Creek via seven outfalls: Discharge Point Nos. 001, 002, 004, 005, 007, 008, and 009. Attachment B provides site maps.

A. Wastewater Treatment (Discharge Point No. 001)

The Facility discharges process wastewater, non-process wastewater, sanitary wastewater, and stormwater at Discharge Point No. 001 after treatment at the wastewater treatment plant. Process wastewater and non-process wastewater include desalter effluent, sour water, boiler blowdown, cooling tower blowdown, and groundwater from extraction systems. Attachment C provides a process flow diagram for the wastewater treatment plant.

The wastewater treatment plant consists of three oil-water separators (one American Petroleum Institute [API] separator, one Gross Oil Separator [GOS], and one Corrugated Plate Interceptor [CPI]), four tanks that can operate as either oil-water separators or dissolved nitrogen flotation units, five equalization and diversion tanks, three activated sludge biological treatment systems (biotreaters), four treatment ponds, four retention ponds to store wastewater requiring additional treatment or wastewater from turnaround activities, a chemical precipitation unit for selenium removal, and a granular activated carbon (GAC) adsorption system that provides final polishing of treated wastewater by reducing effluent toxicity and removing some metals and hydrocarbons.

The treatment plant hydraulic capacity is approximately 10 MGD. All wastewater is processed through the entire treatment system, except for low biochemical oxygen demand streams, such as cooling tower blowdown, boiler system blowdown, and noncontact stormwater. Depending on operation, these streams can be routed to either the selenium precipitation unit or the polishing pond (Pond 5C-2), before then being treated by GAC adsorption units. The Discharger also routes wastewater from the Shell Chemical Plant, along with a stream of cooling tower

blowdown water from that area, downstream of the API oil-water separator to two tanks that can operate as oil-water separators or dissolved nitrogen flotation units and then to the biotreater.

Treated wastewater is discharged from Discharge Point No. 001 to Carquinez Strait. The discharge occurs through a 24-inch multiport diffuser located under the Martinez Refinery Wharf, about 500 feet from shore. The diffuser is 54 feet long, lies at an average depth of 25 feet, and has 18 horizontal 3-inch-diameter ports spaced 24 feet apart facing the seaward direction (Exponent, *Diffuser Dilution Study in Support of NPDES Permit Renewal*, December 9, 2016).

B. Stormwater Treatment and Control (Discharge Point Nos. 002, 004, 005, 007, 008, and 009)

The Facility discharges stormwater runoff from mostly non-process areas through six stormwater discharge points (see Table 2 of this Order). The Facility discharges stormwater runoff from most process areas at Discharge Point No. 001 after treatment at the wastewater treatment plant. During wet weather, these wastewater flows can contain a significant volume of stormwater.

At times, to maintain efficient operations and to avoid flooding the API oil-water separator, the Discharger re-routes the stormwater flow downstream of the API oil-water separator to the ETP-2 equalization/diversion tanks, Pond 6, or Pond 8 (see Attachment C). These facilities provide residence time to allow oil-water separation that is functionally equivalent to the API/tank units. Additionally, these facilities accommodate storm surge volumes until the water can be processed through one of the biotreaters and downstream treatment units. The process for determining when these alternate routings are necessary depends on several factors, including the API separator level (typically kept at less than 90%), the amount of rainfall, and the ETP-2 diversion tank levels. These typical wet weather operations are not bypasses subject to Attachment D section I.G. Moreover, significant storms that result in high flows may require that a portion of biologically-treated wastewater bypass the GAC adsorption units. High flow conditions are generally defined as an effluent discharge rate of 8.6 mgd (about 6,000 gallons per minute) or higher. Bypass of the GAC adsorption units are subject to Attachment D section I.G.

Stormwater routed to retention basins is discharged from four outfalls (Discharge Point Nos. 002, 004, 005, and 007). There are also two small areas where stormwater discharges via sheet flow (Discharge Point Nos. 008 and 009). The stormwater discharge points and their treatment controls are listed in the table below:

Table F-2. Stormwater Outfalls and Treatment Controls

Discharge Point	Type of Treatment Control
002	Retention Basin; valve-controlled discharge
004	Retention Basin; valve-controlled discharge
005	Retention Basin; valve-controlled discharge
007	Retention Basin; valve-controlled discharge
008	None (sheet flow)
009	None (sheet flow)

1. **Discharge Point No. 002.** Discharge Point No. 002 discharges stormwater runoff from about 230 acres. This area includes the Light Oil Processing area, tank farms, and many of the units for the Clean Fuels area. During wet weather, the Discharger routes first flush stormwater from the Light Oil Processing area and Clean Fuels area to the wastewater treatment plant. After the first-flush, the Discharger routes stormwater from these areas along with

stormwater from the tank farms to three ponds operated in series (commonly referred to as the Lake Slobodnik system). There is an upper, middle, and lower pond, and each is equipped with an oil baffle/weir and a valve that is kept closed and manually opened only when needed. Before opening the valve, the Discharger conducts visual observations and measures pH, total organic carbon (TOC), and sometimes oil and grease. Discharge is from the lower pond at a point about 600 feet south of the Marina Vista I-680 southbound on-off ramps into an unnamed earthen drainage course contiguous with Peyton Slough, which flows into Carquinez Strait.

Historically, oil sheen has been observed in the upper pond of the Lake Slobodnik system due to process wastewater mixing with stormwater. In response, the Discharger revised the first flush procedure. At the start of a rain event, runoff from the Clean Fuel PAD sump is diverted to the wastewater treatment plant. This first flush lasts approximately 30 minutes, after which runoff is routed to the Low Point sump. After the first flush from the Clean Fuel PAD sump has begun, the first flush from the Low Point sump (also lasting approximately 30 minutes) is diverted to the wastewater treatment plant. The Discharger then routes stormwater runoff from the Light Oil Processing area and Clean Fuels area to Lake Slobodnik. Because of the potential for the upper pond of Lake Slobodnik system to contain process wastewater, Provision VI.C.2 of this Order requires the Discharger to monitor for priority pollutants during any discharge from Discharge Point No. 002 that contains water from upper Lake Slobodnik.

2. **Discharge Point No. 004.** Discharge Point No. 004 discharges stormwater runoff from about 230 acres. This area includes a tank farm. The Discharger collects stormwater runoff in two ponds that operate in series (commonly referred to as the Vine Hill ponds). There is an upper and lower pond, and each is equipped with an oil baffle/weir and a valve that is kept closed and manually opened only when needed. Before opening the valve, the Discharger conducts visual observations and measures pH, TOC, and sometimes oil and grease. Discharge is from the lower pond to Peyton Creek at a point about 1,500 feet south of the Mt. View Sanitary District treatment plant, then into Peyton Slough, which flows into Carquinez Strait.

3. **Discharge Point No. 005.** Discharge Point No. 005 discharges stormwater runoff from about 30 acres. This area includes an emergency flare system. The Discharger routes stormwater runoff from this area to a pond equipped with an oil baffle/weir and valve that is kept closed and manually opened only when needed. Before opening the valve, the Discharger conducts visual observations and measures pH, TOC, and sometimes oil and grease. Discharge from the pond is to Peyton Creek at a point about 900 feet south of the Mt. View Sanitary District treatment plant, then into Peyton Slough, which flows into Carquinez Strait.

4. **Discharge Point No. 007.** Discharge Point No. 007 discharges stormwater runoff from about 7 acres. This area includes a propane/butane storage area. The Discharger routes stormwater runoff from this area to a pond equipped with an oil baffle/weir and valve that is kept closed and manually opened only when needed. Before opening the valve, the Discharger conducts visual observations and measures pH, TOC, and sometimes oil and grease. Discharge from the pond is to Peyton Creek at a point about 600 feet south of the Mt. View Sanitary District treatment plant, then into Peyton Slough, which flows into Carquinez Strait.

5. **Discharge Point No. 008.** Discharge Point No. 008 discharges stormwater runoff from about 16 acres. This area includes maintenance shops and warehouses. Stormwater runoff from this

area is discharged to Peyton Creek and eventually to Peyton Slough, which flows into Carquinez Strait.

6. **Discharge Point No. 009.** Discharge Point No. 009 discharges stormwater runoff from about 2 acres. This area includes Catalyst Packaging and Warehouse Operations. Stormwater runoff from this area is discharged to a dead-end section of Mococo Road and possibly into a small isolated wetlands area. This may connect to Peyton Slough, which flows into Carquinez Strait.

C. Summary of Existing Requirements and Monitoring Data

1. **Effluent Limitations and Monitoring Data for Discharge Point No. 001.** The previous order's effluent limitations and representative monitoring data for Discharge Point No. 001 are as follows:

Table F-3. Previous Effluent Limitations and Monitoring Data for Discharge Point No. 001

Parameter	Units	Effluent Limitations		Monitoring Data (08/2012 – 04/2017)	
		Maximum Daily	Average Monthly	Highest Maximum Daily	Highest Average Monthly
Biochemical Oxygen Demand (5-day @ degrees Celsius) (BOD_5)	lbs/day	3,300	1,900	2,700	1,500
Total Suspended Solids (TSS)	lbs/day	2,300	1,500	9,900	2,700
Chemical Oxygen Demand (COD)	lbs/day	25,000	13,000	18,000	12,000
Oil and Grease	mg/L	15	8.0	4.9 [1]	4.9 [1]
	lbs/day	1,000	540	270 [1]	270 [1]
Sulfide, Total	lbs/day	22	9.8	22	9.7
Phenolic Compounds, Total	lbs/day	25	7.6	5.5	5.5
Nickel, Total Recoverable	µg/L	72	43	40	40
Ammonia Nitrogen, Total (as N)	mg/L	72	22	11	11
	lbs/day	2,200	1,000	550	550
Chromium, Total Recoverable	lbs/day	26	8.9	0.24	0.24
Chromium (VI), Total Recoverable	lbs/day	1.6	0.73	0.24	0.24
Copper, Total Recoverable	µg/L	120	61	3.6	3.6
Cyanide, Total	µg/L	38	22	27	22
Nickel, Total Recoverable	µg/L	72	43	40	40
Selenium, Total Recoverable	µg/L	50	42	72	42
	kg/day	0.92 [2]	--	0.77 [3]	--
Dioxin-TEQ	µg/L	2.8×10^{-8}	1.4×10^{-8}	6.9×10^{-11} [1]	6.9×10^{-11} [1]
Acute Toxicity	% Survival	11-Sample Median: 90% minimum		97 (lowest)	
		11-Sample 90th Percentile: 70% minimum		87 (lowest)	
Chronic Toxicity	TU_c	Single-Sample Maximum: 10 TU_c		4.7	
pH	s.u.	6.0 – 9.0		6.1 – 9.6 [4]	

Unit Abbreviations:

lbs/day = pounds per day
mg/L = milligrams per liter
µg/L = micrograms per liter
kg/day = kilograms per day
% Survival = percent survival
TU_c = chronic toxic units
s.u. = standard units

Footnotes:

[1] This result is an estimated value.
[2] This is a maximum running annual average limitation.
[3] This is the maximum running annual average observed.
[4] These are the lowest and highest pH values observed.

2. **Monitoring Data for Discharge Point Nos. 002, 004, 005, 007, 008 and 009.** The following table describes stormwater quality during the previous order term (August 2012 through April 2017).

Table F-4. Monitoring Data for Discharge Point Nos. 002, 004, 005, 007, 008 and 009

Discharge Point No.	TOC (mg/L)		Oil and Grease [1] (mg/L)		TSS (mg/L)		pH (s.u.)	
	Max.	Avg.	Max.	Avg.	Max.	Avg.	Min.	Max.
002	27	11	8.1	3.8	92	28	6.7	8.5
004	1200	79	6.6	5.4	213	40	6.9	8.0
005	38	6.7	<2.4	<1.8	64	19	6.6	8.1
007	17	7.3	11	4.4	110	30	6.5	8.2
008	19	6.9	<4.5	3.3	150	50	5.9	7.5
009	53	19	<2.3	<2.1	25	14	5.9	7.90

Unit Abbreviations:

mg/L = milligrams per liter
s.u. = standard units

Footnote:

[1] A "<" sign signifies that the value shown is the minimum detection level (MDL).

D. Compliance Summary

1. **Discharge Point No. 001.** During the previous order term (August 2012 through April 2017), the Discharger violated the mercury, selenium, TSS, and pH numeric effluent limitations at Discharge Point No. 001, as listed below:

Table F-5. Effluent Limitation Violations at Discharge Point No. 001

Date of Violation	Parameter	Effluent Limitation	Reported Value	Units
11/22/2012	Mercury, Total Maximum Daily	0.12 [1]	0.33	µg/L
11/27/2012	Mercury, Total Maximum Daily	0.12 [1]	0.20	µg/L
11/29/2012	Mercury, Total Maximum Daily	0.12 [1]	0.34	µg/L
11/30/2012	Mercury, Total Average Monthly	0.079 [1]	0.14	µg/L
12/02/2012	Mercury, Total Maximum Daily	0.12 [1]	0.34	µg/L
01/09/2014	Mercury, Total	0.12 [1]	0.16	µg/L

Date of Violation	Parameter	Effluent Limitation	Reported Value	Units
	Maximum Daily			
01/15/2014	Selenium, Total Maximum Daily	50	53	µg/L
05/23/2016	pH Maximum Daily	9.0	9.6	s.u.
01/12/2017	TSS Maximum Daily	3200 [2]	4,200	lbs/day
01/12/2017	Mercury, Total Maximum Daily	0.12 [1]	0.83	µg/L
01/20/2017	Selenium, Total Maximum Daily	50	72	µg/L
01/31/2017	Mercury, Total Average Monthly	0.079 [1]	0.13	µg/L
02/09/2017	TSS Maximum Daily	3200 [2]	9,900	lbs/day
02/15/2017	TSS Maximum Daily	2900 [2]	8,300	lbs/day
02/17/2017	Mercury, Total Maximum Daily	0.12 [1]	0.37	µg/L
02/24/2017	Mercury, Total Maximum Daily	0.12 [1]	0.15	µg/L
02/28/2017	TSS Average Monthly	1800 [2]	2,700	lbs/day

Unit Abbreviations:

µg/L = micrograms per liter
mg/L = milligrams per liter
s.u. = standard units
lbs/day = pounds per day

Footnotes:

[1] This limitation is from the mercury and PCBs watershed permit, NPDES Permit No. CA0038849 (Order No. R2 2012-0096).

[2] This limitation reflects the additional contaminated runoff allocation for TSS as described in Table 6b of the previous order.

a. Mercury. The Discharger exceeded its maximum daily total mercury effluent limitation eight times and its average monthly total mercury effluent limitation twice.

The Discharger reported that startup issues at the Flexicoker unit in late October 2012 resulted in a release of micro-fine-sized coke particles that caused mercury effluent limitation violations in November and December 2012. Mercury normally associated with larger solids removed by settling combined with small coke particles that passed through the treatment processes. In response, the Discharger submitted an Action Plan for Mercury Reduction (March 25, 2013) pursuant to Special Provision C.1 of Order No. R2-2012-0096. This plan describes the incident investigation and the actions taken to improve both the source control at the Flexicoker unit and the recovery measures at the wastewater treatment plant. The Regional Water Board issued a $15,000 mandatory minimum penalty for these violations (Order No. R2-2013-1021).

The mercury effluent limitation violation in January 2014 was also related to high solids content in the effluent. The Discharger reported that a pause in routine solids removal at the polishing pond (Pond 5C-2), in conjunction with a lowered pond level and inefficient solids removal upstream of the pond, resulted in higher solids. In response, the Discharger resumed and increased solids removal activities, increased the frequencies of backwashing and carbon change-outs of GAC units, increased ferric chloride additions to the chemical precipitation unit, and began interim maintenance on lamellas (inclined plates that aid in solids removal) at the chemical precipitation unit. The Regional Water Board issued a $3,000 mandatory minimum penalty for this violation (Order No. R2-2014-1025).

The Discharger reported that heavy rains caused poor solids removal and mercury effluent limitation violations in January and February 2017. The cause and corrective action is the same as those for the TSS effluent limitation violations in January and February 2017 described below.

b. Selenium. The Discharger exceeded its maximum daily total selenium effluent limitation twice.

The selenium effluent limitation violation in January 2014 was related to the mercury effluent limitation violation during the same month, when there was a high solids content in the effluent. The Regional Water Board issued a $3,000 mandatory minimum penalty for this violation (Order No. R2-2014-1025).

The Discharger reported that heavy rains caused poor solids removal and a selenium effluent limitation violation in January 2017. The cause and corrective action is the same as those for TSS effluent limitation violations in January and February 2017 described below.

c. Total Suspended Solids (TSS). The Discharger exceeded its maximum daily TSS effluent limitation three times and its average monthly total TSS effluent limitation once.

The Discharger reported that heavy rains caused carryover of solids from biotreaters to clarifiers and excessive hydraulic flows through the polishing pond (Pond 5C-2). This resulted in poor solids removal and TSS effluent limitation violations in January and February 2017. As a corrective action, the Discharger reseeded the biotreater with healthy material, increased the frequency of carbon change-outs of GAC units, and increased the rate of solids removal at Pond 5D (upstream of the polishing pond) at the chemical precipitation unit. The Regional Water Board is considering enforcement for the violations that occurred in January and February 2017.

d. pH. The Discharger exceeded its maximum daily pH effluent limitation once.

The Discharger reported that a malfunction of the final pH adjustment control probe caused the pH effluent limitation violation in May 2016. As a corrective action, the Discharger added instructions to the operator control screen that specify treated wastewater with a pH outside the range of 6.4 to 8.6 should be diverted to a storage pond and rerouted through the wastewater treatment plant.

2. **Discharge Point Nos. 002, 004, 005, 007, 008, and 009.** During the previous order term (August 2012 through April 2017), the Discharger violated its TOC and pH effluent limitations at Discharge Point Nos. 004, 008, and 009, as listed below:

Table F-6. Effluent Limitation Violations at Discharge Point Nos. 002, 004, 005, 007, 008, and 009

Discharge Point	Date of Violation	Parameter	Limitation	Reported Value	Units
004	05/28/2013	TOC	110	1,200	mg/L
009	02/06/2015	pH (min)	6.5	5.9	s.u.
009	06/10/2015	pH (min)	6.5	6.4	s.u.
009	10/14/2016	pH (min)	6.5	6.4	s.u.
009	03/24/2017	pH (min)	6.5	6.0	s.u.
008	03/24/2017	pH (min)	6.5	5.9	s.u.

Unit Abbreviations:
mg/L = milligrams per liter
s.u. = standard units

   a. **Total Organic Carbon (TOC).** The Discharger reported that the TOC effluent limitation violation at Discharge Pont No. 004 in May 2013 was most likely due to the presence of biological matter (i.e., bird fecal matter or plant matter) in the sample container rather than a petroleum source. The Regional Water Board issued a $3,000 mandatory minimum penalty (Order No. R2-2014-1025).

   b. **pH.** The Discharger was unable to determine the causes of the pH violations at Discharge Point Nos. 008 and 009. The Discharger evaluated the area around the discharge points and the daily activities that took place at the time of the violations, but found no changes that could explain the low pH readings.

3. **Discharge Prohibitions.** The Discharger violated Discharge Prohibition III.A of the previous order by discharging process waste into the Lake Slobodnik system, the stormwater impoundment associated with Discharge Point No. 002 that is only permitted to handle stormwater. Regional Water Board and U.S. EPA staff observed a significant amount of oil in this stormwater impoundment during a December 3, 2014, inspection. The Regional Water Board issued a Notice of Violation on January 15, 2015, that required the Discharger to report how it will eliminate process waste from entering the Lake Slobodnik system. In response to this Notice of Violation, as well as previous investigations, the Discharger removed process waste from upper Lake Slobodnik by excavating accumulated solids from the bottom of the impoundment and hydroblasting and replacing some of the surrounding rock walls. To prevent process waste from entering the Lake Slobodnik system, the Discharger established an enhanced first flush procedure as described in Fact Sheet section II.B.1.a.

E. Planned Changes

The Discharger plans to complete the following projects during the next five years. These changes are for informational purposes only and are not requirements of this Order, except to the extent that they pertain to increasing or ensuring the reliability of treatment or wastewater conveyance systems. Their inclusion here does not imply Regional Water Board authorization. The Discharger must obtain any necessary permits or permit modifications to implement these changes.

1. **West Watershed Stormwater Management**. The Discharger plans to evaluate stormwater management options on the west side of the Facility (see Attachment B, Figure B-3) to more efficiently capture and equalize stormwater currently routed to the wastewater treatment plant.

2. **Upstream Selenium Treatment**. The Discharger plans to conduct pilot studies to treat selenium upstream of the wastewater treatment plant to reduce solids loading at the settling ponds.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

A. Legal Authorities. This Order serves as WDRs pursuant to California Water Code article 4, chapter 4, division 7 (commencing with § 13260). This Order is also issued pursuant to Clean Water Act (CWA) section 402 and implementing regulations adopted by U.S. EPA and Water Code chapter 5.5, division 7 (commencing with § 13370). It shall serve as an NPDES permit authorizing the Discharger to discharge into waters of the United States at the discharge location described in Table 2 subject to the WDRs in this Order.

B. California Environmental Quality Act. Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of the California Environmental Quality Act, Public Resources Code division 13, chapter 3 (commencing with § 21100).

C. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plan.** The Regional Water Board adopted the *Water Quality Control Plan for the San Francisco Bay Basin* (Basin Plan), which designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. Requirements in this Order implement the Basin Plan. In addition, this Order implements State Water Board Resolution No. 88-63, which established State Policy that all waters, with certain exceptions, are to be considered suitable or potentially suitable for municipal or domestic supply.

   Because of the marine influence on Carquinez Strait, total dissolved solids levels exceed 3,000 mg/L. Therefore, Carquinez Strait meets an exception to State Water Board Resolution No. 88-63 and does not support the municipal or domestic supply beneficial use. Beneficial uses applicable to Carquinez Strait, Peyton Slough, and Peyton Creek are as follows:

Table F-7. Beneficial Uses

Discharge Points	Receiving Water	Beneficial Uses
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) Estuarine Habitat (EST)
002 and 009	Peyton Slough, a tributary of	Same as above

Discharge Points	Receiving Water	Beneficial Uses
	Carquinez Strait	
004, 005, 007, and 008	Peyton Creek, a tributary of Carquinez Strait	Same as above

2. **Sediment Quality.** The State Water Board adopted the *Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1, Sediment Quality* on September 16, 2008, and it became effective on August 25, 2009. This plan supersedes other narrative sediment quality objectives and establishes new sediment quality objectives and related implementation provisions for specifically defined sediments in most bays and estuaries. This Order implements the sediment quality objectives of this plan.

3. **National Toxics Rule (NTR) and California Toxics Rule (CTR).** U.S. EPA adopted the NTR on December 22, 1992, and amended it on May 4, 1995, and November 9, 1999. About 40 criteria in the NTR apply in California. On May 18, 2000, U.S. EPA adopted the CTR. The CTR promulgated new toxics criteria for California and incorporated the previously adopted NTR criteria that applied in the State. U.S. EPA amended the CTR 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 U.S. EPA promulgated for California through the NTR and the priority pollutant objectives the Regional Water Board established in the Basin Plan. The SIP became effective on May 18, 2000, with respect to the priority pollutant criteria U.S. EPA promulgated 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. **Antidegradation Policy.** Federal regulations at 40 C.F.R. section 131.12 require that state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy through State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality of Waters in California*, which is deemed to incorporate 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 Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. Permitted discharges must be consistent with the antidegradation provisions of 40 C.F.R. section 131.12 and State Water Board Resolution No. 68-16.

6. **Anti-Backsliding Requirements.** CWA sections 402(o) and 303(d)(4) and 40 C.F.R. section 122.44(l) restrict backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit be as stringent as those in the previous order, with some exceptions in which limitations may be relaxed.

D. Impaired Waters on CWA 303(d) List

On July 30, 2015, U.S. EPA approved a revised list of impaired waters prepared pursuant to CWA section 303(d), which requires 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. Where it has not done so already, the Regional Water Board plans to adopt total maximum daily loads (TMDLs) for pollutants on the 303(d) list. TMDLs establish wasteload allocations for point sources and load allocations for non-point sources and are established to achieve the water quality standards for the impaired waters.

