NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
PERMIT FACT SHEET

Facility Name: Mobil Cabras Terminal

Permittee Name: Mobil Oil Guam, Inc.

Type of Facility: Petroleum bulk storage terminal, SIC Code 5171

Mailing Address: P.O. Box EU
Hagatna, GU 96932

Facility Location: 1189 Cabras Highway, Cabras Island, Apra Harbor
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NPDES Permit No.: GU0020036

I. STATUS OF PERMIT

Mobil Oil Guam Inc. (the "permittee" or "Mobil") applied for the renewal of their National Pollutant Discharge Elimination System (NPDES) permit to authorize the discharge of treated effluent from the Mobil Cabras Terminal to Apra Harbor located in the Territory of Guam ("Guam"). An application was submitted on April 27, 2011. Additional discharge monitoring data was submitted on June 16, 2011. EPA Region IX developed this permit and fact sheet pursuant to Section 402 of the Clean Water Act, which requires point source dischargers to control the amount of pollutants that are discharged to waters of the United States through obtaining a NPDES permit.

This permittee has been classified as a minor discharger.

II. GENERAL DESCRIPTION OF FACILITY

The Mobil Cabras Terminal ("terminal" or "facility") is a petroleum bulk storage terminal located on Cabras Island in Apra Harbor, on the west coast of the island of Guam. The terminal consists of two separate onshore non-production storage and distribution facilities (Area A and Area C Tank Farms), and an adjacent fuel transfer (vessel loading/unloading) facility at Golf Pier. Mobil owns and operates Area C; the Port Authority of Guam owns, and Mobil operates, Area A and Golf Pier.

The facility is primarily engaged in storage and wholesale distribution of petroleum products at this marketing facility. Bulk fuels are stored at the facility and distributed via tank trucks to

service stations and commercial and government accounts throughout the island. The terminal also supplies diesel fuel to marine vessels mainly through the transfer pipeline and three bunkering locations at Golf Pier.

Bulk fuels are delivered to the facility at the adjacent Golf Pier marine transfer facility. Typically, four grades of products are delivered in bulk to the terminal via tanker vessel every twenty days: Unleaded Gasoline; Super Unleaded Gasoline; Auto Diesel Oil; and Jet A-1 or Aviation Turbine Fuel.

The terminal also serves as a storage and distribution center for bulk fuels to Mobil bulk storage terminals in Micronesia and Rota and Tinian islands in the Commonwealth of the Northern Mariana Islands. Bulk fuels including Jet A-1, gasoline, and auto diesel oil are loaded at the pier to coastal tankers for distribution to the islands.

III. DESCRIPTION OF RECEIVING WATER

To protect the designated uses of waters of the U.S., Guam has adopted water quality criteria for marine waters depending on the level of protection required. Apra Harbor is a near-shore territorial water of Guam and is designated as a Category M-3 or "Fair" marine water according to *Guam Water Quality Standards, 2001 Revision* (GEPA, 2001). Guam water quality standards state that "water in this category is intended for general, commercial and industrial use, while allowing for protection of aquatic life, aesthetic enjoyment and compatible recreation with limited body contact. Specific intended uses include the following: shipping, boating and berthing, industrial cooling water, and marinas." During facility operations, the permittee discharges to Apra Harbor through the following discharge outfalls:

Table 1. Discharge Outfall locations.

Discharge Outfall No.	Latitude	Longitude	Outfall Description
001	13°26'29" N	144°38'51" E	Area A Tank Farm
002	13°27'44" N	144°39'45" E	Area C Tank Farm

Apra Harbor (Category M-3) is not listed as impaired according to the Guam Environmental Protection Agency (GEPA) 2010 Integrated Report: Clean Water Act Sections 303(d), 305(b) and 314.

IV. DESCRIPTION OF DISCHARGE

The permittee stores and distributes a variety of petroleum products, as described in Part II of this fact sheet. Discharges from the facility are intermittent, and include:

- tank bottom water draws, which originate at the lowest inner part of petroleum storage tanks where liquid drains from interior spaces as a result of rainwater accumulation and water condensation from the petroleum product itself
- hydrostatic test water from integrity testing of piping and tankage

- ship to shore transference spills and leaks
- service water flows associated with incidental leaks, system tests, and facility maintenance activities
- firewater system testing
- storm water runoff from the storage tank area, loading rack, roadways, garage drum storage, and roof drains

Runoff from Area A flows to Outfall 001; runoff from Area C flows to Outfall 002. Currently, each discharge is treated by an oil-water separator prior to release from its outfall as described above.

The estimated maximum flow rate of Outfalls 001 and 002 are 0.864 million gallons per day (MGD) and 1.008 MGD, respectively. From 2008-2012, there were 78 discharges from Outfall 001, with an average duration of 64 minutes and a maximum duration of 1283 minutes (which the permittee acknowledges may have been a recording error, as the next longest discharge was 175 minutes); and 112 discharges from Outfall 002, with an average duration of 165 minutes and a maximum duration of 758 minutes. No mixing zone has been authorized for either outfall. Table 2 summarizes the characteristics of the discharge based on monthly Discharge Monitoring Report (DMR) forms from January 2007 to March 2011 and the permittee's NPDES permit application. With the exception of pH, the data meet existing permit effluent limits. (See Part VI.B.4 of this fact sheet for history of compliance). The permittee submitted additional monthly zinc monitoring data collected from October 2011 through March 2012, which was considered in the Reasonable Potential Analysis in Part VI.B.5 of this fact sheet.

Table 2. Discharge Monitoring Report Data for years 2007-2011 and Permit Application Data.

Pollutant/ Parameter	Daily Max. Allowable Effluent Limit from 2006 Permit	Daily Maximum Concentration from DMR Forms		Average Concentration from Permit Application [1]	
		Discharge Outfall No. 001	Discharge Outfall No. 002	Discharge Outfall No. 001	Discharge Outfall No. 002
Flow Rate (MGD)	N/A [2]	0.180	1.181	0.024017	0.038091
pH (Std. Units) [3]	6.5 – 8.5	6.55 – 8.92	7.55 – 9.2	6.18 - 8.92	7.49 - 9.2
Oil and Grease (mg/l)	15	5.34	1.2	<1	<1
Lead (mg/l)	0.0081	<0.00693 [4]	<0.00693 [4]	<0.01	<0.01
Benzene (mg/l)	0.071	0.017	0.03	<0.005	<0.01
Toluene (mg/l)	N/A [2]	0.57	1.2	<0.005	<0.12
Ethylbenzene (mg/l)	N/A [2]	0.0047	0.066	<0.005	<0.01
Xylene (mg/l)	N/A [2]	0.021	0.11	--	--
Temperature (°C)	N/A [2]	N/A [5]	N/A [5]	Ambient	Ambient
Biochemical Oxygen Demand (mg/l)	N/A [2]	N/A [5]	N/A [5]	8	8
Chemical Oxygen Demand (mg/l)	N/A [2]	N/A [5]	N/A [5]	30	<3.5
Total Organic Carbon (mg/l)	N/A [2]	N/A [5]	N/A [5]	5	0.6
Total Suspended Solids (mg/l)	N/A [2]	N/A [5]	N/A [5]	7.5	<1
Ammonia (as N) (mg/l)	N/A [2]	N/A [5]	N/A [5]	0.28	0.17

