

FACT SHEET FOR NPDES PERMIT WA-000178-3
FACILITY NAME: U.S. Oil & Refining Co.
June 13, 2008

PURPOSE of this Fact Sheet

This fact sheet explains and documents the decisions Ecology made in drafting this proposed National Pollutant Discharge Elimination System (NPDES) permit.

The Environmental Protection Agency (EPA) developed the NPDES permitting program as a tool to “restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” EPA delegated to Ecology the power and duty to write, issue, and enforce NPDES permits within Washington State. Both state and federal laws require any industrial facility to obtain a permit before discharging waste or chemicals to a water body.

An NPDES permit limits the types and amounts of pollution the permittee may discharge. Those limits are based either on (1) the pollution control or wastewater treatment technology available to the industry, or on (2) the receiving water’s customary beneficial uses. This fact sheet complies with Section 173-220-060 of the Washington Administrative Code (WAC), which requires Ecology to prepare a draft permit and accompanying fact sheet for public evaluation before issuing an NPDES permit.

PUBLIC ROLE in the Permit

Ecology places a copy of the draft permit and fact sheet within the community, for public review and comment, at least thirty (30) days before we issue the final permit to the facility operator (WAC 173-220-050). Copies of the fact sheet and draft permit for U.S. Oil & Refining Co (USOR) NPDES permit WA-000178-3, are available for public review and comment from February 28, 2008 until the close of business March 31, 2008. For more details on reading the draft documents and on preparing and filing comments about them, please see **Appendix A - Public Involvement**.

Before Ecology published this draft NPDES permit, USOR reviewed it for factual accuracy. Ecology corrected any errors or omissions about the facility’s location, product type or production rate, discharges or receiving water, or its history.

After the public comment period closes, Ecology will weigh the merits of each comment. Then we will summarize substantive comments and our responses to them. We will attach our summary and responses to comments to this Fact Sheet as **Appendix D - Response to Comments**, and publish it when we issue the final NPDES permit. The rest of the fact sheet will not be revised, but the full document will become part of the legal history contained in the facility’s permit file.

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

TABLE OF CONTENTS

I. INTRODUCTION	1
Applicant.....	1
SIC Code.....	1
Discharge Locations.....	1
Process Wastewater Outfalls.....	1
II. BACKGROUND INFORMATION.....	2
A. Facility Description.....	2
History--	2
Industrial Process-.....	2
Wastewater Treatment--.....	3
Discharge Wastewater/water and Outfalls--	3
B. Permit Status	3
C. Summary of Compliance with Previous Permit Issued.....	5
D. Wastewater Characterization	5
III. PROPOSED PERMIT CONDITIONS	7
A. Design Criteria	7
B. Technology-Based Effluent Limits	7
Process Wastewater--	8
Stormwater Allocations--	12
Marine Terminal Stormwater--	12
Pollution Prevention to Date--	13
New Requirements--	14
C. Surface Water Quality-Based Effluent Limits	15
Numerical Criteria for the Protection of Aquatic Life and Recreation--	15
Numerical Criteria for the Protection of Human Health--	15
Narrative Criteria--.....	15
Antidegradation--	15
Mixing Zones--	16
D. Description of the Receiving Water.....	21
E. Designated Uses and Surface Water Quality Criteria	21
F. Evaluation of Surface Water Quality -Based Effluent Limits for Numeric Criteria	22
G. Whole Effluent Toxicity	23
H. Human Health	27
I. Sediment Quality	28
J. Ground Water Quality Limits.....	28
K. Comparison Of Effluent Limits With The Previous Permit Issued January 2002.....	29
L. Dangerous Waste - Permit By Rule Requirements.....	29
IV. MONITORING REQUIREMENTS.....	31
A. Lab Accreditation.....	31

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

V. OTHER PERMIT CONDITIONS	31
A. Reporting and Recordkeeping.....	31
B. Non Routine and Unanticipated Discharges	31
C. Outfall Evaluation	32
D. Treatment System Operating Plan	32
E. General Conditions.....	32
F. Construction Stormwater.....	32
VI. PERMIT ISSUANCE PROCEDURES	33
A. Permit Modifications.....	33
B. Proposed Permit Issuance.....	33
VII. REFERENCES FOR TEXT AND APPENDICES	34
APPENDIX A--PUBLIC INVOLVEMENT INFORMATION.....	35
APPENDIX B--GLOSSARY	37
APPENDIX C--TECHNICAL CALCULATIONS	39
APPENDIX D--RESPONSE TO COMMENTS	40
APPENDIX E--PROCESS FACTOR AND TECHNICAL LIMITS DETERMINATION.....	41
APPENDIX F--USOR VICINITY MAP.....	42
APPENDIX G--REASONABLE POTNETIAL CALCULATION.....	43

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

I. INTRODUCTION

Table 1: General Facility Information

Applicant	U.S. Oil & Refining Co.
Facility Name and Address	U.S. Oil & Refining Co. 3001 Marshall Ave Tacoma, WA 98421
Type of Facility	Petroleum Refinery
SIC Code	2911
Discharge Locations	Waterbody name: City storm drain line (Outfall #001-A) Blair Waterway (Outfall 001-B), Lincoln Ave Ditch (Outfall #002), Ground Water (Outfall #003), and Marshall Ave Ditch (Outfall 004)
Water Body ID Number	WA-10-0020
Process Wastewater Outfall	
Outfall 001A	Latitude: 47° 15' 25" N Longitude: 122° 23' 29" W
Clean Water Outfalls (Hydro test, Firewater, and Stormwater)	
Outfall 001B	Latitude: 47° 15' 29" N Longitude: 122° 23' 38" W
Outfall 002	Latitude: 47° 15' 27" N Longitude: 122° 23' 06" W
Outfall 003	Latitude: 47° 15' 53" N Longitude: 122° 23' 53" W
Outfall 004	Latitude: 47° 15' 14" N Longitude: 122° 23' 33" W

The Federal Clean Water Act (FCWA, 1972, and later amendments in 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One mechanism for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), designed by the federal Environmental Protection Agency (EPA). The EPA authorized the State of Washington to manage the NPDES permit program in our state. Our state legislature accepted the delegation and assigned the power and duty for conducting NPDES permitting and enforcement to Ecology. The legislature defined Ecology's authority and obligations for the wastewater discharge permit program in Chapter 90.48 RCW (Revised Code of Washington).

Ecology adopted rules describing how we exercise our authority:

- Procedures Ecology follows for issuing NPDES permits (Chapter 173-220 WAC),
- Water quality criteria for surface waters (Chapter 173-201A WAC) and for ground waters (Chapter 173-200 WAC)
- Sediment management standards (Chapter 173-204 WAC).

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

These rules require any industrial facility operator to obtain an NPDES permit before discharging wastewater to state waters. They also define the basis for limits on each discharge and for other performance requirements imposed by the permit.

Under the NPDES permit program Ecology must prepare a draft permit and accompanying fact sheet, and offer it for public review. Ecology must also publish an announcement (public notice) telling people where they can read the draft permit, and where to send their comments on the draft permit, during a period of thirty days (WAC 173-220-050). (See **Appendix A--Public Involvement** for more detail about the Public Notice and Comment procedures). After the Public Comment Period closes, Ecology may change a condition or requirement in the draft NPDES permit, as suggested by a timely comment, to improve the facility's environmental performance.

II. BACKGROUND INFORMATION

E. A. Facility Description

History

The refinery was constructed in 1957 from units of an old Spokane, Washington topping refinery and consists of two parts: the refinery and tank farm, and the Marine Terminal. The refinery houses the process units and the tank farm with its 2 million barrel capacity (the capacity will be increased to 2.84 million in 2008 when 5 new tanks are placed into service) on 122 acres.

Approximately 3/4 mile north and on the Blair Waterway is the marine terminal, where crude oil arrives and products are shipped out from the two piers. Four pipelines ranging in diameter from 8 to 24 inches transmit crude oil and products from the marine terminal and the tank farm.

Products are also loaded onto tanker trucks from the loading rack at the refinery, via pipeline to the McChord Air Force Base, and can also be shipped via rail lines.

Industrial Process

USOR has the capacity to process 39,000 bbls/calendar day of crude oil (Note: bbls means barrels, the most common measure of oil volume used in the U.S. One barrel equals 42 gallons). The highest daily average throughput for any one month was 38,703 bbls/calendar day for the month of September 2005. For the past five years from January 2002 through December of 2006 the average daily throughput of crude oil was 35,683 bbls/stream day. During this same period the highest average throughput for any consecutive 12 month period (9/05-8/06) was 37,690 bbls per calendar day. The crude unit does not always run at the maximum attainable rate every day of the month. As a result, the monthly average barrels per stream day are different than the average barrels per calendar day. (Note: bbls/calendar day means that the throughput is averaged over all of the days of a month; bbls/stream-day means that throughput is averaged over only those days of the month that the crude unit is operating. These values are the same if the refinery is in operation for every day of the month, but can differ significantly if the crude unit is shut down for some period of days in a month.)

The main source of crude oil has historically been from tankers delivering oil from Alaska's North Slope, however, crude oils from other sources are also processed. The refinery separates crude oil into its various component parts. Separated components are further processed and blended into a variety of petroleum products. Those products include gasoline, military and

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

commercial jet fuel, ultra low sulfur diesel fuel, marine fuel, gas oils, and emulsified and road asphalts.

The refinery employs about 165 people.

Wastewater Treatment

Process water and contaminated stormwater from the refinery receive primary and secondary treatment in a wastewater treatment system prior to being discharged at Outfall 001A, which discharges into a WWT outfall line placed into service in November 2005 which goes from the Refinery to a City of Tacoma storm drain line.