Carquinez Strait is listed as an impaired waterbody for chlordane, DDT, dieldrin, dioxin compounds, furan compounds, invasive species, mercury, PCBs, dioxin-like PCBs, and selenium. On February 12, 2008, U.S. EPA approved a TMDL for mercury in San Francisco Bay. On March 29, 2010, U.S. EPA approved a TMDL for PCBs in San Francisco Bay. NPDES Permit No. CA0038849 implements the mercury and PCBs TMDLs with respect to the discharges covered by this Order. On August 23, 2016, U.S. EPA approved a selenium TMDL for North San Francisco Bay, including Carquinez Strait. This Order implements the TMDL as it applies to the Discharger. As shown in Fact Sheet section IV.D.3, chlordane, DDT, and dieldrin have not been detected in Facility discharges. This Order contains dioxin-TEQ effluent limitations to ensure that dioxins and furans in effluent are kept below water quality objectives. Facility discharges are not a source of invasive species.

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 discharged into waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. The two principal bases for effluent limitations are 40 C.F.R. section 122.44(a), which requires that permits include applicable technology-based limitations and standards, and 40 C.F.R. section 122.44(d), which 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 receiving waters.

A. Discharge Prohibitions

1. **Discharge Prohibition III.A (Discharge of treated or untreated wastewater at location or in manner different than described in this Order):** This prohibition is based on 40 C.F.R. section 122.21(a) and Water Code section 13260, which require the Discharger to file an application and Report of Waste Discharge before a discharge can occur. This Order prohibits discharges not described in the application and Report of Waste Discharge and, subsequently, in this Order.

2. **Discharge Prohibition III.B (Discharge at Discharge Point No. 001 when treated wastewater does not receive initial dilution of at least 16:1):** This prohibition is based on Basin Plan Discharge Prohibition 1, which prohibits discharges that do not receive a minimum initial dilution of at least 10:1 (10 parts total receiving water after mixing with 1 part effluent). Furthermore, this order allows a 10:1 dilution credit in the calculation of some water quality-based effluent limitations and a 16:1 dilution credit in the calculation of the ammonia water quality-based effluent limitations. These water quality-based effluent

limitations would not be protective of water quality if the discharge did not actually achieve at least 16:1 dilution.

3. **Discharge Prohibition III.C (Bypass of untreated or partially-treated wastewater is prohibited):** This prohibition is based on 40 C.F.R. section 122.41(m) (see Attachment D section I.G).

B. Basin Plan Discharge Prohibition No. 1

This Order permits discharge of stormwater from Discharge Point Nos. 002, 004, 005, 007, 008, and 009 without an initial dilution of at least 10:1. Although Basin Plan Discharge Prohibition No. 1 prohibits discharges having characteristics of particular concern that do not receive a minimum initial dilution of 10:1, the Basin Plan indicates that the prohibition is to address discharges of undiluted wastes or abnormal discharges caused by the malfunction or upset of a treatment process. Since these stormwater discharges do not contain process wastewaters that are undiluted or would be subject to upset, the prohibition does not apply.

C. Technology-Based Effluent Limitations

1. Scope and Authority

CWA section 301(b) and 40 C.F.R. section 122.44(a) require that permits include applicable technology-based limitations based on several levels of control:

- 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. Conventional pollutants include BOD_5, TSS, pH, and oil and grease.

- 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 control technology (BCT) represents the control from existing industrial point sources of conventional pollutants. 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 for new sources. The intent of NSPS guidelines is to set limitations that represent state-of-the-art treatment technology for new sources.

Where U.S. EPA has not yet developed technology-based standards for a particular industry or a particular pollutant, CWA section 402(a)(1) and 40 C.F.R. section 125.3 authorize the use of best professional judgement (BPJ) to derive technology-based effluent limitations on a case-by-case basis. When BPJ is used, the permit must reflect specific factors outlined at 40 C.F.R. section 125.3.

U.S. EPA has established standards of performance (technology-based limitations and standards) for the petroleum refining industry at 40 C.F.R. section 419, *Effluent Limitations Guidelines for the Petroleum Refining Point Source Category*. Subpart B of these regulations for the Cracking Subcategory applies to discharges from the Facility and has been used to develop this Order's limitations and requirements.

2. Technology-Based Effluent Limitations – Discharge Point No. 001

The effluent limitations guidelines established in 40 C.F.R. part 419 require that technology-based effluent limitations for Discharge Point No. 001 be derived based on refinery production (total crude oil throughput) and the treatment processes used. Attachment F-1 presents the derivation of the production-based effluent limitations based on 40 C.F.R. part 419, subpart B. Crude oil throughput is currently 147,400 barrels per day (bbls/d).

The table below lists the most stringent of the calculated BPT, BAT, and BCT limitations. (NSPS limitations do not apply because the Facility was constructed prior to October 18, 1982.) The table also presents the previous order's limitations that were based on a slightly higher crude oil throughput of 149,200 bbls/d. The new limitations are lower (more stringent) than previous limitations for BOD_5, oil and grease, and sulfide. However, the previous order contained more stringent limitations for phenolic compounds, total chromium, and hexavalent chromium. This Order includes the more stringent effluent limitations from the previous order, shown in bold below, to avoid backsliding.

Table F-8. Technology-Based Effluent Limitations for Process Wastewater

Pollutant	Newly Calculated Effluent Limitations (pounds/day)		Previous Effluent Limitations (pounds/day)	
	Maximum Daily	Average Monthly	Maximum Daily	Average Monthly
BOD_5	3,300	1,800	3,300	1,900
TSS	2,300	1,500	2,300	1,500
COD	25,000	13,000	25,000	13,000
Oil and Grease	1,000	530	1,000	540
Sulfide	22	9.6	22	9.8
Phenolic Compounds, Total	25	7.9	25	**7.6**
Total Ammonia, as N	2,200	1,000	2,200	1,000
Chromium, Total Recoverable	27	9.2	**26**	**8.9**
Chromium (VI), Total Recoverable	1.7	0.75	**1.6**	**0.73**
pH	6.0 – 9.0 standard units		6.0 – 9.0 standard units	

Because ballast water (e.g., cargo hold wash water) and contaminated runoff commingled with process wastewater may also be discharged through Discharge Point No. 001, Tables 5 and 6 of this Order provide additional allocations that may be applied to the mass-based effluent limitations in Table 4. These additional contaminated runoff allocations are based on 40 C.F.R. sections 419.52(e)(2), 419.53(f)(2), and 419.54(e)(2). The ballast water allocations are based on 40 C.F.R. sections 419.52(c), 419.53(d), and 419.54(c). Attachment F-1 presents the derivation of these allocations.

3. Technology-Based Effluent Limitations – Discharge Point Nos. 002, 004, 005, 007, 008, and 009

The technology-based effluent limitations for the stormwater outfalls are based on 40 C.F.R. section 419, subpart B (see the derivation in Attachment F-1). However, the pH limitations in this Order are based on Basin Plan section 3.3.9 because the water quality-based effluent limitations are more stringent than the technology-based effluent limitations required by 40 C.F.R. section 419, subpart B. Water quality-based effluent limitations for pH, visible oil, and visible color are discussed in Fact Sheet section IV.D.4.b.

D. Water Quality-Based Effluent Limitations

1. Scope and Authority

This Order contains water quality-based effluent limitations (WQBELs) that implement water quality objectives that protect beneficial uses. CWA section 301(b) and 40 C.F.R. section 122.44(d) require that permits include limitations more stringent than federal technology-based requirements where necessary to achieve applicable water quality standards. According to 40 C.F.R. section 122.44(d)(1)(i), permits must include effluent limitations for all pollutants that are or may be discharged at levels that have a 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, WQBELs must be established using (1) U.S. EPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting a narrative criterion, supplemented with relevant information (40 C.F.R. § 122.44[d][1][vi]). The process for determining reasonable potential and calculating WQBELs is intended to achieve applicable water quality objectives and criteria and protect designated uses of receiving waters as specified in the Basin Plan.

2. Water Quality Criteria and Objectives

Fact Sheet section III.C.1 (Table F-7) identifies the receiving waters for Facility discharges and their beneficial uses. Water quality criteria and objectives to protect these beneficial uses are described below:

a. Basin Plan Objectives. The Basin Plan specifies numeric water quality objectives for ten priority pollutants, ammonia, and total polynuclear aromatic hydrocarbons (PAHs), and narrative water quality objectives for toxicity, bioaccumulation, oil, and color. The narrative color objective (Basin Plan § 3.3.4) states, "Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses." The narrative oil and grease water quality objective (Basin Plan § 3.3.7) states, "Waters shall not contain oils, greases, waxes, or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect beneficial uses." The translation of the Basin Plan's ammonia, toxicity, and bioaccumulation objectives is discussed below:

i. Ammonia. For Central San Francisco Bay and upstream waters, Basin Plan section 3.3.20 contains water quality objectives for un-ionized ammonia of 0.025

mg/L as an annual median and 0.16 mg/L as a maximum. For this Order, these un-ionized ammonia objectives were translated to equivalent total ammonia concentrations (as nitrogen) since (1) sampling and laboratory methods are not available to analyze for un-ionized ammonia, and (2) the fraction of total ammonia that exists in the toxic un-ionized form depends on the pH, salinity, and temperature of the receiving water. Based on receiving water data at Pacheco Creek Station (BF10) from 1993 through 2001, the un-ionized fraction of total ammonia was calculated as follows:

$$\text{For salinity} > 10 \text{ ppt: fraction of } NH_3 = \frac{1}{1+10^{(pK-pH)}}$$

Where:

$$pK = 9.245 + 0.116(I) + 0.0324(298 - T) + \frac{0.0415(P)}{(T)}$$

$$I = \text{Molal ionic strength of saltwater} = \frac{19.9273(S)}{(1{,}000 - 1.005109[S])}$$

S = Salinity (parts per thousand)

T = Temperature in degrees Kelvin

P = Pressure (one atmosphere)

The median and 90th percentile un-ionized ammonia fractions were then used to express the daily maximum and annual average un-ionized ammonia objectives as chronic and acute total ammonia criteria. This approach is consistent with U.S. EPA guidance on translating dissolved metal water quality objectives to total recoverable metal water quality objectives (U.S. EPA, *The Metals Translator: Guidance for Calculating a Total Recoverable Limit from a Dissolved Criterion*, EPA Publication 823-B-96-007, 1996). The resulting total ammonia chronic and acute criteria are 1.24 mg/L and 4.66 mg/L as nitrogen, respectively.

ii. Toxicity. The narrative toxicity objective (Basin Plan § 3.3.18) states, "All waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce other detrimental responses in aquatic organisms." This Order translates this objective to a numeric criterion of 1.0 chronic toxicity unit (TU_c). At 1.0 TU_c, there is no observable detrimental effect when the indicator organism is exposed to 100 percent effluent; therefore, 1.0 TU_c is a direct translation of the narrative objective into a number. Moreover, in *Technical Support Document for Water Quality-based Toxics Control* (EPA/505/2-90-001, March 1991) (see section 3.3.3), U.S. EPA recommends that 1.0 TU_c be used as a criterion continuous concentration (typically a four-day average).

iii. Bioaccumulation (Dioxin-TEQ). The narrative bioaccumulation objective (Basin Plan § 3.3.2) states, "Many pollutants can accumulate on particulates, in sediments, or bioaccumulate in fish and other aquatic organisms. Controllable 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." Because it is the consensus of the scientific community that dioxins and furans associate with particulates, accumulate in sediments, and

bioaccumulate in the fatty tissue of fish and other organisms, the Basin Plan's narrative bioaccumulation water quality objective applies to these pollutants. Elevated levels of dioxins and furans in San Francisco Bay fish tissue demonstrate that the narrative bioaccumulation water quality objective is not being met. U.S. EPA has therefore included San Francisco Bay as impaired by dioxins and furans in the current CWA section 303(d) listing of receiving waters where water quality objectives are not being met after imposition of technology-based requirements.

When the CTR was promulgated, U.S. EPA stated its support of the regulation of dioxin and dioxin-like compounds through the use of toxicity equivalencies (TEQs). U.S. EPA stated, "For California waters, if the discharge of dioxin or dioxin-like compounds has reasonable potential to cause or contribute to a violation of a narrative criterion, numeric water quality-based effluent limitations for dioxin or dioxin-like compounds should be included in NPDES permits and should be expressed using a TEQ scheme" (Fed. Reg. Vol. 65, No. 97, pages 31695-31696, May 18, 2000). This Order uses a TEQ scheme based on a set of toxicity equivalency factors (TEFs) the World Health Organization developed in 1998, and a set of bioaccumulation equivalency factors (BEFs) U.S. EPA developed for the Great Lakes region (40 C.F.R. § 132, Appendix F) to convert the concentration of any congener of dioxin or furan into an equivalent concentration of 2,3,7,8-tetrachlorinated dibenzo-p-dioxin (2,3,7,8-TCDD). Although the 1998 World Health Organization scheme includes TEFs for dioxin-like PCBs, they are not included in this Order's TEQ scheme. The CTR has established a specific water quality criterion for PCBs, and dioxin-like PCBs are included in the analysis of total PCBs.

The CTR establishes a numeric water quality objective for 2,3,7,8-TCDD of 1.4×10^{-8} µg/L for the protection of human health when aquatic organisms are consumed. The CTR criterion is used as a criterion for dioxin-TEQ because dioxin-TEQ represents a toxicity-weighted concentration equivalent to 2,3,7,8-TCDD, thus translating the narrative bioaccumulation objective into a numeric criterion.

b. California Toxics Rule (CTR) Criteria. The CTR specifies numeric aquatic life and human health criteria for numerous priority pollutants. These criteria apply to inland surface waters and enclosed bays and estuaries. Some human health criteria are for consumption of "water and organisms" and others are for consumption of "organisms only." The CTR criteria applicable to "organisms only" apply to Carquinez Strait and San Francisco Bay because they do not support the municipal or domestic supply (MUN) beneficial use (i.e., neither is a drinking water source).

c. National Toxics Rule (NTR) Criteria. The NTR establishes numeric aquatic life and human health criteria for a number of toxic pollutants for San Francisco Bay waters upstream to and including Suisun Bay and the Sacramento-San Joaquin Delta. These NTR criteria apply to Carquinez Strait, the receiving water for Discharge Point No. 001 for this Discharger.

d. Sediment Quality Objectives. The *Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1, Sediment Quality* contains a narrative water quality objective: "Pollutants in sediments shall not be present in quantities that, alone or in combination,

are toxic to benthic communities in bays and estuaries of California." This objective is to be implemented by integrating three lines of evidence: sediment toxicity, benthic community condition, and sediment chemistry. The policy requires that if the Regional Water Board determines that a discharge has reasonable potential to cause or contribute to an exceedance of this objective, it is to impose the objective as a receiving water limitation.

e. Receiving Water Salinity and Hardness. Basin Plan section 4.6.2 (like the CTR and NTR) states that the salinity characteristics (i.e., freshwater vs. saltwater) of the receiving water are to be considered in determining the applicable water quality objectives. Freshwater criteria apply to discharges to waters with salinities equal to or less than one part per thousand (ppt) at least 95 percent of the time. Saltwater criteria 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 waters with salinities between these two categories, or tidally-influenced freshwaters that support estuarine beneficial uses, the water quality objectives are the lower of the salt or freshwater objectives (the latter calculated based on ambient hardness) for each substance.

Carquinez Strait, the receiving water for Discharge Point No. 001, is tidally-influenced. Carquinez Strait is estuarine pursuant to the Basin plan salinity definition. Therefore, this Order specifies effluent limitations for discharges to Carquinez Strait based on the lower of the marine and freshwater objectives. The Discharger collected hardness data near its outfall from 2007 through 2011. During this period, the geometric mean of hardness data collected by the Discharger was 1,030 mg/L. The Regional Water Board chose to use a more conservative value of 400 mg/L for hardness because U.S. EPA recommends 400 mg/L as the maximum hardness value that should be used in determining water quality objectives.

f. Site-Specific Metals Translators. Effluent limitations for metals must be expressed as total recoverable metal (40 C.F.R. § 122.45[c]). Since the water quality objectives for metals are typically expressed as dissolved metal, translators must be used to convert metals concentrations from dissolved to total recoverable and vice versa. The CTR contains default translators; however, site-specific conditions, such as water temperature, pH, suspended solids, and organic carbon may affect the form of metal (dissolved, non-filterable, or otherwise) present and therefore available to cause toxicity. In general, dissolved metals are more available and more toxic to aquatic life than other forms. Site-specific translators can account for site-specific conditions, thereby preventing overly stringent water quality objectives.

As listed in the table below, this Order incorporates site-specific translators for copper from Basin Plan Table 7.2.1-2 and site-specific translators for nickel from *North of Dumbarton Bridge Copper and Nickel Development and Selection of Final Translators* (Clean Estuary Partnership, March 2005). CTR default translators were used for all other metals.

Table F-9. Site-Specific Translators

Pollutant	Acute	Chronic
Copper	0.66	0.38
Nickel	0.57	0.27

3. Need for WQBELs (Reasonable Potential Analysis)

Assessing whether a pollutant has reasonable potential to exceed a water quality objective is the fundamental step in determining whether a WQBEL is required. The reasonable potential analysis below applies to the discharges at Discharge Point No. 001. Discharge Point Nos. 002, 004, 005, 007, 008, and 009 discharge stormwater and are subject to technology-based limitations as described in Fact Sheet section IV.C.3 and narrative WQBELs as set forth in Provision VI.C.4.c. These narrative requirements include implementation of best management practices in accordance with 40 C.F.R. section 122.44(k).

a. Available Information. The reasonable potential analysis is based on effluent monitoring data the Discharger collected from August 2012 through September 2016. For ambient background data, this reasonable potential analysis relies on Regional Monitoring Program (RMP) data collected at the Yerba Buena Island RMP station (BC10) from 1993 through 2013 and additional Bay Area Clean Water Agencies data from *San Francisco Bay Ambient Water Monitoring Interim Report (2003)* and *Ambient Water Monitoring: Final CTR Sampling Update (2004).* These reports contain monitoring results from 2002 and 2003 for priority pollutants the RMP did not monitor at the time.

This Order does not contain WQBELs for constituents that do not demonstrate reasonable potential; however, Provision VI.C.2.a of this Order still requires monitoring for those pollutants. If concentrations are found to have increased significantly, Provision VI.C.2 of this Order requires the Discharger to investigate the causes of the increases and implement remedial measures if the increases pose a threat to receiving water quality.

b. Methodology. SIP section 1.3 sets forth the methodology used to assess whether pollutants have reasonable potential to exceed water quality objectives. The analysis begins with identifying the maximum effluent concentration (MEC) observed for each pollutant based on available effluent data and the ambient background concentration (B). SIP section 1.4.3 states that ambient background concentrations are either the maximum ambient concentration observed or, for water quality objectives intended to protect human health, the arithmetic mean of observed concentrations. There are three triggers in determining reasonable potential:

- **Trigger 1** is activated if the maximum effluent concentration is greater than or equal to the lowest applicable water quality objective (MEC $\geq$ water quality objective).

- **Trigger 2** is activated if the ambient background concentration observed in the receiving water is greater than the water quality objective (B > water quality objective) *and* the pollutant is detected in any effluent sample.

- **Trigger 3** is activated if a review of other information indicates that a water quality-based effluent limitation is needed to protect beneficial uses.

c. Discharge Point No. 001

i. Priority Pollutants, Dioxin-TEQ, and Ammonia. The MECs, most stringent applicable water quality criteria and objectives, and ambient background concentrations used in the analysis are presented in the following table, along with the

reasonable potential analysis results (yes or no) for each pollutant. Reasonable potential was not determined for all pollutants because there are not water quality objectives for all pollutants and monitoring data are unavailable for others. The pollutants that exhibit reasonable potential are copper, nickel, selenium, cyanide, dioxin-TEQ, and total ammonia.

Table F-10. Reasonable Potential Analysis

CTR No.	Priority Pollutants	C or Governing criterion or objective (µg/L)	MEC or Minimum DL (µg/L) [1, 2]	B or Minimum DL (µg/L) [1, 2, 3]	RPA Result [4]
1	Antimony	4,300	0.68	1.8	No
2	Arsenic	36	3.1	2.8	No
3	Beryllium	No Criteria	<0.06	0.22	U
4	Cadmium	7.3	0.06	0.13	No
5a	Chromium (III)	640	3.3	4.4	No
5b	Chromium (VI)	11	<0.1	4.4	No
6	**Copper**	**14**	**3.6**	**2.5**	**Yes** [5]
7	Lead	8.5	0.13	0.80	No
8	Mercury	--	--	--	[6]
9	**Nickel**	**30**	**40**	**3.7**	**Yes**
10	**Selenium**	**--**	**--**	**--**	[6]
11	Silver	2.2	0.38	0.052	No
12	Thallium	6.3	<0.05	0.21	No
13	Zinc	86	18	5.1	No
14	**Cyanide**	**2.9**	**27**	**<0.40**	**Yes**
15	Asbestos	No Criteria	Unavailable	Unavailable	U
16	2,3,7,8-TCDD (Dioxin)	1.4×10^{-8}	$<4.7 \times 10^{-7}$	8.2×10^{-9}	No
16-TEQ	**Dioxin-TEQ**	**1.4×10^{-8}**	**6.9×10^{-11}** [7]	**5.3×10^{-8}**	**Yes**
17	Acrolein	780	<1.7	<0.50	No
18	Acrylonitrile	0.66	<0.69	0.030	No
19	Benzene	71	<0.18	<0.050	No
20	Bromoform	360	1.3	<0.50	No
21	Carbon Tetrachloride	4.4	<0.16	0.060	No
22	Chlorobenzene	21,000	0.3	<0.50	No
23	Chlorodibromomethane	34	1.8	<0.050	No
24	Chloroethane	No Criteria	<0.38	<0.50	U
25	2-Chloroethylvinyl ether	No Criteria	<0.28	<0.50	U
26	Chloroform	No Criteria	7.5	<0.50	U
27	Dichlorobromomethane	46	2.6	<0.05	No
28	1,1-Dichloroethane	No Criteria	<0.19	<0.05	U
29	1,2-Dichloroethane	99	<0.18	0.040	No
30	1,1-Dichloroethylene	3.2	<0.21	<0.50	No
31	1,2-Dichloropropane	39	<0.18	<0.050	No
32	1,3-Dichloropropylene	1,700	<0.29	<0.50	No
33	Ethylbenzene	29,000	<0.26	<0.50	No
34	Methyl Bromide	4,000	<0.17	<0.50	No
35	Methyl Chloride	No Criteria	<0.23	<0.50	U
36	Methylene Chloride	1,600	<0.2	22	No