Bromide (mg/l)	N/A [2]	N/A [5]	N/A [5]	1.2	1.2
Color (CPU)	N/A [2]	N/A [5]	N/A [5]	25	5
Enterococcus (MPN/100ml)	N/A [2]	N/A [5]	N/A [5]	10	<10
Fluoride (mg/l)	N/A [2]	N/A [5]	N/A [5]	0.28	<0.1
Nitrate-Nitrite (as N) (mg/l)	N/A [2]	N/A [5]	N/A [5]	0.11	<0.1
Nitrogen, Total Organic (as N) (mg/l)	N/A [2]	N/A [5]	N/A [5]	1.4	0.8
Phosphorous, Total (as P) (mg/l)	N/A [2]	N/A [5]	N/A [5]	0.12	0.15
Sulfate (as SO_4) (mg/l)	N/A [2]	N/A [5]	N/A [5]	14	4.4
Aluminum, Total (mg/l)	N/A [2]	N/A [5]	N/A [5]	0.0514	0.096
Total Nitrogen (mg/l)	N/A [2]	N/A [5]	N/A [5]	1.79	1.06
Barium, Total (mg/l)	N/A [2]	N/A [5]	N/A [5]	0.0219	<0.01
Boron, Total (mg/l)	N/A [2]	N/A [5]	N/A [5]	0.118	<0.02
Iron, Total (mg/l)	N/A [2]	N/A [5]	N/A [5]	0.412	0.172
Magnesium, Total (mg/l)	N/A [2]	N/A [5]	N/A [5]	7.36	1.68
Manganese, Total (mg/l)	N/A [2]	N/A [5]	N/A [5]	0.086	0.022
Copper, Total (mg/l)	N/A [2]	N/A [5]	N/A [5]	<0.01	<0.01
Nickel, Total (mg/l)	N/A [2]	N/A [5]	N/A [5]	<0.01	<0.01

Zinc, Total (mg/l)	N/A [2]	N/A [5]	N/A [5]	0.0733	0.028
Phenols, Total (mg/l)	N/A [2]	N/A [5]	N/A [5]	0.31	<0.046
Phenol (mg/l)	N/A [2]	N/A [5]	N/A [5]	not detected	not detected
Naphthalene (mg/l)	N/A [2]	N/A [5]	N/A [5]	not detected	not detected

[1] Pollutants believed to be absent in the effluent, based on the permittee's application, are not included.
[2] N/A indicates not applicable since no effluent limit was established in the 2006 permit.
[3] pH effluent limits and concentrations were reported as the minimum and maximum values.
[4] All reported concentrations were less than the laboratory's practical quantitation limits (the highest of which was 0.00693 mg/l) during the previous permit term.
[5] N/A indicates not applicable since no monitoring requirements were established in the 2006 permit.

V. SIGNIFICANT CHANGES TO PREVIOUS PERMIT

- Numeric effluent limitations and monitoring requirements for total suspended solids (Outfall 001), total ammonia (with a corresponding schedule of compliance), and zinc (with a corresponding schedule of compliance) have been added to the permit (see Part VI of this fact sheet)

- Narrative effluent limitations for salinity, total suspended solids, and chemical firefighting foaming agents have been added to the permit (see Part VII of this fact sheet)

- Numeric effluent limits for benzene at Outfall 001 and for lead at both outfalls have been removed (see Part VI.C of this fact sheet)

- Monitoring frequency has been reduced to once per quarter for benzene at Outfall 001, and toluene and ethylbenzene at both outfalls; and to once per permit term for lead (see Part VI.C of this fact sheet)

- Monitoring-only requirements for total suspended solids (Outfall 002) and volatile and semi-volatile organic compounds have been added to the permit (see Part VI.C of this fact sheet)

- Monitoring for xylene has been discontinued (see Part VI.C of this fact sheet)

- Receiving water visual monitoring has been discontinued due to physical obstacles in accessing each outfall to conduct receiving water visual monitoring.

VI. DETERMINATION OF NUMERICAL EFFLUENT LIMITATIONS

EPA has developed effluent limitations and monitoring requirements in the permit based on an evaluation of the technology used to treat the pollutant (e.g., "technology-based effluent limits") and the water quality standards applicable to the receiving water (e.g., "water quality-based effluent limits"). EPA has established the most stringent of applicable technology-based or water quality-based standards in the permit, as described below.

A. Applicable Technology-Based Effluent Limitations

Effluent Limitations Guidelines (ELGs)

EPA has established national standards based on the performance of treatment and control technologies for wastewater discharges to surface waters for certain industrial categories. Effluent limitations guidelines represent the greatest pollutant reductions that are economically achievable for an industry, and are based on Best Practicable Control Technology (BPT), Best Conventional Pollutant Control Technology (BCT), and Best Available Technology Economically Achievable (BAT) (Sections 304(b)(1), 304(b)(4), and 304(b)(2) of the CWA respectively).

There are no applicable ELGs for petroleum bulk storage terminals (SIC 5171). EPA considered the need for ELGs for petroleum bulk storage terminals in the Technical Support

Document for the 2004 Effluent Guidelines Program Plan, but concluded that regulation of this industry category under individual permits was adequate (EPA, 2004). Refer to Part VI.B.3 for a list of typical pollutants of concern for this type of facility.

Oil and Grease

The permit retains a technology-based daily maximum effluent limit of 15 mg/l for oil and grease. The effluent limit for oil and grease is based on EPA's Best Professional Judgment (BPJ) related to the development of technology-based effluent limits since (1) there are no applicable effluent limitation guidelines and performance standards for oil and grease, and (2) this facility has shown that 15 mg/l can be achieved by the oil-water separators. Section 402(a)(1) of the Clean Water Act (CWA) provides for the establishment of BPJ-based effluent limits when effluent limitation guidelines and performance standards are not available for a pollutant of concern. In addition to this technology-based numerical effluent limit, narrative water quality-based limits for oil and grease are included in the permit (see Part VII of this fact sheet). Monitoring for oil and grease is required monthly.

B. Water Quality-Based Effluent Limitations

Water quality-based effluent limitations are required in NPDES permits when the permitting authority determines that a discharge causes, has the reasonable potential to cause, or contributes to an excursion above any water quality standard (40 CFR 122.44(d)(1)).

When determining whether an effluent discharge causes, has the reasonable potential to cause, or contributes to an excursion above narrative or numeric criteria, the permitting authority shall use procedures which account for existing controls on point and non point sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity) and where appropriate, the dilution of the effluent in the receiving water (40 CFR 122.44(d)(1)(ii)).

EPA evaluated the reasonable potential to discharge toxic pollutants according to guidance provided in the *Technical Support Document for Water Quality-Based Toxics Control* (TSD) (Office of Water Enforcement and Permits, U.S. EPA, March 1991) and the *U.S. EPA NPDES Permit Writers Manual* (Office of Water, U.S. EPA, December 1996). These factors include:

1. Applicable standards, designated uses and impairments of receiving water
2. Dilution in the receiving water
3. Type of industry
4. History of compliance problems and toxic impacts
5. Existing data on toxic pollutants - Reasonable Potential Analysis

1. Applicable Standards, Designated Uses and Impairments of Receiving Water

To protect the designated uses of waters of the U.S., Guam has adopted water quality criteria for marine waters depending on the level of protection required. Apra Harbor is a near-shore territorial water of Guam and is designated as a Category M-3 or "Fair" marine water according to *Guam Water Quality Standards, 2001 Revision.* Guam water quality standards state that "water in this category is intended for general, commercial and industrial use, while allowing for protection of aquatic life, aesthetic enjoyment and compatible recreation with limited body contact. Specific intended uses include the following: shipping, boating and berthing, industrial cooling water, and marinas."

The receiving water, "Apra Harbor 3" (Category M-3), was assessed as part of the GEPA 2010 Integrated Report: Clean Water Act Sections 303(d), 305(b) and 314, and is not listed as impaired. "Apra Harbor 1" (Category M-1) and "Apra Harbor 2" (Category M-2), adjacent to the receiving water, are listed as impaired for PCBs in fish tissue (GEPA, 2010). PCBs are not considered a typical pollutant of concern for petroleum bulk storage terminals.

2. Dilution in the Receiving Water

No dilution of the effluent has been considered in the development of water quality-based effluent limits applicable to the discharge.

3. Type of Industry

According to the *Technical Support Document for the 2004 Effluent Guidelines Program Plan* (EPA, 2004), typical pollutants for petroleum bulk storage terminals are oil & grease, total petroleum hydrocarbons, biochemical oxygen demand, chemical oxygen demand, total organic carbon, ammonia, total suspended solids, phenols, total dissolved solids, naphthenic acids, aromatics (benzene, toluene, ethylbenzene, xylene), and surfactants. Benzene, toluene, ethylbenzene and xylene are the more volatile components of petroleum hydrocarbons. These pollutants are usually present in petroleum products, but are most associated with petroleum products with lighter ranges of hydrocarbons, such as gasoline. Since discharges from this facility may come into contact with petroleum products, including gasoline, and because oil-water separators are the only means of treatment, it is reasonable to expect that these pollutants may be discharged to surface waters.

