American Samoa Power Authority – Utulei Sewage Treatment Plant
NPDES Permit No. AS0020001

Response to Comments Document
U.S. EPA Region 9
November 14, 2019

Comments submitted by American Samoa EPA (AS-EPA) on July 12, 2019:

Formatting Corrections: EPA acknowledges AS-EPA's suggestions for various minor formatting edits to improve clarity in the permit and fact sheet and has incorporated the suggested changes.

Specific Questions posed by AS-EPA:

(A) Why is Total Ammonia reported as Nitrogen (N) if the purpose for monitoring is for toxicity?

This is a unit-of-measurement convention which has no effect on implementing the underlying American Samoa Water Quality Standard (AS-WQS) for Ammonia. When laboratories test for Ammonia, they can report results either in terms of "Ammonia as mg/L NH_3", or "Ammonia as mg/L N", without affecting the total amount of ammonia detected. "Ammonia as N" does not represent a lab test which would pick up other sources of Nitrogen, i.e., it is still specifically an Ammonia test.

The conversion to "…as N" is only mathematical, factoring out the mass of the 3 hydrogen atoms in each ammonia molecule:

$$\frac{1\ molecule\ of\ Ammonia\ (as\ N)}{1\ molecule\ of\ Ammonia\ (as\ NH_3)} = \frac{average\ atomic\ mass\ of\ a\ Nitrogen\ atom}{average\ atomic\ mass\ of\ 1\ Nitrogen\ and\ 3\ Hydrogen\ atoms} = \frac{14.00643}{14.00643+3*(1.00784)} = 0.8224$$

..., so "Ammonia as N" is always 0.822 times the value of "Ammonia as NH_3". This is reflected in the 2013 revision of the AS-WQS: Appendix A (page 37) specifies a factor of 1 mg/L ammonia-as-NH_3 → 0.822 mg ammonia-as-N, and that is the factor EPA has used.

To minimize any potential confusion which could be caused by unit conversions, EPA has revised the Ammonia limits table (Attachment E to the permit) to pre-calculate the variable limits in terms of "Ammonia as N", eliminating the need for the discharger to apply the factor of 0.822.

(B) Provide a clear and concise description of compliance determination using Ammonia Impact Ratio (AIR) along with an example of its use related to the Utulei Sewage Treatment Plant.

The AIR is a tool meant to streamline determination of compliance with ammonia standards which are dependent on pH and Temperature, like those in the AS-WQS. A permittee can tell whether their discharge is in compliance with the permit limit based directly on the result of the AIR calculation (a value less than 1 indicates compliance), rather than submitting raw pH, temperature, and ammonia concentration data to EPA and waiting to find out from EPA whether compliance was achieved. The AIR result is then reported to EPA along with the data used to calculate it.

For example, if the following data are collected during a monthly ammonia sampling event:

- Effluent temperature 25ºC,
- Effluent pH 7.2,
- Effluent ammonia concentration 16 mg/L ammonia (as NH_3),

then the steps for completing the AIR analysis would be:

1) Convert the "ammonia as NH_3" concentration into "ammonia as N", as described in response (A) above.
   16 mg/L ammonia as NH_3 * 0.822 = 13.152 mg/L ammonia as N

2) Enter the values into the next empty line of the Ammonia Impact Ratio Data Log (permit attachment D). Note that separate lines should be used for checking the Daily Maximum and Monthly Average limit:

Date of Sample	Ammonia Concentration in Effluent (mg/L as N)	Effluent Temperature (º C)	Effluent pH (standard pH units)	Ammonia Objective with Dilution. (look up objective in Attachment E, using data from columns C and D)	Ammonia Impact Ratio (AIR) **(divide Column B by Column E, B ÷ E)**
…	…	…	…	…	…
30 February, 2050	13.152 mg/L	25 ºC	7.2		

3) Determine the closest available value of the Ammonia Objective from the tables in permit attachment E. Looking at the tables, a pH of 7.2 is below any of the values listed, so as a conservative assumption use the row for the next higher available value, 7.8. Then look up the closest (or next higher) temperature column (25ºC) and find that the first table gives a Daily Maximum limit of 590.9 mg/L Ammonia-as-N, while the second table gives a Monthly Average limit of 89.8 mg/L ammonia-as-N.

