**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM**
**PROPOSED PERMIT FACT SHEET**
**November 2017**

| | |
|---|---|
| Permittee Name: | Guam Waterworks Authority |
| Mailing Address: | Gloria B. Nelson Public Service Building, Suite 200<br>688 Route 15<br>Mangilao, Guam 96913 |
| Facility Location: | Route 2A, Tipalao<br>Agat, Guam 96928 |
| Contact Person(s): | Paul Kemp, Assistant General Manager- Compliance and Safety<br>671-300-6885<br>paulkemp@guamwaterworks.org |
| NPDES Permit No.: | GU0020222 |

## I. STATUS OF PERMIT

The Guam Waterworks Authority (the "permittee") has applied for the renewal of their National Pollutant Discharge Elimination System (NPDES) permit to authorize the discharge of treated effluent from Agat-Santa Rita Waste Water Treatment Plant to Tipalao Bay located in the Philippine Sea of the Pacific Ocean. A complete application was submitted on January 8, 2015. EPA Region IX has 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.

The permittee is currently discharging under NPDES permit GU0020222 issued on June 14, 2010, effective on August 1, 2010, and expired July 31, 2015. Pursuant to 40 CFR 122.21, the terms of the existing permit are administratively extended until the issuance of a new permit.

This permittee has been classified as a major discharger.

## II. GENERAL DESCRIPTION OF FACILITY

The permittee owns and operates a municipal wastewater treatment facility located at Gaan Point, on the Island of Guam, that collects sanitary wastewater from approximately 19,800 residents in Agat and Santa Rita. The permittee constructed a new WWTP that began operating in March 2017 and has a maximum daily inflow rate of 1.6 MGD during dry weather and 9.3 MGD during wet weather. The facility consists of a headworks, flow equalization tanks, oxidation ditches (2 anoxic/anaerobic basins and 2 aerobic basins), 2 secondary clarifiers, 2 ultraviolet disinfection channels, and 3 aerobic digesters, and 2 gravity belt thickeners. Solids are removed from the secondary clarifier and sent to aerobic digestion, then sludge drying beds before being trucked to Northern District STP (GU0020141).

The effluent from this treatment facility is sent through a combined outfall shared with the U.S. Navy's Apra Harbor Wastewater Treatment Plant (permit GU0110019) and discharged to the ocean through the Tipalao Bay outfall. The outfall terminates at a diffuser located approximately 1,600 feet from shore, at a depth of 125 feet.

The permittee is under a compliance order to reduce inflow and infiltration into their collection system and rehabilitate the facility in order to comply with their NPDES permit. The permittee is additionally planning to shut down their Baza Gardens Treatment Plant and re-route all flows to the Agat-Santa Rita facility by April 30, 2018.

## III. DESCRIPTION OF RECEIVING WATER

The permittee discharges out a joint deep ocean outfall along with the U.S. Navy's Apra Harbor WWTP into Tipalao Bay of the Philippine Sea (13° 24' 48" N, 144° 38' 30" E). Discharge from Apra Harbor WWTP is regulated under NPDES permit GU0110019.

The Philippine Sea in the vicinity of the discharge is classified as Category M-2 ("Good") by the Guam Water Quality Standards (WQS). M-2 waters must be of sufficient quality to allow for the propagation and survival of marine organisms, particularly shellfish and other similarly harvested aquatic organisms, corals and other reef-related resources, and whole body contact recreation. Other important and intended uses include mariculture activities, aesthetic enjoyment, and related activities.

## IV. DESCRIPTION OF DISCHARGE

### A. Application Discharge Data

As part of the application for permit renewal, the permittee provided data from an analysis of the facility's treated wastewater discharge, shown in Table 1.

Table 1. Application Discharge Data.

| **Parameter** | **Units** | **Discharge Data[(1)]** | |
|---|---|---|---|
| | | Maximum Daily Discharge | Average Daily Discharge |
| Flow | MGD | 5.0 | 1.25 |
| pH | Standard Units | 7.78-8.53 (min-max) | |
| Biochemical Oxygen Demand, 5-day ($BOD_5$) | mg/L | 74.77 | 25.15 |
| Total Suspended Solids (TSS) | mg/L | 602.8 | 61.53 |
| Ammonia (as N) | mg/L | 31 | 9.35 |
| Total Residual Chlorine | mg/L | ND[(2)] | ND |