4. History of Compliance Problems and Toxic Impacts

In their renewal application, the permittee reported that no significant leaks or spills of toxic or hazardous pollutants occurred in the last three years that were reportable and/or reached navigable waters, and that all spills and leaks of petroleum products are promptly cleaned up.

Discharge from the facility violated effluent limitations for pH five times at Outfall 001 and five times at Outfall 002 during the previous permit term. The facility noted in their DMRs for these months that the violations were likely due to runoff coming into contact with fresh cement or leaked firefighting foam.

An NPDES Compliance Evaluation Inspection was performed by EPA contractors and GEPA representatives at the facility on March 8, 2010. A report was prepared on March 14, 2010 (PG Environmental, 2010). Inspectors noted that the oil-water separator treating discharge to Outfall 001 appeared to be overloaded, the existing practice of sampling for oil and grease using a plastic bucket was not consistent with monitoring requirements in 40 CFR 136, and certain components of the facility's Pollution Prevention Plan did not appear to be implemented consistent with requirements of the facility's NPDES permit.

5. Existing Data on Toxic Pollutants

For pollutants with effluent data available and applicable water quality standards (as listed in Appendix A of this fact sheet), EPA has conducted a reasonable potential analysis based on statistical procedures outlined in EPA's *Technical Support Document for Water Quality-based Toxics Control* herein after referred to as EPA's TSD (EPA, 1991). These statistical procedures result in the calculation of the projected maximum effluent concentration based on monitoring

data to account for effluent variability and a limited data set. The projected maximum effluent concentrations were estimated assuming a coefficient of variation of 0.6 and the 99 percent confidence interval of the 99th percentile based on an assumed lognormal distribution of daily effluent values (sections 3.3.2 and 5.5.2 of EPA's TSD). EPA calculated the projected maximum effluent concentration for each pollutant using the following equation:

Projected maximum concentration = C_e × *reasonable potential multiplier factor.*

Where, "C_e" is the reported maximum effluent value and the multiplier factor is obtained from Table 3-1 of the TSD.

Table 3a. Summary of Reasonable Potential Statistical Analysis, Outfall 001

Parameter	**Maximum Observed or Estimated Concentration(1)**	***n***	**RP Multiplier**	**Projected Maximum Effluent Concentration**	**Most Stringent Numeric Water Quality Criterion**	**Statistical Reasonable Potential?**
Benzene	17 µg/l	46	1.7	28.9 µg/l	71 µg/l (human health, consumption of organism only)	No
Toluene	570 µg/l	46	1.7	969 µg/l	200,000 µg/l (human health, consumption of organism only)	No
Ethylbenzene	4.7 µg/l	46	1.7	7.99 µg/l	29,000 µg/l (human health, consumption of organism only)	No
Lead, total	(2)	46	1.7	(2)	8.1 µg/l (aquatic life, chronic)	No
Total Suspended Solids	**7.5 mg/l**	**1**	**13.2**	**99 mg/l**	**40 mg/l**	**Yes**
Total Ammonia	**0.28 mg/l**	**1**	**13.2**	**3.70 mg/l**	**0.15 mg/l (3)**	**Yes**
Enterococcus	10 MPN/100ml	1	13.2	132 MPN/100ml	276 MPN/100ml (instantaneous maximum for Category M-3 waters)	No

Fluoride	0.28 mg/l	1	13.2	3.696 mg/l	[4]	No
Aluminum, Total	0.0514 mg/l	1	13.2	0.67848 mg/l	[4]	No
Barium, Total	0.0219 mg/l	1	13.2	0.28908 mg/l	0.50 mg/l	No
Boron, Total	0.118 mg/l	1	13.2	1.5576 mg/l	5.00 mg/l	No
Iron, Total	0.412 mg/l	1	13.2	5.4384 mg/l	[4]	No
Manganese, Total	0.086 mg/l	1	13.2	1.1352 mg/l	[4]	No
Copper, Total	[2]	1	13.2	[2]	3.1 µg/l (aquatic life, chronic)	No
Nickel, Total	[2]	1	13.2	[2]	8.2 µg/l (aquatic life, chronic)	No
Zinc, Total	**156 µg/l**	**6**	**3.8**	**592.8 µg/l**	**86 µg/l (aquatic life, chronic)**	**Yes**
Phenol	[2]	1	13.2	[2]	4,600,000 µg/l (human health, consumption of organism only)	No

[1] All reported laboratory Method Detection Limits and Reporting Levels are lower than applicable Guam water quality standards.
[2] All reported concentrations were less than the laboratory's practical quantitation limit.
[3] Converted from the un-ionized ammonia criterion in the Guam Water Quality Standards, per the *Ambient Water Quality Criteria for Ammonia (Saltwater)-1989*. See Part VI.C of this fact sheet for further discussion.
[4] Guam water quality standards state: "Whenever natural concentrations of any toxic substance or element occur and exceed the limits established in these standards, this greater concentration shall constitute the limit; provided, that this natural concentration was not directly affected by non-induced causes." (p. 84, GEPA, 2001). This constituent is not a common pollutant of concern for this type of industry, and the permittee indicated in their renewal application that the source of this pollutant in the effluent is seawater used at the facility (taken from the same waterbody as the receiving water). Therefore, the ambient concentration in the source/receiving water constitutes the applicable criterion for this parameter, and the facility does not demonstrate reasonable potential to cause or contribute to an exceedance of this criterion.

Table 3b. Summary of Reasonable Potential Statistical Analysis, Outfall 002

Parameter	**Maximum Observed or Estimated Concentration[1]**	***n***	**RP Multiplier**	**Projected Maximum Effluent Concentration**	**Most Stringent Water Quality Criterion**	**Statistical Reasonable Potential?**

Benzene	**30 µg/l**	**16**	**2.5**	**75 µg/l**	**71 µg/l (human health, consumption of organism only)**	**Yes**
Toluene	1,200 µg/l	16	2.5	3,000 µg/l	200,000 µg/l (human health, consumption of organism only)	No
Ethylbenzene	66 µg/l	16	2.5	165 µg/l	29,000 µg/l (human health, consumption of organism only)	No
Lead, total	(2)	16	2.5	(2)	8.1 µg/l (aquatic life, chronic)	No
Total Suspended Solids	(2)	1	13.2	(2)	40 mg/l	No
Total Ammonia	**0.17 mg/l**	**1**	**13.2**	**2.24 mg/l**	**0.15 mg/l (3)**	**Yes**
Enterococcus	(2)	1	13.2	(2)	276 MPN/100ml (instantaneous maximum for Category M-3 waters)	No
Fluoride	(2)	1	13.2	(2)	1.50 mg/l	No
Aluminum, Total	0.096 mg/l	1	13.2	1.2672 mg/l	(4)	No
Barium, Total	(2)	1	13.2	(2)	0.50 mg/l	No
Boron, Total	(2)	1	13.2	(2)	5.00 mg/l	No
Iron, Total	0.172 mg/l	1	13.2	2.2704 mg/l	(4)	No
Manganese, Total	0.022 mg/l	1	13.2	0.2904 mg/l	(4)	No
Copper, Total	(2)	1	13.2	(2)	3.1 µg/l (aquatic life, chronic)	No

Nickel, Total	[2]	1	13.2	[2]	8.2 µg/l (aquatic life, chronic)	No
Zinc, Total	**130 µg/l**	**7**	**3.6**	**468 µg/l**	**86 µg/l (aquatic life, chronic)**	**Yes**
Phenol	[2]	1	13.2	[2]	4,600,000 µg/l (human health, consumption of organism only)	No

[1] All reported laboratory Method Detection Limits and Reporting Levels are lower than applicable Guam water quality standards.
[2] All reported concentrations were less than the laboratory's practical quantitation limit.
[3] Converted from the un-ionized ammonia criterion in the Guam Water Quality Standards, per the *Ambient Water Quality Criteria for Ammonia (Saltwater)-1989*. See Part VI.C of this fact sheet for further discussion.
[4] Guam water quality standards state: "Whenever natural concentrations of any toxic substance or element occur and exceed the limits established in these standards, this greater concentration shall constitute the limit; provided, that this natural concentration was not directly affected by non-induced causes." (p. 84, GEPA, 2001). This constituent is not a common pollutant of concern for this type of industry, and the permittee indicated in their renewal application that the source of this pollutant in the effluent is seawater used at the facility (taken from the same waterbody as the receiving water). Therefore, the ambient concentration in the source/receiving water constitutes the applicable criterion for this parameter, and the facility does not demonstrate reasonable potential to cause or contribute to an exceedance of this criterion.