4) Enter these values in the Ammonia Objective column of the AIR Data Log (attachment D):

30 February, 2050	13.152 mg/L	25 ºC	7.2	590.9 (daily max)	
"	"	"	"	89.8 (monthly avg)	

5) Calculate the respective AIRs (13.152 divided by 590.9 and 89.8, respectively)

30 February, 2050	13.152 mg/L	25 ºC	7.2	590.9 (daily max)	0.0222

"	"	"	"	89.8 (monthly avg)	0.146

6) Because both AIR values are less than 1.0, this sample shows an ammonia concentration that is in compliance with the permit limit. Report the following 6 values in the appropriate spaces on this month's Discharge Monitoring Report (DMR):

Parameter	**Units**	**Reported Value on DMR**
Temperature	ºC	25
pH	standard pH units	7.2
Ammonia (as N), monthly avg.	mg/L	13.152
Ammonia (as N), daily maximum	mg/L	13.152
Ammonia Impact Ratio (monthly avg.)	n/a	0.146
Ammonia Impact Ratio (daily max)	n/a	0.0222

Note that if *more* than one ammonia sample is collected in any given month, the two "Ammonia (as N)" lines should not show the same value. And in addition to properly calculating and reporting the monthly average and daily maximum values based on those multiple samples, the temperature and pH values associated with *each separate* ammonia sampling event must also be reported on the DMR.

(C) Why is the pH and Temperature important for the Plant's 'effluent' monitoring in the calculation of AIR when the receiving waters are at the harbor (saltwater) outfall?

As American Samoa's ammonia standards are pH- and temperature dependent, pH and temperature data must be collected at the same time as ammonia samples in order to determine whether the standard and permit limit(s) have been met. Receiving water monitoring for pH and temperature at the same frequency as ammonia sampling (monthly) would potentially increase the monitoring workload considerably. The AIR protocol therefore allows use of effluent pH and Temperature as an alternative source of data, to avoid imposing a requirement for additional receiving water data collection on the permittee.

(D) Implementation of American Samoa fresh vs salt water ammonia standards:

EPA acknowledges AS-EPA's inquiry about the applicability of the saltwater vs. freshwater Ammonia standards issued as Appendix A to the American Samoa Water Quality Standards (AS-WQS), given the sample collection location within the treatment plant. NPDES permit limits apply to the "discharge of pollutants" which is defined at 40 CFR §122.2 to specifically mean "*addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source.* " The Water of the United States which this permit is designed to protect from potential effects of Ammonia (and other) discharge is a body of salt water (Pago Pago Harbor), and EPA Region 9 has therefore found the saltwater ammonia standard to be most applicable. Any contact the effluent may have with fresh water would occur within the treatment plant, prior to discharge and addition to a water of the United States (i.e., Pago Pago Harbor) – meaning that the "addition of a pollutant" takes place to the salt water.

Comments submitted by the discharger, American Samoa Power Authority (ASPA), on July 12, 2019:

(E) Comment I.B-1: Calculation of the Ammonia Impact Ratio (AIR)

See discussion in response to AS-EPA comments on the same topic, comments (B) and (C) above. Note also that the requested conversion of permit Attachment E to Ammonia-as-N basis (multiplication by 0.822) has been made.

EPA notes the request to extend the American Samoa Water Quality Standards (AS-WQS) Appendix A tables to lower pH values. However, EPA's permit must implement the territory's water quality standards in the form they were approved. It is not within the allowable scope of an EPA permitting action to modify or extend the existing water quality standards, which requires a separate standards process including formal submission, review, public comment, and approval by EPA.