CTR No.	Priority Pollutants	C or Governing criterion or objective (µg/L)	MEC or Minimum DL (µg/L) [1, 2]	B or Minimum DL (µg/L) [1, 2, 3]	RPA Result [4]
37	1,1,2,2-Tetrachloroethane	11	<0.1	<0.050	No
38	Tetrachloroethylene	8.9	<0.19	<0.050	No
39	Toluene	200,000	<0.19	<0.30	No
40	1,2-Trans-Dichloroethylene	140,000	<0.22	<0.50	No
41	1,1,1-Trichloroethane	No Criteria	<0.19	<0.50	U
42	1,1,2-Trichloroethane	42	<0.16	<0.050	No
43	Trichloroethylene	81	<0.2	<0.50	No
44	Vinyl Chloride	525	<0.25	<0.50	No
45	2-Chlorophenol	400	<0.4	<1.2	No
46	2,4-Dichlorophenol	790	<0.4	<1.3	No
47	2,4-Dimethylphenol	2,300	<0.4	<1.3	No
48	2-Methyl- 4,6-Dinitrophenol	765	<0.3	<1.2	No
49	2,4-Dinitrophenol	14,000	<0.2	<0.70	No
50	2-Nitrophenol	No Criteria	<0.4	<1.3	U
51	4-Nitrophenol	No Criteria	<0.5	<1.6	U
52	3-Methyl 4-Chlorophenol	No Criteria	<0.5	<1.1	U
53	Pentachlorophenol	7.9	<0.4	<1.0	No
54	Phenol	4,600,000	<0.3	<1.3	No
55	2,4,6-Trichlorophenol	6.5	3.2	<1.3	No
56	Acenaphthene	2,700	<0.01	0.0019	No
57	Acenaphthylene	No Criteria	<0.02	0.0013	U
58	Anthracene	110,000	<0.01	0.00059	No
59	Benzidine	0.00054	<4	<0.0015	No
60	Benzo(a)Anthracene	0.049	<0.02	0.0053	No
61	Benzo(a)Pyrene	0.049	<0.01	0.0033	No
62	Benzo(b)Fluoranthene	0.049	<0.01	0.0046	No
63	Benzo(ghi)Perylene	No Criteria	<0.02	0.0045	U
64	Benzo(k)Fluoranthene	0.049	<0.01	0.0018	No
65	Bis(2-Chloroethoxy)Methane	No Criteria	<0.5	<0.30	U
66	Bis(2-Chloroethyl)Ether	1.4	<0.4	<0.00015	No
67	Bis(2-Chloroisopropyl)Ether	170,000	<0.4	Unavailable	No
68	Bis(2-Ethylhexyl)Phthalate	5.9	<0.5	<0.70	No
69	4-Bromophenyl Phenyl Ether	No Criteria	<0.5	<0.23	U
70	Butylbenzyl Phthalate	5,200	<0.5	0.0056	No
71	2-Chloronaphthalene	4,300	<0.4	<0.30	No
72	4-Chlorophenyl Phenyl Ether	No Criteria	<0.5	<0.30	U
73	Chrysene	0.049	<0.01	0.0028	No
74	Dibenzo(a,h)Anthracene	0.049	<0.02	0.00064	No
75	1,2-Dichlorobenzene	17,000	<0.27	<0.30	No
76	1,3-Dichlorobenzene	2,600	<0.18	<0.30	No

CTR No.	Priority Pollutants	C or Governing criterion or objective (µg/L)	MEC or Minimum DL (µg/L) [1, 2]	B or Minimum DL (µg/L) [1, 2, 3]	RPA Result [4]
77	1,4-Dichlorobenzene	2,600	<0.18	<0.30	No
78	3,3 Dichlorobenzidine	0.077	<5	<0.0010	No
79	Diethyl Phthalate	120,000	<0.5	<0.21	No
80	Dimethyl Phthalate	2,900,000	<0.5	<0.21	No
81	Di-n-Butyl Phthalate	12,000	<0.4	0.016	No
82	2,4-Dinitrotoluene	9.1	<0.4	<0.27	No
83	2,6-Dinitrotoluene	No Criteria	<0.4	<0.29	U
84	Di-n-Octyl Phthalate	No Criteria	<0.4	<0.38	U
85	1,2-Diphenyhydrazine	0.54	<0.5	0.0037	No
86	Fluoranthene	370	<0.02	0.011	No
87	Fluorene	14,000	<0.01	0.0021	No
88	Hexachlorobenzene	0.00077	<0.4	0.000022	No
89	Hexachlorobutadiene	50	<0.4	<0.30	No
90	Hexachlorocyclopentadiene	17,000	<0.3	<0.30	No
91	Hexachloroethane	8.9	<0.4	<0.20	No
92	Indeno(1,2,3-cd)Pyrene	0.049	<0.02	0.0040	No
93	Isophorone	600	<0.5	<0.30	No
94	Naphthalene	No Criteria	<0.02	0.013	U
95	Nitrobenzene	1,900	<0.5	<0.25	No
96	N-Nitrosodimethylamine	8.1	<0.3	<0.30	No
97	N-Nitrosodi-n-Propylamine	1.4	<0.5	<0.0010	No
98	N-Nitrosodiphenylamine	16	<0.3	<0.0010	No
99	Phenanthrene	No Criteria	<0.01	0.0095	U
100	Pyrene	11,000	<0.02	0.019	No
101	1,2,4-Trichlorobenzene	No Criteria	<0.4	<0.30	U
102	Aldrin	0.00014	<0.004	0.0000028	No
103	Alpha-BHC	0.013	<0.005	0.00050	No
104	Beta-BHC	0.046	<0.004	0.00041	No
105	Gamma-BHC	0.063	<0.004	0.00070	No
106	Delta-BHC	No Criteria	<0.004	0.000053	U
107	Chlordane (303(d) listed)	0.00059	<0.005	0.00018	No
108	4,4'-DDT (303(d) listed)	0.00059	<0.004	0.00017	No
109	4,4'-DDE (linked to DDT)	0.00059	<0.003	0.00069	No
110	4,4'-DDD	0.00084	<0.004	0.00031	No
111	Dieldrin (303d listed)	0.00014	<0.004	0.00026	No
112	Alpha-Endosulfan	0.0087	<0.004	0.000031	No
113	beta-Endosulfan	0.0087	<0.005	0.000069	No
114	Endosulfan Sulfate	240	<0.005	0.000082	No
115	Endrin	0.0023	<0.005	0.000040	No
116	Endrin Aldehyde	0.81	<0.005	Unavailable	No
117	Heptachlor	0.00021	<0.005	0.000019	No
118	Heptachlor Epoxide	0.00011	<0.004	0.000094	No
119-125	PCBs sum	---	---	---	[6]
126	Toxaphene	0.00020	<0.2	Unavailable	No

CTR No.	Priority Pollutants	C or Governing criterion or objective (µg/L)	MEC or Minimum DL (µg/L) [1, 2]	B or Minimum DL (µg/L) [1, 2, 3]	RPA Result [4]
--	Tributyltin	0.0074	Unavailable	Unavailable	No
--	**Total Ammonia (mg/L as N)**	**1.2**	**6.1**	**0.20**	**Yes**

Footnotes:

[1] The maximum effluent concentration and ambient background concentration are the actual detected concentrations unless preceded by a "<" sign, in which case the value shown is the minimum detection level (MDL).

[2] The maximum effluent concentration or ambient background concentration is "Unavailable" when there are no monitoring data for the constituent.

[3] All background data is from the Yerba Buena Island RMP station (BC10), from 1993 through 2013, except total ammonia, which is from Pacheco Creek Station (BF10), from 1993 through 2001.

[4] RPA Results = Yes, if MEC ≥ WQC, B > WQC and MEC is detected, or Trigger 3
= No, if MEC and B are < WQC or all effluent data are undetected
= Unknown, cannot determine (U), if no criteria have been promulgated

[5] Basin Plan section 7.2.1.2 requires copper WQBELs.

[6] SIP section 1.3 excludes from its reasonable potential analysis procedure priority pollutants for which a TMDL has been developed. TMDLs have been developed for mercury and PCBs in San Francisco Bay and selenium in North San Francisco Bay. Mercury and PCBs from wastewater discharges are regulated under NPDES Permit No. CA0038849, which implements the San Francisco Bay Mercury and PCBs TMDLs. This Order implements the North San Francisco Bay Selenium TMDL by establishing mass-based selenium limitations. See Fact Sheet section IV.D.4.a.iii.

[7] This result is an estimated value.

i. Acute and Chronic Toxicity. Due to the complexity of the discharge, there is reasonable potential for it to cause or contribute to exceedance of the narrative toxicity objectives in Basin Plan section 3.3.18, which states, "There shall be no acute toxicity in ambient waters…." and "There shall be no chronic toxicity in ambient waters." Refinery discharges can contain many different combinations of potentially toxic pollutants in addition to those for which numeric water quality objectives have been established. Acute and chronic toxicity WQBELs are needed to ensure that the toxicity objective is met in Carquinez Strait. In addition, Basin Plan Table 4-3 requires acute toxicity effluent limitations. Furthermore, monitoring data for Discharge Point No. 001 over the previous order term shows a maximum effluent concentration of 4.7 TU_c (see Table F-3). This is greater than the translated chronic toxicity objective (1.0 TU_c). Therefore, there is reasonable potential for the discharge to cause or contribute to exceedances of the chronic toxicity water quality objective.

ii. Bacteria. Because this discharge includes some sanitary wastewater, there is reasonable potential for it to cause or contribute to exceedance of the Basin Plan Table 3-1 water quality objectives for total coliform and enterococcus bacteria. These objectives apply because the receiving water, Carquinez Strait, is an estuarine receiving water with the water contact recreation beneficial use (see Table F-7).

iii. Sediment Quality. Pollutants in some receiving water sediments may be present in quantities that alone or in combination are toxic to benthic communities. Efforts are underway to identify stressors causing such conditions. However, to date there is no evidence directly linking compromised sediment conditions to the discharges subject to this Order; therefore, the Regional Water Board cannot draw a conclusion about reasonable potential for these discharges to cause or contribute to exceedances of the sediment quality objectives. Nevertheless, the Discharger continues to participate in

the RMP, which monitors San Francisco Bay sediment and seeks to identify stressors responsible for degraded sediment quality. Thus far, the monitoring has provided only limited information about potential stressors and sediment transport. The Regional Water Board is exploring options for obtaining additional information that may inform future analyses.

d. Discharge Point Nos. 002, 004, 005, 007, 008, and 009. Discharge Point Nos. 002, 004, 005, 007, 008, and 009 discharge stormwater from current and former areas of refinery operations. Based on refinery operations, stormwater discharged at these discharge points has a reasonable potential to cause or contribute to an exceedance of the narrative water quality objectives for color (Basin Plan § 3.3.4), oil and grease (Basin Plan § 3.3.6), and pH (Basin Plan § 3.3.9). The discharge has no reasonable potential to cause or contribute to an exceedance of the water quality objectives for total coliform or enterococcus bacteria (Basin Plan Table 3-1) because there is no sanitary wastewater component to this discharge. Stormwater discharges could also contain other pollutants that could cause or contribute to exceedances of other narrative and numeric water quality objectives; therefore, Provision VI.C.4.c requires a Stormwater Pollution Prevention Plan and Best Management Practices as narrative WQBELs.

4. WQBELs

WQBELs were developed for the pollutants determined to have reasonable potential to cause or contribute to exceedances of water quality objectives. Except where explained below, the WQBELs are based on SIP section 1.4, as shown in Table F-11 below.

a. Discharge Point No. 001

i. Dilution Credits. SIP section 1.4.2 allows dilution credits under certain circumstances. The outfall at Discharge Point No. 001 is designed to achieve a minimum initial dilution ratio of at least 10:1. In compliance with Provision VI.C.2.e of the previous order, the Discharger submitted a dilution study titled *Diffuser Dilution Study in Support of NPDES Permit Renewal* (Exponent, December 9, 2016) that evaluated dilution using U.S. EPA's modeling software, *Visual Plumes UM3*. The previous dilution study, titled *Water Quality and Dye Dilution Studies, Martinez Manufacturing Complex, Shell Oil Company* (Brown and Caldwell, October 1987), indicated that the diffuser achieves a minimum initial dilution of 16:1.

The new study estimated initial dilution at Discharge Point No. 001 at slack tide for both the maximum wet-weather discharge and the average daily discharge. The estimated minimum near-field dilution the Discharger modeled used an average daily discharge rate of 6.0 MGD (the average of daily measurements collected from April 1, 2001 to March 31, 2016) and a maximum wet-weather discharge rate of 10 MGD (the hydraulic capacity of the treatment plant). The seasonal average temperature and salinity of the receiving water were based on data from the California Data Exchange Center Martinez Station for January 2012 through December 2015. Modeling showed that, during slack tide conditions, the diffuser could be expected to achieve a minimum initial dilution of 38:1, with little variation between seasons.

This study also estimated initial dilution at Discharge Point No. 001 during a typical tidal cycle. Using averaged tidal current speeds during a December 2013 tidal cycle, dilution was simulated to range from 27:1 to 320:1 based on strength of tidal currents and effluent discharge rate. The minimum dilution of 27:1 was simulated to occur using the maximum wet-weather discharge of 10 MGD and was observed when the current was flowing upstream (inland) in the opposite direction of the flow from the diffuser ports. Such flow dynamics limit both the height of plume rise and the distance the plume travels away from the diffuser before reaching the edge of the zone of initial dilution. Under these circumstances, the zone of initial dilution is small and dilution is lower because the discharge has mixed with a smaller volume of ambient water before reaching the edge of the zone of initial dilution.

In a tidally-influenced estuary environment, such as Carquinez Strait, slack tide conditions (i.e., zero ambient current) are assumed to represent worst-case scenarios, but this study showed that the minimum dilution over a tidal cycle is, at times, lower than dilution at slack tide. The conditions influencing the observed minimum initial dilution during a typical tidal cycle, like slack current conditions, are momentary occurrences persisting for a very short time, and additional mixing will occur beyond the zone of initial dilution due to ambient flow and turbulence. Therefore, a conservative estimate of the initial dilution at the edge of the mixing zone is 27:1.

(a) Bioaccumulative Pollutants: For certain bioaccumulative pollutants, dilution credit is denied. Specifically, these pollutants include dioxin and furan compounds, which appear on the CWA section 303(d) list for Carquinez Strait because, based on available data on the concentrations of these pollutants in aquatic organisms, sediment, and the water column, they impair San Francisco Bay beneficial uses. The following factors suggest insufficient assimilative capacity in San Francisco Bay for these pollutants. Tissue samples taken from San Francisco Bay fish show the presence of these pollutants at concentrations greater than screening levels (*Contaminant Concentrations in Fish from San Francisco Bay*, May 1997). The results of a 1994 San Francisco Bay pilot study, presented in *Contaminated Levels in Fish Tissue from San Francisco Bay* (Regional Water Board, 1994), also show elevated levels of chemical contaminants in fish tissues. The Office of Environmental Health and Hazard Assessment completed a preliminary review of the data in the 1994 report and in December 1994 issued an interim consumption advisory covering certain fish species in San Francisco Bay due to the levels of some of these pollutants. The Office of Environmental Health and Hazard Assessment updated this advisory in a May 2011 report, *Health Advisory and Safe Eating Guidelines for San Francisco Bay Fish and Shellfish*, which still suggests insufficient assimilative capacity in San Francisco Bay for dioxins and furans.

(b) Ammonia. For ammonia, a conservative initial dilution of 16:1 (D=15) was used to calculate the effluent limitations. This is justified because ammonia, a non-persistent pollutant, quickly disperses and degrades to a non-toxic state, and cumulative toxicity is unlikely. While the *Diffuser Dilution Study in Support of NPDES Permit Renewal* indicates that the discharge receives an initial dilution of 27:1, this Order continues to base ammonia effluent limitations on the more restrictive dilution ratio of 16:1 from the previous order because the Discharger can comply with effluent limitations for ammonia based on this dilution ratio.

(c) Other Non-Bioaccumulative Pollutants: This Order grants a conservative dilution credit of 10:1 (D = 9) for other non-bioaccumulative pollutants (excluding ammonia), including chronic toxicity. This dilution credit is based, in part, on Basin Plan Prohibition 1 (Table 4-1), which prohibits discharges with less than 10:1 dilution. SIP section 1.4.2 allows for limiting the dilution credit. The dilution credit is limited for the following reasons:

(1) San Francisco Bay is a complex estuarine system with highly variable and seasonal upstream freshwater inflows and diurnal tidal saltwater inputs. SIP section 1.4.3 allows background conditions to be determined on a discharge-by-discharge or water body-by-water body basis. A water body-by-water body approach is taken here due to inherent uncertainties in characterizing ambient background conditions in a complex estuarine system on a discharge-by-discharge basis.

(2) Because of the complex hydrology of San Francisco Bay, there are uncertainties in accurately determining an appropriate mixing zone. The models used to predict dilution do not consider the three dimensional nature of San Francisco Bay currents resulting from the interaction of tidal flushes and seasonal fresh water outflows. Being heavier and colder than fresh water, ocean saltwater enters San Francisco Bay on a twice-daily tidal cycle, generally beneath the warmer fresh water that flows seaward. When these waters mix and interact, complex circulation patterns occur due to the varying densities of the fresh and ocean waters. The complex patterns occur throughout San Francisco Bay, but are most prevalent in San Pablo Bay, Carquinez Strait, and Suisun Bay. The locations of this mixing and interaction change, depending on the strength of each tide. Additionally, sediment loads from the Central Valley change on a long-term basis, affecting the depth of different parts of San Francisco Bay, resulting in alteration of flow patterns, mixing, and dilution at the outfall.

ii. WQBEL Calculations. The following table shows the WQBEL calculations for Discharge Point No. 001:

Table F-11. WQBEL Calculations

PRIORITY POLLUTANTS	Copper	Cyanide	Nickel	Dioxin-TEQ	Total Ammonia (acute)	Total Ammonia (chronic)
Units	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**mg/L N**	**mg/L N**
Basis and Criteria type	Basin Plan Site-Specific Objectives (SSO)	Basin Plan Site-Specific Objectives (SSO)	CTR Aquatic Life	CTR Human Health	Basin Plan Aquatic Life	Basin Plan Aquatic Life
Criteria -Acute	-----	-----	74	-----	4.7	-----
Criteria -Chronic	-----	-----	8.2	-----	-----	1.2
SSO Criteria -Acute	3.9	9.4	-----	-----	-----	-----
SSO Criteria -Chronic	2.5	2.9	-----	-----	-----	-----
Water Effects ratio (WER)	2.4	1	1	1	1	1

PRIORITY POLLUTANTS	Copper	Cyanide	Nickel	Dioxin-TEQ	Total Ammonia (acute)	Total Ammonia (chronic)
Units	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**mg/L N**	**mg/L N**
Lowest WQO	2.5	2.9	8.2	1.4×10^{-8}	4.7	1.2
Site Specific Translator - MDEL	0.66	-----	0.57	-----	-----	-----
Site Specific Translator - AMEL	0.38	------	0.27	-----	-----	-----
Dilution Factor (D) (if applicable)	9	9	9	0	15	15
No. of samples per month	4	4	4	4	4	30
Aquatic life criteria analysis required? (Y/N)	Y	Y	Y	N	Y	Y
HH criteria analysis required? (Y/N)	N	Y	N	Y	N	N
Applicable Acute WQO	14	9.4	130	-----	4.7	-----
Applicable Chronic WQO	16	2.9	30	-----	-----	1.2
HH criteria	-----	220,000	4,600	1.4×10^{-8}	-----	-----
Background (Maximum Conc. for Aquatic Life calc.)	2.6	0.40	3.7	-----	0.20	0.070
Background (Average Conc. for Human Health calc.)	-----	------	-----	5.3×10^{-8}	-----	-----
Is the pollutant on the 303d list and/or bioaccumulative (Y/N)?	N	N	N	Y	N	N
ECA acute	120	90	1,300	-----	72	-----
ECA chronic	140	25	270	-----	-----	19
ECA HH	-----	2.2×10^{5}	-----	1.4×10^{-8}	-----	-----
No. of data points <10 or at least 80% of data reported non detect? (Y/N)	N	N	N	Y	N	N
Avg. of effluent data points	1.3	12	16	1.3×10^{-11}	2.9	2.9
Std. Dev. of effluent data points	0.73	4.8	6.1	2.4×10^{-11}	1.8	1.8
CV calculated	0.57	0.42	0.39	N/A	0.63	0.63
CV (Selected) - Final	0.57	0.42	0.39	0.60	0.63	0.63
ECA acute mult99	0.33	0.43	0.45	-----	0.31	-----
ECA chronic mult99	0.54	0.63	0.65	-----	-----	0.93
LTA acute	40	38	570	-----	22	-----
LTA chronic	73	16	180	-----	-----	17
minimum of LTAs	40	16	180	-----	22	17
AMEL mult95	1.5	1.4	1.3	1.6	1.6	1.2
MDEL mult99	3.0	2.4	2.2	3.1	3.3	3.3
AMEL (aq life)	60	22	240	-----	35	21
MDEL(aq life)	120	38	390	-----	72	57
MDEL/AMEL Multiplier	2.0	1.7	1.7	2.0	2.1	2.7
AMEL (human hlth)	-----	2.2×10^{5}	-----	1.4×10^{-8}	-----	-----
MDEL (human hlth)	-----	3.8×10^{5}	-----	2.8×10^{-8}	-----	-----
minimum of AMEL for Aq. life vs HH	60	22	240	1.4×10^{-8}	35	21

PRIORITY POLLUTANTS	Copper	Cyanide	Nickel	Dioxin-TEQ	Total Ammonia (acute)	Total Ammonia (chronic)
Units	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**mg/L N**	**mg/L N**
minimum of MDEL for Aq. Life vs HH	120	38	390	2.8×10^{-8}	72	57
Previous order limit (30-day average)	61	22	43	1.4×10^{-8}	22	22
Previous order limit (daily)	120	38	72	2.8×10^{-8}	72	72
Final limitation - AMEL	60	22	43 [1]	1.4×10^{-8}	21	21
Final limitation - MDEL	120	38	72 [1]	2.8×10^{-8}	57	57

Footnote:

[1] Consistent with anti-backsliding provisions, this Order retains previous order effluent limitations more stringent than the newly calculated effluent limitations.

iii. Selenium Mass Emission Limitation. A TMDL for selenium has been adopted for North San Francisco Bay, including a portion of the Sacramento/San Joaquin Delta, Suisun Bay, Carquinez Strait, San Pablo Bay, and Central San Francisco Bay. The TMDL establishes a wasteload allocation of 244 kg/year for the Discharger. Basin Plan section 7.2.4.5 allows the Discharger to discharge no more than its current load based on its selenium concentration and discharge volumes as reported from 2000 through 2012. Specifically, it says selenium WQBELs are to be calculated as the 95th percentile daily load based on representative data reported during 2000 through 2012 and are to be expressed in units of kilograms per day (kg/day). The 95th percentile daily load for this period, after excluding outliers greater than 1.4 kg/day, was 1.1 kg/day. Therefore, this Order establishes a performance-based average monthly mass emission limitation of 1.1 kg/day.

iv. Acute Toxicity. This Order includes acute toxicity limitations based on Basin Plan section 4.5.5.3.1. All bioassays are to be performed according to the U.S. EPA-approved method in 40 C.F.R. part 136, currently *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, 5th Edition (EPA-821-R-02-012). The test species specified in the MRP is rainbow trout (*Onchorhynchus mykiss*).

v. Chronic Toxicity. This Order includes a chronic toxicity limitation based on Basin Plan section 4.5.5.3.2. The single-sample WQBEL of 10 TU_c is based on the chronic toxicity criterion of 1.0 TU_c and a dilution credit of 10:1 (D = 9). This WQBEL is consistent with the CTR and SIP section 4, Toxicity Control Provisions. The test species specified in the MRP is mysid shrimp (*Americamysis bahia*), which was the most sensitive species identified in the Discharger's November 16, 2016, final chronic toxicity screening report.

vi. Bacteria. The total coliform and enterococcus effluent limitations are based on the Basin Plan:

(a) Total Coliform. The total coliform effluent limitations are based on the Basin Plan Table 4-2A.

(b) Enterococcus. The enterococcus effluent limitation is based on the Basin Plan Tables 3-1 and 4-2A. Basin Plan Table 4-2A lists a 30-day geometric mean enterococcus limitation of 35 most probable number per 100 milliliters (MPN/100 mL) to implement Basin Plan Table 3-1. Basin Plan section 4.5.5.1 states that this effluent limitation may be adjusted to account for dilution in a manner consistent with SIP procedures. This Order grants a conservative initial dilution of 10:1 (D=9) to calculate the enterococcus effluent limitation (see Fact Sheet section IV.D.4.a.i[c]). To establish background conditions, the Discharger collected five receiving water samples near its outfall for enterococcus from May 2011 through February 2012. The geometric mean of these samples was 23 MPN/100 mL.