| Parameter | Units | Discharge Data[1] | |
|---|---|---|---|
| | | Maximum Daily Discharge | Average Daily Discharge |
| Fecal Coliform | CFU/ 100mL | 2,419,000 | 1,363,830 |
| Enterococci | CFU/ 100mL | 2,183,349 | 130,471 |
| Nickel | µg/L | 25.2 | 0.66 |
| Copper | µg/L | 103.3 | 6.68 |
| Zinc | µg/L | 528 | 17.3 |
| Aluminum | µg/L | 2980 | 148 |
| 4,4-DDE | µg/L | ND | ND |
| 4,4-DDD | µg/L | ND | ND |
| Chlordane | µg/L | 0.5 | .022 |
| Dieldrin | µg/L | .0048 | .00021 |
| Oil and Grease | mg/L | 24 | 3.5 |

(1) Based on permittee's NPDES renewal application.
(2) Not Detected

## B. Recent Discharge Monitoring Report (DMR) Data (2012-2015)

Table 2 provides a summary of effluent limitations and monitoring data based on the facility's most recent 3 years of DMRs

Table 2. Discharge Monitoring Report Data for years 2012-2015.

| Parameter | Units | Current Permit Effluent Limitations | | | Discharge Monitoring Data | | | Current Monitoring Requirements | |
|---|---|---|---|---|---|---|---|---|---|
| | | Average Monthly | Average Weekly | Maximum Daily | Highest Average Monthly | Highest Average Weekly | Highest Maximum Daily | Monitoring Frequency | Sample Type |
| Flow Rate | MGD | 0.75 | -- | Monitoring Only | 2.01 | -- | NR | Continuous | Metered |
| Ammonia (as N) | mg/L | -- | -- | Monitoring Only | NR | -- | 31.3 | Monthly | Composite |
| Biochemical Oxygen Demand (5-day) | mg/L | 30 | 45 | -- | 49 | 70 | -- | Weekly | Composite |
| | lbs/day | 188 | 282 | -- | 723 | 1,384 | -- | | |
| | Percent Removal | 85% Removal (Minimum) | | | 2% (Min) | | | | |
| Fecal Coliform | MPN/ 100mL | 200 | 400 | -- | NR | 241,960 | -- | Weekly | Discrete |
| Enterococci | MPN/ 100mL | 35 | -- | 104 | 231,128 | -- | 2,419,600 | Weekly | Discrete |
| Total Suspended Solids | mg/L | 30 | 45 | -- | 134 | 230 | -- | Weekly | Composite |
| | lbs/day | 188 | 282 | -- | 1,242 | 3,951 | -- | | |
| | Percent Removal | 85% Removal (Minimum) | | | 0% (Min) | | | | |
| Total Residual Chlorine | µg/L | 7.5 | -- | 12.3 | N/A | -- | N/A | Monthly | Discrete |
| Copper | µg/L | 2.2 | -- | 4.8 | 31 | -- | 31 | Monthly | Composite |
| Nickel | µg/L | 8.2 | -- | 13 | 11 | -- | 11 | Monthly | Composite |
| Zinc | µg/L | 45.8 | -- | 95.0 | 240 | -- | 240 | Monthly | Composite |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | µg/L | 120 | -- | 200 | 1,000 | -- | 1,000 | Monthly | Composite |
| Heavy Metals | µg/L | -- | -- | Monitoring Only | -- | -- | NR | Twice/ permit term | Composite |
| Pesticides | µg/L | -- | -- | Monitoring Only | -- | -- | NR | Twice/ permit term | Composite |
| 4,4 DDE | µg/L | -- | -- | Monitoring Only | -- | -- | NR | Annually | Composite |
| 4,4 DDD | µg/L | -- | -- | Monitoring Only | -- | -- | NR | Annually | Composite |
| Chlordane | µg/L | .182 | -- | .320 | .5 | -- | .5 | Monthly | Composite |
| Dieldrin | µg/L | -- | -- | Monitoring Only | -- | -- | NR | Annually | Composite |
| Oil & Grease | µg/L | 10 | -- | 15 | 159 | -- | 159 | Monthly | Discrete |
| Whole Effluent Toxicity | TUc | 67 | -- | 134 | 32.26 | -- | 32.26 | Quarterly | Composite |
| pH | Standard Units | Between 6.5 and 8.5 at all times | | | 6.76 – 8.53 (min-max) | | | Weekly | Discrete |

NR= Not Reported
N/A=Not Applicable; Permittee did not chlorinate.