C. Rationale for Numeric Effluent Limits and Monitoring

EPA evaluated the typical pollutants expected to be present in the effluent and selected the most stringent of applicable technology-based standards or water quality-based effluent limitations. Where effluent concentrations of toxic parameters are unknown or are not reasonably expected to be discharged in concentration that have the reasonable potential to cause or contribute to water quality violations, EPA may establish monitoring requirements in the permit. Where monitoring is required, data will be re-evaluated and the permit may be re-opened to incorporate effluent limitations as necessary. No dilution of the effluent has been considered in the development of water quality-based effluent limits applicable to the discharge; therefore, limits apply end-of-pipe.

Flow

No limits established for flow, but flow rates must be monitored and reported. Monitoring is required daily.

Oil and Grease

As described in Part VI.A of this fact sheet, the permit retains a technology-based daily maximum effluent limit of 15 mg/l for oil and grease, based on BPJ.

pH

Guam water quality standards require that all marine waters, including Category M-3 marine waters, maintain a pH range of 6.5 to 8.5. Therefore, the permit retains the requirement for

effluent pH to remain between 6.5 and 8.5. pH shall be taken as a field measurement at the time of sampling.

Total Suspended Solids (TSS)

Guam water quality standards contain receiving water criteria of 40 mg/l for TSS for category M-3 receiving waters. Based on effluent data in the permit renewal application, EPA has determined that the discharge has a reasonable potential to cause or contribute to an exceedance of applicable water quality criteria for TSS at Outfall 001, but not at Outfall 002. The permit contains effluent limits and monthly monitoring requirements for TSS at Outfall 001 based on the most stringent water quality criteria in *Guam Water Quality Standards, 2001 Revision* for Category M-3 receiving waters. Quarterly monitoring is required at Outfall 002, based on BPJ, as TSS is considered a typical pollutant of concern for petroleum bulk storage terminals. Narrative effluent limits for TSS have also been included in the permit.

Ammonia

Ammonia is considered a typical pollutant of concern for petroleum bulk storage terminals. Guam water quality standards contain a "maximum numeric limit" of 0.02 mg/l for ammonia in marine waters. EPA has interpreted this criterion as total un-ionized ammonia (UIA), the toxic form of ammonia. The discharger reported total ammonia (un-ionized-NH_3 and ionized-NH_{4^+}, as N) in their renewal application. EPA used critical pH, temperature, and salinity values measured in the receiving water to convert the Guam UIA criterion to a total ammonia criterion by using the *Ambient Water Quality Criteria for Ammonia (Saltwater)-1989* (EPA, 1989). The document provides guidance on ammonia speciation and the conversion between total ammonia and UIA for saltwater systems.

EPA used the highest receiving water pH (8.41 standard units), highest receiving water temperature (28.7°C), and lowest receiving water salinity (35 parts per thousand) measured in 2011 at the nearest GEPA monitoring station (APM18) to calculate the most protective water quality criterion for total ammonia applicable to the receiving water, 0.15 mg/L. Based on effluent data in the permit renewal application, EPA has determined that the discharge has a reasonable potential to cause or contribute to an exceedance of applicable water quality criteria for ammonia.

Therefore, the permit contains new final effluent limits for total ammonia at Outfalls 001 and 002 based on the most stringent water quality criteria in *Guam Water Quality Standards, 2001 Revision* for Category M-3 receiving waters. As there is minimal effluent data for this parameter, monthly monitoring is required.

The permittee submitted ammonia sampling data demonstrating that the facility cannot immediately comply with these new final effluent limits for total ammonia, and requested a schedule of compliance for meeting the final limits. *Guam Water Quality Standards* discusses schedules of compliance under section 5104.A.13. Based on the provisions in the *Guam Water Quality Standards*, the permit incorporates an appropriate schedule of compliance that will lead to compliance with final effluent limitations for total ammonia to meet applicable Guam water quality standards. The schedule is based on the length of time needed to identify the source(s) of ammonia in the effluent, and to design and implement appropriate control or treatment measures, and will lead to compliance with the final effluent limits as soon as possible (by the expiration date of the permit). The schedule contains interim requirements and dates for their achievement, with dates of completion less than 1 year apart, as required by *Guam Water Quality Standards* section 5104.A.13.e.

Benzene (Outfall 002)

Based on effluent data during the previous permit term, EPA has determined that the discharge from Outfall 002 has a reasonable potential to cause or contribute to an exceedance of applicable water quality criteria for benzene. Therefore, the permit contains an effluent limit at Outfall 002 for benzene, based on the most stringent water quality criteria in *Guam Water Quality Standards, 2001 Revision* for Category M-3 receiving waters. Monitoring is required monthly.

As discharges from the facility are intermittent, and monitoring for this parameter is required only once/month, the 71 µg/l human health criterion is incorporated into the permit as a maximum daily limit, consistent with the effluent limit for benzene in the previous permit.

Benzene (Outfall 001), Toluene, Ethylbenzene

Based on the reasonable potential analysis, EPA has determined that the discharge does not have reasonable potential to cause or contribute to an exceedance for benzene (at Outfall 001), toluene, and ethylbenzene. Therefore, effluent limits for benzene at Outfall 001 have been removed from the permit, and no effluent limits have been established for toluene or ethylbenzene. Monitoring for these parameters is retained based on best professional judgment, as these are considered typical pollutants of concern for petroleum bulk storage terminals, but monitoring frequencies have been reduced to once per quarter.

Lead

Lead was never detected in the effluent during the previous permit term. The permittee reported that lead is no longer used as an additive in gasoline at the facility. Therefore, effluent limits and monitoring requirements for lead have been removed from the permit; however, lead concentrations must be measured and reported in the fourth year of the permit term as part of the priority toxic pollutants scan (see Part VIII.C of this fact sheet).

Xylene

No applicable Guam water quality standards for xylene exist. Therefore, monitoring requirements for xylene have been removed from the permit.

Zinc

Criteria listed in Guam's water quality standards for the protection of saltwater aquatic life and human health (consumption of organisms only), as designated for Category M-3 marine waters, apply to the receiving water. Based on effluent data in the permit renewal application and monthly effluent monitoring data taken from October 2011 through March 2012, EPA has determined that the discharge has a reasonable potential to cause or contribute to an exceedance of applicable water quality criteria for zinc. Therefore, the permit contains effluent limits for zinc at Outfalls 001 and 002 based on the most stringent water quality criteria in *Guam Water Quality Standards, 2001 Revision* for Category M-3 receiving waters. As there is minimal effluent data for this parameter, monthly monitoring is required.

As discussed in Part IV of this fact sheet, the average discharge duration during the past four years was 64 minutes for Outfall 001 (78 distinct discharges in total) and 165 minutes for Outfall 002 (112 distinct discharges in total). The criteria maximum concentration for protection of saltwater aquatic life is a one-hour average concentration that should not be exceeded more than once every three years. As discharges from the facility are, on average, greater than one hour in duration and occur more frequently than once every three years, the criteria maximum concentration alone is not protective of aquatic life in the receiving water. Therefore, the 86 µg/l

criterion continuous concentration for protection of saltwater aquatic life (a 4-day average that should not be exceeded more than once every three years) is the most stringent applicable water quality criterion for zinc, and is incorporated into the permit as a maximum daily limit.