The enterococcus effluent limitation was calculated, as specified in SIP section 1.4, using the following equation:

ECA = C + D (C – B)

where:

ECA = Effluent Concentration Allowance (effluent limitation)
C = water quality objective (35 MPN/100 mL)
D = dilution factor (D = 9)
B = background concentration (23 MPN/100 mL)

This calculation results in a five-sample geometric mean enterococcus effluent limitation of 140 MPN/100 mL.

vii. Effluent Limitation Adjustments for Recycled Water Use. Effluent Limitations and Discharge Specifications section IV.A.6 and Provision VI.C.4.e of this Order provide a process for the Discharger to obtain effluent limitation credits for recycled water used in its processes (this process does not apply to treated wastewater used onsite for landscape irrigation). These requirements are included to encourage wastewater recycling, consistent with Basin Plan section 4.16 and State Water Board Resolution Nos. 77-1 and 2009-0011, by accounting for increased pollutant concentrations that may result from recycled water use.

b. Discharge Point Nos. 002, 004, 005, 007, 008, and 009

For stormwater discharged from Discharge Point Nos. 002, 004, 005, 007, 008, and 009, this Order retains from the previous order the narrative WQBELs of no visible oil or color and imposes additional narrative WQBELs as set forth in Provision VI.C.4.c. These narrative requirements include best management practices in accordance with 40 C.F.R. section 122.44(k). For stormwater discharged from Discharge Point Nos. 002, 004, 005, 007, 008, and 009, this Order also imposes pH WQBELs based on Basin Plan section 3.3.9 because they are more stringent than the technology-based pH effluent limitations.

E. Discharge Requirement Considerations

1. Anti-backsliding

This Order complies with the anti-backsliding provisions of CWA sections 402(o) and 303(d)(4) and 40 C.F.R. section 122.44(l) because the effluent limitations in this Order are at least as stringent as those in the previous order.

The previous order contained concentration-based selenium effluent limitations calculated according to SIP procedure and a mass-based effluent limitation based on a running average. It also stated that the Regional Water Board would amend the selenium effluent limitations to be consistent with TMDL wasteload allocations when a selenium TMDL is completed. This Order implements the North San Francisco Bay Selenium TMDL (Basin Plan § 7.2.4) adopted on November 18, 2015, and contains a mass-based selenium effluent limitation. The wasteload allocation for Shell Oil Products US caps Facility discharges at current loads. Consistent with the findings described in State Water Board Order WQ 2001-06, the anti-backsliding rule does not apply to the newly established limitation because it is not "comparable" to the prior limitation.

2. Antidegradation

This Order complies with the antidegradation provisions of 40 C.F.R. section 131.12 and State Water Board Resolution 68-16. It continues the status quo with respect to the level of discharge authorized in the previous order, which is the baseline by which to measure whether degradation will occur. This Order does not allow for a flow increase, a reduced level of treatment, or higher effluent limitations relative to those in the previous order. The new selenium limitations, derived from the North San Francisco Bay Selenium TMDL (Basin Plan § 7.2.4), reflect the Facility's current loading and accordingly are designed to maintain existing water quality.

3. Stringency of Requirements for Individual Pollutants

This Order contains both technology-based and WQBELs for individual pollutants. This Order's technology-based requirements implement minimum, applicable federal technology-based requirements. In addition, this Order contains more stringent effluent limitations as necessary to meet water quality standards. Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement CWA requirements.

This Order's WQBELs have been derived to implement water quality objectives that protect beneficial uses. The beneficial uses and water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. To the extent that WQBELs were derived from the CTR, the CTR is the applicable standard pursuant to 40 C.F.R. section 131.38. The procedures for calculating these WQBELs are based on the CTR, as implemented in accordance with the SIP, which U.S. EPA approved on May 18, 2000. U.S. EPA approved most Basin Plan beneficial uses and water quality objectives prior to May 30, 2000. Beneficial uses and water quality objectives submitted to U.S. EPA prior to May 30, 2000, but not approved by U.S. EPA before that date, are nonetheless "applicable water quality standards for purposes of the CWA" pursuant to 40 C.F.R. section 131.21(c)(1). U.S. EPA approved the remaining beneficial uses and water quality objectives so they are applicable water quality standards pursuant to 40 C.F.R. section 131.21(c)(2).

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

The receiving water limitations in sections V.A and V.B of this Order are based on Basin Plan narrative and numeric water quality objectives. The receiving water limitations in section V.C of this Order require compliance with State and federal water quality standards in accordance with the CWA and regulations adopted thereunder.

VI. RATIONALE FOR PROVISIONS

A. Standard Provisions

Attachment D contains federal standard provisions that apply to all NPDES permits in accordance with 40 C.F.R. section 122.41 and additional conditions applicable to specific categories of permits in accordance with 40 C.F.R. section 122.42. The Discharger must comply with these provisions. The conditions set forth in 40 C.F.R. sections 122.41(a)(1) and (b) through (n) apply to all state-issued NPDES permits and must be incorporated into the permits either expressly or by reference.

In accordance with 40 C.F.R. section 123.25(a)(12), states may omit or modify conditions to impose more stringent requirements. Attachment G contains standard provisions that supplement the federal standard provisions in Attachment D. This Order omits federal conditions that address enforcement authority specified in 40 C.F.R. sections 122.41(j)(5) and (k)(2) because the State's enforcement authority under the Water Code is more stringent. In lieu of these conditions, this Order incorporates Water Code section 13387(e) by reference.

B. Monitoring and Reporting

Pursuant to 40 C.F.R. section 122.48, NPDES permits must specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383, and 40 C.F.R. sections 122.41(h) and (j), authorize the Regional Water Board to require technical and monitoring reports. This Order establishes monitoring and reporting requirements, contained in the Monitoring and Reporting Program (Attachment E) that implement State and federal requirements. For more background regarding these requirements, see Fact Sheet section VII.

C. Special Provisions

1. Reopener Provisions

These provisions are based on 40 C.F.R. sections 122.62 and 122.63 and allow modification of this Order and its effluent limitations as necessary in response to updated water quality objectives, regulations, or other new and relevant information that may become available in the future, and other circumstances as allowed by law.

2. Effluent Characterization Study and Report

This Order does not include effluent limitations for priority pollutants that do not demonstrate reasonable potential, but this provision requires the Discharger to continue monitoring for these pollutants as described in the MRP and Attachment G. Monitoring data are necessary to verify that the "no" and "unknown" reasonable potential analysis

conclusions of this Order (Table F-10) remain valid. This requirement is authorized pursuant to Water Code section 13267 and is necessary to inform the next permit reissuance and to ensure that the Discharger takes timely steps in response to any unanticipated change in effluent quality during the term of this Order.

This provision also requires the Discharger to monitor for priority pollutants at Monitoring Location EFF-002 if the discharge at Discharge Point No. 002 contains water from the upper pond of Lake Slobodnik. This Order authorizes only stormwater to be discharged at this outfall. Because there is a potential for process wastewater to enter the upper pond, if any water from this portion of the Lake Slobodnik system is present in the discharge, the Discharger must monitor for priority pollutants to document that process wastewater has not mixed with stormwater and the discharge from Discharge Point No. 002 complies with Discharge Prohibition III.A. Moreover, monitoring data for Discharge Point No. 002 may be used to conduct a future reasonable potential analysis.

Because Provision VI.C.2.a requires the Discharger to monitor priority pollutants of stormwater associated with the upper pond of Lake Slobodnik at Discharge Point No. 002, the additional sampling required by the Regional Water Board in a letter dated October 24, 2013, pursuant to Water Code section 13267, no longer applies.

3. Pollutant Minimization Program

This provision is based on Basin Plan section 4.13.2 and SIP section 2.4.5.

4. Other Special Provisions

a. Copper Action Plan. This provision is based on Basin Plan section 7.2.1.2 and is necessary to ensure that use of copper site-specific objectives is consistent with antidegradation policies. The Basin Plan requires a copper action plan to ensure compliance with State and federal antidegradation policies when copper limitations are based on the site-specific objectives. The copper action plan requires additional actions depending on the three-year rolling mean dissolved copper concentration in San Pablo Bay. Data compiled by the San Francisco Estuary Institute for 2011 through 2015 indicate no degradation of San Francisco Bay water quality with respect to copper (http://www.sfei.org/pages/copper-site-specific-objectives-3-year-rolling-averages-0).

b. Cyanide Action Plan. This provision is based on Basin Plan section 4.7.2.2 and is necessary to ensure that use of cyanide site-specific objectives is consistent with antidegradation policies. The Basin Plan requires a cyanide action plan to ensure compliance with State and federal antidegradation policies when cyanide limitations are based on the site-specific objectives.

c. Stormwater Pollution Prevention Plan and Annual Report. This provision is based on Basin Plan section 4.8 and is consistent with the requirements of *NPDES General Permit for Storm Water Discharges Associated with Industrial Activities* (State Water Board Order No. 2014-0057-DWQ). These narrative requirements include implementation of best management practices in accordance with 40 C.F.R. section 122.44(k).

d. Construction and Development Requirements for Stormwater. This provision clarifies when the Discharger must apply for coverage under *NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities*, Order No. 2009-0009-DWQ.

e. Conditions for Recycled Water Use Adjustment. This provision protects beneficial uses by requiring the Discharger to ensure that recycled water use adjustments, if any are applied, will not cause toxicity. This provision does not authorize any increase in pollutant mass to the receiving water. It authorizes recycling of treated wastewater that could otherwise be discharged to the receiving water without further treatment.

f. Average Annual Selenium Load. This provision is based on Basin Plan section 7.2.4.5. The information will be used to confirm whether selenium loads are consistent with wasteload allocations.

g. Innovative Technologies for Selenium Treatment. This provision will generate new information regarding the Discharger's application of best practicable control technology currently available (BPT) and best available technology economically achievable (BAT) for selenium control pursuant to 40 C.F.R. section 125.3. It requires the Discharger to provide information necessary to establish technology-based effluent limitations based on best professional judgment (BPJ), if warranted.

h. Acceptance of Ballast Water. This provision is necessary to ensure that ballast water discharges are not a pathway for invasive species to reach San Francisco Bay. It is consistent with California Code of Regulations, title 2, section 2284(a)(4), which requires approval by the California State Lands Commission to discharge ballast water to a facility. Such approval requires a treatment process adequate to ensure that the discharge of treated ballast water does not release invasive species.

VII. RATIONALE FOR MONITORING AND REPORTING PROGRAM (MRP)

CWA section 308 and 40 C.F.R. sections 122.41(h), 122.41(j)-(l), 122.44(i), and 122.48 require that NPDES permits specify monitoring and reporting requirements. Water Code sections 13267 and 13383 also authorize the Regional Water Board to establish monitoring, inspection, entry, reporting, and recordkeeping requirements. The Monitoring and Reporting Program (Attachment E) of this Order establishes monitoring, reporting, and recordkeeping requirements that implement State and federal requirements. The following provides the rationale for the MRP requirements:

A. Monitoring Requirements Rationale

1. **Influent Monitoring.** This Order does not require the Discharger to monitor wastewater treatment plant influent. However, the Discharger has the option of using recycled water and seeking effluent limitation adjustments, in which case the Discharger must monitor recycled water and raw water intake at Monitoring Locations INF-001 and INF-002 for the parameters for which recycled water adjustments are desired.

2. **Effluent Monitoring.** This Order requires effluent monitoring to evaluate compliance with the discharge prohibitions and effluent limitations in this Order. This Order retains the effluent monitoring requirements from the previous order; however, the monitoring

frequency of TSS at Monitoring Location EFF-001 is increased from once per month to once per week from April 1 through December 31 and three times per week from December 1 through March 31. This increased monitoring frequency is necessary to better characterize effluent quality. Data review and inspections of the wastewater treatment system have indicated high variability in TSS concentrations, especially during wet weather.

3. **Toxicity Testing.** This Order requires toxicity testing to evaluate compliance with the acute and chronic toxicity effluent limitations.

4. **Receiving Water Monitoring.** This Order requires the Discharger to continue participating in the Regional Monitoring Program, which involves collecting data on pollutants and toxicity in San Francisco Bay water, sediment, and biota. This monitoring is necessary to characterize the receiving water and the effects of the discharges this Order authorizes.

B. Monitoring Requirements Summary

The table below summarizes routine monitoring requirements. This table is for informational purposes only. The actual requirements are specified in the MRP and elsewhere in this Order.

Table F-12. Monitoring Requirements Summary

Parameter	Influent INF-001	Influent INF-002	Effluent EFF-001	Effluent EFF-001D	Effluent EFF-002, [1] EFF-004, EFF-005, and EFF-007	Effluent EFF-008 and EFF-009	Receiving Water
Flow	Continuous [2]	---	Continuous	---	---	---	---
pH	---	---	Continuous	---	Each Discharge Event	2/Wet Weather Season or 1/Day [3]	---
Temperature	---	---	Continuous	---	---	---	---
Specific Conductance	---	---	---	---	Each Discharge Event	2/Wet Weather Season or 1/Day [3]	---
BOD_5	1/Month [2]	1/Year [2]	1/Month	---	Each Discharge Event [4]	2/Wet Weather Season [5]	---
TSS	1/Week or 3/Week [2, 6]	1/Year [2]	1/Week or 3/Week [7]	---	Each Discharge Event	2/Wet Weather Season or 4/Year or 1/Day [3, 8]	---
COD	1/Month [2]	1/Year [2]	1/Month	---	Each Discharge Event [4]	2/Wet Weather Season [5]	---
TOC	---	---	---	---	Each Discharge Event	2/Wet Weather Season or 1/Day [3]	---
Oil and Grease	1/Month [2]	1/Year [2]	1/Month	---	Each Discharge Event	2/Wet Weather	---

Parameter	Influent INF-001	Influent INF-002	Effluent EFF-001	Effluent EFF-001D	Effluent EFF-002, [1] EFF-004, EFF-005, and EFF-007	Effluent EFF-008 and EFF-009	Receiving Water
						Season or 1/Day [3]	
Sulfide, Total	1/Month [2]	1/Year [2]	1/Month	---	---	---	---
Phenolic Compounds, Total	1/Month [2]	1/Year [2]	1/Month	---	Each Discharge Event [4]	2/Wet Weather Season [5]	---
Ammonia Nitrogen, Total (as N)	1/Month [2]	1/Year [2]	1/Month	---	---	---	---
Chromium, Total Recoverable	1/Month [2]	1/Year [2]	1/Month	---	Each Discharge Event [4]	2/Wet Weather Season [5]	---
Chromium (VI), Total Recoverable	1/Month [2]	1/Year [2]	1/Month	---	Each Discharge Event [4]	2/Wet Weather Season [5]	---
Copper, Total Recoverable	1/Month [2]	1/Year [2]	1/Month	---	---	---	Support RMP
Cyanide, Total	1/Month [2]	1/Year [2]	1/ Month	---	---	---	Support RMP
Nickel, Total Recoverable	1/Month [2]	1/Year [2]	1/Month	---	---	---	Support RMP
Selenium, Total Recoverable	1/Week [2]	1/Year [2]	1/Week	---	---	---	Support RMP
Dioxin-TEQ	2/Year [2]	1/Year [2]	2/Year	---	---	---	Support RMP
Total Coliform	---	---	---	1/Week	---	---	---
Enterococcus	---	---	---	1/Month	---	---	---
Acute Toxicity	---	---	1/Week	---	---	---	Support RMP
Chronic Toxicity	---	---	1/Quarter	---	---	---	Support RMP
All other priority pollutant	---	---	2/Year	---	---	---	Support RMP
Standard Observations	---	---	---	---	Each Discharge Event	2/Wet Weather Season or 1/Day [3]	---

Footnotes:

[1] The Discharger is to monitor for all priority pollutants at Monitoring Location EFF-002 when discharge from Discharge Point No. 002 contains stormwater from upper Lake Slobodnik.

[2] This monitoring is only required when seeking recycled water use effluent limitation adjustments.

[3] If and when supplemental effluent limitations for the pollutants in Table 8 of this Order become effective, the Discharger is to increase the monitoring frequency at outfalls where the limitations are in effect to daily during each storm. The Discharger is to continue daily monitoring until two consecutive samples show compliance with the TOC and oil and grease limitations in Table 7 of this Order.

[4] If and when supplemental effluent limitations for the pollutants in Table 8 of this Order become effective, the Discharger is to begin monitoring at outfalls where the limitations are in effect. The Discharger is to continue monitoring each discharge event until two consecutive samples show compliance with the TOC and oil and grease limitations in Table 7 of this Order.

[5] If and when supplemental effluent limitations for the pollutants in Table 8 of this Order become effective, the Discharger is to begin monitoring at outfalls where the limitations are in effect. The Discharger is to continue monitoring each storm event until two consecutive samples show compliance with the TOC and oil and grease limitations in Table 7 of this Order.

[6] In accordance with Provision VI.c.4.e of this Order, the Discharger is to sample and analyze TSS at Monitoring Location INF-001 at least as frequently as the MRP requires for monitoring at Monitoring Location EFF-001 if it wishes to seek effluent limitation adjustments.

[7] From April 1 through November 30, the TSS monitoring frequency at Monitoring Location EFF-001 is once per week. From December 1 through March 31, the TSS monitoring frequency at Monitoring Location EFF-001 is three times per week.

[8] If TSS exceeds one or both of the numeric action levels included in Provision VI.C.4.c of this Order during the previous wet weather season, the Discharger is to increase the monitoring frequency at outfalls where a numeric action level exceedance occurred to four times per year. The Discharger is to continue monitoring TSS four times per year until TSS levels for an entire wet weather season are below the numeric action levels.

VIII. PUBLIC PARTICIPATION

The Regional Water Board considered the issuance of WDRs that will serve as an NPDES permit for the Facility. As a step in the WDR adoption process, Regional Water Board staff developed tentative WDRs and encouraged public participation in the WDR adoption process.

A. Notification of Interested Parties. The Regional Water Board notified the Discharger and interested agencies and persons of its intent to prescribe WDRs for the discharge and provided an opportunity to submit written comments and recommendations. Notification was provided through the *Martinez News-Gazette*. The public had access to the agenda and any changes in dates and locations through the Regional Water Board's website at http://www.waterboards.ca.gov/sanfranciscobay.

B. Written Comments. Interested persons were invited to submit written comments concerning the tentative WDRs as explained through the notification process. Comments were to be submitted either in person or by mail to the Executive Officer at the Regional Water Board at 1515 Clay Street, Suite 1400, Oakland, California 94612, to the attention of Patrick Karinja.

For full staff response and Regional Water Board consideration, the written comments were due at the Regional Water Board office by 5:00 p.m. on September 8, 2017.

C. Public Hearing. The Regional Water Board held a public hearing on the tentative WDRs during its regular meeting at the following date and time, and at the following location:

Date: October 12, 2017
Time: 9:00 a.m.
Location: Elihu Harris State Office Building
1515 Clay Street, 1st Floor Auditorium
Oakland, CA 94612

Contact: Patrick Karinja, (510) 622-2407, patrick.karinja@waterboards.ca.gov

Interested persons were invited to attend. At the public hearing, the Regional Water Board heard testimony pertinent to the discharge, WDRs, and permit. For accuracy of the record, important testimony was requested to be in writing.

Dates and venues change. The Regional Water Board web address is http://www.waterboards.ca.gov/sanfranciscobay, where one could access the current agenda for changes in dates and locations.

D. Reconsideration of Waste Discharge Requirements. Any aggrieved person may petition the State Water Board to review the Regional Water Board decision regarding the final WDRs. The State Water Board must receive the petition at the following address within 30 calendar days of the Regional Water Board action:

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

For instructions on how to file a petition for review, see http://www.waterboards.ca.gov/public_notices/petitions/water_quality/wqpetition_instr.shtml.

E. Information and Copying. The Report of Waste Discharge, related supporting documents, and comments received are on file and may be inspected at the Regional Water Board (address above) at any time between 9:00 a.m. and 5:00 p.m., Monday through Friday. Copying of documents may be arranged 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 the 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 Patrick Karinja, at (510) 622-2407 or patrick.karinja@waterboards.ca.gov.

ATTACHMENT F-1

Derivation of Technology-Based Effluent Limitations
Shell Martinez Refinery

References

1. 40 C.F.R. section 419, subpart B – Cracking Subcategory, *Effluent Limitation Guidelines and New Source Performance Standards for the Petroleum Refining Point Source Category* (2006)

2. *Development Document for Effluent Limitations Guidelines and New Source Performance Standards for the Petroleum Refining Point Source Category,* EPA 440/1-82-014 (1982)

3. *Guide for the Application of Effluent Limitations Guidelines for the Petroleum Refining Industry,* U.S. EPA Office of Water Regulations and Standards (1985)

4. Shell Martinez Refinery, *NPDES Permit Renewal Application, NPDES Permit No. CA0005789* (January 31, 2017)

5. Refinery Production Data from *NPDES Permit Renewal Application, NPDES Permit No. CA0005789* (January 31, 2017)

Applicable Definitions

Process Wastewater means any water, which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product. [40 C.F.R. § 401.11(q)]

Runoff means the flow of stormwater resulting from precipitation coming into contact with petroleum refinery property. [40 C.F.R. § 419.11(b)]

Ballast means the flow of waters, from a ship, that is treated along with refinery wastewaters in the main treatment system. [40 C.F.R. § 419.11(c)]

Contaminated Runoff means runoff that comes into contact with any raw material, intermediate product, finished product, by-product, or waste product located on petroleum refinery property. [40 C.F.R. § 419.11(g)]

Background

Effluent Limitations Guidelines (ELGs) for the Cracking Subcategory of the Petroleum Refining Point Source Category at 40 C.F.R. part 419, Subpart B, are based, in part, on a discharger's production rate. The Discharger's current production rate is 147,400 barrels per day (bbls/day).

<u>*Process Wastewaters.*</u> The ELGs include limitations for process wastewaters based on best practicable control technology currently available (BPT), best available technology economically achievable (BAT), and best conventional pollutant control technology (BCT). Specific BPT, BAT, and BCT effluent limitations that apply to the Discharger must be derived using methods described by the ELGs and take into account such factors as production rate, as well as refinery processes and configuration. The most stringent of BPT, BAT, and BCT limitations apply.

For derivation of BPT, BAT, and BCT limitations for process wastewaters being discharged at Discharge Point No. 001, size factors and process factors are determined as follows:

Size Factor. At a crude processing rate of 147,400 bbls/day, based on process data collected between September 1, 2014, through August 31, 2015, the appropriate size factor, pursuant to the ELGs at 40 C.F.R. section 419.22(b)(1) for BPT, 40 C.F.R. section 419.23(b)(1) for BAT, and 40 C.F.R. section 419.24(b)(1) for BCT, for derivation of technology-based effluent limitations is 1.35.

Process Factor. The process configuration for each process is determined by summing the process feedstock rates for each crude and cracking and coking process at the refinery. Each individual feedstock rate is multiplied by the capacity relative to the throughput, and a weight factor specific for each process, to derive a "process configuration," which in turn is used to determine a "process factor" in accordance with the ELGs at 40 C.F.R. section 419.22(b) (2) for BPT, 40 C.F.R. section 419.23(b)(2) for BAT, and 40 C.F.R. section 419.24(b)(2) for BCT.

Processes considered in deriving the process factors are those processes within the crude and cracking and coking categories as reported by the Discharger. The forgoing categories correspond to the process groups listed within the *Guide for the Application of Effluent Limitations Guidelines for the Petroleum Refining Industry*.

Derivation of the process configuration for a production rate of 147,400 bbls/day is shown in the following table:

Table F-1A. Process Configurations for Discharge Point No. 001

Production at 147,400 bbls/day				
Process	**Process Feedstock Rate (x 1,000 bbls/day)**	**Process/Feedstock Ratio**	**Weight Factor**	**Process Configuration**
Crude				
Atm. Dist.	147.40	1.000		
Vac. Dist.	83.70	0.568		
Desalt.	147.40	1.000		
Total	378.50	2.568	1	= 2.57
Cracking				
Fluid Catalytic Cracking	66.80	0.453		
Delayed Coking	23.90	0.162		
Hydrocracking	41.50	0.282		
Fluid Coking (Flexicooker)	19.80	0.134		
Total	152.00	1.031	6	= 6.19
Lube				
Lube Hydrofining	0.00	0.00		
Deasphalting	0.00	0.00		
Solvent Dewax/Treating	0.00	0.00		
Fractionation	0.00	0.00		
Deoiling	0.00	0.00		
Others (Clay Contacting)	0.00	0.00		
Total	0.00	0.00	13	= 0.00
Asphalt				
Asphalt Production	0.00	0.00		
Asphalt Oxidizing	0.00	0.00		
Asphalt Emulsions	0.00	0.00		
Unfluxed Asphalt	0.00	0.00		

Production at 147,400 bbls/day				
Process	**Process Feedstock Rate (x 1,000 bbls/day)**	**Process/Feedstock Ratio**	**Weight Factor**	**Process Configuration**
Total	0.00	0.00	12	= 0.00
Reforming and Alkylation Processes				
Catalytic Reforming	26.80	0.182		
Sulfuric Acid Alkylation	13.00	0.088		
Total	39.80	0.270	0	= 0.00
Total Refinery Configuration at 147,400 bbls/day				**= 8.76**

The process factor, as determined in accordance with 40 C.F.R. section 419.22(b)(2) for BPT, 40 C.F.R. section 419.23(b)(2) for BAT, and 40 C.F.R. section 419.24(b)(2) for BCT, is 1.67.