## V. SIGNIFICANT CHANGES TO PREVIOUS PERMIT

| Permit Condition | Previous Permit | Proposed Permit | Reason for change |
|---|---|---|---|
| Removed Limits | Fecal Coliform, Chlorine Residual limits | No limits for Fecal Coliform and Chlorine Residual | Limitation for fecal coliform removed while enterococci limitation retained consistent with TMDL. Chlorine residual limits removed as a result of UV disinfection installation. |
| Revised Limits | Copper, Aluminum, Nickel limits applied end of pipe | Dilution for Copper, Aluminum, and Nickel | Limitations for copper, nickel, and aluminum relaxed as a result of multiple mixing zone studies. |
| Nutrients | No limits or monitoring | Limits and quarterly monitoring for nitrate and orthophosphate | Effluent limitations established consistent with Guam WQS and mixing zone study. |
| Monitoring | Weekly/Monthly | Monthly/Quarterly | Monitoring frequency has been reduced for many pollutants to what is necessary to determine compliance. Effluent monitoring is now required for nitrogen and phosphorus to assess compliance with Guam WQS. |
| Asset Management Planning | None | Asset Management Plan development required. | To ensure proper operation and maintenance of the WWTP and collection system. |
| Ammonia Impact Ratio | Monitoring Only for Ammonia | Incorporation of Ammonia Impact Ratio ("AIR") to track compliance with ammonia standard | Reasonable Potential demonstrated to exceed Water Quality Standards. EPA including AIR into new permits, where appropriate. |
| FOG Program | None | Requirements for a FOG program. | Language included to acquiesce with requirements for other GWA facilities. |
| Test for Significant Toxicity | NOEC Whole Effluent Toxicity testing | Test for Significant Toxicity | EPA R9 inclusion of TST in new permits. |
| E-reporting | None | E-reporting required | Consistent with E-reporting rule. |

## 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 proposed permit, as described below.

**A. Applicable Technology-Based Effluent Limitations**

*Publicly Owned Wastewater Treatment Systems (POTWs)*

EPA developed technology-based treatment standards for municipal wastewater treatment plants in accordance with Section 301(b)(1)(B) of the Clean Water Act. The minimum levels of effluent quality attainable by secondary treatment for Biochemical Oxygen Demand ($BOD_5$), Total Suspended Solids (TSS), and pH, as defined in 40 CFR 133.102, are listed below. Mass limits, as required by 40 CFR 122.45(f), are included for $BOD_5$ and TSS.

$BOD_5$

30-day average – 30 mg/L
7-day average – 45 mg/L
Removal Efficiency – minimum of 85%

TSS

30-day average – 30 mg/L
7-day average – 45 mg/L
Removal efficiency – Minimum of 85%

pH

Instantaneous Measurement: 6.0 – 9.0 standard units (S.U.)

Therefore, effluent limits for $BOD_5$ and TSS are established in the permit as stated above.

**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**

Guam Water Quality Standards categorize the receiving water as M-2 (“Good”) and establish standards protective of relevant beneficial uses.

Tipalao Bay is listed as impaired according to the CWA Section 303(d) List of Water Quality Limited Segments for PCBs in fish tissue. No TMDL has been developed for PCBs. In addition, Guams beaches are impaired for enterococcus bacteria. A TMDL for Guam’s southern beaches was finalized February 20, 2015 and include waste load allocations (“WLAs”) for all permitted

wastewater treatment facilities in Guam. For facilities discharging into M-2 waters, WLAs for Enterococcus are 35/100mL geometric mean and 104/100mL instantaneous maximum. The Margin of Safety discussion establishes an assumption of no mixing. Therefore, the WLA for enterococcus has been incorporated into the permit end-of-pipe.

**2. Dilution in the Receiving Water**

GWA submitted a Mixing Zone Study for Agat-Santa Rita WWTP conducted by Brown and Caldwell on June 16, 2017. The mixing zone study utilizes a UM3 model calibrated with two days of dye tracer monitoring. Results from the model were then compared with a 2015 Space and Naval Warfare Systems "SPAWAR" Study utilizing CORMIX conducted for the same joint outfall.