The permittee submitted zinc sampling data demonstrating that the facility cannot immediately comply with these new final effluent limits for total recoverable zinc, and requested a schedule of compliance for meeting the final limits. *Guam Water Quality Standards* discusses schedules of compliance under section 5104.A.13. Based on the provisions in the *Guam Water Quality Standards*, the permit incorporates an appropriate schedule of compliance that will lead to compliance with final effluent limitations for total recoverable zinc to meet applicable Guam water quality standards. The schedule is based on the length of time needed to identify the source(s) of zinc in the effluent, and to design and implement appropriate control or treatment measures, and will lead to compliance with the final effluent limits as soon as possible (by the expiration date of the permit). The schedule contains interim requirements and dates for their achievement, with dates of completion less than 1 year apart, as required by *Guam Water Quality Standards* section 5104.A.13.e.

Remaining volatile and semi-volatile organic compounds

Volatile and semi-volatile organic compounds (as listed in Attachment E of the permit) are considered typical pollutants of concern for petroleum bulk storage terminals. Guam water quality standards contain criteria for volatile and semi-volatile organic compounds that are applicable to the receiving water. As there is minimal effluent data for these parameters, annual monitoring is required.

D. Anti-Backsliding

Section 402(o) of the CWA prohibits the renewal or reissuance of an NPDES permit that contains effluent limits less stringent than those established in the previous permit, except as provided in the statute.

The permit does not establish any effluent limits less stringent than those in the previous permit and does not allow backsliding. In accordance with CWA Section 402(o), WQBELs for benzene at Outfall 001 and for lead are discontinued based on new information indicating that the effluent data demonstrate no reasonable potential for the discharge to cause or contribute to an excursion above applicable Guam water quality standards for these parameters.

E. Antidegradation Policy

EPA's antidegradation policy at 40 CFR 131.12 and Guam water quality standards require that existing water uses and the level of water quality necessary to protect the existing uses be maintained. Guam water quality standards also state that if a project may lower water quality in a higher quality water, that water quality shall be maintained and protected unless an interdisciplinary review consistent with the National Environmental Policy Act is submitted, which requires the project to comply with local and federal laws and regulations for the protection of the environment and includes mitigation as a condition for granting approval of the project.

The permit is a reissuance of a permit for an existing facility. No new construction, new outfalls, new industrial process waste streams, or land, habitat, or hydrology alterations are associated with the permit reissuance. The permit does not establish any effluent limits less stringent than those in the previous permit. WQBELs for benzene at Outfall 001 and for lead are

discontinued based on new information indicating that effluent data demonstrate no reasonable potential for the discharge to cause or contribute to an exceedance of applicable Guam water quality standards for these parameters. As described in this document, the permit establishes effluent limits and monitoring requirements to ensure that all applicable water quality standards are met. The permit does not include a mixing zone, and thus these limits will apply at the end of pipe without consideration of dilution in the receiving water. Therefore, the permit does not authorize any lowering of water quality in the receiving water and complies with GEPA's antidegradation policy.

VII. NARRATIVE WATER QUALITY-BASED EFFLUENT LIMITS

The permit incorporates narrative water quality-based limits from Sections 5103 and 5104 of the *Guam Water Quality Standards, 2001 Revision*. The permit also contains a narrative water quality limit for chemical firefighting foaming agents, based on BPJ.

VIII. MONITORING AND REPORTING REQUIREMENTS

The permit requires the permittee to conduct monitoring for all parameters where effluent limits have been established, at the minimum frequency specified. Additionally, where effluent concentrations of toxic parameters are unknown or where data are insufficient to determine reasonable potential, monitoring may be required for parameters where effluent limits have not been established.

A. Effluent Monitoring and Reporting

The permittee shall conduct effluent monitoring to evaluate compliance with the permit conditions. The permittee shall perform all monitoring, sampling and analyses in accordance with the methods described in the most recent edition of 40 CFR 136 and in accordance with Part I.H.1 of the permit. All monitoring data shall be reported on monthly DMR forms and submitted quarterly as specified in the permit.

B. Priority Toxic Pollutants Scan

A Priority Toxics Pollutants scan shall be conducted during the fourth year of the five-year permit term to ensure that the discharge does not contain toxic pollutants in concentrations that may cause a violation of water quality standards. The permittee shall perform all effluent sampling and analyses for the priority pollutants scan in accordance with the methods described in the most recent edition of 40 CFR 136 and in accordance with Part I.H.1 of the permit. 40 CFR 131.36 provides a complete list of Priority Toxic Pollutants.

IX. SPECIAL CONDITIONS

A. Development and Implementation of Best Management Practices

Pursuant to 40 CFR 122.44(k)(4), EPA may impose Best Management Practices (BMPs) which are "reasonably necessary…to carry out the purposes of the Act." The pollution prevention requirements or BMPs in the permit operate as technology-based limitations on effluent discharges that reflect the application of Best Available Technology and Best Control

Technology. Therefore, the permit requires that the permittee maintain, update, and implement their Pollution Prevention Plan with appropriate pollution prevention measures or BMPs designed to prevent pollutants from entering Apra Harbor while performing normal operations at the facility.

X. OTHER CONSIDERATIONS UNDER FEDERAL LAW

A. Impact to Threatened and Endangered Species

Section 7 of the Endangered Species Act (ESA) of 1973 (16 U.S.C. § 1536) requires federal agencies to ensure that any action authorized, funded, or carried out by the federal agency does not jeopardize the continued existence of a listed or candidate species, or result in the destruction or adverse modification of its habitat.

The U.S. Fish and Wildlife Service Pacific Islands Office (FWS) provides assistance with ESA compliance regarding species on land or the terrestrial portion of the proposed action. EPA submitted a request to FWS for a list of endangered and threatened terrestrial species in the vicinity of Apra Harbor on May 6, 2011. FWS responded on June 15, 2011 with a list of two sea turtles, the threatened green turtle (*Chelonia mydas*) and the endangered hawksbill turtle (*Eretmochelys imbricata*), which may occur in the vicinity of Apra Harbor. Both species have been documented to use beaches in Apra Harbor for basking and possibly nesting. FWS also noted that there is no designated or proposed critical habitat in the vicinity of Apra Harbor. (Mehrhoff, 2011). EPA drafted a biological evaluation with regard to the discharge, and determined that issuance of the permit would have no effect on the endangered hawksbill turtle or the threatened green turtle.

The Pacific Islands Office of the National Marine Fisheries Service (NMFS) provides assistance with ESA compliance regarding marine species. EPA submitted a request to NMFS for a list of endangered and threatened terrestrial species in the vicinity of Apra Harbor on June 6, 2011. NMFS responded on June 10, 2011 with a list of two federally threatened or endangered species that occur in Apra Harbor: the endangered hawksbill turtle (*Eretmochelys imbricata*) and the threatened green turtle (*Chelonia mydas*). NMFS also noted that there is no designated or proposed critical habitat in Apra Harbor. (Opay, 2011). EPA drafted a biological evaluation with regard to the discharge, and determined that issuance of the permit would have no effect on the endangered hawksbill turtle or the threatened green turtle, nor would it have any effect on threatened or endangered species outside Apra Harbor.

B. Impact to Coastal Zones

The Coastal Zone Management Act (CZMA) requires that Federal activities and licenses, including Federally permitted activities, must be consistent with an approved state Coastal Management Plan (CZMA Sections 307(c)(1) through (3)). Section 307(c) of the CZMA and implementing regulations at 40 CFR 930 prohibit EPA from issuing a permit for an activity affecting land or water use in the coastal zone until the applicant certifies that the proposed activity complies with the State (or Territory) Coastal Zone Management program, and the State (or Territory) or its designated agency concurs with the certification. In Guam, the lead agency responsible for performing Coastal Zone Management consistency reviews is the Guam Bureau of Statistics and Plans (BSP).

EPA provided copies of the draft permit and this fact sheet to BSP for review and comment during the public notice period. BSP provided a consistency certification on July 11, 2012.

C. Impact to Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act (MSA) set forth a number of new mandates for the National Marine Fisheries Service, regional fishery management councils and other federal agencies to identify and protect important marine and anadromous fish species and habitat. The MSA requires Federal agencies to make a determination on Federal actions that may adversely impact Essential Fish Habitat (EFH).