To determine BAT limitations for total and hexavalent chromium and phenolic compounds in process wastewaters, the ELGs require consideration of effluent factors and refinery processes. BAT effluent factors are presented at 40 C.F.R. section 419.23(c)(1); the refinery processes considered are the crude, cracking and coking, and reforming and alkylation processes, which correspond to those identified within the *Guide for the Application of Effluent Limitations Guidelines for the Petroleum Refining.*

Contaminated Runoff. The ELGs establish BPT, BAT, and BCT limitations for contaminated runoff, which apply to all stormwater discharges except stormwater treated and discharged with process wastewaters through Discharge Point No. 001. The ELGs establish effluent limitations for oil and grease and total organic carbon (TOC). The ELGs also establish additional limitations for BOD_5, TSS, COD, phenolic compounds, total chromium, hexavalent chromium, and pH, found at 40 C.F.R. section 419.22(e)(2) and 419.23(f)(2), which apply if limitations for oil and grease or TOC are exceeded,

Determination of Process Wastewater Effluent Limitations at Discharge Point No. 001

BPT. The following table shows the derivation of process wastewater BPT limitations at a production rate of 147,400 bbls/day.

Effluent Limitation = (Size Factor) x (Process Factor) x (Feed Stock Rate) x (Effluent Limitation Factor)

Table F-1B. BPT Limitations for Process Wastewaters

	Preliminary Effluent Limitation Factors [1]		**Size Factor**	**Process Factor**	**Feed Stock Rate**	**Effluent Limitations** [2]	
	Max Daily	**Avg Monthly**				**Max Daily**	**Avg Monthly**
Production at 147,400 bbls/day							
BOD_5	9.9	5.5	1.35	1.67	147.4	3,300	1,800
TSS	6.9	4.4	1.35	1.67	147.4	2,300	1,500
COD	74.0	38.4	1.35	1.67	147.4	25,000	13,000
Oil & Grease	3.0	1.6	1.35	1.67	147.4	1,000	530
Phenolic (4AAP)	0.074	0.036	1.35	1.67	147.4	25	12
Ammonia (as N)	6.6	3.0	1.35	1.67	147.4	2,200	1,000
Sulfide	0.065	0.029	1.35	1.67	147.4	22	9.6
Total Chromium	0.15	0.088	1.35	1.67	147.4	50	29

	Preliminary Effluent Limitation Factors [1]		Size Factor	Process Factor	Feed Stock Rate	Effluent Limitations [2]	
	Max Daily	Avg Monthly				Max Daily	Avg Monthly
Hexavalent Chromium	0.012	0.0056	1.35	1.67	147.4	4.0	1.9
pH	--	--	--	--	--	6.0 - 9.0	

[1] From 40 C.F.R. § 419.22(a) (pounds per 1,000 bbls of feedstock)
[2] Pounds per day (lbs/day)

BAT. The following table shows the derivation of BAT limitations for process wastewaters at production rates of 147,400 bbls/day:

Table F-1C. BAT Limitations for Process Wastewater

	Preliminary Effluent Limitation Factors [1]		Size Factor	Process Factor	Feed Stock Rate	Effluent Limitations [2]	
	Max Daily	Avg Monthly				Max Daily	Avg Monthly
Production at 147,400 bbls/day							
COD [3]	74.0	38.4	1.35	1.67	147.4	25,000	13,000
Total Ammonia, as N	6.6	3.0	1.35	1.67	147.4	2,200	1,000
Sulfide	0.065	0.029	1.35	1.67	147.4	22	9.6

[1] From 40 C.F.R. § 419.23(a) (pounds per 1,000 bbls of feedstock)
[2] Pounds/day (lbs/day)
[3] If the Discharger can demonstrate that the effluent chloride concentration exceeds 1,000 mg/L, TOC may be substituted in lieu of COD. Effluent limitations for TOC must then be based on effluent data correlating TOC to BOD_5.

BAT limitations for total and hexavalent chromium and phenolic compounds are based on feedstock rates. Figures used in calculations for this Order are shown in the following table:

Table F-1D. Feedstock Rates for Determining BAT Limitations

Refinery Throughput	147,400 bbls/day
Crude	
Atmospheric Distillation	147.40
Vacuum Distillation	83.70
Desalter	147.40
Total	**378.50**
Cracking and Coking	
Fluid Cat Cracking	66.80
Delayed Coking	23.90
Hydrocracking	41.50
Fluid Coking (Flexicooker)	19.80
Total	**152.00**
Reforming and Alkylation	
Cat Reforming	26.80
Sulfuric Acid Alkylation	13.00
Total	**39.80**

Based on the total feedstock rates shown above, derivation of BAT limitations for total and hexavalent chromium and phenolic compounds is shown in the following table:

Table F-1E. BAT Limitations for Process Wastewater (Chromium and Phenolics)

Pollutant	Preliminary Effluent Limitation Factors [1]		Feedstock Rate	Effluent Limitations [2]	
	Max Daily	Avg Monthly		Max Daily	Avg Monthly
Production at 147,400 bbls/day					
Phenolic Compounds					
Crude	0.013	0.003	378.50	4.92	1.14
Cracking and Coking	0.147	0.036	152.00	22.34	5.47
Asphalt	0.079	0.019	0.00	0.00	0.00
Lube	0.369	0.090	0.00	0.00	0.00
Reforming and Alkylation	0.132	0.032	39.80	5.25	1.27
Limitation (Sum)	---	---	---	**32.52**	**7.88**
Total Chromium					
Crude	0.011	0.004	378.50	4.16	1.51
Cracking and Coking	0.119	0.041	152.00	18.09	6.23
Asphalt	0.064	0.022	0.00	0.00	0.00
Lube	0.299	0.104	0.00	0.00	0.00
Reforming and Alkylation	0.107	0.037	39.80	4.26	1.47
Limitation (Sum)	---	---	---	**26.51**	**9.22**
Hexavalent Chromium					
Crude	0.0007	0.0003	378.50	0.26	0.11
Cracking and Coking	0.0076	0.0034	152.00	1.16	0.52
Asphalt	0.0041	0.0019	0.00	0.00	0.00
Lube	0.0192	0.0087	0.00	0.00	0.00
Reforming and Alkylation	0.0069	0.0031	39.80	0.27	0.12
Limitation (Sum)	---	---	---	**1.69**	**0.75**

[1] From 40 C.F.R. § 419.23(c) (pounds per 1,000 bbls of feedstock)
[2] Pounds per day

BCT. The following table shows the derivation of BCT limitations for process wastewaters at production rates of 147,400 bbls/day:

Table F-1F. BCT Limitations for Process Wastewater

Pollutant	Preliminary Effluent Limitation Factors [1]		Size Factor	Process Factor	Feed Stock Rate	Final Effluent Limitations [2]	
	Max Daily	Avg Monthly				Max Daily	Avg Monthly
Production at 147,400 bbls/day							
BOD_5	9.9	5.5	1.35	1.67	147.4	3,300	1,800
TSS	6.9	4.4	1.35	1.67	147.4	2,300	1,500
Oil and Grease	3.0	1.6	1.35	1.67	147.4	1,000	530
pH	--	--	--	--	--	6.0 – 9.0	

[1] From 40 C.F.R. § 419.24(a) (pounds per 1000 bbls of feedstock)
[2] Pounds per day (lbs/day)

Most Stringent Technology-Based Process Wastewater Effluent Limitations. The following table presents the technology-based process wastewater effluent limitations for Discharge Point No. 001. The

limitations are the most stringent of the BPT, BAT, and BCT limitations calculated above and are expressed in units of pounds per day.

Table F-1G. Summary of Technology-Based Process Wastewater Effluent Limitations

Pollutant	Effluent Limitations [1],[2]	
	Max Daily	Avg Monthly
Production at 147,400 bbls/day		
BOD_5	3,300	1,800
TSS	2,300	1,500
COD	25,000	13,000
Oil and Grease	1,000	530
Phenolics (4AAP)	25	7.9 [3, 4]
Ammonia (as N)	2,200	1,000
Sulfide	22	9.6
Total Chromium	27 [3, 4]	9.2 [3, 4]
Hexavalent Chromium	1.7 [3, 4]	0.75 [3, 4]
pH	6.0 – 9.0 pH units	

[1] Units are lbs/day.
[2] All technology-based effluent limitations for process wastewater reflect BPT requirements from 40 C.F.R. § 419.22 unless otherwise noted.
[3] Reflect BAT requirements from 40 C.F.R. § 419.23.
[4] Consistent with anti-backsliding provisions, this Order retains from the previous order effluent limitations that are more stringent than these newly calculated effluent limitations.

Determination of Effluent Limitations for Contaminated Runoff

If contaminated stormwater discharges exceed the oil and grease limitation (15 mg/L) or the total organic carbon limitation (110 mg/L), additional concentration-based limitations for BOD_5, TSS, COD, phenolic compounds, total chromium, hexavalent chromium, and pH are required to become immediately effective. The effluent limitations for these pollutants are derived from the most stringent of BPT and BAT effluent concentration-based limitations provided in the ELGs. Tables summarizing these effluent limitations are shown below:

Table F-1H. Effluent Limitations for Contaminated Runoff

Pollutant	Units	Max Daily [1]	Average Monthly [1]
BOD_5	mg/L	48	26
TSS		33	21
COD		360	180
Oil and Grease		15	8.0
Phenolic Compounds		0.35	0.17
Total Chromium		0.60	0.21
Hexavalent Chromium		0.062	0.028
pH	s.u.	6.0 – 9.0	

[1] All effluent limitations reflect BPT requirements from 40 C.F.R. § 419.22(e)(2), except limitations for total chromium, which reflect BAT requirements from 40 C.F.R. § 419.22(f)(2).

Determination of Additional Effluent Limitation Allocations for Contaminated Runoff and Ballast Water

If contaminated runoff or ballast water is comingled with process wastewater, additional effluent limitation allocations are established on top of the process wastewater mass-based limitations. These additional effluent limitation allocations are derived from the most stringent of BPT and BAT effluent

concentration-based limitations provided in the ELGs. Tables summarizing these additional effluent limitation allocations are shown below:

Table F-1I. Additional Contaminated Runoff Effluent Limitation Allocations

Pollutant	Units	Max Daily [1]	Average Monthly [1]
BOD_5	mg/L	48	26
TSS		33	21
COD		360	180
Oil and Grease		15	8.0
Phenolic Compounds		0.35	0.17
Total Chromium		0.60	0.21
Hexavalent Chromium		0.062	0.028

[2] All effluent limitations reflect BPT requirements from 40 C.F.R. § 419.22(e)(2), except limitations for total chromium, which reflect BAT requirements from 40 C.F.R. § 419.22(f)(2).

Table F-1J. Additional Ballast Water Effluent Limitation Allocations

Pollutant	Units	Max Daily [1]	Average Monthly [1]
BOD_5	mg/L	48	26
TSS		33	21
COD		470	240
Oil and Grease		15	8.0

[1] All effluent limitations reflect BPT requirements from 40 C.F.R. § 419.22(c).

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ATTACHMENT G

REGIONAL STANDARD PROVISIONS, AND MONITORING AND REPORTING REQUIREMENTS
(SUPPLEMENT TO ATTACHMENT D)

For

NPDES WASTEWATER DISCHARGE PERMITS

March 2010

Contents

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

REGIONAL STANDARD PROVISIONS, AND MONITORING AND REPORTING REQUIREMENTS (SUPPLEMENT TO ATTACHMENT D)

FOR

NPDES WASTEWATER DISCHARGE PERMITS

APPLICABILITY

This document applies to dischargers covered by a National Pollutant Discharge Elimination System (NPDES) permit. This document does not apply to Municipal Separate Storm Sewer System (MS4) NPDES permits.

The purpose of this document is to supplement the requirements of Attachment D, Standard Provisions. The requirements in this supplemental document are designed to ensure permit compliance through preventative planning, monitoring, recordkeeping, and reporting. In addition, this document requires proper characterization of issues as they arise, and timely and full responses to problems encountered. To provide clarity on which sections of Attachment D this document supplements, this document is arranged in the same format as Attachment D.

I. STANDARD PROVISIONS - PERMIT COMPLIANCE

A. Duty to Comply – Not Supplemented

B. Need to Halt or Reduce Activity Not a Defense – Not Supplemented

C. Duty to Mitigate – This supplements I.C. of Standard Provisions (Attachment D)

1. Contingency Plan - The Discharger shall maintain a Contingency Plan as originally required by Regional Water Board Resolution 74-10 and as prudent in accordance with current municipal facility emergency planning. The Contingency Plan shall describe procedures to ensure that existing facilities remain in, or are rapidly returned to, operation in the event of a process failure or emergency incident, such as employee strike, strike by suppliers of chemicals or maintenance services, power outage, vandalism, earthquake, or fire. The Discharger may combine the Contingency Plan and Spill Prevention Plan into one document. Discharge in violation of the permit where the Discharger has failed to develop and implement a Contingency Plan as described below will be the basis for considering the discharge a willful and negligent violation of the permit pursuant to California Water Code Section 13387. The Contingency Plan shall, at a minimum, contain the provisions of a. through g. below.

a. Provision of personnel for continued operation and maintenance of sewerage facilities during employee strikes or strikes against contractors providing services.

b. Maintenance of adequate chemicals or other supplies and spare parts necessary for continued operations of sewerage facilities.

c. Provisions of emergency standby power.

d. Protection against vandalism.

e. Expeditious action to repair failures of, or damage to, equipment and sewer lines.

f. Report of spills and discharges of untreated or inadequately treated wastes, including measures taken to clean up the effects of such discharges.

g. Programs for maintenance, replacement, and surveillance of physical condition of equipment, facilities, and sewer lines.

2. Spill Prevention Plan - The Discharger shall maintain a Spill Prevention Plan to prevent accidental discharges and minimize the effects of such events. The Spill Prevention Plan shall:

a. Identify the possible sources of accidental discharge, untreated or partially treated waste bypass, and polluted drainage;

b. Evaluate the effectiveness of present facilities and procedures, and state when they became operational; and

c. Predict the effectiveness of the proposed facilities and procedures, and provide an implementation schedule containing interim and final dates when they will be constructed, implemented, or operational.

This Regional Water Board, after review of the Contingency and Spill Prevention Plans or their updated revisions, may establish conditions it deems necessary to control accidental discharges and to minimize the effects of such events. Such conditions may be incorporated as part of the permit upon notice to the Discharger.

D. Proper Operation & Maintenance – This supplements I.D of Standard Provisions (Attachment D)

1. Operation and Maintenance (O&M) Manual - The Discharger shall maintain an O&M Manual to provide the plant and regulatory personnel with a source of information describing all equipment, recommended operational strategies, process control monitoring, and maintenance activities. To remain a useful and relevant document, the O&M Manual shall be kept updated to reflect significant changes in treatment facility equipment and operational practices. The O&M Manual shall be maintained in usable condition and be available for reference and use by all relevant personnel and Regional Water Board staff.

2. Wastewater Facilities Status Report - The Discharger shall regularly review, revise, or update, as necessary, its Wastewater Facilities Status Report. This report shall document how the Discharger operates and maintains its wastewater collection, treatment, and disposal facilities to ensure that all facilities are adequately staffed, supervised, financed, operated, maintained, repaired, and upgraded as necessary to provide adequate and reliable transport, treatment, and disposal of all wastewater from both existing and planned future wastewater sources under the Discharger's service responsibilities.

3. Proper Supervision and Operation of Publicly Owned Treatment Works (POTWs) - POTWs shall be supervised and operated by persons possessing certificates of appropriate grade pursuant to Division 4, Chapter 14, Title 23 of the California Code of Regulations.

E. Property Rights – Not Supplemented

F. Inspection and Entry – Not Supplemented

G. Bypass – Not Supplemented

H. Upset – Not Supplemented

I. Other – This section is an addition to Standard Provisions (Attachment D)

1. Neither the treatment nor the discharge of pollutants shall create pollution, contamination, or nuisance as defined by California Water Code Section 13050.

2. Collection, treatment, storage, and disposal systems shall be operated in a manner that precludes public contact with wastewater, except in cases where excluding the public is infeasible, such as private property. If public contact with wastewater could reasonably occur on public property, warning signs shall be posted.

3. If the Discharger submits a timely and complete Report of Waste Discharge for permit reissuance, this permit continues in force and effect until a new permit is issued or the Regional Water Board rescinds the permit.

J. Stormwater – This section is an addition to Standard Provisions (Attachment D)

These provisions apply to facilities that do not direct all stormwater flows from the facility to the wastewater treatment plant headworks.

1. Stormwater Pollution Prevention Plan (SWPP Plan)

The SWPP Plan shall be designed in accordance with good engineering practices and shall address the following objectives:

a. To identify pollutant sources that may affect the quality of stormwater discharges; and

b. To identify, assign, and implement control measures and management practices to reduce pollutants in stormwater discharges.

The SWPP Plan may be combined with the existing Spill Prevention Plan as required in accordance with Section C.2. The SWPP Plan shall be retained on-site and made available upon request of a representative of the Regional Water Board.

2. Source Identification

The SWPP Plan shall provide a description of potential sources that may be expected to add significant quantities of pollutants to stormwater discharges, or may result in non-stormwater discharges from the facility. The SWPP Plan shall include, at a minimum, the following items:

a. A topographical map (or other acceptable map if a topographical map is unavailable), extending one-quarter mile beyond the property boundaries of the facility, showing the wastewater treatment facility process areas, surface water bodies (including springs and wells), and discharge point(s) where the facility's stormwater discharges to a municipal storm drain system or other points of discharge to waters of the State. The requirements of this paragraph may be included in the site map required under the following paragraph if appropriate.

b. A site map showing the following:

1) Stormwater conveyance, drainage, and discharge structures;

2) An outline of the stormwater drainage areas for each stormwater discharge point;

3) Paved areas and buildings;

4) Areas of actual or potential pollutant contact with stormwater or release to stormwater, including but not limited to outdoor storage and process areas; material loading, unloading, and access areas; and waste treatment, storage, and disposal areas;

5) Location of existing stormwater structural control measures (i.e., berms, coverings, etc.);

6) Surface water locations, including springs and wetlands; and

7) Vehicle service areas.

c. A narrative description of the following:

1) Wastewater treatment process activity areas;

2) Materials, equipment, and vehicle management practices employed to minimize contact of significant materials of concern with stormwater discharges;

3) Material storage, loading, unloading, and access areas;

4) Existing structural and non-structural control measures (if any) to reduce pollutants in stormwater discharges; and

5) Methods of on-site storage and disposal of significant materials.

d. A list of pollutants that have a reasonable potential to be present in stormwater discharges in significant quantities.

3. Stormwater Management Controls

The SWPP Plan shall describe the stormwater management controls appropriate for the facility and a time schedule for fully implementing such controls. The appropriateness and priorities of controls in the SWPP Plan shall reflect identified potential sources of pollutants. The description of stormwater management controls to be implemented shall include, as appropriate:

a. Stormwater pollution prevention personnel

Identify specific individuals (and job titles) that are responsible for developing, implementing, and reviewing the SWPP Plan.

b. Good housekeeping

Good housekeeping requires the maintenance of clean, orderly facility areas that discharge stormwater. Material handling areas shall be inspected and cleaned to reduce the potential for pollutants to enter the storm drain conveyance system.

c. Spill prevention and response

Identify areas where significant materials can spill into or otherwise enter stormwater conveyance systems and their accompanying drainage points. Specific material handling procedures, storage requirements, and cleanup equipment and procedures shall be identified, as appropriate. The necessary equipment to implement a cleanup shall be available, and personnel shall be trained in proper response, containment, and cleanup of spills. Internal reporting procedures for spills of significant materials shall be established.

d. Source control

Source controls include, for example, elimination or reduction of the use of toxic pollutants, covering of pollutant source areas, sweeping of paved areas, containment of potential pollutants, labeling of all storm drain inlets with “No Dumping” signs, isolation or separation of industrial and non-industrial pollutant sources so that runoff from these areas does not mix, etc.

e. Stormwater management practices

Stormwater management practices are practices other than those that control the sources of pollutants. Such practices include treatment or conveyance structures, such as drop inlets, channels, retention and detention basins, treatment vaults, infiltration galleries, filters, oil/water separators, etc. Based on assessment of the potential of various sources to contribute pollutants to stormwater discharges in significant quantities, additional stormwater management practices to remove pollutants from stormwater discharges shall be implemented and design criteria shall be described.

f. Sediment and erosion control

Measures to minimize erosion around the stormwater drainage and discharge points, such as riprap, revegetation, slope stabilization, etc., shall be described.

g. Employee training

Employee training programs shall inform all personnel responsible for implementing the SWPP Plan. Training shall address spill response, good housekeeping, and material management practices. New employee and refresher training schedules shall be identified.

h. Inspections

All inspections shall be done by trained personnel. Material handling areas shall be inspected for evidence of, or the potential for, pollutants entering stormwater discharges. A tracking or follow up procedure shall be used to ensure appropriate response has been taken in response to an inspection. Inspections and maintenance activities shall be documented and recorded. Inspection records shall be retained for five years.

i. Records

A tracking and follow-up procedure shall be described to ensure that adequate response and corrective actions have been taken in response to inspections.

4. Annual Verification of SWPP Plan

An annual facility inspection shall be conducted to verify that all elements of the SWPP Plan are accurate and up-to-date. The results of this review shall be reported in the Annual Report to the Regional Water Board described in Section V.C.f.

K. Biosolids Management – This section is an addition to Standard Provisions (Attachment D)

Biosolids must meet the following requirements prior to land application. The Discharger must either demonstrate compliance or, if it sends the biosolids to another party for further treatment or distribution, must give the recipient the information necessary to ensure compliance.

1. Exceptional quality biosolids meet the pollutant concentration limits in Table III of 40 CFR Part 503.13, Class A pathogen limits, and one of the vector attraction reduction requirements

in 503.33(b)(1)-(b)(8). Such biosolids do not have to be tracked further for compliance with general requirements (503.12) and management practices (503.14).

2. Biosolids used for agricultural land, forest, or reclamation shall meet the pollutant limits in Table I (ceiling concentrations) and Table II or Table III (cumulative loadings or pollutant concentration limits) of 503.13. They shall also meet the general requirements (503.12) and management practices (503.14) (if not exceptional quality biosolids) for Class A or Class B pathogen levels with associated access restrictions (503.32) and one of the 10 vector attraction reduction requirements in 503.33(b)(1)-(b)(10).

3. Biosolids used for lawn or home gardens must meet exceptional quality biosolids limits.

4. Biosolids sold or given away in a bag or other container must meet the pollutant limits in either Table III or Table IV (pollutant concentration limits or annual pollutant loading rate limits) of 503.13. If Table IV is used, a label or information sheet must be attached to the biosolids packing that explains Table IV (see 503.14). The biosolids must also meet the Class A pathogen limits and one of the vector attraction reduction requirements in 503.33(b)(1)-(b)(8).

II. STANDARD PROVISIONS – PERMIT ACTION – Not Supplemented

III. STANDARD PROVISIONS – MONITORING

A. Sampling and Analyses – This section is a supplement to III.A and III.B of Standard Provisions (Attachment D)

1. Use of Certified Laboratories

Water and waste analyses shall be performed by a laboratory certified for these analyses in accordance with California Water Code Section 13176.

2. Use of Appropriate Minimum Levels

Table C lists the suggested analytical methods for the 126 priority pollutants and other toxic pollutants that should be used, unless a particular method or minimum level (ML) is required in the MRP.