Based on the results of the mixing zone study, EPA is proposing application of the conservative peak wet weather effluent flow, 10$^{th}$ percentile current speed, centerline initial dilution for acute impacts from toxics, including metals and ammonia, of 45:1. For nutrients, EPA is proposing application of the annual average effluent flow, flux-average dilution at the edge of the ZOM of 186:1. Because this estimate is not conservative, EPA is applying a 10% margin of safety, resulting in a dilution ratio for nutrients and chronic impacts from toxics of 167:1.

The dilution factor has not been considered in determining reasonable potential, however will be used for calculating effluent limitations. Effluent limitations were calculated using ambient water data from multiple sources. Receiving water data for nickel, copper, and aluminum were applied from the 2015 SPAWAR study. Receiving water data for ammonia, nitrate, and phosphate was applied based on quarterly receiving water monitoring conducted by GWA from 2014-2017 at three ambient locations as required by their permit.

The findings of the dilution and resulting effluent limitations are subject to 401 certification approval by Guam EPA.

**3. Existing Data on Toxic Pollutants**

For pollutants with effluent data available, 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 99$^{th}$ 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 3. Summary of Reasonable Potential Statistical Analysis (µg/L):

| Parameter | Maximum Observed Concentration | *n* | RP Multiplier | Projected Maximum Effluent Concentration | Most Stringent Water Quality Criterion | Statistical Reasonable Potential? |
|---|---|---|---|---|---|---|
| Ammonia (mg/L as N) | 31.3 | >20 | 2.3 | 72 | 0.57 | Y |
| Copper | 31 | >20 | 2.3 | 71 | 3.1 | Y |
| Nickel | 11 | 5 | 4.2 | 46 | 8.2 | Y |
| Zinc | 240 | >20 | 2.3 | 552 | 86 | Y |
| Aluminum | 1,000 | >20 | 2.3 | 2,300 | 200 | Y |
| 4,4 DDE | ND | 12 | 2.08 | - | .00059 | N |
| 4,4 DDD | ND | 12 | 2.08 | - | .00084 | N |
| Chlordane | .5 | 12 | 2.08 | 1.04 | .0022 | Y |
| Dieldrin | 0.0048 | 12 | 2.08 | .010 | .00014 | Y |

NR=Not Reported; ND=Not Detected.

## 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.

*Flow*

A limit for flow has been retained for Agat to ensure the facility is operating in accordance with its designed capacity. A footnote has been included to allow the permittee to request an elevated flow limit once construction is complete on the upgraded facility. The new limit may reflect the design dry weather flow at the facility and be no greater than 1.6 MGD.

*$BOD_5$ and TSS*

Limits for $BOD_5$ and TSS are established for POTWs as described above and are incorporated into the permit.

*pH*

National standards and the Guam WQS establish standards for secondary treatment within 6.0 and 9.0 standard units. The Guam WQS also establish pH standards for marine waters within a range of 6.5 and 8.5 standard units. This permit retains previous pH limitations of 6.5 to 8.5.

*Oil & Grease*

Oil & Grease is a common pollutant in domestic wastewater. Guam WQS state that waters shall be free from oil, grease and scum which degrade water quality or use. Oil & Grease limitations of 10 and 15 mg/L average monthly and max daily are common in POTW permits on a "best professional judgment" basis and have been retained from the previous permit.

*Enterococcus*

Guam WQS establish numerical bacteria criteria for M-2 waters of 35 enterococci/100 ml based upon the geometric mean of five samples taken over a period of thirty days and 104 enterococci/100 ml instantaneous maximum. Additionally, a TMDL has been established for bacteria in the vicinity of the discharge. A WLA consistent with the criteria has been assigned to the discharger. The WLA has been established without consideration of a mixing zone. Therefore, the 35 and 104 cfu/100mL concentrations have been established as effluent limits in the permit.

*Ammonia*

The Guam WQS establish numeric criteria for ammonia which are pH-dependent. Based on the reasonable potential analysis, EPA has determined that the discharge has a reasonable potential to cause or contribute to an exceedance of applicable water quality standards for ammonia. Therefore, EPA is establishing an ammonia-N effluent limit using the ammonia impact ratio ("AIR") and quarterly monitoring and reporting requirements for ammonia concentrations in the effluent.

The AIR is calculated as the ratio of the ammonia value in the effluent to the applicable ammonia water quality standard. The GEPA WQS contain ammonia criteria which are pH-dependent. Therefore, pH and ammonia sampling must be concurrent. EPA is using the water quality criterion from the chronic tables in section 5103(C)(3), "Nutrients," because the chronic criterion is most protective of water quality. See Attachment E of the permit for a sample log to help calculate and record the AIR values and attachment F for applicable pH-dependent Water Quality Standards.