Primary treatment facilities for process wastewater include an API oil/water separator and an induced air flotation (IAF) unit. All process wastewater and stormwater runoff from the process area is routed to the primary wastewater treatment unit. The treated water then goes to Tank No. 80008, which provides retention capacity and serves as an equalization reservoir. The design capacity of the IAF unit is 330 gpm. Operating experience indicates the unit can satisfactorily process wastewater up to 400 gpm on a steady basis and up to 450 gpm on a short term basis.

Secondary treatment facilities for process wastewater consist of an activated sludge biological unit (Orbal) followed by a clarifier. The Orbal was designed for flows at 451 gpm average and 687 gpm at peak flow. Based on its engineering report, USOR is running 430 gpm at maximum monthly average for the period of July 2001 through June 2004. If based on the operational data from 1995 to 2007, USOR should be able to run Orbal at 555 gpm hydraulic loading without much increase for TSS at discharge from the clarifier. USOR added a third disc to the Orbal in January 2002 to enhance aeration and increase contaminant loading processing capacities.

Treated effluent is then normally routed to Outfall 001A, although it can be diverted to two wastewater ponds (also called off test ponds) during upset conditions or during routine maintenance. These ponds consist of the former equalization pond and south off test pond.

Sanitary waste is collected and discharged separately into the City of Tacoma sewer system for treatment in their municipal wastewater treatment plant. All other stormwater from the refinery site is sent to a concrete-lined basin for oil skimming, and is then pumped to a stormwater retention pond prior to being transferred to the Orbal for treatment. Waste activated sludge from the secondary clarifier is treated in an aerobic digester, then is dewatered and discharged to a concrete-lined pit. The solids are allowed to dry and then ultimately sent out for landfill disposal. Leachate from the pit is returned to the aerobic digester or to a geotextile dewatering system in the adjacent containment cell.

Discharge Wastewater/Water and Outfalls

The refinery storm water collection system normally will collect runoff water from general area drainage, tankage berm drains, and excess stormwater. Any storm water that is processed through the primary and secondary treatment systems is discharged into Outfall 001A.

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

The old Outfall 001 concrete structure is renamed as Outfall 001B which is used for discharging stormwater, firewater, and hydrotest water. The stormwater from the new tank area (Three tanks are complete as of March 2008, with two tanks still under construction. One of the new tanks is being constructed in an existing bermed area.) will be discharged through Outfall 002. Clean water discharges, such as hydrotest water from newly cleaned storage tanks or fire system test water, can be discharged at Outfalls 001-B, 002 and 003 on a case-by-case basis subject to certain criteria. Prior to discharge of any clean water, the refinery is required to report certain information/discharge water test results to the Washington Department of Ecology. Then Ecology may issue an authorization to discharge.

Stormwater from the Marine Terminal tank containment area is handled two ways. Areas with the highest likelihood of generating contaminated stormwater, such as pump pads or valve pads, drain to sumps which are emptied by vacuum trucks. The trucks return the stormwater to the refinery for treatment. Stormwater from the floor of the containment area drains to a vault, where any oil present can be retained by baffles in the vault. The water in the vault is then pumped to Outfall 003, an infiltration basin for release to groundwater.

In this permit, USOR proposed a new outfall, Outfall #004, for only discharging stormwater along Marshall Avenue. This natural drainage point takes stormwater from the unimproved Eastern section of the refinery property to the ditch on the north side of Marshall Avenue, then into the city storm water line. The stormwater discharge has similar monitoring requirements as the cleanwater discharge at Outfalls, 001B, 002, and 003.

F. B. Permit Status

The previous permit for this facility was issued on April 8, 2002 and it was modified on April 16, 2002. The previous permit placed effluent limitations on the following parameters tabulated below.

Effluent Limitations: Outfall 001-A

Parameter	Units	Effluent Limitation	
		Avg Monthly	Max Daily
Biochemical Oxygen Demand (5-day)	lbs/day	125	236
Chemical Oxygen Demand	lbs/day	628	1215
Total Suspended Solids	lbs/day	106	165
Oil and Grease	lbs/day	38	74
Oil and Grease	mg/l	Shall at no time exceed 15 mg/l, and shall not exceed 10 mg/l more than three times per month	

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

Parameter	Units	Effluent Limitation	
		Avg Monthly	Max Daily
Phenolic Compounds	lbs/day	0.65	1.77
Ammonia as N	lbs/day	14	31
Sulfide	lbs/day	0.71	1.56
Total Chromium	lbs/day	0.87	2.28
Hexavalent Chromium	lbs/day	0.06	0.13
pH	pH shall be maintained within the range of 6.0-9.0 Excursions between 5.0 and 6.0, or 9.0 and 10.0 must not be considered violations provided no single excursion exceeds 60 minutes in length and total excursions do not exceed 7 hours and 30 minutes per month. Any excursions below 5.0 and above 10.0 are violations.		

C. Summary of Compliance with Previous Permit Issued

A compliance inspection at USOR was completed on May 9, 2007. This inspection included sampling of the discharge and laboratory review. No deficiencies were noted at the inspection.

During the history of this permit term, the Permittee has generally remained in compliance based on Discharge Monitoring Reports (DMRs) submitted to Ecology and inspections conducted by the Department.

The daily maximum limit for total suspended solids (TSS) was exceeded by a factor of 5 on February 8, 2007, for which U.S. Oil was fined \$3,000. Multiple factors contributed to the violation including excessive solids in the API separator and inadequately controlled contractor discharges to the system.

The previous permit required a number of special reports to be completed during the term of the permit. Studies included: Treatment Efficiency Study Results and Engineering Report (S3.A), Sediment Sampling and Analysis Plan (S3.B.3), Human Health Criteria Sampling Results(S3.B.1), Outfall Line to Blair Waterway Engineering Design Report and Construction of New Outfall Line (S3.G).

G. D. Wastewater Characterization

An application for permit renewal was submitted to Ecology on November 3, 2006. Three submitted references of the application are: 1) Updated Treatment System Operating Plan, 2) Pollution Prevention Plan Update, and 3) Engineering Report Update.

The proposed wastewater discharge was characterized by USOR in the application process for conventional pollutants, metals, cyanide, phenols, volatile organic compounds, acid organic compounds, base neutral organic compounds, and pesticides. Conventional parameter data

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

reported below is based on data contained in the application, as well as on extensive (daily to weekly) monitoring completed during the term of the permit, and on the results of Class II water quality inspections (2002 to 2007). **Maximum daily values of pollutants with significant concentrations and/or of interest are tabulated below.** The maximum concentration and mass values for the various parameters did not necessarily occur on the same day. No organics are listed in the table below because none were quantified at greater than detection limits in any of the testing done during the term of the permit.

Maximum Daily Values of Pollutants

Parameter/ Date of Value	Maximum Concentration	Mass
BOD	10.0 mg/l	28.1 lb/day
COD	127 mg/l	661.8 lb/day
TOC	9.5 mg/l	34 lb/day
TSS	114 mg/l	605.7 lb/day
Ammonia	0.7 mg/l	2.8 lb/day
Flow	705.6 gpm	
Temperature (winter)	23.9 °C	
Temperature (summer)	27.2 °C	
pH	6.4 minimum/9.1 maximum	
Nitrate	7.2 mg/l	25.8 lb/day
Nitrogen (Total Organic)	1.0 mg/l	3.6 lb/day
Oil and Grease	8.0 mg/l	33.3 lb/day
Phosphorous	4.6 mg/l	16.4 lb/day
Sulfate	130 mg/l	466 lb/day
Sulfide (5/9/2002)	0.04 mg/l	0.73 lb/day
Surfactants	0.16 mg/l	0.6 lb/day
Antimony (4/21/2005)	2.06 µg/l	0.009 lb/day
Arsenic	44.0 µg/l	0.13 lb/day
Cadmium (5/19/2004)	1.22 µg/l	0.003 lb/day
Chromium (total)	5.0 µg/l	0.05 lb/day
Lead (5/19/2004)	1.11 µg/l	0.003 lb/day
Nickel (5/19/2004)	4.5 µg/l	0.016 lb/day

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

Parameter/ Date of Value	Maximum Concentration	Mass
Selenium (6/21/2006)	9.10 µg/l	0.02 lb/day
Zinc (6/21/2006)	16.7 µg/l	0.05 lb/day
Copper (5/19/2004)	2.3 µg/l	0.005 lb/day
Phenols (5/9/2007)	0.26 µg/l	0.0063 lb/day
Mercury (11/8/2006)	25.6 ng/l (nano grams/L)	

III. PROPOSED PERMIT CONDITIONS

Federal and State regulations require that each NPDES permit set forth either technology- or water quality-based effluent limits.

- Technology-based limits are based upon the treatment methods available to treat specific pollutants. Technology-based limits are set by the EPA and published as a regulation, or Ecology develops the limit on a case-by-case basis (40 CFR 125.3, and Chapter 173-220 WAC).
- Water quality-based limits are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (40 CFR 131.36). The most stringent of these limits apply to each parameter of concern. These limits are described below.

The limits in this permit reflect information received in the application. Ecology evaluated the permit application and determined the limits needed to comply with the rules adopted by the State of Washington. However, Ecology does not develop effluent limits for all reported pollutants. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, or do not have a reasonable potential to cause a water quality violation.

Nor does Ecology usually develop permit limits for pollutants that were not reported in the permit application but that may be present in the discharge. The permit does not authorize discharge of the non-reported pollutants. During the five-year permit term, the facility's effluent discharge conditions may change from those conditions reported in the permit application. The facility must notify Ecology, as described in 40 CFR 122.42(a), if significant changes occur in any constituent. Industries may be in violation of their permit until the permit is modified to reflect additional discharge of pollutants.