(F.1) Comment I.B-2: ASPA requests that Enterococci limitations be based on the reassessed dilution of 313:1 for the new diffuser configuration

Increasing the permitted dilution for enterococci from the existing value of 91:1 to 313:1 would allow a substantially increased discharge of Enterococci and other pollutants (see response (G) below). Based on prior experiences with elevated bacteria levels in Pago Pago Harbor, allowing such an increase in discharges of bacteria could potentially impair the protected uses of Pago Pago Harbor specified in the American Samoa Water Quality Standards (AS-WQS), such as "whole and limited body-contact recreation, e.g. swimming, snorkeling, and scuba diving" (American Samoa Administrative Rule 001-2013, §24.0205(e)(1)(A)(v)). Thus allowing an increased discharge of bacteria relative to the previous permit could fail to be protective of the AS-WQS.

Under section 301(h) of the Clean Water Act, the 9th condition to be eligible for a §301(h) variance from secondary treatment requirements is that the discharged effluent must meet the criteria established under Clean Water Act §304(a)(1), which are the applicable water quality standards (implemented through permit effluent limits). Therefore, for the discharge to remain eligible for a 301(h) variance, bacteria levels must be controlled to avoid interference with the designated uses in the AS-WQS.

Additionally, as discussed in the fact sheet, the Anti-Backsliding provisions of Clean Water Act section 402 and provisions of AS-WQS §24.0202 (prohibiting "water quality degradation which would interfere with or become injurious to these existing uses") do not permit EPA to reissue the permit with such an increased discharge of enterococci.

The diffuser upgrades installed by the discharger remain helpful in ensuring protection of water quality, and thus contribute to the basis for renewal of the 301(h) variance.

(F.2) Comment I.B-2, second paragraph: ASPA requests that the limitations for the effluent be based on a minimum of five sequential samples…and the geometric mean and statistical threshold values be applied rather than daily maximum and monthly average.

Adjusting the statistical methods used to determine compliance permit limits in the suggested manner would potentially allow an increase in the discharge of pollutants, which is not permissible in the context of anti-backsliding and the requirements a permit variance under §301(h)(9); see response (F.1).

(G) Comment I.B-3: Total Nitrogen (TN) and Total Phosphorus (TP) limitations

EPA cannot grant the requested increase in dilution credit in the context of a §301(h)-modified permit for the reasons discussed in response (F.1), above, as an increased dilution credit could allow a greater total discharge of these pollutants and potentially interfere with the designated and existing uses of Pago Pago Harbor as specified in the AS-WQS. Increased TN and TP discharges can have undesirable effects such as stimulating algae blooms, which would impair the protected uses of Pago Pago harbor such as Recreational and subsistence fishing, Aesthetic enjoyment, Whole and limited body-contact recreations, and Support and Propagation of marine life (see American Samoa Administrative Rule 001-2013, §24.0205(e)(1)(A) subsections i, iv, v, and vi).

EPA also notes that the discharger's concerns lie with single data points exceeding the monthly average TN and TP limits, at a frequency well under 50% of the time (8% for TN and 36% for TP), although those data points do not exceed the maximum daily limit. In this context, it may be appropriate for the discharger to collect additional nutrient samples in any given sensitive month, in order to arrive at more representative monthly average nutrient values for the discharge. Based on the data presented with this comment, and assuming the effluent data statistically follow a Normal Distribution, it is feasible that collecting a second sample would resolve the discharger's concerns and bring the monthly average value into compliance.

Permit Part I.E.4 Stations to be monitored:

(H) Comment I.E.4-1: request to eliminate monitoring at Diffuser Station U

EPA does not agree that stations whose data are not used for compliance determination are unnecessary. Data on receiving water characteristics in the immediate vicinity of the discharge are important for assessing plume behavior (they are key inputs in dilution modeling) as well as for determining potential effects on endangered species which may be transient or resident within the zone of mixing. Data collection only on the edge of the ZID / ZOM is not sufficient to evaluate these effects and meet EPA's obligations under the Endangered Species Act and other federal regulations. EPA has retained this monitoring location in the permit.