The permit contains technology-based effluent limits and numerical and narrative water quality-based effluent limits as necessary for the protection of applicable aquatic life uses. Furthermore, the permit contains a re-opener provision for additional numeric effluent limits to be established if any parameters demonstrate potential to exceed or contribute to an exceedance of Guam water quality standards for the protection of marine life. Therefore, EPA determined that issuance of the permit would not adversely affect essential fish habitat.

D. Impact to National Historic Properties

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to consider the effect of their undertakings on historic properties that are either listed on, or eligible for listing on, the National Register of Historic Places. Pursuant to the NHPA and 36 CFR §800.3(a)(1), EPA made a determination that issuing this NPDES permit does not have the potential to affect any historic properties or cultural properties. As a result, Section 106 does not require EPA to undertake additional consulting on this permit issuance.

XI. STANDARD CONDITIONS

A. Reopener Provision

In accordance with 40 CFR 122 and 124, this permit may be modified by EPA to include effluent limits, monitoring, or other conditions to implement new regulations, including EPA-approved water quality standards; or to address new information indicating the presence of effluent toxicity or the reasonable potential for the discharge to cause or contribute to exceedances of water quality standards.

B. Standard Provisions

The permit requires the permittee to comply with EPA Region IX Standard Federal NPDES Permit Conditions, dated July 1, 2001.

XII. ADMINISTRATIVE INFORMATION

A. Public Notice (40 CFR 124.10)

The public notice is the vehicle for informing all interested parties and members of the general public of the contents of a draft NPDES permit or other significant action with respect to an NPDES permit or application.

B. Public Comment Period (40 CFR 124.10)

Notice of the draft permit must be placed in a daily or weekly newspaper within the area affected by the facility or activity, with a minimum of 30 days provided for interested parties to respond in writing to EPA. After the closing of the public comment period, EPA is required to respond to all significant comments at the time a final permit decision is reached or at the same time a final permit is actually issued.

EPA published a public notice of the draft permit and fact sheet in the Guam Pacific Daily News on April 30, 2012. The public comment period ended May 30, 2012. EPA received comments from Mobil Oil Guam, Inc. (see EPA's Response to Comments).

C. Public Hearing (40 CFR 124.12(c))

A public hearing may be requested in writing by any interested party. The request should state the nature of the issues proposed to be raised during the hearing. A public hearing will be held if EPA determines there is a significant amount of interest expressed during the 30-day public comment period or when it is necessary to clarify the issues involved in the permit decision.

D. Water Quality Certification Requirements (40 CFR 124.53 and 124.54)

For States, Territories, or Tribes with EPA approved water quality standards, EPA is requesting certification from the affected State, Territory, or Tribe that the permit will meet all applicable water quality standards. Certification under section 401 of the CWA shall be in writing and shall include the conditions necessary to assure compliance with referenced applicable provisions of sections 208(e), 301, 302, 303, 306, and 307 of the CWA and appropriate requirements of Territory law.

EPA provided copies of the draft permit and this fact sheet to GEPA for review and comment during the public notice period, and requested water quality certification under CWA section 401 on June 20, 2012. GEPA provided section 401 water quality certification on September 6, 2012. This water quality certification is included in Attachment F of the permit.

XIII. CONTACT INFORMATION

Comments, submittals, and additional information relating to this proposal may be directed to:

Amelia Whitson, (415) 972-3216
Whitson.Amelia@EPA.gov

EPA Region IX
75 Hawthorne Street (WTR-5)
San Francisco, California 94105

XIV. REFERENCES

GEPA. 2001. Guam Water Quality Standards. Public Law 26-113, June 18, 2002.

GEPA. 2010. Integrated Report: Clean Water Act Sections 303(d), 305(b) and 314.

EPA. 1989. *Ambient Water Quality Criteria for Ammonia (Saltwater) – 1989*. Office of Water, Regulations and Standards, Criteria and Standards Division, EPA. EPA 440/5-88-004.

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

EPA. 2004. *Technical Support Document for the 2004 Effluent Guidelines Program Plan*. Office of Water, EPA. EPA-821-R-04-014.

EPA. 2010. *U.S. EPA NPDES Permit Writers' Manual*. Office of Water, EPA. EPA-833-K-10-001.

Mehrhoff, Loyal. U.S. Fish & Wildlife Service, Pacific Islands Fish and Wildlife Office. Personal correspondence, 2011-SL-0311. Dated 15 June 2011.

National Marine Fisheries Service, Pacific Islands Regional Office. 2010. *Marine Protected Species of the Mariana Islands*. [Online] Available: http://www.fpir.noaa.gov/Library/PRD/ESA%20Consultation/Marianas%20Species%20List%20May%202010.pdf

Opay, Patrick. NOAA/NMFS Pacific Islands Regional Office. Personal Correspondence. Dated 10 June 2011.

Permittee's NPDES permit application documents. Dated April 21, 2011, and April 27, 2011.

PG Environmental. EPA Region IX, Guam: NPDES Compliance Evaluation Inspection. Prepared March 14, 2010.

APPENDIX A: Applicable numeric Guam Water Quality Standards for monitored parameters, Category M-3 Fair Marine Waters

pH
pH shall remain within the range of 6.5-8.5

Total Non-Filterable Suspended Solids
The total concentration of suspended matter at any point should not exceed 40 mg/l, except when due to natural conditions.

Priority Toxic Pollutants (including Lead, Benzene, Toluene, Ethylbenzene, and volatile and semi-volatile organic compounds)
Appendix A of the 2001 Guam Water Quality Standards contains a matrix of the 126 CWA Section 307(A) Toxic Pollutants, attached below. Criteria listed under columns "Saltwater CMC" (Criteria Maximum Concentration) (C1), "Saltwater CCC" (Criterion Continuous Concentration) (C2), and "Human Health for Consumption of Organism Only" (D2) are applicable to the receiving water.

A (#)COMPOUND	CAS Number	B FRESHWATER CMC d (ug/l) B1	B FRESHWATER CCC d (ug/l) B2	C SALTWATER CMC d (ug/l) C1	C SALTWATER CCC d (ug/l) C2	D HUMAN HEALTH For Consumption of: Water & Organisms (ug/) D1	D HUMAN HEALTH For Consumption of: Organism Only (ug/l) D2
1. Antimony	7440360					14a	4300 a
2. Arsenic	7440382	340 m	150 m	69	36	5	
3. Beryllium	7440417					j	j
4. Cadmium	7440439	3.9 d, m	1.1 d, m	42	9.3	j	j
5a. Chromium (III)	16065831	1700 d	210 d			j	j
b. Chromium (VI)	8540299	16 m	11 m	1100	50	j	j
6. Copper	7440508	18 d, m	12 d, m	4.8	3.1	1300	
7. Lead	7439921	82 d	3.2 d	210	8.1	j	j
8. Mercury	7439976	2.4 m	0.012 m	2.1	0.025	0.050 a	0.051 a
9. Nickel	7440020	470 d, m	52 d, m	74	8.2	610 a	4600 a
10. Selenium	7782492	20	5.0	290	71	j	j

A (#)COMPOUND	CAS Number	B FRESHWATER CMC d (ug/l) B1	B FRESHWATER CCC d (ug/l) B2	C SALTWATER CMC d (ug/l) C1	C SALTWATER CCC d (ug/l) C2	D HUMAN HEALTH For Consumption of: Water & Organisms (ug/) D1	D HUMAN HEALTH For Consumption of: Organism Only (ug/l) D2
11. Silver	7440224	4.1 d		2.3			
12. Thallium	7440280					1.7 a	6.3 a
13. Zinc	7440666	120 d, m	110 d, m	95	86	9,100	69,000
14. Cyanide	57125	22 n	5.2 n	1	1	700 a	200,000 ah
15. Asbestos	1332214					7,000,000 fibers/L	i
16. 2,3,7,8-TCDD (Dioxin)	1746016					0.000000013 b	0.000000014 b
17. Acrolein	107028					320	780
18. Acrylonitrile	107131					0.059 a, b	0.66 a, b
19. Benzene	71432					1.2 a, b	71 a, b
20. Bromoform	75252					4.3 a, b	360 a, b
21. Carbon Tetrachloride	56235					0.25 a,b	4.4 a, b