H. A. Design Criteria

Under WAC 173-220-150 (1)(g), neither flows nor waste loadings may exceed approved design criteria. USOR submitted Wastewater Treatment Efficiency Study and Engineering Report in

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

August 2004; it compares actual wastewater loading to the biological treatment unit (Orbal) values with design values for selected parameters as listed on the following table.

Parameter	Units	Design Value	Value between 2001 to 2004	1995 -2007 Historical Data
Maximum Average Monthly flow	gpm Gallon/day	451 650,000	430 619,200	655
Peak Hourly Flow	gpm	687	659	789
BOD	Lbs/day	900	491	1,447

Ecology may determine the design criteria for hydraulic loading and BOD loading to the Orbal in the permit.

B. Technology-Based Effluent Limits

Process Wastewater

Ecology based the effluent limits for USOR on Best Conventional Pollutant Control Technology (BCT), Best Available Technology Economically Achievable (BAT), Best Practicable Control Technology Currently Available (BPT), and on New Source Performance Standards (NSPS), as developed by the Environmental Protection Agency (EPA).

EPA published guidelines for developing effluent limitations on August 12, 1985 [under 40 CFR Part 419] for the topping subcategory of petroleum refining. EPA based these limits on terms of a settlement agreement dated April 17, 1984, between EPA and the Natural Resources Defense Council, resolving litigation about the EPA guidelines. The August 12, 1985 guidelines establish Best Available Technology (BAT) and Best Conventional Technology (BCT) as equal to Best Practicable Technology (BPT) for all parameters except phenols and chromium. Ecology regulates phenols and chromium by whichever guideline is more stringent. USOR must use all known, available, and reasonable methods (AKART) to control toxicants in its wastewater.

On December 31, 2003 EPA published its intention to review the petroleum refining industry's practices to decide whether it should revise the industry's effluent guidelines. EPA evaluated pollution prevention opportunities, emerging treatment technologies, trends reflected in the effluent guidelines, and expanding the list of regulated pollutants. EPA reviewed information and comments on several issues including: control technologies for polycyclic aromatic hydrocarbons (PAHs), dioxin sources and reduction/control technologies, sources of toxic metals, process modifications to reduce metals content, and toxics commonly released but remain unreported. EPA reviewed the available dioxin information collected by refineries nationwide much of which was collected at the Washington state refineries.

On September 2, 2004 (Federal Register Volume 69 No. 170) EPA published its decision about the refinery effluent guidelines. EPA concluded:

- there is little evidence that PAHs are present in refinery wastewater discharges in concentrations above the detection limit.

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

- the concentration of metals being discharged by refineries is at or very near treatable levels, leaving little to no opportunity to reduce metals discharges through conventional end-of-pipe treatment.
- dioxins are only occasionally discharged, in relatively low concentrations, in treated refinery effluent. In EPA's opinion this data did not warrant the development of national categorical limitations on dioxin in refinery wastewater discharges. But EPA did note that on a case-by-case, best-professional-judgment basis, permit writers may decide to include effluent limitations for dioxin.

As a result of the evaluation, EPA found no need to revise the federal effluent guidelines at this time. But EPA encourages permit writers and refineries to consider pollution prevention opportunities.

Ecology must decide whether the effluent guidelines also constitute "all known, available and reasonable methods of treatment" (AKART). As a general rule, if the effluent guidelines for a particular pollutant/source category are five years old or newer, Ecology presumes they will be AKART. If the effluent guidelines are over 10 years old, Ecology reviews the federal effluent guidelines development document and analyzes unit processes design and efficiencies to determine that the effluent guidelines constitute AKART and meet the intent of RCW 90.48.520. The federal effluent guidelines development document describes production processes, pollutants generated, treatment efficiencies, and unit process designs present nationwide in the specific industry at the time of effluent guideline development.

In the 2002 permit, USOR was required to prepare an engineering report predicting design capacities for the facility's wastewater treatment system based upon current operating conditions. This permit condition also required that USOR collect additional treatment unit influent and effluent data. The data was evaluated to determine current treatment unit operating efficiencies. The operating efficiencies and design/flow capacities detailed in the study yielded results better than standards and predicted loadings. Ecology reviewed the reports and determined that USOR is providing AKART for its wastewater. EPA's 2003 effluent guidelines evaluation also supports Ecology's determination.

Ecology also applied new source performance standards on the basis of AKART, making our permit limitations more stringent than those applied in other states. Ecology began applying the more stringent new source performance standards to all crude throughput increases in 1984.

Since the previous NPDES permit was issued on April 16, 2002, U.S. Oil's crude oil throughput rate has slowly increased. The rate changes in refinery processes are shown below along with the applicable size and process factors selected for the EPA guidelines. These factors are multiplied by the actual feed stock in barrels per stream day to obtain an adjusted feed stock used in determining effluent limitations, except for determining BAT limitations for phenols and chromium. The unit process rates of the proposed permit in the following table are based on the highest 12 consecutive months value in previous 5 years. The following table lists the refinery processes, flows, and process and size factors as calculated in **Appendix E**.

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

Parameters	1990 Permit	2002 Permit	Proposed Permit
Actual Feed Stock, bbls/stream day	30,500	37,220	37,690
Desalting, bbls /stream day	30,500	37,220	37,690
Atmospheric Distillation, bbls/stream day	30,500	37,220	37,690
Vacuum Distillation, bbls/stream day	17,300	18,650	16,030
Catalytic Reforming, bbls/stream day	3,800	4,140	5,750
Asphalt Production, bbls/stream day	5,300	3,770	5,630
Emulsified Asphalt, bbls/stream day		1,020	230
Process Factor	0.95	0.80	0.80
Size Factor	1.06	1.06	1.06
Adjusted Feed Stock, bbls/stream day	30,700	31,560	31,961

Increases in the feedstock rate are subject to limitations determined by Ecology to be the treatment level obtained from using all known, available, and reasonable treatment methods. They are therefore subject to New Source Performance Standards. These limitations were calculated by multiplying the increase in adjusted feed stock, $(31,961 - 27,189 = 4,772$ barrels (bbls) per day) by New Source Performance Standards (NSPS). The resulting NSPS increment, based upon a current feedstock rate of 37,690 bbls per day, was then added to BAT and BPT limitations, based upon the adjusted baseline feedstock rate of 27,189 bbls per day. BCT limitations were not included because they are equivalent to BPT limitations.

The EPA/NRDC settlement agreement provided separate factors for calculating phenols, total chromium, and hexavalent chromium for the BAT limitation. These calculations required feedstock rate data for additional processes including: hydrotreating, catalytic reforming, and alkylation. This information is included in the Table above.

The permit limit calculations are tabulated in **Appendix E**. The actual permit limit is the most stringent of the BAT and BPT determinations. The proposed technology-based effluent limitations are listed in the table below in pounds per day unless otherwise noted.

Parameters	Proposed Technology-Based Limits (Outfall 001A)		
	Units	Monthly Average	Daily Maximum
Biochemical Oxygen Demand (5-day)	lbs/day	126	238
Chemical Oxygen Demand	lbs/day	633	1,224

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

Parameters	Units	Proposed Technology-Based Limits (Outfall 001A)	
		Monthly Average	Daily Maximum
Total Suspended Solids	lbs/day	107	167
Oil and Grease	lbs/day	39	74
Oil and Grease	mg/l	Cannot at anytime exceed 15 mg/l, and cannot exceed 10 mg/l more than 3 times per month	
Phenolic Compounds	lbs/day	0.65	1.78
Ammonia as N	lbs/day	14	32
Sulfide	lbs/day	0.71	1.57
Total Chromium	lbs/day	0.88	2.31
Hexavalent Chromium	lbs/day	0.06	0.13
pH		<p style="text-align: center;">In the range of 6.0 to 9.0</p> <p>Excursions between 5.0 and 6.0, or 9.0 and 10.0 must not be considered violations provided no single excursion exceeds 60 minutes in length and total excursions do not exceed 7 hours and 30 minutes per month. Any excursions below 5.0 and above 10.0 are violations</p>	

The EPA determined federal effluent guidelines for total and hexavalent chromium, back when chromium was commonly used in cooling water systems and discharged at much higher levels in the effluent. Since the EPA banned chromium from use in cooling systems, in the early 1990's, the only remaining source at refineries is any low levels of chromium present in the crude oil.

Because federal effluent guidelines still include limits for chromium, Ecology must include an effluent limit for chromium in the proposed permit to ensure that refineries in Washington are subject to the same requirements as refineries located in other states.

Ecology's Best Professional Judgment concludes that a 50 µg/l hexavalent chromium concentration limit is technologically achievable, reasonable, and protective of the receiving water quality. The 50 µg/l limit, at a 0.99 MGD effluent flow, converts to 0.41 lbs/day--which is less stringent than the federal effluent guideline limit of 0.13 lbs/day, a water quality-based limit. This technology-based limit, therefore, can not replace both the total chromium limit and the hexavalent chromium limit in the permit.

If chromium level changes in the crude oil refined at USOR result in concentration increases, Ecology will modify the permit to increase the limit as needed to allow continued facility compliance. We will evaluate any revised limit to ensure that the effluent continues to meet water quality standards within the authorized mixing zone, and to ensure that chromium concentrations do not exceed limits allowed under the federal effluent guidelines. In the event that federal effluent guidelines are promulgated without chromium limitations, we will drop the

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

limit from the permit unless the situation changes and Ecology determines a water quality limit is necessary. USOR will continue to perform semi-annual hexavalent chromium monitoring.