(I) Comment I.E.4-2: request to eliminate monitoring at Reference Station 5

EPA does not agree that stations whose data are not used for compliance determination are unnecessary. Note also that Pago Pago Harbor has different standards under the AS-WQS than the open ocean, therefore a reference station for a harbor discharge must reasonably collect its reference / background data from within the harbor, where those standards apply. The suggested alternate reference station, station FF, is significantly more distant from the harbor than station 5, placing station FF clearly within waters where a different set of water quality standards apply. Station FF is therefore unrepresentative of background levels in the harbor, which is what the reference station data are intended to provide. For these reasons and for the sake of data continuity to track long-term trends, EPA will retain the monitoring requirement at station 5 in the permit at this time. If a more representative *within-harbor* reference station can be identified, EPA may consider adoption of a new reference station as a modification to the permit. There will at minimum need to be a transition period of data collection at both stations to enable comparison of baselines.

(J) Comment I.E.4-3: request to eliminate monitoring at ZOM Stations A1 and B1

EPA agrees that ZID stations should be used in preference to ZOM stations for compliance determination for this 301(h)-modified NPDES permit, as the 301(h) regulations only grant mixing credit for dilution within the ZID. However, because data collection has not occurred at the ZID for many years, a transition period of data collection at both the new ZID stations and the existing ZOM stations is necessary in order for the anticipated new ZID data to be cross-correlated with the older ZOM data. The Final Permit includes a requirement that the discharger submit 2 ZID stations for EPA consideration and approval. EPA has the ability to re-open the permit to phase out ZOM data collection once sufficient data have been collected for the transition.

Permit Part I.E.6: Parameters to be monitored:

(K) Comment I.E.6-1: Request for expansion of allowable semi-annual monitoring date ranges from "March" to "February thru April", and "August" to "August thru October".

EPA finds that the requested broad date ranges for sampling have the potential to introduce too much variability in the collected data and would thus hinder comparison of interannual (year-to-year) performance of the treatment system. In particular, average rainfall in American Samoa varies significantly between the month of February and the month of April, and similarly average rainfall in August is much different from October. Rainfall remains a significant factor in the treatment burden faced by the Utulei STP due to collection system infiltration and other factors. While rainfall will vary naturally from year to year, introducing additional variability through less-consistent monitoring times would exacerbate this uncertainty. EPA prefers to retain the monitoring schedule with specific months designated for sampling to minimize this additional source of uncertainty.

(L) Comment I.E.6-2: ASPA requests that the sampling depths "*1m, mid-depth, and 1 m above the bottom*" be qualified to say that if the water depth is greater than the discharge depth the samples will be at "*1 m below the surface, mid-depth between the surface and the discharge depth, and at the discharge depth*".

EPA does not agree that sampling collection which may occur below the discharge depth is not useful. One major purpose of receiving water monitoring is to assess the reaction(s) of the harbor environment as a whole, and therefore consistency in how "bottom" samples are collected across stations is more relevant than constraining sampling depths to an arbitrary depth based on the bathymetry of the outfall location.

(M) Comment I.E.6-3: ASPA requests that the "Sample Type/Method" for Turbidity in the table on page 10 be stated as "Bench Meter *or Field Sensor*" rather than "Bench Meter".

EPA appreciates that discharger's consultant is seeking to evaluate alternate and simpler methods of data collection for the permit and has incorporated this change in the permit language.

(N) Comment I.E.6-4: ASPA requests that ammonia be reported as N rather than as NH3

EPA has incorporated this change to the format of the ammonia limit, see response to comment (A), above.

(O) Comment I.E.6-5: ASPA requests that the Sample Type /Method for ammonia be listed as "*Lab Sample (EPA 350.1)*" rather than "*Lab Sample (AS-EPA)*"

EPA appreciates discharger's sharing this update to their monitoring arrangements and has made the requested edit to the permit language.

(P) Comment I.E.6-6: ASPA requests that Enterococci be monitored at five stations: the two ZID Stations (to be determined) and the farfield Stations (C, 16, and 18), eliminating the diffuser, reference, and ZOM stations.