For priority pollutant monitoring, when there is more than one ML value for a given substance, the Discharger may select any one of the analytical methods cited in Table C for compliance determination, or any other method described in 40 CFR part 136 or approved by U.S. EPA (such as the 1600 series) if authorized by the Regional Water Board. However, the ML must be below the effluent limitation and water quality objective. If no ML value is below the effluent limitation and water quality objective, then the method must achieve an ML no greater than the lowest ML value indicated in Table C. All monitoring instruments and equipment shall be properly calibrated and maintained to ensure accuracy of measurements.

3. Frequency of Monitoring

The minimum schedule of sampling analysis is specified in the MRP portion of the permit.

a. Timing of Sample Collection

1) The Discharger shall collect samples of influent on varying days selected at random and shall not include any plant recirculation or other sidestream wastes, unless otherwise stipulated by the MRP.

2) The Discharger shall collect samples of effluent on days coincident with influent sampling unless otherwise stipulated by the MRP or the Executive Officer. The Executive Officer may approve an alternative sampling plan if it is demonstrated to be representative of plant discharge flow and in compliance with all other permit requirements.

3) The Discharger shall collect grab samples of effluent during periods of day-time maximum peak effluent flows (or peak flows through secondary treatment units for facilities that recycle effluent flows).

4) Effluent sampling for conventional pollutants shall occur on at least one day of any multiple-day bioassay test the MRP requires. During the course of the test, on at least one day, the Discharger shall collect and retain samples of the discharge. In the event a bioassay test does not comply with permit limits, the Discharger shall analyze these retained samples for pollutants that could be toxic to aquatic life and for which it has effluent limits.

i. The Discharger shall perform bioassay tests on final effluent samples; when chlorine is used for disinfection, bioassay tests shall be performed on effluent after chlorination-dechlorination; and

ii. The Discharger shall analyze for total ammonia nitrogen and calculate the amount of un-ionized ammonia whenever test results fail to meet the percent survival specified in the permit.

b. Conditions Triggering Accelerated Monitoring

1) If the results from two consecutive samples of a constituent monitored in a 30-day period exceed the monthly average limit for any parameter (or if the required sampling frequency is once per month and the monthly sample exceeds the monthly average limit), the Discharger shall, within 24 hours after the results are received, increase its sampling frequency to daily until the results from the additional sampling show that the parameter is in compliance with the monthly average limit.

2) If any maximum daily limit is exceeded, the Discharger shall increase its sampling frequency to daily within 24 hours after the results are received that indicate the exceedance of the maximum daily limit until two samples collected on consecutive days show compliance with the maximum daily limit.

3) If final or intermediate results of an acute bioassay test indicate a violation or threatened violation (e.g., the percentage of surviving test organisms of any single acute bioassay test is less than 70 percent), the Discharger shall initiate a new test as soon as practical, and the Discharger shall investigate the cause of the mortalities and report its findings in the next self monitoring report (SMR).

4) The Discharger shall calibrate chlorine residual analyzers against grab samples as frequently as necessary to maintain accurate control and reliable operation. If an effluent violation is detected, the Discharger shall collect grab samples at least every 30 minutes until compliance with the limit is achieved, unless the Discharger monitors chlorine residual continuously. In such cases, the Discharger shall continue to conduct continuous monitoring as required by its permit.

5) When a bypass occurs (except one subject to provision III.A.3.b.6 below), the Discharger shall monitor flows and collect samples on a daily basis for all constituents at affected discharge points that have effluent limits for the duration of the bypass (including acute toxicity using static renewals), except chronic toxicity, unless otherwise stipulated by the MRP.

6) Unless otherwise stipulated by the MRP, when a bypass approved pursuant to Attachment D, Standard Provisions, Sections I.G.2 or I.G.4, occurs, the Discharger shall monitor flows and, using appropriate procedures as specified in the MRP, collect and retain samples for affected discharge points on a daily basis for the duration of the bypass. The Discharger shall analyze for total suspended solids (TSS) using 24-hour composites (or more frequent increments) and for bacteria indicators with effluent limits using grab samples. If TSS exceeds 45 mg/L in any composite sample, the Discharger shall also analyze the retained samples for that discharge for all other constituents that have effluent limits, except oil and grease, mercury, dioxin-TEQ, and acute and chronic toxicity. Additionally, at least once each year, the Discharger shall analyze the retained samples for one approved bypass discharge event for all other constituents that have effluent limits, except oil and grease, mercury, dioxin-TEQ, and acute and chronic toxicity. This monitoring shall be in addition to the minimum monitoring specified in the MRP.

c. Stormwater Monitoring

The requirements of this section only apply to facilities that are not covered by an NPDES permit for stormwater discharges and where not all site storm drainage from process areas (i.e., areas of the treatment facility where chemicals or wastewater could come in contact with stormwater) is directed to the headworks. For stormwater not directed to the headworks during the wet season (October 1 to April 30), the Discharger shall:

1) Conduct visual observations of the stormwater discharge locations during daylight hours at least once per month during a storm event that produces significant stormwater discharge to observe the presence of floating and suspended materials, oil and grease, discoloration, turbidity, and odor, etc.

2) Measure (or estimate) the total volume of stormwater discharge, collect grab samples of stormwater discharge from at least two storm events that produce significant stormwater discharge, and analyze the samples for oil and grease, pH, TSS, and specific conductance.

   The grab samples shall be taken during the first 30 minutes of the discharge. If collection of the grab samples during the first 30 minutes is impracticable, grab samples may be taken during the first hour of the discharge, and the Discharger shall explain in the Annual Report why the grab sample(s) could not be taken in the first 30 minutes.

3) Testing for the presence of non-stormwater discharges shall be conducted no less than twice during the dry season (May 1 to September 30) at all stormwater discharge locations. Tests may include visual observations of flows, stains, sludges, odors, and other abnormal conditions; dye tests; TV line surveys; or analysis and validation of accurate piping schematics. Records shall be maintained describing the method used, date of testing, locations observed, and test results.

4) Samples shall be collected from all locations where stormwater is discharged. Samples shall represent the quality and quantity of stormwater discharged from the facility. If a facility discharges stormwater at multiple locations, the Discharger may sample a reduced number of locations if it establishes and documents through the monitoring program that stormwater discharges from different locations are substantially identical.

5) Records of all stormwater monitoring information and copies of all reports required by the permit shall be retained for a period of at least three years from the date of sample, observation, or report.

d. Receiving Water Monitoring

   The requirements of this section only apply when the MRP requires receiving water sampling.

   1) Receiving water samples shall be collected on days coincident with effluent sampling for conventional pollutants.

   2) Receiving water samples shall be collected at each station on each sampling day during the period within one hour following low slack water. Where sampling during lower slack water is impractical, sampling shall be performed during higher slack water. Samples shall be collected within the discharge plume and down current of the discharge point so as to be representative, unless otherwise stipulated in the MRP.

   3) Samples shall be collected within one foot of the surface of the receiving water, unless otherwise stipulated in the MRP.

B. Biosolids Monitoring – This section supplements III.B of Standard Provisions (Attachment D)

When biosolids are sent to a landfill, sent to a surface disposal site, or applied to land as a soil amendment, they must be monitored as follows:

1. Biosolids Monitoring Frequency

Biosolids disposal must be monitored at the following frequency:

Metric tons biosolids/365 days	**Frequency**
0-290	Once per year
290-1500	Quarterly
1500-15,000	Six times per year
Over 15,000	Once per month

(Metric tons are on a dry weight basis)

2. Biosolids Pollutants to Monitor

Biosolids shall be monitored for the following constituents:

- Land Application: Arsenic, cadmium, copper, mercury, molybdenum, nickel, lead, selenium, and zinc
- Municipal Landfill: Paint filter test (pursuant to 40 CFR 258)
- Biosolids-only Landfill or Surface Disposal Site (if no liner and leachate system): arsenic, chromium, and nickel

C. Standard Observations – This section is an addition to III of Standard Provisions (Attachment D)

1. Receiving Water Observations

The requirements of this section only apply when the MRP requires standard observations of the receiving water. Standard observations shall include the following:

a. *Floating and suspended materials* (e.g., oil, grease, algae, and other macroscopic particulate matter): presence or absence, source, and size of affected area.

b. *Discoloration and turbidity*: description of color, source, and size of affected area.

c. *Odor*: presence or absence, characterization, source, distance of travel, and wind direction.

d. *Beneficial water use*: presence of water-associated waterfowl or wildlife, fisherpeople, and other recreational activities in the vicinity of each sampling station.

e. *Hydrographic condition*: time and height of corrected high and low tides (corrected to nearest National Oceanic and Atmospheric Administration location for the sampling date and time of sample collection).

f. *Weather conditions*:

1) Air temperature; and

2) Total precipitation during the five days prior to observation.

2. Wastewater Effluent Observations

The requirements of this section only apply when the MRP requires wastewater effluent standard observations. Standard observations shall include the following:

a. *Floating and suspended material of wastewater origin* (e.g., oil, grease, algae, and other macroscopic particulate matter): presence or absence.

b. *Odor*: presence or absence, characterization, source, distance of travel, and wind direction.

3. Beach and Shoreline Observations

The requirements of this section only apply when the MRP requires beach and shoreline standard observations. Standard observations shall include the following:

a. *Material of wastewater origin*: presence or absence, description of material, estimated size of affected area, and source.

b. *Beneficial use*: estimate number of people participating in recreational water contact, non-water contact, or fishing activities.

4. Land Retention or Disposal Area Observations

The requirements of this section only apply to facilities with on-site surface impoundments or disposal areas that are in use. This section applies to both liquid and solid wastes, whether confined or unconfined. The Discharger shall conduct the following for each impoundment:

a. Determine the amount of freeboard at the lowest point of dikes confining liquid wastes.

b. Report evidence of leaching liquid from area of confinement and estimated size of affected area. Show affected area on a sketch and volume of flow (e.g., gallons per minute [gpm]).

c. Regarding odor, describe presence or absence, characterization, source, distance of travel, and wind direction.

d. Estimate number of waterfowl and other water-associated birds in the disposal area and vicinity.

5. Periphery of Waste Treatment and/or Disposal Facilities Observations

The requirements of this section only apply when the MRP specifies periphery standard observations. Standard observations shall include the following:

a. *Odor*: presence or absence, characterization, source, and distance of travel.

b. *Weather conditions*: wind direction and estimated velocity.

IV. STANDARD PROVISIONS – RECORDS

A. Records to be Maintained – This supplements IV.A of Standard Provisions (Attachment D)

The Discharger shall maintain records in a manner and at a location (e.g., wastewater treatment plant or Discharger offices) such that the records are accessible to Regional Water Board staff. The minimum period of retention specified in Section IV, Records, of the Federal Standard Provisions shall be extended during the course of any unresolved litigation regarding the subject discharge, or when requested by the Regional Water Board or Regional Administrator of U.S. EPA, Region IX.

A copy of the permit shall be maintained at the discharge facility and be available at all times to operating personnel.

B. Records of monitoring information shall include – This supplements IV.B of Standard Provision (Attachment D)

1. Analytical Information

Records shall include analytical method detection limits, minimum levels, reporting levels, and related quantification parameters.

2. Flow Monitoring Data

For all required flow monitoring (e.g., influent and effluent flows), the additional records shall include the following, unless otherwise stipulated by the MRP:

a. Total volume for each day; and

b. Maximum, minimum, and average daily flows for each calendar month.

3. Wastewater Treatment Process Solids

a. For each treatment unit process that involves solids removal from the wastewater stream, records shall include the following:

1) Total volume or mass of solids removed from each collection unit (e.g., grit, skimmings, undigested biosolids, or combination) for each calendar month or other time period as appropriate, but not to exceed annually; and

2) Final disposition of such solids (e.g., landfill, other subsequent treatment unit).

b. For final dewatered biosolids from the treatment plant as a whole, records shall include the following:

1) Total volume or mass of dewatered biosolids for each calendar month;

2) Solids content of the dewatered biosolids; and

3) Final disposition of dewatered biosolids (disposal location and disposal method).

4. Disinfection Process

For the disinfection process, these additional records shall be maintained documenting process operation and performance:

a. For bacteriological analyses:

1) Wastewater flow rate at the time of sample collection; and

2) Required statistical parameters for cumulative bacterial values (e.g., moving median or geometric mean for the number of samples or sampling period identified in this Order).

b. For the chlorination process, when chlorine is used for disinfection, at least daily average values for the following:

1) Chlorine residual of treated wastewater as it enters the contact basin (mg/L);

2) Chlorine dosage (kg/day); and

3) Dechlorination chemical dosage (kg/day).

5. Treatment Process Bypasses

A chronological log of all treatment process bypasses, including wet weather blending, shall include the following:

a. Identification of the treatment process bypassed;

b. Dates and times of bypass beginning and end;

c. Total bypass duration;

d. Estimated total bypass volume; and

e. Description of, or reference to other reports describing, the bypass event, the cause, the corrective actions taken (except for wet weather blending that is in compliance with permit conditions), and any additional monitoring conducted.

6. Treatment Facility Overflows

This section applies to records for overflows at the treatment facility. This includes the headworks and all units and appurtenances downstream. The Discharger shall retain a chronological log of overflows at the treatment facility and records supporting the information provided in section V.E.2.

C. Claims of Confidentiality – Not Supplemented

V. STANDARD PROVISIONS – REPORTING

A. Duty to Provide Information – Not Supplemented

B. Signatory and Certification Requirements – Not Supplemented

C. Monitoring Reports – This section supplements V.C of Standard Provisions (Attachment D)

1. Self Monitoring Reports

For each reporting period established in the MRP, the Discharger shall submit an SMR to the Regional Water Board in accordance with the requirements listed in this document and at the frequency the MRP specifies. The purpose of the SMR is to document treatment performance, effluent quality, and compliance with the waste discharge requirements of this Order.

a. Transmittal letter

Each SMR shall be submitted with a transmittal letter. This letter shall include the following:

1) Identification of all violations of effluent limits or other waste discharge requirements found during the reporting period;

2) Details regarding violations: parameters, magnitude, test results, frequency, and dates;

3) Causes of violations;

4) Discussion of corrective actions taken or planned to resolve violations and prevent recurrences, and dates or time schedule of action implementation (if previous reports have been submitted that address corrective actions, reference to the earlier reports is satisfactory);

5) Data invalidation (Data should not be submitted in an SMR if it does not meet quality assurance/quality control standards. However, if the Discharger wishes to invalidate any measurement after it was submitted in an SMR, a letter shall identify the measurement suspected to be invalid and state the Discharger's intent to submit, within 60 days, a formal request to invalidate the measurement. This request shall include the original measurement in question, the reason for invalidating the measurement, all relevant documentation that supports invalidation [e.g., laboratory sheet, log entry, test results, etc.], and discussion of the corrective actions taken or planned [with a time schedule for completion] to prevent recurrence of the sampling or measurement problem.);

6) If the Discharger blends, the letter shall describe the duration of blending events and certify whether blended effluent was in compliance with the conditions for blending; and

7) Signature (The transmittal letter shall be signed according to Section V.B of this Order, Attachment D – Standard Provisions.).

b. Compliance evaluation summary

Each report shall include a compliance evaluation summary. This summary shall include each parameter for which the permit specifies effluent limits, the number of samples taken during the monitoring period, and the number of samples that exceed applicable effluent limits.

c. Results of analyses and observations

1) Tabulations of all required analyses and observations, including parameter, date, time, sample station, type of sample, test result, method detection limit, method minimum level, and method reporting level, if applicable, signed by the laboratory director or other responsible official.

2) When determining compliance with an average monthly effluent limitation and more than one sample result is available in a month, the Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of detected but not quantified (DNQ) or nondetect (ND). In those cases, the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

i. The data set shall be ranked from low to high, reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

ii. 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.

If a sample result, or the arithmetic mean or median of multiple sample results, is below the reporting limit, and there is evidence that the priority pollutant is present in the effluent above an effluent limitation and the Discharger conducts a Pollutant Minimization Program, the Discharger shall not be deemed out of compliance.

3) Dioxin-TEQ Reporting: The Discharger shall report for each dioxin and furan congener the analytical results of effluent monitoring, including the quantifiable limit (reporting level), the method detection limit, and the measured concentration. The Discharger shall report all measured values of individual congeners, including data qualifiers. When calculating dioxin-TEQ, the Discharger shall set congener concentrations below the minimum levels (ML) to zero. The Discharger shall calculate and report dioxin-TEQs using the following formula, where the MLs, toxicity equivalency factors (TEFs), and bioaccumulation equivalency factors (BEFs) are as provided in Table A:

$$\text{Dioxin-TEQ} = \Sigma\ (C_x \times TEF_x \times BEF_x)$$

where: C_x = measured or estimated concentration of congener *x*
TEF_x = toxicity equivalency factor for congener x
BEFx = bioaccumulation equivalency factor for congener *x*

Table A

Minimum Levels, Toxicity Equivalency Factors,
and Bioaccumulation Equivalency Factors

Dioxin or Furan Congener	Minimum Level (pg/L)	1998 Toxicity Equivalency Factor (TEF)	Bioaccumulation Equivalency Factor (BEF)
2,3,7,8-TCDD	10	1.0	1.0
1,2,3,7,8-PeCDD	50	1.0	0.9
1,2,3,4,7,8-HxCDD	50	0.1	0.3
1,2,3,6,7,8-HxCDD	50	0.1	0.1
1,2,3,7,8,9-HxCDD	50	0.1	0.1
1,2,3,4,6,7,8-HpCDD	50	0.01	0.05
OCDD	100	0.0001	0.01
2,3,7,8-TCDF	10	0.1	0.8
1,2,3,7,8-PeCDF	50	0.05	0.2
2,3,4,7,8-PeCDF	50	0.5	1.6
1,2,3,4,7,8-HxCDF	50	0.1	0.08
1,2,3,6,7,8-HxCDF	50	0.1	0.2
1,2,3,7,8,9-HxCDF	50	0.1	0.6
2,3,4,6,7,8-HxCDF	50	0.1	0.7
1,2,3,4,6,7,8-HpCDF	50	0.01	0.01
1,2,3,4,7,8,9-HpCDF	50	0.01	0.4
OCDF	100	0.0001	0.02

d. Data reporting for results not yet available

The Discharger shall make all reasonable efforts to obtain analytical data for required parameter sampling in a timely manner. Certain analyses require additional time to complete analytical processes and report results. For cases where required monitoring parameters require additional time to complete analytical processes and reports, and results are not available in time to be included in the SMR for the subject monitoring period, the Discharger shall describe such

circumstances in the SMR and include the data for these parameters and relevant discussions of any observed exceedances in the next SMR due after the results are available.

e. Flow data

The Discharger shall provide flow data tabulation pursuant to Section IV.B.2.

f. Annual self monitoring report requirements

By the date specified in the MRP, the Discharger shall submit an annual report to the Regional Water Board covering the previous calendar year. The report shall contain the following:

1) Annual compliance summary table of treatment plant performance, including documentation of any blending events;

2) Comprehensive discussion of treatment plant performance and compliance with the permit (This discussion shall include any corrective actions taken or planned, such as changes to facility equipment or operation practices that may be needed to achieve compliance, and any other actions taken or planned that are intended to improve performance and reliability of the Discharger's wastewater collection, treatment, or disposal practices.);

3) Both tabular and graphical summaries of the monitoring data for the previous year if parameters are monitored at a frequency of monthly or greater;

4) List of approved analyses, including the following:

(i) List of analyses for which the Discharger is certified;

(ii) List of analyses performed for the Discharger by a separate certified laboratory (copies of reports signed by the laboratory director of that laboratory shall not be submitted but be retained onsite); and

(iii) List of "waived" analyses, as approved;

5) Plan view drawing or map showing the Discharger's facility, flow routing, and sampling and observation station locations;

6) Results of annual facility inspection to verify that all elements of the SWPP Plan are accurate and up to date (only required if the Discharger does not route all stormwater to the headworks of its wastewater treatment plant); and

7) Results of facility report reviews (The Discharger shall regularly review, revise, and update, as necessary, the O&M Manual, the Contingency Plan, the Spill Prevention Plan, and Wastewater Facilities Status Report so that these documents remain useful and relevant to current practices. At a minimum, reviews shall be conducted annually. The Discharger shall include, in each Annual Report, a description or summary of review and evaluation procedures, recommended or planned actions, and an estimated time schedule for implementing these actions. The Discharger shall complete changes to these documents to ensure they are up-to-date.).

g. Report submittal

The Discharger shall submit SMRs to:

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

h. Reporting data in electronic format

The Discharger has the option to submit all monitoring results in an electronic reporting format approved by the Executive Officer. If the Discharger chooses to submit SMRs electronically, the following shall apply:

1) *Reporting Method*: The Discharger shall submit SMRs electronically via a process approved by the Executive Officer (see, for example, the letter dated December 17, 1999, "Official Implementation of Electronic Reporting System [ERS]" and the progress report letter dated December 17, 2000).

2) *Monthly or Quarterly Reporting Requirements*: For each reporting period (monthly or quarterly as specified in the MRP), the Discharger shall submit an electronic SMR to the Regional Water Board in accordance with the provisions of Section V.C.1.a-e, except for requirements under Section V.C.1.c(1) where ERS does not have fields for dischargers to input certain information (e.g., sample time). However, until U.S. EPA approves the electronic signature or other signature technologies, Dischargers that use ERS shall submit a hard copy of the original transmittal letter, an ERS printout of the data sheet, and a violation report (a receipt of the electronic transmittal shall be retained by the Discharger). This electronic SMR submittal suffices for the signed tabulations specified under Section V.C.1.c(1).

3) *Annual Reporting Requirements*: Dischargers who have submitted data using the ERS for at least one calendar year are exempt from submitting the portion of the annual report required under Section V.C.1.f(1) and (3).

D. Compliance Schedules – Not supplemented

E. Twenty-Four Hour Reporting – This section supplements V.E of Standard Provision (Attachment D)

1. Spill of Oil or Other Hazardous Material Reports

a. Within 24 hours of becoming aware of a spill of oil or other hazardous material that is not contained onsite and completely cleaned up, the Discharger shall report by telephone to the Regional Water Board at (510) 622-2369.

b. The Discharger shall also report such spills to the State Office of Emergency Services [telephone (800) 852-7550] only when the spills are in accordance with applicable reporting quantities for hazardous materials.

c. The Discharger shall submit a written report to the Regional Water Board within five working days following telephone notification unless directed otherwise by Regional Water Board staff. A report submitted electronically is acceptable. The written report shall include the following:

1) Date and time of spill, and duration if known;

2) Location of spill (street address or description of location);

3) Nature of material spilled;

4) Quantity of material involved;

5) Receiving water body affected, if any;

6) Cause of spill;

7) Estimated size of affected area;

8) Observed impacts to receiving waters (e.g., oil sheen, fish kill, water discoloration);

9) Corrective actions taken to contain, minimize, or clean up the spill;

10) Future corrective actions planned to be taken to prevent recurrence, and schedule of implementation; and

11) Persons or agencies notified.

2. Unauthorized Discharges from Municipal Wastewater Treatment Plants[1]

The following requirements apply to municipal wastewater treatment plants that experience an unauthorized discharge at their treatment facilities and are consistent with and supercede requirements imposed on the Discharger by the Executive Officer by letter of May 1, 2008, issued pursuant to California Water Code Section 13383.

a. Two (2)-Hour Notification

For any unauthorized discharges that result in a discharge to a drainage channel or a surface water, the Discharger shall, as soon as possible, but not later than two (2) hours after becoming aware of the discharge, notify the State Office of Emergency Services (telephone 800-852-7550), the local health officers or directors of environmental health with jurisdiction over the affected water bodies, and the Regional Water Board. The notification to the Regional Water Board shall be via the Regional Water Board's online reporting system at www.wbers.net, and shall include the following:

1) Incident description and cause;

2) Location of threatened or involved waterway(s) or storm drains;

3) Date and time the unauthorized discharge started;

[1] California Code of Regulations, Title 23, Section 2250(b), defines an unauthorized discharge to be a discharge, not regulated by waste discharge requirements, of treated, partially treated, or untreated wastewater resulting from the intentional or unintentional diversion of wastewater from a collection, treatment or disposal system.