Stormwater Allocations

Contaminated stormwater from the process area is collected by the oily water sewer and is treated at the wastewater treatment facility.

In the previous Fact Sheet, USOR estimated dry weather flow by using a water flow balance for each water user in the refinery. The basis for the water balance report was an audit of water usage data for the calendar year 1998. Using the audit, the dry weather flow rate was determined to be 237 GPM. With the subtraction of hydrotest water generated during 1998, the dry weather flow was estimated to be 331,200 gallons per day (230 GPM).

USOR has conducted a Treatment Efficiency Study and Engineering Report and submitted the report to Ecology on August 3, 2004. An average dry weather flow rate of 227 gpm final effluent was determined based on the statistical analysis of the three-year (July 1, 2001 to June 30, 2004) flow data and data collected during the sampling period performed between January 2003 and September 2003. This value agrees with the 230 gpm dry weather flow calculated in the August 2000 water audit performed by CH2MHill. After carefully reviewing the engineering Report, Ecology accepts the 227 gpm dry weather flow.

The stormwater allocations in the permit are based on guidelines in 40 CFR419.12(e). Phenolic compounds are not included in the stormwater allocation because of the compliance record of U.S. Oil. During the period of January 1991 to December 2007 the refinery has been in compliance with the permit limits for phenolic compounds. The allocations for stormwater only apply to runoff from areas associated with industrial activity, not outlying areas such as parking lots and surrounding acreage. During the months of June through September, U.S. Oil will only be allowed to claim the stormwater allocation when it can be demonstrated that measurable rainfall has occurred at the refinery site during the previous 10 calendar days. The allocations are tabulated below.

Parameters	Stormwater Allocation (Outfall 001A) pounds/Million gallons	
	Monthly Average	Daily Maximum
Biochemical Oxygen Demand (5-day)	220	400
Chemical Oxygen Demand	1500	3000
Total Suspended Solids	180	280
Oil and Grease	67	130

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

Marine Terminal Stormwater

Outfall No. 003: The containment area at the Marine Terminal generates stormwater that is of moderate risk of having petroleum contamination, due to past oil spills. The stormwater is collected in a vault that allows any oil present to separate, and the water is discharged from under a weir leaving the oil, if any behind. The water in this area is manually inspected by the dock operator for the presence of oil or any sheening prior to manually activating the discharge pump. The stormwater is pumped to the infiltration basin, an area on the Marine Terminal property that has a sandy floor and is surrounded by berms, for release to groundwater.

The limitations listed below are similar to the ones required for stormwater from other, nearby petroleum storage tank containment areas. The monitoring for BOD₅, COD, and NWTPH-D_x, is intended to gather information about these parameters in stormwater from petroleum storage facilities. Sampling is only required during those months where stormwater is being discharged to the infiltration basin.

Parameter	Marine Terminal Stormwater Limitation (Outfall 003)	Monitoring Frequency/Sample
Oil and Grease	The concentration in the discharge shall at no time exceed 15 mg/l	Once per month/grab when discharging
pH	In the range of 6.0 to 9.0	Once per month/grab when discharging
Biochemical Oxygen Demand (5-day)	Once per year/grab	
Chemical Oxygen Demand	Once per year/grab	
NWTPH-D _x	Once per year/grab	

Pollution Prevention to Date

USOR submitted NPDES Pollution Prevention Plan phase I and II on December 2004 and 2005, respectively, as required by the current NPDES permit. In the phase I, USOR selected 11 pollution prevention opportunities for study and in the phase II, USOR added a new opportunity, underground piping inspection program.

On October 26, 2006, USOR sent Ecology a copy of Pollution Prevention Plan Biennial Progress Report. In the report USOR summarized the status of the first 11 opportunities. There are six opportunities were rejected by "Economically Infeasible" or "Low Probability of Success", which are: 1) reduction of boiler blowdown, 2) reduction of cooling tower blowdown, 3) install secondary desalting system, 4) brine recycling at the desalter, 5) segregate B area drain system, and 6) pretreatment of CRU regeneration caustic wash.

The opportunities USOR is still working on are listed as in the following table:

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

1	Employee Training on Surfactant	Delayed due to facility workload. New Target is 3 rd quarter 2008.
2	Development of Refinery-wide Chemical Approval Procedure	Complete and fully implemented.
3	Recovery of Lab Hydrocarbon Samples	Due to safety concerns regarding the accumulation of low flash point hydrocarbons, additional study is required. Target 4 th quarter 2009 for completion.
4	Recovery of Steam Condensate	Complete and fully implemented.
5	Evaluation of Refinery Containment Systems	Delayed due to SPCC rule delay. New Target is 3 rd quarter 2009.
6	Underground Piping Inspection Program	Program developed and implemented. The execution of this program will be impacted by Department of Ecology Administrative Order DE5020.

New Requirements

In the proposed permit, Ecology requires USOR to update the water-oriented NPDES Pollution Prevention plan. Ecology's goals and objectives for developing and implementing pollution prevention plans are to identify, reduce, eliminate, and prevent the generation and release of pollutants to influent wastewater streams, stormwater, and/or waters of the state; and to prevent violations of surface water, ground water, and sediment quality standards. The objective of this update is to identify any new sources of pollutants, to reevaluate previously identified pollution prevention opportunities, and to identify any new opportunities and implement those that are technically and economically achievable.

Required NPDES Pollution Prevention plan elements include identification and implementation of Best Management Practices (BMPs). Pursuant to 90.48 RCW and Sections 302 and 402 of the Clean Water Act, Ecology may incorporate BMPs as permit conditions. BMPs are actions or procedures that prevent or minimize the potential for release of pollutants or hazardous substances, in significant quantities, to surface waters. BMPs, though normally qualitative, are most effective when used in conjunction with numerical (quantitative) effluent limits in NPDES permits.

The NPDES Pollution Prevention plan also addresses stormwater. Ecology published guidance for the prevention of stormwater runoff contamination, titled *Stormwater Pollution Prevention Planning for Industrial Facilities* (September 1993). USOR may incorporate (into the pollution prevention plan) the appropriate sections of Ecology's guidance--or any other plans previously developed by the refinery--which include procedures for prevention of stormwater runoff contamination. These plans, however, will not necessarily include all of the BMPs necessary for preventing stormwater contamination by more conventional pollutants – in particular, total suspended solids (TSS). Pollution Prevention plans do not generally address “clean” areas of the facility (those areas where petroleum products or hazardous materials are not stored or used). These “clean” areas may contribute conventional pollutants to the facility's stormwater.

Ecology included a review of solid waste handling and disposal procedures in the NPDES Pollution Prevention Plan to prevent solid waste and solid waste leachate from causing pollution

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

of state waters. In addition, USOR's latest plan describes measures already taken to prevent the accidental release of pollutants to state waters and to minimize damages if such a spill should occur.

I. C. Surface Water Quality-Based Effluent Limits

The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) were designed to protect existing water quality and preserve the beneficial uses of Washington's surface waters. Waste discharge permits must include conditions that ensure the discharge will meet established surface water quality standards (WAC 173-201A-060). The Water quality-based effluent limits may be based on an individual waste load allocation or on a waste load allocation developed during a basin wide total maximum daily loading study (TMDL).

Numerical Criteria for the Protection of Aquatic Life and Recreation

"Numerical" water quality criteria are numerical values published in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in receiving water to protect aquatic life and recreation in and on the water. Ecology uses numerical criteria along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limits, the permit must include the water quality-based limits.

Numerical Criteria for the Protection of Human Health

The U.S. EPA has published 91 numeric water quality criteria for the protection of human health that are applicable to dischargers in Washington State (EPA 1992). These criteria are designed to protect humans from cancer and other diseases, based on consuming fish and shellfish and drinking contaminated surface waters. The Water Quality Standards also include radionuclide criteria to protect humans from the effects of radioactive substances.

Narrative Criteria

Narrative water quality criteria (e.g., WAC 173-201A-260(2); 2006) limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge to levels below those which have the potential to:

- Adversely affect designated water uses.
- Cause acute or chronic toxicity to biota.
- Impair aesthetic values.
- Adversely affect human health.

Narrative criteria protect the specific designated uses of all fresh waters (WAC 173-201A-600, and WAC 173-201A-602; 2006) and of all marine waters (WAC 173-201A-610, 612; 2006) in the State of Washington.

Antidegradation

The purpose of Washington's Antidegradation Policy (WAC 173-201A-300-330; 2006) is to:

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

- Restore and maintain the highest possible quality of the surface waters of Washington.
- Describe situations under which water quality may be lowered from its current condition.
- Apply to human activities that are likely to have an impact on the water quality of surface water.
- Ensure that all human activities that are likely to contribute to a lowering of water quality, at a minimum, apply all known, available, and reasonable methods of prevention, control, and treatment (AKART).
- Apply three Tiers of protection (described below) for surface waters of the state.

Tier I ensures existing and designated uses are maintained and protected and applies to all waters and all sources of pollutions. Tier II ensures that waters of a higher quality than the criteria assigned are not degraded unless such lowering of water quality is necessary and in the overriding public interest. Tier II applies only to a specific list of polluting activities. Tier III prevents the degradation of waters formally listed as "outstanding resource waters," and applies to all sources of pollution.

A facility must prepare a Tier II analysis when all three of the following conditions are met:

- The facility is planning a new or expanded action.
- Ecology regulates or authorizes the action.
- The action has the potential to cause measurable degradation to existing water quality at the edge of a chronic mixing zone.

This facility must meet Tier I requirements.