A (#)COMPOUND	CAS Number	B FRESHWATER CMC d (ug/l) B1	B FRESHWATER CCC d (ug/l) B2	C SALTWATER CMC d (ug/l) C1	C SALTWATER CCC d (ug/l) C2	D HUMAN HEALTH For Consumption of: Water & Organisms (ug/) D1	D HUMAN HEALTH For Consumption of: Organism Only (ug/l) D2
22. Chlorobenzene	108907					680 a	21,000 a, h
23. Chlorodibromomethane	124481					0.41 a, b	34 a, b
24. Chloroethane	75003						
25. 2-Chloroethylvinyl-Ether	110758						
26. Chloroform	67663					5.7 a, b	470 a, b
27. Dichlorobrpmomethane	75274					0.56 a, b	46 a, b
28. 1,1-Dichloroethane	75343						
29. 1,2Dichloroethane	107062					0.38 a, b	99 a, b

A (#)COMPOUND	CAS Number	B FRESHWATER CMC d (ug/l) B1	B FRESHWATER CCC d (ug/l) B2	C SALTWATER CMC d (ug/l) C1	C SALTWATER CCC d (ug/l) C2	D HUMAN HEALTH For Consumption of: Water & Organisms (ug/) D1	D HUMAN HEALTH For Consumption of: Organism Only (ug/l) D2
30. 1,1-Dichloroethylene	75354					0.057 a, b	3.2 a, b
31. 1,2-Dichloropropane	78875					0.52 a	39 a
32. 1,3-Dichloropropene	542756					10 a	1700 a
33. Ethylbenzene	100414					3,100 a	29,000 a
34. Methyl Bromide	74839					48 a	4,000 a
35. Methyl Chloride	74873					j	j
36. Methylene Chloride	75092					4.7 a, b	1,600 a, b
37. 1,1,2,2-Tetra-chloroethane	79345					0.17 a, b	11 a, b

A (#)COMPOUND	CAS Number	B FRESHWATER CMC d (ug/l) B1	B FRESHWATER CCC d (ug/l) B2	C SALTWATER CMC d (ug/l) C1	C SALTWATER CCC d (ug/l) C2	D HUMAN HEALTH For Consumption of: Water & Organisms (ug/) D1	D HUMAN HEALTH For Consumption of: Organism Only (ug/l) D2
38.Tetrachloroethylene	127184					0.8 b	8.85 b
39. Toluene	108883					6,800 a	200,000 a
40. 1,2-Trans-Dichloro-ethylene	156605					700 a	140,000 a
41. 1,1,1-Trichloroethane	71556					j	j
42. 1,1,2-Trichloroethane	79005					0.60 a, b	42 a, b
43. Trichloroethylene	79016					2.7 b	81 b

A (#)COMPOUND	CAS Number	B FRESHWATER CMC d (ug/l) B1	B FRESHWATER CCC d (ug/l) B2	C SALTWATER CMC d (ug/l) C1	C SALTWATER CCC d (ug/l) C2	D HUMAN HEALTH For Consumption of: Water & Organisms (ug/) D1	D HUMAN HEALTH For Consumption of: Organism Only (ug/l) D2
44. Vinyl Chloride	75014					2 b	525 b
45. 2-Chlorophenol	95578					120 a	400 a
46. 2,4-Dichlorophenol	120832					93 a	790 a
47. 2,4-Dimethylphenol	105679					540 a	2300 a
48. 2-Methyl-4,6-Dinitro-phenol	534521					13.4	765
49. 2,4-Dinitrophenol	51285					70 a	14,000 a
50. 2-Nitrophenol	88755						
51. 4-Nitrophenol	100027						

A (#)COMPOUND	CAS Number	B FRESHWATER CMC d (ug/l) B1	B FRESHWATER CCC d (ug/l) B2	C SALTWATER CMC d (ug/l) C1	C SALTWATER CCC d (ug/l) C2	D HUMAN HEALTH For Consumption of: Water & Organisms (ug/) D1	D HUMAN HEALTH For Consumption of: Organism Only (ug/l) D2
52. 3-Methyl-4-Chloro-phenol	59507						
53. Pentachlorophenol	87865	19 e, m	15 e, m	13	7.9	0.28 a, b	8.2 a, b, h
54. Phenol	108952					21,000 a	4,600,000 a,h
55. 2,4,6-Trichlorophenol	88062					*2.1 a, b	6.5 a, b
56. Acenaphtene	83329					1,200 a	2,700 a
57. Acenaphthylene	208968						
58. Anthracene	120127					9,600 a	110,000 a
59. Benzidine	92875					0.00012 a, b	0.00054 a, b
60. Benzo(a)Antracene	56553					0.0044 a, b	0.049 a, b
61. Benzo(a)Pyrene	50328					0.0044 a, b	0.049 a, b

62. Benzo(b)Fluofranthene 205992			0.0044 a, b	0.049 a, b
63. Benzo(ghi)Perylene 191242				
64. Benzo(k)Fluoranthene 207089			0.0044 a, b	0.049 a, b
65. Bis(2-Chloroethoxy) - Methane 111911			0.031 a, b	1.4 a, b
66. Bis(2-Chloroethyl)-Ether 111444				
67. Bis(2-Chloroisopropyl)-Ether 108601			1,400 a	170,000 a
68. Bis(2-Ethylhexyl)-Phthalate 117817			1.8 a, b	5.9 a, b

69. 4-Bromophenyl Phenyl Ether 101553				
70. Butylbenzyl Phthalate 85687			3,000 a	5,200 a
71. 2-Chloronaphthalene 91587			1,700 a	4,300 a
72. 4-Chlorophenyl - Phenyl Ether 7005723				
73. Chrysene 218019			0.0044 a, b	0.049 a, b
74. Dibenzo (a,h) Anthracene 53703			0.0044 a, b	0.049 a, b
75. 1,2-Dichlorobenzene 95501			2,700 a	17,000 a
76. 1,3-Dichlorobenzene 541731			400	2,600

77. 1,4-Dichlorobenzene 106467			400	2,600
78. 3,3-Dichlorobenzidine 91941			0.04 a, b	0.077 a, b
79. Diethyl Phthalate 84662			23,000 a	120,000 a
80. Dimethyl Phthalate 131113			313,000	2,900,000
81. Di-n-Butyl Phthalate 84742			2,700 a	12,000 a
82. 2,4-Dinitrotoluene 121142			0.11 b	9.1 b
83. 2,6-Dinitrotoluene 606202				
84. Di-n-Octyl Phthalate 117840				
85. 1,2-Diphenylhydrazine 122667			0.040 a, b	0.54 a, b
86. Fluoranthene 206440			300 a	370 a

87. Fluorene 86737			1,300 a	14,000 a
88. Hexachlorobenzene 118741			0.00075 a, b	0.00077 a, b
89. Hexachlorobutadiene 87683			0.44 a, b	50 a, b
90. Hexachlorocyclopen-tadiene 77474			240 a	17,000 a,h
91. Hexachloroethane 67721			1.9 a, b	8.9 a, b
92. Indeno(1,2,3-cd)-Pyrene 193395			0.0044 a, b	0.049 a, b
93. Isophorone 78591			36 b	2,600 b
94. Napthalene 91203				
95. Nitrobenzene 98953			17a	1,900 a,h

96. N-Nitrosodimethylamine 62759					0.00069 a, b	8.1 a, b
97. N-NitrosodiPropylamine 621647					0.005 a, b	1.4 a, b
98. N-Nitrosodiphenyl-amine 86306					5.0 a, b	16 a, b
99. Phenanthrene 85018					960 a	11,000 a
100. Pyrene 129000						
101. 1,2,4-Trichlorobenzene 120821					260	940
102. Aldrin 309002	3 f			1.3 f	0.00013 a, b	0.00014 a,b
103. alpha-BHC 319846					0.0039 a, b	0.013 a, b
104. beta-BHC 319857					0.014 a, b	0.046 a, b
105. gamma-BHC 58899	0.95 m			0.16 f	0.019 b	0.063 b
106. delta-BHC 319868						
107. Chlordane 57749	2.4 f	0.0043f		0.09 f	0.004 f	0.0021 a, b	0.0022 a, b
108. 4-4-DDT 50293	1.1f	0.001 f		0.13 f	0.001 f	0.00059 a, b	0.00059 a, b