4) Estimated quantity and duration of the unauthorized discharge (to the extent known), and the estimated amount recovered;

5) Level of treatment prior to discharge (e.g., raw wastewater, primary treated, undisinfected secondary treated, and so on); and

6) Identity of the person reporting the unauthorized discharge.

b. 24-hour Certification

Within 24 hours, the Discharger shall certify to the Regional Water Board, at www.wbers.net, that the State Office of Emergency Services and the local health officers or directors of environmental health with jurisdiction over the affected water bodies have been notified of the unauthorized discharge.

c. 5-Day Written Report

Within five business days, the Discharger shall submit a written report, via the Regional Water Board's online reporting system at www.wbers.net, that includes, in addition to the information required above, the following:

1) Methods used to delineate the geographical extent of the unauthorized discharge within receiving waters;

2) Efforts implemented to minimize public exposure to the unauthorized discharge;

3) Visual observations of the impacts (if any) noted in the receiving waters (e.g., fish kill, discoloration of water) and the extent of sampling if conducted;

4) Corrective measures taken to minimize the impact of the unauthorized discharge;

5) Measures to be taken to minimize the chances of a similar unauthorized discharge occurring in the future;

6) Summary of Spill Prevention Plan or O&M Manual modifications to be made, if necessary, to minimize the chances of future unauthorized discharges; and

7) Quantity and duration of the unauthorized discharge, and the amount recovered.

d. Communication Protocol

To clarify the multiple levels of notification, certification, and reporting, the current communication requirements for unauthorized discharges from municipal wastewater treatment plants are summarized in Table B that follows.

Table B

Summary of Communication Requirements for Unauthorized Discharges[1] from Municipal Wastewater Treatment Plants

Discharger is required to:	Agency Receiving Information	Time frame	Method for Contact
1. Notify	California Emergency Management Agency (Cal EMA)	As soon as possible, but not later than **2 hours** after becoming aware of the unauthorized discharge.	Telephone – (800) 852-7550 (obtain a control number from Cal EMA)
	Local health department	As soon as possible, but not later than **2 hours** after becoming aware of the unauthorized discharge.	Depends on local health department
	Regional Water Board	As soon as possible, but not later than **2 hours** after becoming aware of the unauthorized discharge.	Electronic[2] www.wbers.net
2. Certify	Regional Water Board	As soon as possible, but not later than **24 hours** after becoming aware of the unauthorized discharge.	Electronic[3] www.wbers.net
3. Report	Regional Water Board	Within **5 business days** of becoming aware of the unauthorized discharge.	Electronic[4] www.wbers.net

F. Planned Changes – Not supplemented

G. Anticipated Noncompliance – Not supplemented

[1] California Code of Regulations, Title 23, Section 2250(b), defines an unauthorized discharge to be a discharge, not regulated by waste discharge requirements, of treated, partially treated, or untreated wastewater resulting from the intentional or unintentional diversion of wastewater from a collection, treatment or disposal system.

[2] In the event that the Discharger is unable to provide online notification within 2 hours of becoming aware of an unauthorized discharge, it shall phone the Regional Water Board's spill hotline at (510) 622-2369 and convey the same information contained in the notification form. In addition, within 3 business days of becoming aware of the unauthorized discharge, the Discharger shall enter the notification information into the Regional Water Board's online system in electronic format.

[3] In most instances, the 2-hour notification will also satisfy 24-hour certification requirements. This is because the notification form includes fields for documenting that OES and the local health department have been contacted. In other words, if the Discharger is able to complete all the fields in the notification form within 2 hours, certification requirements are also satisfied. In the event that the Discharger is unable to provide online certification within 24 hours of becoming aware of an unauthorized discharge, it shall phone the Regional Water Board's spill hotline at (510) 622-2369 and convey the same information contained in the certification form. In addition, within 3 business days of becoming aware of the unauthorized discharge, the Discharger shall enter the certification information into the Regional Water Board's online system in electronic format.

[4] If the Discharger cannot satisfy the 5-day reporting requirements via the Regional Water Board's online reporting system, it shall submit a written report (preferably electronically in pdf) to the appropriate Regional Water Board case manager. In cases where the Discharger cannot satisfy the 5-day reporting requirements via the online reporting system, it must still complete the Regional Water Board's online reporting requirements within 15 calendar days of becoming aware of the unauthorized discharge.

H. Other Noncompliance – Not supplemented

I. Other Information – Not supplemented

VI. STANDARD PROVISION – ENFORCEMENT – Not Supplemented

VII. ADDITIONAL PROVISIONS – NOTIFICATION LEVELS – Not Supplemented

VIII. DEFINITIONS – This section is an addition to Standard Provisions (Attachment D)

More definitions can be found in Attachment A of this NPDES Permit.

1. Arithmetic Calculations

   a. Geometric mean is the antilog of the log mean or the back-transformed mean of the logarithmically transformed variables, which is equivalent to the multiplication of the antilogarithms. The geometric mean can be calculated with either of the following equations:

   $$\text{Geometric Mean} = Anti\log\left(\frac{1}{N}\sum_{i=1}^{N} Log(C_i)\right)$$

   or

   $$\text{Geometric Mean} = (C_1 * C_2 * \ldots * C_N)^{1/N}$$

   Where "N" is the number of data points for the period analyzed and "C" is the concentration for each of the "N" data points.

   b. Mass emission rate is obtained from the following calculation for any calendar day:

   $$\text{Mass emission rate (lb/day)} = \frac{8.345}{N}\sum_{i=1}^{N} Q_i C_i$$

   $$\text{Mass emission rate (kg/day)} = \frac{3.785}{N}\sum_{i=1}^{N} Q_i C_i$$

   In which "N" is the number of samples analyzed in any calendar day and "Q_i" and "C_i" are the flow rate (MGD) and the constituent concentration (mg/L) associated with each of the "N" grab samples that may be taken in any calendar day. If a composite sample is taken, "C_i" is the concentration measured in the composite sample and "Q_i" is the average flow rate occurring during the period over which the samples are composited. The daily concentration of a constituent measured over any calendar day shall be determined from the flow-weighted average of the same constituent in the combined waste streams as follows:

   $$\text{Cd = Average daily concentration} = \frac{1}{Q_t}\sum_{i=1}^{N} Q_i C_i$$

In which "N" is the number of component waste streams and "Q" and "C" are the flow rate (MGD) and the constituent concentration (mg/L) associated with each of the "N" waste streams. "Q_t" is the total flow rate of the combined waste streams.

c. Maximum allowable mass emission rate, whether for a 24-hour, weekly 7-day, monthly 30-day, or 6-month period, is a limitation expressed as a daily rate determined with the formulas in the paragraph above, using the effluent concentration limit specified in the permit for the period and the specified allowable flow.

d. POTW removal efficiency is the ratio of pollutants removed by the treatment facilities to pollutants entering the treatment facilities (expressed as a percentage). The Discharger shall determine removal efficiencies using monthly averages (by calendar month unless otherwise specified) of pollutant concentration of influent and effluent samples collected at about the same time and using the following equation (or its equivalent):

Removal Efficiency (%) = 100 × [1-(Effluent Concentration/Influent Concentration)]

2. Biosolids means the solids, semi-liquid suspensions of solids, residues, screenings, grit, scum, and precipitates separated from or created in wastewater by the unit processes of a treatment system. It also includes, but is not limited to, all supernatant, filtrate, centrate, decantate, and thickener overflow and underflow in the solids handling parts of the wastewater treatment system.

3. Blending is the practice of recombining wastewater that has been biologically treated with wastewater that has bypassed around biological treatment units.

4. Bottom sediment sample is (1) a separate grab sample taken at each sampling station for the determination of selected physical-chemical parameters, or (2) four grab samples collected from different locations in the immediate vicinity of a sampling station while the boat is anchored and analyzed separately for macroinvertebrates.

5. Composite sample is a sample composed of individual grab samples collected manually or by an automatic sampling device on the basis of time or flow as specified in the MRP. For flow-based composites, the proportion of each grab sample included in the composite sample shall be within plus or minus five percent (+/-5%) of the representative flow rate of the waste stream being measured at the time of grab sample collection. Alternatively, equal volume grab samples may be individually analyzed with the flow-weighted average calculated by averaging flow-weighted ratios of each grab sample analytical result. Grab samples comprising time-based composite samples shall be collected at intervals not greater than those specified in the MRP. The quantity of each grab sample comprising a time-based composite sample shall be a set of flow proportional volumes as specified in the MRP. If a particular time-based or flow-based composite sampling protocol is not specified in the MRP, the Discharger shall determine and implement the most representative sampling protocol for the given parameter subject to Executive Officer approval.

6. Depth-integrated sample is defined as a water or waste sample collected by allowing a sampling device to fill during a vertical traverse in the waste or receiving water body being sampled. The Discharger shall collect depth-integrated samples in such a manner that the collected sample will be representative of the waste or water body at that sampling point.

7. Flow sample is an accurate measurement of the average daily flow volume using a properly calibrated and maintained flow measuring device.

8. Grab sample is an individual sample collected in a short period of time not exceeding 15 minutes. Grab samples represent only the condition that exists at the time the wastewater is collected.

9. Initial dilution is the process that results in the rapid and irreversible turbulent mixing of wastewater with receiving water around the point of discharge.

10. Overflow is the intentional or unintentional spilling or forcing out of untreated or partially treated wastes from a transport system (e.g., through manholes, at pump stations, and at collection points) upstream from the treatment plant headworks or from any part of a treatment plant facility.

11. Priority pollutants are those constituents referred to in 40 CFR Part 122 as promulgated in the Federal Register, Vol. 65, No. 97, Thursday, May 18, 2000, also known as the California Toxics Rule, the presence or discharge of which could reasonably be expected to interfere with maintaining designated uses.

12. Stormwater means stormwater runoff, snow melt runoff, and surface runoff and drainage. It excludes infiltration and runoff from agricultural land.

13. Toxic pollutant means any pollutant listed as toxic under federal Clean Water Act section 307(a)(1) or under 40 CFR 401.15.

14. Untreated waste is raw wastewater.

15. Waste, waste discharge, discharge of waste, and discharge are used interchangeably in the permit. The requirements of the permit apply to the entire volume of water, and the material therein, that is disposed of to surface and ground waters of the State of California.

Table C

List of Monitoring Parameters and Analytical Methods

CTR No.	Pollutant/Parameter	Analytical Method[5]	Minimum Levels[6] (µg/l)											
			GC	GCMS	LC	Color	FAA	GFAA	ICP	ICP MS	SPGFAA	HYD RIDE	CVAA	DCP
1.	Antimony	204.2					10	5	50	0.5	5	0.5		1000
2.	Arsenic	206.3				20		2	10	2	2	1		1000
3.	Beryllium						20	0.5	2	0.5	1			1000
4.	Cadmium	200 or 213					10	0.5	10	0.25	0.5			1000
5a.	Chromium (III)	SM 3500												
5b.	Chromium (VI)	SM 3500				10	5							1000
	Chromium (total)[7]	SM 3500					50	2	10	0.5	1			1000
6.	Copper	200.9					25	5	10	0.5	2			1000
7.	Lead	200.9					20	5	5	0.5	2			10,000
8.	Mercury	1631 (note)[8]												
9.	Nickel	249.2					50	5	20	1	5			1000
10.	Selenium	200.8 or SM 3114B or C						5	10	2	5	1		1000
11.	Silver	272.2					10	1	10	0.25	2			1000
12.	Thallium	279.2					10	2	10	1	5			1000
13.	Zinc	200 or 289					20		20	1	10			
14.	Cyanide	SM 4500 CN^- C or I				5								
15.	Asbestos (only required for dischargers to MUN waters)[9]	0100.2 [10]												
16.	2,3,7,8-TCDD and 17 congeners (Dioxin)	1613												
17.	Acrolein	603	2.0	5										
18.	Acrylonitrile	603	2.0	2										
19.	Benzene	602	0.5	2										
33.	Ethylbenzene	602	0.5	2										
39.	Toluene	602	0.5	2										
20.	Bromoform	601	0.5	2										
21.	Carbon Tetrachloride	601	0.5	2										
22.	Chlorobenzene	601	0.5	2										
23.	Chlorodibromomethane	601	0.5	2										
24.	Chloroethane	601	0.5	2										
25.	2-Chloroethylvinyl Ether	601	1	1										

[5] The suggested method is the U.S. EPA Method unless otherwise specified (SM = Standard Methods). The Discharger may use another U.S. EPA-approved or recognized method if that method has a level of quantification below the applicable water quality objective. Where no method is suggested, the Discharger has the discretion to use any standard method.

[6] Minimum levels are from the *State Implementation Policy*. They are the concentration of the lowest calibration standard for that technique based on a survey of contract laboratories. Laboratory techniques are defined as follows: GC = Gas Chromatography; GCMS = Gas Chromatography/Mass Spectrometry; LC = High Pressure Liquid Chromatography; Color = Colorimetric; FAA = Flame Atomic Absorption; GFAA = Graphite Furnace Atomic Absorption; ICP = Inductively Coupled Plasma; ICPMS = Inductively Coupled Plasma/Mass Spectrometry; SPGFAA = Stabilized Platform Graphite Furnace Atomic Absorption (i.e., U.S. EPA 200.9); Hydride = Gaseous Hydride Atomic Absorption; CVAA = Cold Vapor Atomic Absorption; DCP = Direct Current Plasma.

[7] Analysis for total chromium may be substituted for analysis of chromium (III) and chromium (VI) if the concentration measured is below the lowest hexavalent chromium criterion (11 ug/l).

[8] The Discharger shall use ultra-clean sampling (U.S. EPA Method 1669) and ultra-clean analytical methods (U.S. EPA Method 1631) for mercury monitoring. The minimum level for mercury is 2 ng/l (or 0.002 ug/l).

[9] MUN = Municipal and Domestic Supply. This designation, if applicable, is in the Findings of the permit.

[10] Determination of Asbestos Structures over 10 [micrometers] in Length in Drinking Water Using MCE Filters, U.S. EPA 600/R-94-134, June 1994.

CTR No.	Pollutant/Parameter	Analytical Method[5]	Minimum Levels[6] (µg/l)											
			GC	GCMS	LC	Color	FAA	GFAA	ICP	ICP MS	SPGFAA	HYD RIDE	CVAA	DCP
26.	Chloroform	601	0.5	2										
75.	1,2-Dichlorobenzene	601	0.5	2										
76.	1,3-Dichlorobenzene	601	0.5	2										
77.	1,4-Dichlorobenzene	601	0.5	2										
27.	Dichlorobromomethane	601	0.5	2										
28.	1,1-Dichloroethane	601	0.5	1										
29.	1,2-Dichloroethane	601	0.5	2										
30.	1,1-Dichloroethylene or 1,1-Dichloroethene	601	0.5	2										
31.	1,2-Dichloropropane	601	0.5	1										
32.	1,3-Dichloropropylene or 1,3-Dichloropropene	601	0.5	2										
34.	Methyl Bromide or Bromomethane	601	1.0	2										
35.	Methyl Chloride or Chloromethane	601	0.5	2										
36.	Methylene Chloride or Dichlorormethane	601	0.5	2										
37.	1,1,2,2-Tetrachloroethane	601	0.5	1										
38.	Tetrachloroethylene	601	0.5	2										
40.	1,2-Trans-Dichloroethylene	601	0.5	1										
41.	1,1,1-Trichloroethane	601	0.5	2										
42.	1,1,2-Trichloroethane	601	0.5	2										
43.	Trichloroethene	601	0.5	2										
44.	Vinyl Chloride	601	0.5	2										
45.	2-Chlorophenol	604	2	5										
46.	2,4-Dichlorophenol	604	1	5										
47.	2,4-Dimethylphenol	604	1	2										
48.	2-Methyl-4,6-Dinitrophenol or Dinitro-2-methylphenol	604	10	5										
49.	2,4-Dinitrophenol	604	5	5										
50.	2-Nitrophenol	604		10										
51.	4-Nitrophenol	604	5	10										
52.	3-Methyl-4-Chlorophenol	604	5	1										
53.	Pentachlorophenol	604	1	5										
54.	Phenol	604	1	1		50								
55.	2,4,6-Trichlorophenol	604	10	10										
56.	Acenaphthene	610 HPLC	1	1	0.5									
57.	Acenaphthylene	610 HPLC		10	0.2									
58.	Anthracene	610 HPLC		10	2									
60.	Benzo(a)Anthracene or 1,2 Benzanthracene	610 HPLC	10	5										
61.	Benzo(a)Pyrene	610 HPLC		10	2									
62.	Benzo(b)Fluoranthene or 3,4 Benzofluoranthene	610 HPLC		10	10									
63.	Benzo(ghi)Perylene	610 HPLC		5	0.1									
64.	Benzo(k)Fluoranthene	610 HPLC		10	2									
74.	Dibenzo(a,h)Anthracene	610 HPLC		10	0.1									
86.	Fluoranthene	610 HPLC	10	1	0.05									
87.	Fluorene	610 HPLC		10	0.1									
92.	Indeno(1,2,3-cd) Pyrene	610 HPLC		10	0.05									
100.	Pyrene	610 HPLC		10	0.05									
68.	Bis(2-Ethylhexyl)Phthalate	606 or 625	10	5										

CTR No.	Pollutant/Parameter	Analytical Method[5]	Minimum Levels[6] (µg/l)											
			GC	GCMS	LC	Color	FAA	GFAA	ICP	ICP MS	SPGFAA	HYD RIDE	CVAA	DCP
70.	Butylbenzyl Phthalate	606 or 625	10	10										
79.	Diethyl Phthalate	606 or 625	10	2										
80.	Dimethyl Phthalate	606 or 625	10	2										
81.	Di-n-Butyl Phthalate	606 or 625		10										
84.	Di-n-Octyl Phthalate	606 or 625		10										
59.	Benzidine	625		5										
65.	Bis(2-Chloroethoxy)Methane	625		5										
66.	Bis(2-Chloroethyl)Ether	625	10	1										
67.	Bis(2-Chloroisopropyl)Ether	625	10	2										
69.	4-Bromophenyl Phenyl Ether	625	10	5										
71.	2-Chloronaphthalene	625		10										
72.	4-Chlorophenyl Phenyl Ether	625		5										
73.	Chrysene	625		10	5									
78.	3,3'-Dichlorobenzidine	625		5										
82.	2,4-Dinitrotoluene	625	10	5										
83.	2,6-Dinitrotoluene	625		5										
85.	1,2-Diphenylhydrazine (note)[11]	625		1										
88.	Hexachlorobenzene	625	5	1										
89.	Hexachlorobutadiene	625	5	1										
90.	Hexachlorocyclopentadiene	625	5	5										
91.	Hexachloroethane	625	5	1										
93.	Isophorone	625	10	1										
94.	Naphthalene	625	10	1	0.2									
95.	Nitrobenzene	625	10	1										
96.	N-Nitrosodimethylamine	625	10	5										
97.	N-Nitrosodi-n-Propylamine	625	10	5										
98.	N-Nitrosodiphenylamine	625	10	1										
99.	Phenanthrene	625		5	0.05									
101.	1,2,4-Trichlorobenzene	625	1	5										
102.	Aldrin	608	0.005											
103.	α-BHC	608	0.01											
104.	β-BHC	608	0.005											
105.	γ-BHC (Lindane)	608	0.02											
106.	δ-BHC	608	0.005											
107.	Chlordane	608	0.1											
108.	4,4'-DDT	608	0.01											
109.	4,4'-DDE	608	0.05											
110.	4,4'-DDD	608	0.05											
111.	Dieldrin	608	0.01											
112.	Endosulfan (alpha)	608	0.02											
113.	Endosulfan (beta)	608	0.01											
114.	Endosulfan Sulfate	608	0.05											
115.	Endrin	608	0.01											
116.	Endrin Aldehyde	608	0.01											
117.	Heptachlor	608	0.01											
118.	Heptachlor Epoxide	608	0.01											

[11] Measurement for 1,2-Diphenylhydrazine may use azobenzene as a screen: if azobenzene is measured at >1 ug/l, then the Discharger shall analyze for 1,2-Diphenylhydrazine.

CTR No.	Pollutant/Parameter	Analytical Method[5]	Minimum Levels[6] (µg/l)											
			GC	GCMS	LC	Color	FAA	GFAA	ICP	ICP MS	SPGFAA	HYD RIDE	CVAA	DCP
119-125	PCBs: Aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260	608	0.5											
126.	Toxaphene	608	0.5											

Appendix B
Comments

SAN FRANCISCO BAYKEEPER®

August 29, 2017

Patrick Karinja
California Regional Water Quality Control Board, San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Submitted via electronic mail Patrick.Karinja@waterboards.ca.gov

RE: Comments on the Proposed NPDES Permit for the Shell Martinez Refinery

Dear Mr. Karinja:

Thank you for the opportunity to comment on the proposed Tentative Order for Shell Oil Products US/Equilon Enterprises LLC's Shell Martinez Refinery ("Shell Refinery" or "Facility") NPDES Permit No. CA0005789 ("Draft Permit"). San Francisco Baykeeper ("Baykeeper"), a 501(c)(3) non-profit organization with the mission of protecting and enhancing the water quality of San Francisco Bay for the benefit of its ecosystems and surrounding communities, submits these comments on behalf of our more than 5,000 members and supporters that live, work, and recreate in and around San Francisco Bay.

Baykeeper has limited capacity to analyze this Draft Permit in full, but is particularly concerned with the Facility's reasonable potential to cause or contribute to an exceedance of fish tissue targets for selenium ("Se"), as promulgated by the recently adopted Total Maximum Daily Load ("TMDL") for Se in North San Francisco Bay, and expressed the in U.S. Environmental Protection Agency's ("EPA") Proposed Aquatic Life and Aquatic-Dependent Wildlife Criteria for Selenium in California's San Francisco Bay and Delta ("Proposed EPA Se Standard"). Baykeeper asks you to address the following concerns to ensure that the Draft Permit adequately protects water quality and appropriately regulates a facility that has been a major source of pollution in the Bay Area since its construction in 1915.

RECENT SELENIUM MONITORING DATA WARRANTS ADDITIONAL DISCHARGE LIMITATIONS

Baykeeper understands the TMDL for Se in North San Francisco Bay has been approved by both the State Water Quality Control Board and EPA. This TMDL does not call for any load reductions, but caps loads to recent historic rates. As a result, the Se mass discharge limit in the Draft Permit was calculated as the 95th percentile of daily Se loads, based on effluent data from 2000 through 2012. This TMDL, however, was based on the assumption that numeric targets for fish tissue quality are being met, yet data from 2014, 2015, and 2016, released soon after the State Water Board approved the TMDL, indicates that numeric targets for fish tissue quality are not being met.

Throughout the North Bay Se TMDL review and approval process, Baykeeper expressed concerns over the fact that the TMDL does not call for a reduction in existing loads, nor does it require additional implementation actions to achieve compliance with proposed numeric targets. At the time of the TMDL approval, however, recent fish tissue data was unavailable and Board members had limited reason to deny the TMDL given data available in the record. Since that time, data has been released putting into question approval of the TMDL. Figure 1 (*Muscle Plug Selenium*) was taken from a presentation at the April 2016 Se Workgroup meeting of the

Regional Monitoring Program ("RMP"). It includes data from the 2015 muscle plug sampling effort, conducted by the California Department of Fish and Wildlife in San Pablo and Suisun Bays. More than half of the 30 white sturgeon (*Acipenser transmontanus*) samples taken recorded Se concentrations in muscle tissue above the 11.3 µg/g muscle tissue dry weight standard.