- Existing and designated uses must be maintained and protected. No degradation may be allowed that would interfere with, or become injurious to, existing or designated uses, except as provided for in this chapter.

Ecology's analysis described in this section of the fact sheet demonstrates that the existing and designated uses of the receiving water will be protected under the conditions of the proposed permit.

Mixing Zones

A mixing zone is the defined area in the receiving water surrounding the discharge port(s), where wastewater mixes with receiving water. Within mixing zones the pollutant concentrations may exceed water quality numeric standards, so long as the diluting wastewater doesn't interfere with designated uses of the receiving water body (e.g., recreation, water supply, and aquatic life and wildlife habitat, etc.) The pollutant concentrations outside of the mixing zones must meet water quality numeric standards.

State and federal rules allow mixing zones because the concentrations and effects of most pollutants diminish rapidly after discharge, due to dilution. Ecology defines mixing zone sizes to limit the amount of time any exposure to the end-of-pipe discharge could harm water quality, plants, or fish.

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

The state's water quality standards allow Ecology to authorize mixing zones for the facility's permitted wastewater discharges only if those discharges already receive all known, available, and reasonable methods of prevention, control and treatment (AKART). Mixing zones typically require compliance with water quality criteria within 200 to 300 feet from the point of discharge; and use no more than 25% of the available width of the water body for dilution. We use modeling to estimate the amount of mixing within the mixing zone. Through modeling we determine the potential for violating the water quality standards at the edge of the mixing zone and to derive any necessary effluent limits. Steady-state models are the most frequently used tools for conducting mixing zone analyses. Ecology chooses values for each effluent and for receiving water variables that correspond to the time period when the most critical condition is likely to occur (see Ecology's Permit Writer's Manual). Each critical condition parameter (by itself) has a low probability of occurrence and the resulting dilution factor is conservative. The term "reasonable worst-case" applies to these values.

The mixing zone analysis produces a numerical value called a dilution factor (DF). A dilution factor represents the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. For example, a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water comprises 90% of the total volume at the boundary of the mixing zone. We use dilution factors with the water quality criteria to calculate reasonable potentials and effluent limits. Water quality standards include both aquatic life-based criteria and human health-based criteria. The former are applied at both the acute and chronic mixing zone boundaries; the latter are applied only at the chronic boundary. The concentration of pollutants at the boundaries of any of these mixing zones may not exceed the numerical criteria for that zone.

Each aquatic life **acute** criterion is based on the assumption that organisms are not exposed to that concentration for more than one-hour and more often than one exposure in three years. Each aquatic life **chronic** criterion is based on the assumption that organisms are not exposed to that concentration for more than four consecutive days and more often than once in three years.

The two types of human health-based water quality criteria distinguish between those pollutants linked to non-cancer effects (non-carcinogenic) and those linked to cancer effects (carcinogenic). The human health-based water quality criteria incorporate several exposure and risk assumptions. These assumptions include:

- A 70-year lifetime of daily exposures.
- An ingestion rate for fish or shellfish measured in kg/day.
- An ingestion rate of two liters/day for drinking water
- A one-in-one-million cancer risk for carcinogenic chemicals.

This permit authorizes a small acute mixing zone, surrounded by a chronic mixing zone around the point of discharge (WAC 173-201A-400; 2006). The water quality standards impose certain conditions before allowing the discharger a mixing zone:

1. Ecology must specify both the allowed size and location in a permit.

This permit specifies the size and location of the allowed mixing zone.

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

2. The facility must fully apply “all known available and reasonable methods of prevention, control and treatment” (AKART) to its discharge.

Ecology has determined that the treatment provided and the pollution prevention activities practiced at USOR meet the requirements of AKART (see “Technology based Limits”).

3. Ecology must consider critical discharge conditions.

Surface water quality-based limits are derived for the water body’s critical condition, (the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or designated water body uses). The critical discharge condition is often pollutant-specific or water body-specific.

Critical discharge conditions are those conditions that result in reduced dilution or increased effect of the pollutant. Factors affecting dilution include the depth of water, the density stratification in the water column, the currents and the rate of discharge. Density stratification is determined by the salinity and temperature of the receiving water. Temperatures are warmer in the surface waters in summer. Therefore, density stratification is generally greatest during the summer months. Density stratification affects how far up in the water column a freshwater plume may raise. The rate of mixing is greatest when an effluent is rising. The effluent stops rising when the mixed effluent is the same density as the surrounding water. After the effluent stops rising, the rate of mixing is much more gradual. Water depth can affect dilution when a plume might rise to the surface when there is little or no stratification. Ecology uses the water depth at mean lower low water (MLLW) for marine waters. Ecology’s Permit Writer’s Manual describes additional guidance on criteria/design conditions for determining dilution factors. The Manual can be obtained from Ecology’s website at: <http://www.ecy.wa.gov/biblio/92109.html>.

Ecology used the following critical conditions to model the discharge:

- The mixing zone calculations were to reflect acute and chronic mixing zone boundaries of 20 and 200 feet, respectively.
- Use of linear diffusivity instead of the 4/3 Law for far –field dilution modeling.
- Choice of the far-field dispersion coefficient.
- The modeling procedure for an intermittent discharge.
- The effluent flow rates selected for the initial dilution PLUMES model for the acute and chronic cases were 19.8 mgd and 9.8 mgd, respectively.
- Predicted dilution at the mixing zone boundaries are 2.0 for acute and 5.8 for chronic.
- Adjustment factor to calculate applicable dilution at the mixing zone boundaries adjusted by the ratio of peak hourly flow rate used in the model (9.8 mgd) to the maximum 4-day average flow rate (0.8mgd). The adjustment factors for calculation of critical acute and chronic dilution are 1.0 for acute and 12.3 for chronic.
- The applicable dilution at the mixing zone boundaries is calculated by multiplying the predicted dilution at each boundary by the respective adjustment factor. Therefore, the applicable acute and chronic dilution factors are $2.0 \times 1.0 = 2.0$ and $5.8 \times 12.3 = 71.3$.

4. Supporting information must clearly indicate the mixing zone would not:

- Have a reasonable potential to cause the loss of sensitive or important habitat,

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

- Substantially interfere with the existing or characteristic uses,
- Result in damage to the ecosystem, or
- Adversely affect public health.

Ecology established Washington State water quality criteria for toxic chemicals using EPA criteria. EPA developed the criteria using toxicity tests with numerous organisms, and set the criteria to generally protect 95% of the species tested and to fully protect all commercially and recreationally important species.

EPA sets acute criteria for toxic chemicals assuming organisms are exposed to the pollutant at the criteria concentration for 1-hour. They set chronic standards assuming organisms are exposed to the pollutant at the criteria concentration for 4 days. Dilution modeling under critical conditions generally shows that both acute and chronic criteria concentrations are reached within minutes of being discharged.

The discharge plume does not impact drifting and non-strong swimming organisms because they cannot stay in the plume close to the outfall long enough to be affected. Strong swimming fish could maintain a position within the plume, but they can also avoid the discharge by swimming away. Mixing zones generally do not affect benthic organisms (bottom dwellers) because the buoyant plume rises in the water column. Ecology has additionally determined that the effluent will not exceed 33 degrees C for more than 2 seconds after discharge; and that the temperature of the water will not create lethal conditions or blockages to fish migration.

Ecology evaluates the cumulative toxicity of an effluent by testing the discharge with whole effluent toxicity (WET) testing. See Ecology's Permit Writer's Manual for details.

<http://www.ecy.wa.gov/biblio/92109.html>

Ecology reviewed the above information, the specific information on the characteristics of the discharge, the receiving water characteristics, and the discharge location. Based on this review we conclude that the discharge does not have a reasonable potential to cause the loss of sensitive or important habitat, substantially interfere with existing or characteristics uses, result in damage to the ecosystem or adversely affect public health

5. The discharge/receiving water mixture must not exceed water quality criteria outside the boundary of a mixing zone.

Ecology conducted a reasonable potential analysis, using procedures established by the EPA and by Ecology, for each pollutant. We concluded the discharge/receiving water mixture will not violate water quality criteria outside the boundary of the mixing zone.

6. The size of the mixing zone and the concentrations of the pollutants must be minimized.

At any given time, the effluent plume uses only a portion of the acute and chronic mixing zone, which minimizes the volume of water involved in mixing. Because tidal currents change direction, the plume orientation within the mixing zone changes. The plume rises through the water column as it mixes therefore much of the receiving water volume at lower depths in the mixing zone is not mixed with discharge. Similarly, because the discharge may stop rising at some depth due to density stratification, waters above that depth will not mix with the discharge.

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

Ecology determined it is impractical to specify in the permit the actual, much more limited volume in which the dilution occurs as the plume rises and moves with the current.

Ecology minimizes the size of mixing zones by requiring dischargers to install diffusers when they are appropriate to the discharge and the specific receiving waterbody. When a diffuser is installed the discharge and the receiving water is more completely mixed in a shorter time period. Ecology also minimizes the size of the mixing zone (in the form of the dilution factor) using design criteria with a low probability of occurrence. For example, Ecology uses the expected 95th percentile pollutant concentration, the 90th percentile background concentration, the centerline dilution factor and the lowest flow occurring once in every 10 years to perform the reasonable potential analysis.

The facility continues to conduct pollution prevention activities and has completed pollution prevention projects. These activities also minimize the concentrations of pollutants in the discharge.

Because of the above reasons, Ecology has effectively minimized the size of the mixing zone authorized in the proposed permit.

7. Maximum size of mixing zone.

The authorized mixing zone does not exceed the maximum size restriction.