EPA does not agree that data collection at stations which are not used for compliance determination is unnecessary. As discussed in the responses to comments (H), (I), (J), and (L), above, a significant purpose of receiving water monitoring is to gather information on the response of the receiving water (harbor) as a whole. Thorough collection of bacteria data is particularly important for this permit because of the context of the newly installed UV disinfection equipment which was vital to the discharger's eligibility for reissuance of a waiver from secondary treatment requirements. For example:

- Bacteria data from the diffuser station are useful for comparison with the new ZID data to validate dilution performance for Enterococci
- Data from the reference station are useful to establish a baseline bacteria level for the harbor against which the effects of the discharge can be evaluated, and
- Data from the existing ZOM stations are needed during a transition period to allow correlations to be drawn with the new ZID data. As discussed under comment (K), EPA retains the ability to phase out ZOM monitoring once sufficient data have been collected for the transition.

Permit Part I.E.7: Sampling Times for Selected Parameters:

(Q) Comment I.E.7-1: The permit requires that: "*Sampling for parameters that are influenced by temperature or pH (i.e., Ammonia) shall be conducted once during the time period between noon and sunset to ensure critical (most stringent) high ambient water temperatures are reflected.*" ASPA requests that this requirement be removed because it is not technically required and it could add considerably to the cost of sampling.

Current American Samoa Water Quality Standards set ammonia standards which are dependent on temperature and pH (appendix A to the AS-WQS). For §301(h)-modified permits in particular, EPA must evaluate compliance "based upon conditions… during… periods when discharge characteristics, water quality, biological seasons, or oceanographic conditions indicate more critical situations may exist " (40 CFR §125.62(a)(iv), emphasis added). The permit language has been revised to more clearly specify that sampling must be representative of these "critical conditions". Because higher receiving water temperatures correlate to more stringent ammonia requirements under the AS-WQS, monitoring should be conducted as close as possible to these most-critical conditions (anticipated peak of daily temperature).

Permit Part I.E.8: Description of Sampling Locations:

(R) Comment I.E.8-1: ASPA requests that this condition be removed and/or incorporated in Part I.E.2

EPA has clarified the language in the permit to make more apparent that Part I.E.2 refers to verifying the coordinates of the existing sampling locations (U, A1, B1, C, 16, 18, 5, FF) during the first receiving water sampling event under this permit, while Part I.E.8 refers to providing details of the new (e.g. ZID) sampling locations once these are identified through development of a revised sampling plan.

Comments on Chronic Whole Effluent Toxicity (WET) Requirements: Permit Part II.C

(S) Comment II.C.1-1: Request for clarification on number of species to use for toxicity testing

EPA has clarified the conflicting language in sections II.C.1 and II.C.2, in addition to adding further detail to the permit limits table (Table 1). The correct species for marine testing are two, the purple sea urchin and the sand dollar. Furthermore, the two species are available as backups for each other and are not required to be tested at the same time:

- If Purple Sea Urchin are not available because it is out of season for their spawning, it would be appropriate to perform toxicity testing using only sand dollars.
- If Sand Dollars are out of season for spawning, it would be appropriate to perform toxicity testing using only Purple Sea Urchins.
- At times when both species are available for testing, it would be most appropriate to test using the species for which the most tests have been conducted—typically this would be the urchin.

(T) Comment II.C.1-2: Request for clarification on frequency of toxicity testing (annual vs semi-annual)

The reference to semi-annual testing was an accidental inclusion of old template language and has been corrected. The toxicity monitoring frequency for this permit is annual, as now listed in the permit limits table (Table 1).

(U) Comment II.C.3-1: Request that toxicity limits be revised on basis of 313:1 dilution with resulting decrease in the Instream Waste Concentration (IWC)

See responses (F.1) and (G) for the reasons EPA cannot grant the increase in dilution for toxicity as it would requested relaxation of permit limits in the context of §301(h). Backsliding on limits for Toxic effects from a discharge would be of particular concern due to the potential effect on marine organisms and potential endangered species in the vicinity of the discharge, as well as risking the protected uses of Pago Pago Harbor described in response (G).