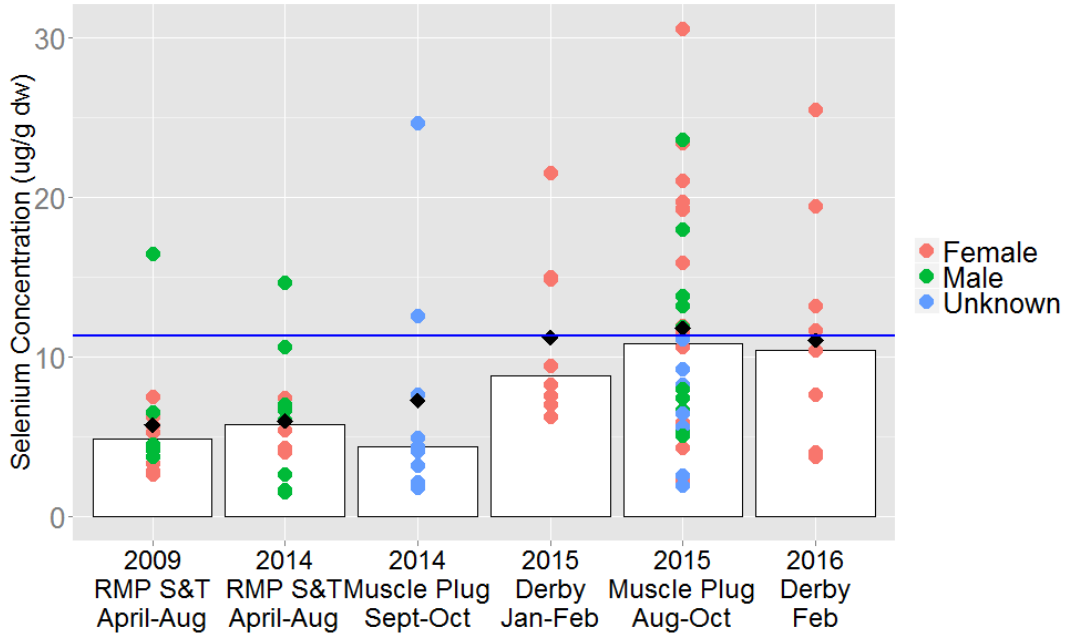


Figure 1. Muscle Plug Selenium – Presented at RMP Selenium Workgroup Meeting, April 2016

The San Francisco Bay Regional Monitoring Program (RMP) is in the process of publishing additional data from 2016 likely to show exceedances of fish tissue targets for Se as the drought subsided. And the U.S. Geological Survey has presented preliminary data showing Se concentrations in sampled clams have routinely exceeded the Proposed EPA Se Standard throughout recent drought conditions. We ask the Board to consider data presented to the RMP's Se Workgroup, which shows Se concentrations are particularly elevated during dry years, permitting greater exposure and bioaccumulation in sensitive species, as demonstrated by unpublished clam and fish tissue monitoring data presented to the RMP Se workgroup in 2016 and 2017. On-going exceedance of the North Bay Se TMDL fish tissue targets is likely to imperil the federally-listed green sturgeon, diving ducks and other sensitive species.

Recent research cited in Baykeeper's previous comment letters to the Regional and State Boards regarding the North Bay Se TMDL, as attached, indicates green sturgeon maintain heightened sensitivity to Se toxicity, compared to white sturgeon. Literature establishes that Se concentrations are elevated during drought conditions, as supported by monitoring results presented to the RMPs Se Workgroup. In light of the finding that average Se concentrations in white sturgeon sampled in 2015 and 2016 exceeded the TMDL target (Figure 1), a more stringent Water Quality Based Effluent Limitation ("WQBEL") for Se is warranted to ensure protection of rare and endangered species, given the reasonable potential to cause or contribute to exceedances of the Se fish tissue target found in the North Bay Se TMDL and Proposed EPA Se Standard.

SELENIUM CONCENTRATIONS FROM SHELL DISPROPORTIONATELY HIGH COMPARED TO REGIONAL REFINERIES

According to the U.S. Energy Information Administration, the refining capacity of Chevron's Richmond refinery is 56% greater than the Shell Refinery. Yet based on the North Bay Se TMDL, the Shell Refinery discharges over

twice as much Se compared to Chevron. Data presented in Table 1 from the North Bay TMDL Staff Report shows that average Se concentrations and loading rates from Shell are the highest of the region's refineries.

Table 1. Summary statistics of treated effluent from petroleum refineries

	TIME PERIOD	NO. OF SAMPLES	MEAN	SD	MIN	MAX	AVG. ANNUAL LOAD	REFINING CAPACITY
			µg/L				kg/yr	barrels/day
Chevron	2008-2012	293	12.1	4.2	2.5	47	111	245,271
Tesoro	2008-2012	248	8.6	2.2	4.3	16	60	166,000
Shell	2008-2012	263	28.9	7.3	9.9	51	244	156,400
Valero	2008-2012	307	22.3	7.8	3.5	67.4	63	145,000
Phillips 66	2008-2012	288	25.3	13.2	2.4	75	93	120,200

Tesoro's Martinez refinery discharges wastewater at less than a third the Se concentration of Shell, suggesting that Shell and other facilities are not meeting technology-based effluent limitations for Se (i.e., Best Practical Treatment Control Technology ("BPT") and Best Available Technology Economically Achievable ("BAT")). Based on a 1982 investigation in support of the development of effluent standards for the petroleum refining industry, EPA found that the average flow-weighted Se concentration from petroleum refineries around the nation was 17.2 µg/L – a value that was referred to as BPT for the time.[1] Over the last 35 years, removal technologies have advanced significantly and implementation of advanced treatment technologies is certainly feasible for a company the size of Shell, which is among the largest public companies in the world.

Other similarly-situated refineries – Tesoro and Chevron – have shown that a higher performance standard is feasible and needed to maintain compliance with the North Bay Se TMDL.

THE DRAFT PERMIT FAILS TO COMPLY WITH ANTIDEGRADATION PROVISIONS WITH RESPECT TO SELENIUM

The Draft Permit claims that it complies with the antidegradation provisions of 40 C.F.R. section 131.12 and State Water Board Resolution 68-16 since "[i]t continues the status quo with respect to the level of discharge authorized in the previous order, which is the baseline by which to measure whether degradation will occur" (Draft Permit at F-32). Recent monitoring during low flow and drought conditions, however, indicate increased concentrations of Se in fish and bivalve tissues at levels exceeding the North Bay Se TMDL and Proposed EPA Se Standards.

Although the pollutant mass of Se discharged from the Shell refinery has not increased, climactic and flow-based variation resulted in increased concentrations in the water column and wildlife tissue, representing further degradation of water quality. Flow-contingent patterns of Se concentration and toxicity have been documented in the Bay-Delta system and elsewhere and neither the North Bay Se TMDL nor Proposed EPA Se Standards allow for flow-based variances of water quality for Se.

[1] US EPA. "Development Document for Effluent Limitations Guidelines and Standards for the Petroleum Refining Point Source Category" (EPA 440/1-82/014). 1982. https://www.epa.gov/sites/production/files/2015-09/documents/petro-refining_dd_1982.pdf

Given the increasing duration and intensity of drought conditions expected in California, documented exceedances of the North Bay Se TMDL, and spatially-correlated increases in Se concentrations in the vicinity of the Shell Refinery, we ask the Regional Board to implement more stringent WQBELs to protect and achieve high water quality, consistent with Federal and State antidegradation policies.

THE DRAFT PERMIT MUST INCLUDE AN EFFLUENT LIMITATION FOR INVASIVE SPECIES

The Draft Permit claims Facility discharges are not a source of invasive species. However, the Draft Permit allows ballast water discharges from Discharge Point No. 001 and it fails to include an effluent limitation for one of the most prominent pollutants found in ballast water discharges – invasive exotic species. The California State Lands Commission ("SLC") is developing strict performance standards for ballast water discharges to implement the State of California's mandate of zero detectable organisms in ballast water discharges. *See* Article 4.7 § 2293; Cal. Pub. Res. Code § 71205.3(a)(3). Since the San Francisco and San Pablo Bays are already listed as impaired by invasive exotic species under section 303(d) of the Clean Water Act and the Draft Permit does not describe whether the Facility's wastewater treatment process is equipped to remove all invasive exotic species to meet the SLC standards for ballast water discharges, Baykeeper requests the Regional Board include an effluent limitation for invasive exotic species from Discharge Point No. 001 and monitoring requirements to ensure that the effluent limitations are met.

///

Thank you for considering Baykeeper's comments, and we look forward to hearing your responses. If you have any questions, please contact Ian Wren at (510) 735-9700, extension 108.

Sincerely,

Ian Wren, Staff Scientist
San Francisco Baykeeper

Appendix C
Response to Comments

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

RESPONSE TO WRITTEN COMMENTS
on the Tentative Order for
Shell Oil Products US & Equilon Enterprises LLC, Shell Martinez Refinery
Martinez, Contra Costa County

On August 29, 2017, the Regional Water Board received written comments from San Francisco Baykeeper on a tentative order distributed on August 9, 2017, for public comment. Regional Water Board staff has summarized the comments, shown below in *italics* (paraphrased for brevity), and followed each comment with a response. For the full content and context of the comments, please refer to the comment letter.

All revisions to the tentative order are shown with underline text for additions and strikethrough ~~text~~ for deletions. This document also contains staff-initiated revisions in addition to those arising from the response to comments.

San Francisco Baykeeper (Baykeeper)

Baykeeper General Comment: *Baykeeper is concerned with Shell's reasonable potential to cause or contribute to an exceedance of the selenium fish tissue targets in the* North San Francisco Bay Selenium TMDL *and* U.S. EPA's Proposed Aquatic Life and Aquatic-Dependent Wildlife Criteria for Selenium in California's San Francisco Bay and Delta *(June 2016, EPA 820-F-16-006).*

Response: The revised tentative order would implement the *North San Francisco Bay Selenium TMDL* by establishing mass-based selenium limits in accordance with Basin Plan section 7.2.4. The TMDL was adopted by the Regional Water Board in November 2015, and approved by the State Water Resources Control Board in March 2016, the Office of Administrative Law in June 2016, and U.S. EPA in August 2016, in accordance with State and federal laws and regulations. The Regional and State Water Boards considered and responded to comments from Baykeeper and others prior to TMDL adoption. The TMDL's mass-based limits will help to ensure that there will be no increased selenium loading in North San Francisco Bay. Consistent with the TMDL, they will also ensure that North San Francisco Bay attain the TMDL fish tissue targets and U.S. EPA's proposed selenium criteria.

Baykeeper Comment 1: ***Recent selenium monitoring data warrant additional discharge limitations.*** *Baykeeper notes that the TMDL does not call for selenium load reductions and asserts that recent data indicate that the TMDL's numeric fish tissue selenium target is not met. Baykeeper states that more than half of the 2015 white sturgeon muscle plug data collected in San Pablo Bay and Suisun Bay exceed the TMDL fish tissue target. Baykeeper further states that the U.S. Geological Survey has preliminary data showing clam tissue selenium concentrations exceeding U.S. EPA's proposed clam tissue standard during the recent drought conditions.*

Baykeeper says elevated selenium concentrations during dry years allow greater exposure and bioaccumulation in sensitive species. Baykeeper concludes that ongoing fish tissue target exceedances are likely to imperil the federally-listed green sturgeon, diving ducks, and other sensitive species; therefore, more stringent water quality-based effluent limitations (WQBELs) are warranted. Baykeeper cites previous comments it made to the Regional and State Water Boards, and attaches a copy of its February 12, 2016, comments to the State Water Board.

Response: We disagree. The revised tentative order's selenium WQBELs implement the TMDL, and re-evaluating the TMDL allocations within the context of an NPDES permit is inappropriate. The main goal of the TMDL implementation plan is to prevent increases of selenium concentrations in North San Francisco Bay waters and attain safe levels of selenium in fish (specifically sturgeon). We provide additional information below to give more context for understanding the latest selenium data.

We agree that recent muscle plug data from 2015 indicate elevated fish tissue selenium concentrations over what has been observed since 1990. The 2015 dataset was also the first relatively extensive set of muscle plug data analyzed by the Regional Monitoring Program (RMP), and additional planned muscle plug data collection will help assess current conditions in Suisun Bay. The observed elevated concentrations may be due to the extended drought, as the overbite clam, a prey item of the sturgeon, has higher selenium concentrations during dry years. The RMP will be sampling muscle plugs again in fall 2017; we expect to see lower concentrations due to the wet winter of 2016 – 2017.

The 2015 data should not be considered in isolation. Selenium bioaccumulation is a long-term process; therefore, data representing more than one year would be needed to demonstrate an actual change in the long-term trend.

Regarding Baykeeper's February 12, 2016, comments to the State Water Board, those comments pertain to the TMDL, not this permit. The State Water Board responded to those comments prior to approving the TMDL, and the time to ask for reconsideration or petition the adoption of the TMDL has passed; therefore, we do not respond further here.

Baykeeper Comment 2: ***Selenium concentrations from Shell are disproportionately high compared to regional refineries.*** *Baykeeper notes that, based on data presented in the* North San Francisco Bay Selenium TMDL Staff Report, *Shell's average selenium concentrations and loading rates are the highest of the region's petroleum refineries. Shell discharges over twice as much selenium as the Chevron Richmond Refinery, which has a 56 percent greater refining capacity. Baykeeper points out the relatively lower selenium concentrations discharged by the Chevron and Tesoro refineries, and suggests that Shell is not implementing the best practical treatment control technology (BPT) and best available technology economically achievable (BAT). Baykeeper cites U.S. EPA's 1982* Development Document for Effluent Limitations Guidelines and Standards for the Petroleum Refining Point Source Category *(EPA 440/1-82/014), which found that the average flow-weighted selenium concentration from petroleum refineries was 17.2 µg/L, and that this value was referred to as BPT at that time. Baykeeper compares this concentration to Shell's average effluent selenium concentration from 2008 through 2012 of 28.9 µg/L, reported in the* North San Francisco Bay Selenium TMDL Staff Report. *Baykeeper also states that removal technologies have significantly advanced since 1982*

and that implementation of advanced treatment technologies should be feasible for a company of Shell's size. Baykeeper asks for new technology-based effluent limitations (TBELs) for selenium to ensure that Shell is meeting BPT and BAT. Baykeeper thinks Shell's treatment performance should at least match those of the Chevron and Tesoro refineries.

Response: We disagree that selenium TBELs are necessary. The revised tentative order already imposes technology-based effluent limitation (TBELs) based on the applicable effluent limitations guidelines (ELGs) for cracking refineries at 40 C.F.R. section 419, subpart B. The ELGs do not address selenium. Regulations at 40 C.F.R. section 125.3(c)(2) state that additional TBELs may be imposed on a case-by-case basis based on best professional judgment "to the extent that EPA-promulgated effluent limitations are inapplicable." This section calls for consideration of the appropriate technology for the category or class of point sources to which the discharger belongs and any unique factors relating to the discharger.

Shell uses a common selenium treatment technology, selenium co-precipitation. Shell's performance is comparable to the Phillips 66 and Valero refineries (as shown in Table 1 of Baykeeper's comment letter), which also use co-precipitation systems. In contrast, the Chevron and Tesoro refineries use pond and wetland-based systems that require substantial land area. This technology is infeasible for Shell since sufficient land is unavailable at the site for treatment ponds and wetlands.

Because Shell uses a common technology for selenium removal and is not able to employ pond and wetland-based systems, if we were to establish selenium TBELs for the Shell refinery based on best professional judgement, the limits would reflect Shell's existing treatment performance. The TMDL-based limits in the revised tentative order are already based on Shell's treatment performance. Therefore, they are essentially the same as the TBELs we would develop.

That said, Shell is currently evaluating the potential for new technology to reduce selenium loads to the wastewater treatment plant. We revised the tentative order to include a new provision that requires Shell to continue investigating new selenium treatment technology and report its findings.

We added Provision VI.C.4.g as follows:

> **Innovative Technologies for Selenium Treatment.** The Discharger shall continue to investigate the use of innovative technologies for selenium removal upstream of the wastewater treatment plant.
>
> **i. Status Report.** By December 1, 2019, the Discharger shall submit a report on its findings and propose studies to advance the feasibility of implementing an innovative technology for improved selenium removal.
>
> **ii. Feasibility Report.** With the next application for permit reissuance, the Discharger shall submit a report evaluating the feasibility of implementing new technologies for improved selenium treatment. At a minimum, the report shall assess the following in accordance with 40 C.F.R. sections 125.3(d)(1) and (3):

(a) The total cost of applying the technology relative to the pollutant reduction benefits to be achieved;

(b) The age of equipment and facilities available for treatment;

(c) The process employed;

(d) The engineering aspects of the control technique;

(e) Necessary process changes; and

(f) Non-water quality environmental impacts, including energy use requirements.

The report shall also assess the potential that the technology will protect or minimize sea level rise and climate change impacts on the Facility. If improved technology can be installed, the Discharger shall provide an implementation schedule. If it cannot be installed, the Discharger shall outline in its report the methods it will employ to ensure and maintain reliable selenium treatment.

We also added Fact Sheet section VI.C.4.g as follows:

> **Innovative Technologies for Selenium Treatment**. This provision will generate new information regarding the Discharger's application of best practicable control technology currently available (BPT) and best available technology economically achievable (BAT) for selenium control pursuant to 40 C.F.R. section 125.3. It requires the Discharger to provide information necessary to establish technology-based effluent limitations based on best professional judgment (BPJ), if warranted.

Based on the results of this study and other relevant information, we will reassess whether another selenium removal technology and additional TBELs are called for when considering the next permit reissuance.

Baykeeper Comment 3: ***The draft permit fails to comply with antidegradation provisions with respect to selenium.*** *Baykeeper notes that monitoring during low flow and drought conditions indicates increased selenium concentrations in fish and bivalve tissues and asserts that these concentrations exceed the* North San Francisco Bay Selenium TMDL*. Baykeeper acknowledges that Shell has not increased the selenium mass it discharges. However, it claims climate and flow variations have resulted in increased selenium concentrations in the water column and wildlife tissue, representing degradation of water quality. It also claims that neither the* North San Francisco Bay Selenium TMDL *nor U.S. EPA's Proposed Selenium Standards account for flow in their implementation requirements. Baykeeper requests that the tentative order include more stringent WQBELs consistent with federal and State antidegradation policies. These limits should reflect the increasing duration and intensity of drought conditions expected in California.*

Response: We disagree. This permit does not authorize degradation of existing water quality. The revised tentative order's selenium WQBELs implement the TMDL and are intended to maintain the status quo with respect to Shell's selenium discharges so as to maintain North San Francisco Bay's attainment of water quality standards. The TMDL's load allocations are based on wet and dry season data to account for seasonal changes, so there is no demonstrated need for further reductions to ensure that North San Francisco Bay water quality is not degraded.

Baykeeper Comment 4: ***The draft permit must include an effluent limitation for invasive species.*** *Baykeeper notes that the tentative order allows ballast water discharges from Discharge Point No. 001, but does not include an effluent limitation for one of the most prominent pollutants found in ballast water discharges – invasive exotic species. Because San Francisco and San Pablo Bays are already listed as impaired by invasive exotic species under Clean Water Act section 303(d) and the tentative order does not describe whether Shell's wastewater treatment process is equipped to remove all invasive exotic species, Baykeeper requests that the tentative order include invasive exotic species effluent limitations and monitoring requirements to ensure that the effluent limitations are met.*

Response: We disagree that an effluent limitation for invasive species is necessary. While Shell has not accepted ballast water in over 20 years, it wishes to retain the ability to do so in the event of an emergency. For example, if a ballast water tank were to rupture and ballast water were to mix with petroleum in a cargo tank, Shell might need to treat the ballast water as wastewater.

The California State Lands Commission must approve any ballast water release to Shell's treatment plant. The approval process requires that Shell's treatment process be adequate to ensure that the discharge of treated ballast water does not release invasive species to San Francisco Bay. To document this existing approval process, we revised the tentative order by adding new Provision VI.C.4.h as follows:

> **Acceptance of Ballast Water**. Before accepting ballast water at its treatment plant, the Discharger shall obtain approval from the California State Lands Commission and notify the Regional Water Board of that approval.

We also added Fact Sheet section VI.C.4.h as follows:

> **Acceptance of Ballast Water.** This provision is necessary to ensure that ballast water discharges are not a pathway for invasive species to reach San Francisco Bay. It is consistent with California Code of Regulations, title 2, section 2284(a)(4), which requires approval by the California State Lands Commission to discharge ballast water to a facility. Such approval requires a treatment process adequate to ensure that the discharge of treated ballast water does not release invasive species.

Staff-Initiated Changes

1. We revised the submittal date for the annual stormwater report described in Provision VI.C.4.c as follows:

   The Discharger shall submit an annual stormwater report by July ~~1~~ 30 of each year covering data for the previous wet weather season.

2. We revised the Process Flow Diagram (Attachment C) to show that cooling tower blowdown, boiler system blowdown, and noncontact stormwater can be routed to either the selenium precipitation unit or the polishing pond (Pond 5C-2), instead of only the selenium precipitation unit. The revision also removed the "Personal Copy" note.

3. We updated the follow sections of the Federal Standard Provisions (Attachment D) to be consistent with current federal regulations and to correct other minor errors:
   We revised Attachment D section I.A.2 as follows:

   2. The Discharger shall comply with effluent standards or prohibitions established under CWA section 307(a) for toxic pollutants ~~and with standards for sewage sludge use or disposal established under CWA section 405(d)~~ 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).)

   We revised Attachment D section I.C as follows:

   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).)

   We revised Attachment D section III.B as follows:

   B. Monitoring must be conducted according to test procedures approved under 40 C.F.R. part 136 for the analyses of pollutants unless another method is required under 40 C.F.R. chapter 1, subchapter~~s~~ N ~~or O~~. Monitoring must be conducted according to sufficiently sensitive test methods approved under 40 C.F.R. part 136 for the analysis of pollutants or pollutant parameters or required under 40 C.F.R. chapter 1, subchapter N ~~or O~~. For the purposes of this paragraph, a method is sufficiently sensitive when:

   We revised Attachment D section III.B.2 as follows:

   2. The method has the lowest ML of the analytical methods approved under 40 C.F.R. part 136 or required under 40 C.F.R. chapter 1, subchapter N ~~or O~~, for the measured pollutant or pollutant parameter.

We revised Attachment D section IV.A as follows:

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 40 C.F.R. part 503), t~~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).)

We revised Attachment D sections V.C.2 and 3 as follows:

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 the results of monitoring, sludge use, or disposal practices~~. As of December 21, 2016, all reports and forms must be submitted electronically to the initial recipient defined in Standard Provisions – Reporting V.J and comply with 40 C.F.R. part 3, 40 C.F.R. section 122.22, and 40 C.F.R. part 127. (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 40 C.F.R. part 136, or another method required for an industry-specific waste stream under 40 C.F.R. chapter 1, subchapter~~s~~ N ~~or O~~, the results of such 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 or State Water Board. (40 C.F.R. § 122.41(l)(4)(ii).)

We deleted Attachment D section V.F.3.

~~**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).)~~

We revised Attachment D section VI.A as follows:

A. The Regional Water Board is authorized to enforce the terms of this Order under several provisions of the Water Code, including, but not limited to, sections 13268, 13350, 13385, 13386, and 13387.

4. We corrected the dates associated with monitoring total suspended solids (TSS) at Monitoring Location EFF-001 in Monitoring and Reporting Program Tables E-2 and E-4, and Fact Sheet Table F-12, as follows:

   From April 1 through ~~January 31~~ November 30, the TSS monitoring frequency at Monitoring Location EFF-001 is once per week. From December 1 through March 31, the TSS monitoring frequency at Monitoring Location EFF-001 is three times per week.

5. We revised the description of the process flow for cooling tower blowdown in Fact Sheet section II.A as follows:

   … All wastewater is processed through the entire treatment system, except for low biochemical oxygen demand streams, such as cooling tower blowdown, boiler system blowdown, and noncontact stormwater ~~that are first treated at the selenium precipitation unit and then by GAC adsorption units~~. Depending on operation, these streams can be routed to either the selenium precipitation unit or the polishing pond (Pond 5C-2), before then being treated by GAC adsorption units. The Discharger also routes wastewater from the Shell Chemical Plant, along with a stream of cooling tower blowdown water from that area, downstream of the API oil-water separator to two tanks that can operate as oil-water separators or dissolved nitrogen flotation units and then to the biotreater.

6. We corrected the language describing the first flush procedure in Fact Sheet section II.B.1 as follows:

   At the start of a rain event, runoff from the Clean Fuel PAD sump is ~~now~~ diverted to the wastewater treatment plant. This first flush lasts approximately 30 minutes, after which runoff is routed to the Low Point sump. ~~Operated in sequence~~ After the first flush from the Clean Fuel PAD sump has begun, the first flush from the Low Point sump (also lasting approximately 30 minutes) is diverted to the wastewater treatment plant. The Discharger then routes stormwater runoff from the Light Oil Processing area and Clean Fuels area to Lake Slobodnik.