8. Acute Mixing Zone.

- The discharge/receiving water mixture must comply with acute criteria as near to the point of discharge as practicably attainable.
Ecology determined the acute criteria will be met at 10% of the distance of the chronic mixing zone.
- The pollutant concentration, duration and frequency of exposure to the discharge, will not create a barrier to migration or translocation of indigenous organisms to a degree that has the potential to cause damage to the ecosystem.

As described above, the toxicity of any pollutant depends upon the exposure, the pollutant concentration and the time the organism is exposed to that concentration. Authorizing a limited acute mixing zone for this discharge assures that it will not create a barrier to migration. The effluent from this discharge will rise as it enters the receiving water, assuring that the rising effluent will not cause translocation of indigenous organisms near the point of discharge (below the rising effluent).

- **Comply with size restrictions.**
The mixing zone authorized for this discharge complies with the size restrictions published in Chapter 173-201A WAC.

9. Overlap of Mixing Zones.

This mixing zone does not overlap another mixing zone.

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

D. Description of the Receiving Water

The receiving water classification of the Blair Waterway has been designated a Class B marine waterbody. The characteristic uses include the following: industrial and; fish migration and shellfish spawning, rearing and harvesting; wildlife habitat; secondary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

The ambient background data used for this permit includes the following from Ecology's Water quality monitoring data:

Ambient Background Data

Parameter	Value used
Temperature (highest annual 1-DADMax)	17.9° C
pH (high)	8.2
Dissolved Oxygen	6.5 mg/L
Total Ammonia-N	N/A
Fecal Coliform	N/A
Turbidity	3.4 NTU
Hardness	N/A
Alkalinity	N/A
Lead (dissolved)	0.020 ug/L
Copper (dissolved)	0.81 ug/L
Zinc (dissolved)	3.7 ug/L
Arsenic (unfiltered)	1.3 ug/L
Cadmium (dissolved)	0.061 ug/L
Mercury (tot. Recoverable)	0.0023 ug/L

J. E. Designated Uses and Surface Water Quality Criteria

Applicable designated uses and surface water quality criteria are defined in chapter 173-201A WAC. In addition, the U.S. EPA set human health criteria for toxic pollutants (40 CFR 131.36). Criteria applicable to this facility's discharge are summarized in **Table** below.

- Aquatic life uses are designated using the following general categories. All indigenous fish and nonfish aquatic species must be protected in waters of the state.

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

- (a) **Extraordinary quality** salmonid and other fish migration, rearing, and spawning; clam, oyster, and mussel rearing and spawning; crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing and spawning.
- (b) **Excellent quality** salmonid and other fish migration, rearing, and spawning; clam, oyster, and mussel rearing and spawning; crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing and spawning.
- (c) **Good quality** salmonid migration and rearing; other fish migration, rearing, and spawning; clam, oyster, and mussel rearing and spawning; crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing and spawning.
- (d) **Fair quality** salmonid and other fish migration.

The Aquatic Life Uses for this receiving water are identified below.

Aquatic Life Uses & Associated Criteria

Excellent quality	
Temperature Criteria – Highest 1D MAX	16°C (60.8°F)
Dissolved Oxygen Criteria – Lowest 1 Day Minimum	6.0 mg/L
Turbidity Criteria	<ul style="list-style-type: none"> • 5 NTU over background when the background is 50 NTU or less; or • A 10 percent increase in turbidity when the background turbidity is more than 50 NTU.
pH Criteria	pH must be within the range of 7.0 to 8.5 with a human-caused variation within the above range of less than 0.5 units.

- To protect **shellfish harvesting**, fecal coliform organism levels must not exceed a geometric mean value of 14 colonies/100 mL, and not have more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 43 colonies/100 mL. (Note 1.)
- The **recreational uses** are primary contact recreation and secondary contact recreation.

The recreational uses for this receiving water are identified below.

Recreational Uses

Recreational use	Criteria
Primary Contact Recreation	Fecal coliform organism levels must not exceed a geometric mean value of 14 colonies/100 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 43 colonies /100 mL. (Note 1.)
Secondary Contact	Enterococci organism levels must not exceed a geometric mean value of 70 colonies/100 mL, with not more than 10 percent of all samples (or any

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

Recreation	single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 208 colonies/100 mL. (Note 1.)
------------	--

Note 1. Since U.S. Oil does not treat sanitary wastes, the discussions regarding fecal coliform and enterococci organisms do not apply.

- The **miscellaneous marine water uses** are wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

K. F. Evaluation of Surface Water Quality -Based Effluent Limits for Numeric Criteria

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as biological oxygen demand (BOD) is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

Pollutant concentrations in the proposed discharge exceed water quality criteria despite using technology-based controls which Ecology determined fulfills AKART. Ecology therefore authorizes a mixing zone in accordance with the geometric configuration, flow restriction, and other restrictions imposed on mixing zones described in chapter 173-201A WAC.

Outfall Configuration – Outfall 001

U. S. Oil’s treated wastewater is conveyed to a City of Tacoma storm sewer and is ultimately discharged along with collected stormwater to an 84-inch pipe that connects with the Lincoln Avenue ditch with a Red Valve Series 35 check valve. The check valve is a rubber duckbill check sleeve that prevents backflow of tidewaters into Lincoln Avenue Ditch during high tide. The U. S. Oil treated wastewater and stormwater is discharged out of a slot check valve rather than an open pipe. Information on the outfall is available in the Operation & Maintenance Manual for the new outfall line, submitted to Ecology in August of 2005. Additional information can be found in the Mixing Zone Evaluation for U. S. Oil’s Discharge to Blair Waterway submitted to Ecology in May of 2000.

Chronic Mixing Zone

WAC 173-201A-100(8)(b)(I) specifies mixing zones shall not extend in any horizontal direction from the discharge point or ports for a distance greater than 200 feet plus the depth of water over the discharge ports as measured during mean lower low water (MLLW). The chronic zone therefore extends 200 feet horizontally from the discharge point.

Acute Mixing Zone

WAC 173-201A-100(8)(b) specifies that, in estuarine waters, a zone where acute criteria may be exceeded shall not extend beyond 10% of the distance established for the maximum or chronic zone as measured independently from the discharge point. The acute zone therefore extends 20 feet from the discharge slot.

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical flow condition of May through October by the use of modeling mentioned above. The dilution factors have been determined to be:

	Acute	Chronic
Aquatic Life	2.0	71.3
Human Health, Carcinogen		71.3
Human Health, Non-carcinogen		71.3

The mixing zone analysis was completed for the aquatic life chronic criteria dilution factor using the highest monthly average flow as a design criteria. Ecology's permit writer's manual allows the permittee to use the annual average flow to make the mixing zone evaluation for carcinogenic human health criteria. This lower flow value will increase the amount of available dilution. In the absence of that information Ecology has based the dilution factor for carcinogenic human health criteria on the more stringent value obtained for the chronic aquatic life criteria.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water. Water quality-based limits are derived for the waterbody's *critical condition*, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota and existing or characteristic water body uses. The critical condition for the Blair Waterway occurs in the late summer when there is little or no stormwater runoff in the Lincoln Avenue Ditch and when the discharge from U.S. Oil comprises nearly all of the flow in the Ditch and is in its most concentrated form.

Dissolved Oxygen and BOD₅ U.S. Oil has limited information on the dissolved oxygen (DO) concentration in their effluent, since they were not required to monitor it in their existing permit. U.S. Oil had, however, previously monitored for this parameter daily during the month of December 1999. DO concentrations during this period were generally much higher than the water quality standard for DO in the receiving water (for a class B marine waterway the standard is 5 mg/l), with an average of 7 mg/l. Ecology is not aware of any information that indicates that the Blair Waterway is impaired due to reduced DO. It is Ecology's judgment that the effluent will not cause a violation of the DO standard in the receiving water.

Temperature. The water quality standards state the temperature shall not exceed 19 °C due to human activities. When natural conditions exceed 19 °C no temperature increases will be allowed which will raise the receiving water temperature greater than 0.3 °C. Incremental temperature increases resulting from point source activities shall not, at any time, exceed $t=16/(T)$. "T" represents the background temperature and represents the highest ambient water temperature in the vicinity of the discharge and "t" represents the maximum possible temperature increase measured at the mixing zone boundary.

The impact of the discharge on the temperature of the receiving water was modeled by simple mixing analysis at critical condition. Temperature is evaluated using the critical chronic mixing zone dilution factor of 71.3, the 95th percentile effluent temperature of 27.5 °C, and the maximum observed surface water temperature of 15.3 °C (9/24/97) at the Ecology ambient monitoring station in Commencement Bay (CMB003). Based on these data water quality

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

compliance for temperature depends on comparison to the allowable incremental change in far-field receiving water temperature. The incremental temperature increase allowance in marine water (i.e. $t=16/T$ where T is the maximum receiving water temperature $1.04\text{ }^{\circ}\text{C}=16/15.3\text{ }^{\circ}\text{C}$) is equal to $1.04\text{ }^{\circ}\text{C}$. The predicted far-field temperature following initial dilution (T_{final}) is calculated using the following equation:

$$T_{\text{final}} = T_{\text{ambient}} + (T_{\text{effluent}} - T_{\text{ambient}}) / D_{\text{cmz}} \quad \text{where:}$$

T_{ambient} = Maximum receiving water temperature in $^{\circ}\text{C}$.

T_{effluent} = 95th percentile effluent temperature in $^{\circ}\text{C}$ (un-stratified data).