An AIR value of 46 is the enforceable effluent limit. The AIR account for a 45:1 dilution factor which is consistent with dilution for toxics. The permittee also must monitor and report ammonia effluent values in addition to the AIR value. AIR provides more flexibility than a specific, fixed effluent concentration and is protective of water quality standards since the value is set relative to the water quality standard, with consideration of dilution. If the reported value exceeds 46, then the effluent ammonia-N concentration exceeded the ammonia water quality criterion after dilution.

*Copper, Nickel, Aluminum, and Zinc*

Based on the reasonable potential analysis, EPA has determined that the discharge has a reasonable potential to cause or contribute to an exceedance of applicable water quality standards for copper, nickel, aluminum, and zinc. New limits based on a dilution factors and mean ambient concentration values were calculated using the formula: Limit = Std + DF(Std-MAC). Dilution factors of 45 and 167 were adapted from the GWA mixing zone study. The maximum daily discharge effluent limitation applies the Criteria Maximum Concentration WQS and the acute dilution ratio of 45:1 while the average monthly limit applies the Criteria Continuous Concentration WQS and the chronic dilution ratio (see Section VI.B.2. for explanation of

dilution ratios). Aluminum only has a single water quality standard which is applied as a maximum daily. Mean ambient concentration values based on data compiled as part of the SPAWAR mixing zone study for monitoring points TB-3 through TB-7 was calculated for aluminum. For copper and nickel, the Navy claimed that the data reported for receiving water monitoring in the mixing zone study and as part of the DMRs was inaccurate due a faulty Inductively Coupled Plasma detector. The Navy provided new data with split samples conducted directly by SPAWAR between 2011 and 2012 for copper and nickel, as well as duplicative testing on copper and nickel in ambient waters at the five foot depth profile between 2014 and 2016. The 2014 to 2016 samples confirmed lower levels of copper and nickel in the ambient water, therefore EPA is using the more conservative SPAWAR split samples data to propose limitations for copper and nickel.

Table 4. Limit calculation for Copper, Nickel and Aluminum

| Pollutant | Mean Ambient Concentration | Averaging Period | Standard | Dilution Factor | Limit |
|---|---|---|---|---|---|
| Copper | .33 | Max Daily | 4.8 | 45 | 197 |
| | | Avg Monthly | 3.1 | 167 | 465 |
| Nickel | .56 | Max Daily | 74 | 45 | 3,378 |
| | | Avg Monthly | 8.2 | 167 | 1,284 |
| Aluminum | 16.5 | - | 200 | 45 | 8,457 |

Because the maximum daily effluent limitation for copper is more stringent than the average monthly, only the maximum daily effluent limitation is applied in the permit.

No receiving water data for zinc was included in the SPAWAR study or provided by GWA, therefore a mixing zone may not be calculated for that pollutant. Limitations from the previous permit have been carried over for zinc.

*Chlordane and Dieldrin*

The Guam WQS establish criteria for chlordane and dieldrin. Monitoring throughout the previous permit term revealed exceedances of the numeric criteria in the effluent. Receiving water data was not provided for these pollutants. Therefore, limits for chlordane and dieldrin are established based on the Guam WQS. Monthly limits are based on human health criteria for fish consumption; maximum daily limits are based on the saltwater CMC.

*4,4 DDE and 4,4 DDD*

The Guam WQS establish criteria for 4,4 DDE and 4,4 DDD. Monitoring throughout the previous permit term revealed no instances of detection for either permit as a result of 12 sample events. Therefore, limits for DDE and DDD have been removed in this permit.

*Whole Effluent Toxicity*

Whole effluent toxicity limitations have been established in this permit to ensure the discharge is not toxic to local aquatic life, including endangered species. The calculated permit limitation incorporates the proposed mixing zone. The permittee is required to use EPA's Test for Significant Toxicity statistical method.

*Nitrate-nitrogen and Orthophosphate ($PO_4$-P)*

The Guam WQS establish numeric criteria for nitrate-nitrogen and orthophosphate. Although the permittee has not submitted effluent monitoring data for nutrients, the effluent from a wastewater treatment plant is likely to contain nitrate and phosphorus. The permit incorporates effluent limitations for nitrate and orthophosphate consistent with the calculated dilution ratio for nutrients and receiving water monitoring conducted by GWA.