109. 4,4-DDE	72559				0.00059 a, b	0.00059 a, b
110. 4,4-DDD	72548				0.00083 a, b	0.00084 a, b
111. Dieldrin	60571	0.24 m	0.056 m	0.71 f	0.0019 f	0.00014 a, b	0.00014 a, b
112. alpha-Endosulfan	959988	0.22 f	0.056 f	0.034 f	0.0087 f	110 a	240 a
113. beta-Endosulfan	33213659	0.22 f	0.056 f	0.034 f	0.0087 f	110 a	240 a
114. Endosulfan Sulfate	1031078					110 a	240 a
115. Endrin	72208	0.086 m	0.036 m	0.037 f	0.0023 f	0.76 a	0.81 a, h
116. Endrin Aldehyde	7421934					0.76 a	0.81 a, h
117. Heptachlor	76448	0.52 f	0.0038 f	0.053 f	0.0036 f	0.00021 a, b	0.00021 a, b
118. Heptachlor Epoxide	1024573	0.52 f	0.0038 f	0.053 f	0.0036 f	0.00010 a, b	0.00011 a, b
119. PCBs			0.014 f, k		0.03 f, k	0.00017 l	0.00017 l
126. Toxaphene	8001352	0.73	0.0002	0.21	0.0002	0.00073 a, b	0.00075 a, b

FOOTNOTES:

a. These criteria have been revised to reflect the U.S. E.P.A. q1* or RfD, as contained in the Integrated Risk Information System ("IRIS") as of October 1, 1996. The fish tissue bioconcentration factor ("BCF") from the 1980 documents was retained in each case.

b. These criteria are based upon carcinogenicity of 10 (-6) risk.

c. The Criteria Maximum Concentration ("CMC") is an acute concentration. It is the one (1) hour average concentration in ambient waters that should not be exceeded more than once every three (3) years on average. Criteria Continuous Concentration ("CCC") is a chronic concentration. It is the four (4) day average concentration of a pollutant in ambient water that should not be exceeded more than once every three (3) years on average. ug/l equals micrograms per liter.

d. These freshwater aquatic life criteria for metals are expressed as a function of total hardness (mg/l) in the water body. Values displayed above in the matrix correspond to a total hardness of 100 mg/l. The equations for calculating metals criteria are provided below:

CMC = WER x CMC x (exp{m_A[ln(hardness)]+b_A})
CCC = WER x CCC x (exp{m_c[ln(hardness)]+b_C})
Where WER = Water Effects Ratio
Final CMC and CCC values should be rounded to two (2) significant figures.

Metal	m_A	b_A	m_c	b_c
Cadmium	1.128	-3.6867	0.7852	-2.715
Copper	0.9422	-1.700	0.8545	-1.702
Chromium (III)	0.8190	3.688	0.8190	1.561
Lead	1.273	-1.460	1.273	-4.705
Nickel	0.8460	2.255	0.8460	0.0584
Silver	1.72	-6.52	------	-------
Zinc	0.8473	0.884	0.8473	0.884

NOTE: The term "exp" represents the base exponential function.
For waters with a hardness of 400 mg/l or less as calcium carbonate, the actual ambient hardness of the surface water shall be used in those equations. For waters with a hardness of over 400 mg/l as calcium carbonate, a hardness of 400 mg/l as calcium carbonate shall be used with a default Water-Effect Ratio ("WER") of one (1), or the actual hardness of the ambient surface water shall be used with a WER.

e. These freshwater aquatic life criteria for pentachlorophenol are expressed as a function of pH. Values displayed above in the matrix correspond to a pH of 7.8. Values are calculated as follows:

CMC = exp(1.005(pH) - 4.869)
CCC = exp(1.005(pH) - 5.134)

f. These aquatic life criteria for these compounds were issued by the U.S. E.P.A. in 1980 utilizing the 1980 Guidelines for criteria development. The acute values shown are final acute values ("FAV"), which by the 1980 Guidelines are instantaneous values as contrasted with a CMC which is a short-term average.

g. These totals simply sum the criteria in each column. For aquatic life, there are thirty (30) priority toxic pollutants with some type of freshwater or saltwater, acute or chronic criteria. For human health, there are one hundred (100) priority toxic pollutants with either "water + organism" or "organism only" criteria. Note that these totals count chromium as one pollutant even though U.S. E.P.A. has developed criteria based upon two (2) valence states. In the matrix, the Agency has assigned numbers 5a and 5b to the criteria for chromium to reflect the fact that this list of one hundred twenty-six (126) priority pollutants includes only a single listing for chromium.

h. No criteria for protection of human health from consumption of aquatic organisms (excluding water) was presented in the 1980 criteria document, or in the 1986 Quality Criteria for Water. Nevertheless, sufficient information was presented in the 1980 document to allow a calculation of a criterion, even though the results of such a calculation were not shown in the document.

i. This criterion for asbestos is the MCL (40 CFR § 141.62).

j. The Agency is not adopting human health criteria for these contaminants. However, permit authorities should address these contaminants in NPDES permit actions using Guam's existing narrative criteria for toxics.

k. PCBs are a class of chemicals which include aroclors 1242, 1254, 1221, 1232, 1248, 1260 and 1016, CAS numbers 53469219, 11097691, 11104282, 11141165, 12672296, 11096825 and 12674112, respectively. The aquatic life criteria apply to this set of PCBs.

l. This criterion applies to total PCBs or congener or isomer analyses.

m. This criterion has been recalculated pursuant to the 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water, Office of Water, EPA-820-B-96-001, September, 1996. See also Great Lakes Water Quality Initiative Criteria Documents for the Protection of Aquatic Life in Ambient Water, Office of Water, EPA-80-B-95-004, March, 1995.

n. This criterion is expressed as µg free cyanide (as CN) /l.

General Notes:

1. This chart lists all of EPA's priority toxic pollutants, whether or not criteria guidance are available. Blank spaces indicate the absence of criteria guidance. Because of variations in chemical nomenclature systems, this listing of toxic pollutants does not duplicate the listing in Appendix A of 40 CFR Part 423. The Chemical Abstracts Service ("CAS") registry numbers are added to provide a unique identification for each chemical.

2. The following chemicals have organoleptic-based criteria recommendations that are not included on this matrix: zinc, 3-methyl-4-chlorophenol.

Additional Toxic Pollutants

Appendix A of the Guam Water Quality Standards contains a table of several additional toxic pollutants, attached below.

Additional Toxic Pollutants.

Substance*	Maximum Numerical Limits		Application Factors
	Marine Water	Fresh Water	
Aluminum	0.20 mg/l	1.0 mg/l	0.01
Ammonia	0.02 mg/l		0.05
Barium	0.50 mg/l		0.05
Boron	5.00 mg/l		0.10
Bromine (free as Bromate)	0.10 mg/l 100.0 mg/l		- -
Chlorine [1] (Total Residual)	0.0075 mg/l	0.011 mg/l	0.1
Fluoride	1.50 mg/l	0.80 mg/l	0.1
Iron	0.05 mg/l	3.00 mg/l	-
Manganese	0.02 mg/l		0.2
Molybdenum	-		0.0
Sulfide	0.005 mg/l		0.1 (Applicable to 20-day LC data)
Tributyltin (TBT)	Marine Water Chronic - 0.010 µg/l Acute - 0.356µg/l	Fresh Water Chronic - 0.64 µg/l Acute - 0.442µg/l	

Uranium [2]	0.00 mg/l	0.01
Vanadium	-	0.05

* Total amounts in indicated chemical state of form.

[1] Greater concentrations of Chlorine may be used to treat a source of drinking water in order to meet the requirements of Subsection II.B.1 of these standards.

[2] Naturally occurring Uranium has been reported in concentrations of 0.003mg/l, 0.00004 mg/l (river water).

Note: Whenever natural concentrations of any toxic substance or element occur and exceed the limits established in these standards, this greater concentration shall constitute the limit; provided, that this natural concentration was not directly affected by non-induced causes.