D_{cmz} = Critical chronic mixing zone dilution factor.

$$T_{\text{final}} = 15.3 + (27.5 - 15.3) / 71.3$$

The predicted temperature is $15.47\text{ }^{\circ}\text{C}$ at the edge of the chronic mixing zone. The incremental increase in temperature is therefore $0.17\text{ }^{\circ}\text{C}$ ($15.47 - 15.3$), which is within the allowable incremental change of $1.04\text{ }^{\circ}\text{C}$. Under these conditions there is no predicted violation of The Water Quality Standards. An effluent limitation was determined not to be necessary.

pH. Because of the high buffering capacity of marine water, compliance with the technology-based limits of 6 to 9 should assure compliance with the Water Quality Standards of 6.5 – 8.5 pH units for Class B Surface Waters at the edge of the mixing zone.

Fecal coliforms The domestic sewage generated at the U.S. Oil refinery enters the Tacoma sanitary sewer via a segregated collection system and is treated at the municipal wastewater treatment plant. Since there is no domestic component to the wastewater treated in the U.S. Oil wastewater system, no chlorination of the effluent is necessary and no fecal coliforms are expected in the effluent.

Toxic pollutants. Federal regulations (40 CFR 122.44) require Ecology to place limits in NPDES permits on toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. Ecology does not exempt facilities with technology-based effluent limits from meeting the surface water quality standards.

The following toxic pollutants are present in the discharge: arsenic, mercury, nickel, sulfide, copper, lead, selenium, zinc, chlorine, and ammonia. We conducted a reasonable potential analysis on these parameters to determine whether effluent limits would be required in this permit.

The reasonable potential for exceeding marine water quality criteria was evaluated with procedures given in EPA's Technical Support document for Water Quality-Based Toxics Control (1991). The procedure with parameters specific to U.S. Oil is shown in the spreadsheet included as **Appendix G**. The dilution factors determined above were used in the analysis.

Valid ambient background data was available for the metals listed above and ammonia. Ecology determined no reasonable potential for this discharge to cause a violation of water quality

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

standards, using all applicable data. Our determination assumes that this facility meets the other effluent limits of this permit.

USOR may provide data clearly demonstrating the seasonal partitioning of the dissolved metal in the ambient water in relation to an effluent discharge. Ecology may adjust metals criteria on a site-specific basis when data is available clearly demonstrating the seasonal partitioning in the ambient water in relation to an effluent discharge.

Ecology may also adjust metals criteria using the water effects ratio approach established by the EPA, as generally guided by the procedures in U.S. EPA Water Quality Standards Handbook, December 1983, as supplemented or replaced.

L. G. Whole Effluent Toxicity

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as reduced growth or diminished reproduction. Chronic toxicity tests involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

All of the compliance monitoring during the term of the previous permit met the acute toxicity performance standard and WAC 173-205-120(1). The Permittee is required to test effluent for acute toxicity during the last year of this permit term to verify that there is no acute toxicity in excess of the performance standard.

When the WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water toxicity, the Permittee will not be given WET limits and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that toxicity has not increased in the effluent. All chronic WET testing conducted in previous permit terms has met the performance standard for chronic toxicity so no chronic WET limit or additional effluent characterization is needed. The Permittee is required to test effluent for chronic toxicity during the last year of this permit term to verify that there is no chronic toxicity in excess of the performance standard.

If the Permittee makes process or material changes which, in Ecology's opinion, result in an increased potential for acute or chronic effluent toxicity, then Ecology may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted for submission with a permit

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard". The Permittee may demonstrate to Ecology that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

M. H. Human Health

Washington's water quality standards include 91 numeric human health-based criteria that Ecology must consider when writing NPDES permits. These criteria were established in 1992 by the U.S. EPA in its National Toxics Rule (40 CFR 131.36). The National Toxics Rule allows states to use mixing zones to evaluate whether discharges comply with human health criteria.

Ecology determined the effluent may contain chemicals of concern posing a risk to human health. Ecology determined this because the volume of wastewater flow to the receiving water, and data or process information indicate regulated chemicals occur in the discharge.

Ecology conducted a determination of the discharge's potential to cause an exceedance of the water quality standards as required by 40 CFR 122.44(d). We followed the procedures published in the Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001) and Ecology's Permit Writer's Manual (Ecology Publication 92-109, July, 1994) to make this reasonable potential determination. Our evaluation showed that the discharge has no reasonable potential to cause a violation of water quality standards excepting arsenic, thus effluent limits are not warranted.

Arsenic

In 1992 the USEPA adopted risk-based arsenic criteria for the protection of human health for the State of Washington. The criterion for marine waters is 0.14 µg/L inorganic arsenic, and is based on exposure from fish and shellfish tissue ingestion. The freshwater criterion is 0.018 µg/L, and is based on exposure from fish and shellfish tissue and water ingestion. These criteria have caused confusion in implementation because they differ from the drinking water maximum contaminant level (MCL) of 10 µg/L, which is not risk-based, and because the human health criteria are sometimes exceeded by natural background concentrations of arsenic in surface water and ground water.

In Washington, when a natural background concentration exceeds the criterion, the natural background concentration becomes the criterion, and no dilution zone is allowed. This could result in a situation where natural groundwater or surface water used as a municipal or industrial source-water would need additional treatment to meet numeric effluent limits even though no arsenic was added as waste. Although this is not the case for all dischargers, we do not have data at this time to quantify the extent of the problem.

A regulatory mechanism to deal with the issues associated with natural background concentrations of arsenic in groundwater-derived drinking waters is currently lacking. Consequently, the Water Quality Program, at this time, has decided to use a three-pronged strategy to address the issues associated with the arsenic criteria. The three strategy elements are:

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

1. Pursue, at the national level, a solution to the regulatory issue of groundwater sources with high arsenic concentrations causing municipal treatment plant effluent to exceed criteria. The revision of the MCL for arsenic offered a national opportunity to discuss how drinking water sources can affect NPDES wastewater discharges, however Ecology was unsuccessful in focusing the discussion on developing a national policy for arsenic regulation that acknowledges the risks and costs associated with management of the public exposure to natural background concentrations of arsenic through water sources. The current arsenic MCL of 10 ug/L could also result in municipal treatment plants being unable to meet criteria-based effluent limits. Ecology will continue to pursue this issue as opportunities arise.

2. Additional and more focused data collection. The Water Quality Program will in some cases require additional and more focused arsenic data collection, will encourage or require dischargers to test for source water arsenic concentrations, and will pursue development of a proposal to have Ecology's Environmental Assessment Program conduct drinking water source monitoring as well as some additional ambient monitoring data. At this time, Washington NPDES permits will contain numeric effluent limits for arsenic based only on treatment technology and aquatic life protection as appropriate.

3. Data sharing. Ecology will share data with USEPA as they work to develop new risk-based criteria for arsenic and as they develop a strategy to regulate arsenic.

Ecology must evaluate whether or not the discharge has reasonable potential to violate human health criteria at the edge of the chronic zone. To thoroughly evaluate human health criteria the permit requires USOR to re-characterize the effluent by sampling for the 91 human health criteria listed pollutants (priority pollutants), excluding PCB's, PBB's, asbestos, and all pesticides except any listed pesticide that is used on the refinery site. The effluent shall be sampled and analyzed annually during the life of the permit.

N. I. Sediment Quality

The aquatic sediment standards (Chapter 173-204 WAC) protect aquatic biota and human health. Under these standards Ecology may require a facility to evaluate the potential for its discharge to cause a violation of sediment standards (WAC 173-204-400).

Review of previous sediment surveys in 1994, 2004, and 2007 by Ecology's sediment management unit, shows no violation of sediment standards.

Through this review and of the discharger characteristics and of the effluent characteristics, Ecology determined that this discharge has no reasonable potential to violate the Sediment Management Standards.

O. J. Ground Water Quality Limits

The Ground Water Quality Standards, (Chapter 173-200 WAC), protect beneficial uses of ground water. Permits issued by Ecology must not allow violations of those standards (WAC 173-200-100).

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

USOR has no unpermitted direct discharges to ground. USOR has several small surface impoundments lined with HDPE that are used primarily for storage of firewater and treated stormwater.

If wastes (firewater is not a waste) from these holding ponds were to leak into the groundwater, then those wastes could discharge very slowly into the Blair Waterway--where the refinery's final (treated) effluent discharges via a marine outfall. The ponds' discharge to groundwater would consist of high quality wastewater (having been treated to secondary levels). It should be noted that the refinery is underlain by a shallow, non-potable fresh water aquifer. The gradient in this aquifer is relatively flat, so there is minimal groundwater movement toward the Blair Waterway.

The concentrations of ground water quality parameters in USOR's effluent measured, in general, less than that allowed by groundwater quality criteria. *Only 2 metal parameters—selenium and arsenic—exceeded the allowed criteria. Arsenic was the only parameter that was significantly higher than its exceptionally low criteria (influenced by drinking water standards).* Incidental leakage of effluent of this quality and in this location will have undetectable or minimal impacts to ground water quality. The volume of potentially impacted groundwater would be very small, and any impacts would occur just prior to the groundwater flowing into surface water, which is the current discharge location.

Currently, it is the policy of Ecology to require all surface impoundments that regularly store or treat process water to demonstrate compliance with the Ground Water Standards by performing a hydro geological study of the pond and the receiving water below. Stormwater impoundments are not subject to the same requirements at this time. The process water impoundments are lined and there should be no leakage from the treatment systems. Therefore no limitations or actions are required based on potential effects to groundwater.

Based on our analysis (above) Ecology did not include groundwater limitations, or monitoring or studies requirements as conditions in the proposed permit.

P. K. Comparison Of Effluent Limits With The Previous Permit Issued April 2002

USOR's production has increased slightly since Ecology issued the previous permit, thus allowing for slight changes to the discharge limits provided by federal guidelines.