Table 5. Limit calculation for Nitrate and Orthophosphate

| Pollutant | Standard | Mean Ambient Concentration | Dilution Factor | Limit |
|---|---|---|---|---|
| Nitrate | 0.2 | .031 | 167 | 28.5 |
| Orthophosphate | 0.05 | .012 | 167 | 6.3 |

Nutrient limitations are applied on an average monthly basis.

**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 retains limitations for all pollutants with the following exceptions:

-The permit removes limitations for fecal coliform on the basis of establishing limitations for enterococci consistent with the recently-adopted bacteria TMDL. Limitations for fecal coliform are redundant to limitations for enterococci and are not necessary under the Guam WQS. Fecal coliform limitations have been removed consistent with 40 CFR 122.44(l)(2)(i)(B)(*2*)

-The permit removes limitations for chlorine on the basis of material and substantial alternations to the permitted facility, including installation of UV disinfection. Chlorine limits have been removed consistent with 40 CFR 122.44(l)(2)(i)(A)

-The permit establishes less stringent limitations for copper, nickel, and aluminum on the basis of new information indicating the presence of a mixing zone and assimilative capacity [40 CFR 122.44(l)(2)(i)(B)(*1*)].

-The permit removes mass-based limitations consistent with 40 CFR 122.44(l)(2)(i)(B)(*2*) for some parameters as they are redundant to the flow and concentration-based limitations. Any discharge that would meet both flow and concentration limits would meet a mass-based limit.

**E. Antidegradation Policy**

EPA's antidegradation policy at 40 CFR 131.12 and Section 5101(B) of the Guam WQS require that existing water uses and the level of water quality necessary to protect the existing uses be maintained.

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 allow for relaxed limitations as a result of a mixing zone study. The 2017 GWA mixing zone study complements a 2015 SPAWAR study conducted by the Navy. Along with the 2015 study,

NAVFAC Marianas submitted a Mixing Zone EIS, which includes an antidegredation analysis. The analysis is consistent with Section 5101(B) of the Guam WQS and concludes that because treatment will only improve at the two facilities, water quality will not be degraded. The same analysis applies to the GWA mixing zone study. The full analysis is available upon request.

Additionally, the permit allows for an increased flow limitation upon completion of the new facility. EPA does not believe the increased flow limitations with allow for degradation of water quality as current performance results in discharges far greater than the design flow of the new facility. Once a larger facility is completed, the permittee should be better prepared to treat and handle these greater flow volumes.

Therefore, EPA believes the discharge will not degrade water quality.

## VII. NARRATIVE WATER QUALITY-BASED EFFLUENT LIMITS

Guam WQS contains narrative water quality standards applicable to the receiving water. Therefore, the permit incorporates applicable narrative water quality standards.

## VIII. MONITORING AND REPORTING REQUIREMENTS

The permit requires the permittee to conduct monitoring for all pollutants or 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 pollutants or parameters where effluent limits have not been established, such as for nitrate and orthophosphate.

### A. Effluent Monitoring and Reporting

The permittee shall conduct effluent monitoring to evaluate compliance with the proposed 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, unless otherwise specified in the proposed permit. All monitoring data shall be reported through NetDMR as specified in the proposed permit.

### B. Priority Toxic Pollutants Scan

A Priority Toxic 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, unless otherwise specified in the proposed permit or by EPA. 40 CFR 131.36 provides a complete list of Priority Toxic Pollutants.

### C. Whole Effluent Toxicity Testing

The permit establishes tests for chronic toxicity to ensure the discharge will not have an adverse effect on marine biota. Chronic toxicity testing evaluates reduced growth/reproduction using the Test of Significant Toxicity. Because the permit does not require both acute and

chronic toxicity testing, limits are conservatively established with consideration of the 45:1 mixing zone for toxics.

**D. Receiving Water Monitoring**

The permit includes receiving water monitoring requirements which are necessary to sustain current dilution or apply for new dilution credit in the next permit. The permittee must conduct receiving water monitoring if they wish to continue receiving mixing zones in future permits. The permittee has an option of consolidating their monitoring program with the U.S. Navy's receiving water monitoring for Apra Harbor WWTP.

## IX. SPECIAL CONDITIONS

**A. Biosolids**

Standard requirements for the monitoring, reporting, recordkeeping, and handling of biosolids in accordance with 40 CFR Part 503 are incorporated into the permit.

**B. Fats, Oils and Grease ("FOG")**

FOG requirements have been incorporated into the permit consistent with conditions in other GWA permits (i.e., permits for Northern District and Agana STPs). The permittee is expected to maintain a FOG program throughout their entire collection system for all GWA-owned and operated facilities.

**C. Development of an Initial Investigation TRE Workplan for Whole Effluent Toxicity**

In the event effluent toxicity is triggered from WET test results, the permit requires the permittee to develop and implement a Toxics Reduction Evaluation (TRE) Workplan after a "fail" test result. The draft permit also requires additional toxicity testing if a chronic toxicity monitoring trigger is exceeded. The permittee should also have an Initial Investigation TRE Workplan (1-2 pages) for chronic toxicity available for to EPA or Guam EPA to review upon request.

**D. Asset Management**

40 CFR 122.41(e) requires permittees to properly operate and maintain all facilities and systems of treatment and control which are installed or used by the permittee to achieve compliance with the conditions of this permit. Asset management planning provides a framework for setting and operating quality assurance procedures and ensuring the permittee has sufficient financial and technical resources to continually maintain a targeted level of service. Asset management requirements have been established in the permit to ensure compliance with the provisions of 40 CFR 122.41(e).

## X. OTHER CONSIDERATIONS UNDER FEDERAL LAW

**A. Impact to Threatened and Endangered Species**

Section 7 of the Endangered Species Act 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 following species are listed as endangered or threatened in Guam by the Pacific Islands Fish and Wildlife Services ("FWS") Office:

Mammals:
-Little Mariana Fruit Bat (*Pteropus tokudae*)
-Mariana Fruit Bat (*Pteropus mariannus*)

Birds:
-Mariana Crow (aga) (*Corvus kubaryi*)
-Guam Micronesian Kingfisher (*Halcyon cinnamomina cinnamomina*)
-Mariana Common Moorhen (*Gallinula chloropus guami*)
-Rail, Guam except Rota (*Rallus owstoni*)
-Mariana Gray Swiftlet (*Aerodramus vanikornsis bartschi*)
-Birdled White-eye (*Zosterops conspicillatus conspicillatus*)
-Micronesian Megapode (*Megapodius laperouse*)
-Nightingale Reed Warbler (*Acrocephalus luscinia*)

Sea Turtles:
-Green Sea Turtle (*Chelonia mydas*)
-Hawksbill Sea Turtle (*Eretmochelys imbricata*)

Plants:
-Iagu, Hayun (*Serianthes nelsonii*)

In addition, the National Marine Fisheries Service ("NMFS") provided a list of threatened and endangered species in Guam as of January 2015. The list includes:

Marine Mammals:
-Blue Whale (*Balaenoptera musculus*)
-Fin Whale (*Balaenoptera physcalus*)
-Humpback Whale (*Megaptera novaeangliae*)
-Sei Whale (*Balaenoptera borealis*)
-Sperm Whale (*Physeter macrocephalus*)
-Dugong (*Dugong dugon*)

Sea Turtles:
-Green Turtle (*Chelonia mydas*)
-Hawksbill Turtle (*Eretmochelys imbricata*)
-Leatherback Turtle (*Caretta caretta*)
-Olive Ridley Turtle (*Lepidochelys olivacea*)

Fish:
-Scalloped Hammerhead Shark (*Sphyrna lewini*)

Corals:
-*Seriatopora aculeate*
-*Acropora globiceps*

*-Acropora retusa*

Effluent from the facility is discharged 1,600 feet offshore at a depth of 125 feet to Tipalao Bay of the Philippine Sea and is therefore expected to have no effect on terrestrial or aquatic freshwater species.

The effluent discharged from this facility is characterized as secondary-treated sanitary wastewater and may, through the course of the permit, discharge up to 1.6 MGD. There are no known industrial discharges to the treatment plant. The permit was written to comply with all applicable water quality standards, established to be protective of all beneficial uses, including propagation and survival of marine organisms. Additional information was considered for each of the following species:

**Green, Hawksbill, Leatherback and Olive Ridley Sea Turtle**:

Although the four species of sea turtles have a varying degree of presence in Guam, none have established nesting or critical habitat on the island. Primary habitat for sea turtles include beaches for nesting, open ocean convergence zones, and coastal areas for benthic feeding. Based on a review of recovery plans, however, EPA is not aware of any scientific information or studies documenting negative effects on sea turtles from these types of ocean discharges. EPA has therefore determined that the listed sea turtle species have no nexus with the ocean discharge beyond speculative incidental contact.