Table 12: Comparison of Effluent Limits (pounds per day)

Parameter	Basis of Limit	Previous Effluent Limits: Outfall # 001A		Proposed Effluent Limits: Outfall # 001A	
		Average Monthly	Maximum Daily	Average Monthly	Maximum Daily
Biochemical Oxygen Demand (5-day)	Technology	125	236	126	238
Chemical Oxygen Demand	Technology	628	1215	633	1224

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

Parameter	Basis of Limit	Previous Effluent Limits: Outfall # 001A		Proposed Effluent Limits: Outfall # 001A	
		Average Monthly	Maximum Daily	Average Monthly	Maximum Daily
Total Suspended Solids	Technology	106	165	107	167
pH	Technology	Within the range of 6.0 to 9.0. Excursions between 5.0 and 6.0, or 9.0 and 10.0 must not be considered violations provided no single excursion exceeds 60 minutes in length and total excursions do not exceed 7 hours and 30 minutes per month. Any excursions below 5.0 and above 10.0 are violations			
Oil & Grease	Technology	38	74	39	74
Phenolic Compounds	Technology	0.65	1.77	0.65	1.78
Ammonia as N	Technology	14	31	14	32
Sulfide	Technology	0.71	1.56	0.71	1.57
Total Chromium	Technology	0.87	2.28	0.88	2.31
Hexavalent Chromium	Technology	0.06	0.13	0.06	0.13

L. Dangerous Wastes – Permit By Rule Requirements

The proposed permit authorizes USOR to treat dangerous wastes--whether generated on or off-site—at the wastewater treatment facility, under the state’s permit-by-rule provisions of WAC 173-303-802(5). Ecology limited this authorization to the on-site and off-site waste streams identified and characterized on USOR’s permit application and to application amendments approved by Ecology. Off-site wastes include ballast water and retail distribution water. Ecology reviewed descriptions of those identified off-site waste streams and determined that they are similar in nature to the wastes generated on-site. We concluded that USOR wastewater facility should effectively treat the off-site wastes and that established effluent sampling and monitoring adequately address the pollutants in these waste streams.

Permit-by-rule provisions cover the identified waste streams so long as the permittee complies with the conditions of the permit, and complies with the dangerous waste requirements pertaining to:

- notification and identification numbers
- designation of dangerous wastes
- performance standards
- general waste analysis

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

- security
- contingency plans and emergency procedures
- emergencies
- the manifest system
- the operating record
- facility reporting

IV. MONITORING REQUIREMENTS

Ecology requires monitoring, recording, and reporting (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and that the discharge complies with the permit's effluent limits. The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The monitoring frequencies for BOD, Ammonia, Phenols, and Sulfides have been reduced based on the excellent performance of the facility. If performance levels deteriorate during the term of the permit, the monitoring frequencies shall revert to daily monitoring. Ecology will notify the facility by letter to increase monitoring upon Ecology's determination of deteriorating performance.

Q. A. Lab Accreditation

Ecology requires that all monitoring data (with the exception of certain parameters) be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. USOR is accredited for the following parameters: ammonia, BOD, COD, dissolved oxygen, hexane extractable O&G, pH, total phenolics, TSS, and sulfide. Testing of all other parameters is contracted to outside accredited laboratories.

V. OTHER PERMIT CONDITIONS

R. A. Reporting and Recordkeeping

Ecology bases permit condition S3 on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

S. B. Non Routine and Unanticipated Discharges

Occasionally, this facility may generate wastewater which was not characterized in the permit application because it is not a routine discharge and was not anticipated at the time of application. These wastes typically consist of waters used to pressure-test storage tanks or fire water systems, or of leaks from drinking water systems. These generally clean waste waters may be contaminated with pollutants.

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

The permit authorizes non-routine and unanticipated discharges under certain conditions. The facility must characterize these waste waters for pollutants and examine the opportunities for reuse. Depending on the nature and extent of pollutants in this wastewater and on any opportunities for reuse, Ecology may:

- Authorize the facility to discharge the water directly via the process wastewater outfall or through a stormwater outfall for clean water.
- Require the facility to treat the wastewater.
- Require the facility to reuse the wastewater.

T. C. Outfall Evaluation

Ecology does not require USOR to conduct an outfall inspection because there is a check valve at the discharge pipe.

U. D. Treatment System Operating Plan

Ecology requires industries to take all reasonable steps to properly operate and maintain their wastewater treatment system in accordance with state and federal regulations (40 CFR 122.41(e) and WAC 173-220-150 (1)(g)). The facility has prepared and submitted an operation and maintenance manual as required by state regulation for the construction of wastewater treatment facilities (WAC 173-240-150). Implementation of the procedures in the Treatment System Operating Plan ensures the facility's compliance with the terms and limits in the permit.

V. E. General Conditions

Ecology bases the standardized General Conditions on state and federal law and regulations. They are included in all individual industrial NPDES permits issued by Ecology.

W. F. Construction Stormwater

The proposed permit authorizes the discharge of stormwater associated with construction activity and construction support activity from Outfall 001B, Outfall 002, Outfall 003, and Outfall 004, subject to a number of requirements and limitations. Construction activity refers to the clearing, grading, excavation, and other land disturbing activities which result in the disturbance of one or more acres. Construction support activity includes equipment staging yards, material storage areas, borrow areas, etc.

The permit states that stormwater discharges must comply with water quality standards and it presumes that discharges are in compliance with water quality standards if the Permittee is in compliance with permit conditions, unless site-specific information shows otherwise.

The permit establishes a narrative technology-based effluent limitation of AKART. AKART specifically includes the preparation and implementation of an adequate Stormwater Pollution Prevention Plan (SWPPP), with all appropriate BMPs installed and maintained in accordance with the SWPPP and the terms and conditions of this permit.

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

The permit includes an enforceable adaptive management tool called a benchmark. Ecology is using a turbidity benchmark in this permit because it is an effective management tool for highly variable stormwater discharges. A benchmark value is not a water quality standard or a numeric effluent limit. Rather it is an indicator value used to determine the effectiveness of BMPs on-site. Meeting the benchmark established in the proposed permit in no way precludes the requirement for discharges to be in compliance with applicable permit conditions and water quality standards. If the benchmark is exceeded, the Permittee is required to take appropriate actions to identify and correct the problems causing the exceedance.

The proposed permit also includes basic monitoring and reporting requirements.

VI. PERMIT ISSUANCE PROCEDURES

X. A. Permit Modifications

Ecology may modify this permit to impose numerical limits, if necessary to comply with water quality standards for surface waters, with sediment quality standards, or with water quality standards for ground waters, after obtaining new information from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

Ecology may also modify this permit to comply with new or amended state or federal regulations.

Y. B. Proposed Permit Issuance

This proposed permit includes all statutory requirements for Ecology to authorize a wastewater discharge. The permit includes limits and conditions to control toxics as needed to, protect human health and aquatic life, and the beneficial uses of waters of the State of Washington. Ecology proposes to issue this permit for a term of 5 years.

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

VII. REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Re-aeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

Washington State Department of Ecology.

Laws and Regulations(<http://www.ecy.wa.gov/laws-rules/index.html>)

Permit and Wastewater Related Information

(<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

Ecology proposes to reissue a permit to (insert the facility name). The permit prescribes operating conditions and wastewater discharge limits. This fact sheet describes the facility and Ecology's reasons for requiring permit conditions.

Ecology will place a Public Notice on February 28, 2008 in the Tacoma News Tribune to inform the public and to invite comment on the proposed reissuance of this National Pollutant Discharge Elimination System permit as drafted.

The Notice –

- tells where copies of the draft Permit and Fact Sheet are available for public evaluation (a local public library, the closest Regional or Field Office, posted on our website.).
- offers to provide the documents in an alternate format to accommodate special needs.
- asks people to tell us how well the proposed permit would protect the receiving water.
- invites people to suggest fairer conditions, limits, and requirements for the permit.
- invites comments on Ecology's determination of compliance with antidegradation rules.
- urges people to submit their comments, in writing, before the end of the Comment Period
- tells how to request a public hearing of comments about the proposed NPDES Permit.
- explains the next step(s) in the permitting process.

Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet addendum, and fact sheet are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Bob King
Department of Ecology
Industrial Section
PO Box 47600
Olympia WA 98504-7600

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the 30-day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. Ecology will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least 30 days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information,

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from reauthorization of this permit.

Ecology will consider all comments received within 30 days from the date of the public notice indicated above, in formulating a final determination to issue, revise, or deny the permit. Ecology's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Ecology by telephone at (360) 407-7563, or by writing to the address listed above.

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

APPENDIX B--GLOSSARY

Acute Toxicity--The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

AKART-- An acronym for “all known, available, and reasonable methods of prevention, control and treatment”.

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --The average of the measured values obtained over a calendar month's time.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in receiving waters after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring --Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor (DF)--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report must contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short a period of time as is feasible.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the pollutant concentration is above zero and is determined from analysis of a sample in a given matrix containing the pollutant.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Responsible Corporate Officer-- 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 the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to receiving waters may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into receiving waters.

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

APPENDIX C--TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on Ecology's homepage at <http://www.ecy.wa.gov>.

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

APPENDIX D--RESPONSE TO COMMENTS

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

APPENDIX E—PROCESS FACTOR AND TECHNICAL LIMITS DETERMINATION

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

APPENDIX F—USOR VICINITY MAP

FACT SHEET FOR NPDES PERMIT WA-000178-3

U.S. Oil, Tacoma

APPENDIX G— REASONABLE POTNETIAL CALCULATION