**Blue, Fin, Humpback, Sei, and Sperm Whales and Dugongs**

There have been an extremely limited number of sightings of marine mammals and no critical habitat identified off the coasts of Guam. EPA is also not aware of any scientific information or studies documenting negative effects on marine mammals from these types of ocean discharges. EPA has therefore determined that the listed sea turtle species have no nexus with the ocean discharge beyond speculative incidental contact.

**Scalloped Hammerhead Shark**

The largest threats to scalloped hammerhead sharks are targeted fisheries, shark fin trade, and bycatch. Critical habitat has not been identified around Guam. EPA is also not aware of any scientific information or studies documenting negative effects on scalloped hammerhead sharks from these types of ocean discharges. EPA has therefore determined that the scalloped hammerhead shark has no nexus with the ocean discharge beyond speculative incidental contact.

***Seriatopora aculeate, Acropora globiceps, and Acropora retusa* (Corals)**

Of the three species of coral, only *Seriatopora aculateate* has a listed habitat depth greater than 10 meters. *Seriatopora aculateate* has a listed depth range of up to 40 meters. The outfall for the discharge is at 125 feet (about 38 meters). The 2011 NMFS Status Review Report issued prior to listing indicated that none of the proposed species is exclusive to Guam and concluded that none of the land-based pollution sources, including treated wastewater discharges, are unlikely to produce extinction at a global scale. A 2008 Guam Coastal Management Report entitled "Status of the Coral Reef Ecosystem of Guam" additionally found no evidence that sewage discharges from permitted outfalls are having discernable effects on corals in Guam.

Top threats to corals to corals include ocean warming, ocean acidification, dredging, coastal development, coastal point source pollution, agricultural and land use practices, disease, predation, reef fishing, aquarium trade, physical damage from boats and anchors, marine debris, and aquatic invasive species. In particular, *Seriatopora aculateate* is most susceptible to ocean warming, disease, acidification, sedimentation, nutrients, predation, and collection and trade. The proposed permit includes limitations for sediment in the form of total suspended solids. While the discharge has not demonstrated a reasonable potential for violating water quality standards for nutrients, monitoring is required for nitrates and orthophosphate. EPA has therefore determined the outfall may affect, but is not likely to adversely affect threatened corals in the vicinity of the outfall.

In consideration of the above, EPA believed that the proposed discharge is not likely to affect endangered species in Guam. EPA provided FWS and NMFS with copies of this fact sheet and the draft permit for review.

**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.

The permittee made a consistency determination that the proposed permit is consistent with the Guam Coastal Management Program and received concurrence by the Guam Coastal Zone Management Program, the Guam Bureau of Statistics and Plans, on September 21, 2017

**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 proposed 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. Therefore, EPA has determined that the proposed permit will 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 is making a determination that issuing this proposed 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 will 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.

**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 proposed 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.

A conditional 401 Water Quality Certification was received by EPA on November 22, 2017. Conditions are incorporated by reference in the final permit.

## XIII. CONTACT INFORMATION

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

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Marincola.JamesPaul@epa.gov

EPA Region IX
75 Hawthorne Street (WTR 2-3)
San Francisco, California 94105

## XIV. REFERENCES

Brown and Caldwell. 2017. *Mixing Zone Study for Agat-Santa Rita WWTP*. Brown and Caldwell prepared for Guam Waterworks Authority. Project No. 148556.230. June 16, 2017.

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

EPA. 1996. *Regions IX & X Guidance for Implementing Whole Effluent Toxicity Testing Programs*, Interim Final, May 31. 1996.

EPA. 2002a. *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* - Fifth Edition. Office of Water, EPA. EPA-821-R-02-012.

EPA. 2002b. *National Recommended Water Quality Criteria*. Office of Water, EPA. EPA-822-R-02-047.

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

GEPA. 2001. *Guam Water Quality Standards*. Guam Environmental Protection Agency.

NAVFAC. 2015. *U.S. Navy Apra Harbor Wastewater Treatment Plant NPDES Permit Application Renewal Discharge Characterization Report*. Prepared by EEC Environmental and Element Environmental, LLC. May 29, 2015.