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**APPENDIX M
UTILITY STUDIES**

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WASTEWATER ANALYSIS
IN SUPPORT OF THE
COMMONWEALTH OF THE NORTHERN MARIANA
ISLANDS
JOINT MILITARY TRAINING
FINAL ENVIRONMENTAL IMPACT STATEMENT



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Naval Facilities Engineering Systems Command, Pacific
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1 PURPOSE

The purpose of this evaluation is to identify existing conditions and estimate the wastewater to be generated with the Proposed Action analyzed in the Commonwealth of the Northern Mariana Islands (CNMI) Joint Military Training Final Environmental Impact Statement (EIS). This assessment evaluates existing wastewater facilities and wastewater treatment facilities resulting from the Proposed Action.

1.1 DESCRIPTION OF PROPOSED WASTEWATER INFRASTRUCTURE

1.1.1 Base Camp

The Proposed Action includes construction of a Base Camp at the United States (U.S.) Agency for Global Media (USAGM) site on Tinian. As envisioned, Administration, Range Control, and Training Support functions proposed in the Base Camp would use the existing operation and administration building, and warehouse requirements would be partially met with the existing warehouse facilities. Other previously disturbed, cleared areas within the site would accommodate other proposed Base Camp new construction needs. Wastewater infrastructure would be constructed at the Base Camp as described in the subsequent sections.

The USAGM site does not appear to be within either a Class I or II Aquifer Recharge Area/Groundwater Protection Zone on Tinian (Captain B. Bearden, U.S. Public Health Service, Personal Communication, March 3, 2025). No changes in wastewater infrastructure are proposed for the USAGM site on Saipan.

1.1.2 Port of Tinian

The biosecurity facility at the Port of Tinian is proposed to include wash racks. Military vehicles would be washed there as required as part of the biosecurity screening process. The wash racks would be a contained concrete facility where multiple vehicles can be washed simultaneously using cleaning equipment. Washing would be conducted using only water and no soaps or solvents are proposed to be used. Wash water would be contained in a holding tank and recycled through an oil/water separator. Once the wash cycles are complete, wash water would be pumped out and disposed of in conformance with CNMI regulations. The oil/water separator would be periodically pumped out and disposed of in conformance with CNMI regulations for oily waste. No domestic demand is proposed at the Port of Tinian as the biosecurity facility would not have a restroom.

1.1.3 Francisco Manglona Borja/Tinian International Airport

The Proposed Action includes construction of an aircraft shelter to be located at Tinian Divert facility at the Francisco Manglona Borja/Tinian International Airport. The shelter would be sized and constructed to provide protection for aircraft from inclement weather, including typhoon force winds. No wastewater infrastructure is proposed at the aircraft shelter.

1.1.4 Other Facilities

The Proposed Action includes construction of various other facilities including ranges, landing zones, and a drop zone. No wastewater infrastructure is proposed for any of these facilities.

Portable toilets may be placed temporarily as required for construction, operation, or training activities.

1.2 COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS WASTEWATER REGULATIONS

The Northern Mariana Islands Administrative Code defines two different types of wastewater treatment systems (Northern Mariana Islands Administrative Code 2017a). The first type is an Individual Wastewater Disposal System, which consists of a septic tank and leach field. An Individual Wastewater Disposal System is typically used for a single residence or business. The second type is an Other Wastewater Treatment System, which includes all treatment methods other than a septic tank.

1.2.1 Individual Wastewater Disposal System Regulations

The following is a summary of the Northern Mariana Islands Administrative Code as it pertains to Individual Wastewater Disposal System design:

- Average daily wastewater flow rates are calculated per Northern Mariana Islands Administrative Code section 65-120-500.
- Septic tank sizing and design are determined per Northern Mariana Islands Administrative Code section 65-120-600.
- Percolation testing is required per Northern Mariana Islands Administrative Code section 65-120-700.
- Leaching field sizing and design are determined per Northern Mariana Islands Administrative Code section 65-120-800.

1.2.2 Other Wastewater Treatment System Regulations

CNMI regulations require construction and operation of an Other Wastewater Treatment System for average daily wastewater flows greater than 5,000 gallons per day (Northern Mariana Islands Administrative Code section 65-120-110). These regulations also state the maximum discharge limits for various effluent constituents, including a total nitrogen limit of 1.0 milligrams per liter (Northern Mariana Islands Administrative Code section 65-120-010). Total nitrogen is removed from wastewater by using bacteria that digest the various forms of nitrogen (e.g., nitrate and nitrite).

1.3 EXISTING WASTEWATER INFRASTRUCTURE

1.3.1 Existing Individual Wastewater Disposal System Infrastructure

Various Public and Private Systems

Tinian has no centralized municipal wastewater collection and treatment system. Residences, businesses, and municipal facilities use Individual Wastewater Disposal Systems that consist of a septic tank and leach field. The Commonwealth Utilities Corporation has awarded a contract to an engineering consultant to prepare a preliminary engineering report for a wastewater treatment plant (Bureau of Environmental and Coastal Quality, Personal Communication, September 12, 2024).

Until such a system is funded and constructed, residents and visitors would continue to rely on Individual Wastewater Disposal Systems.

United States Agency for Global Media

The USAGM, formerly International Broadcasting Bureau, operates an Individual Wastewater Disposal System, constructed in 1997, consisting of a packaged wastewater treatment system for aerobic digestion (Figure 1). Treated wastewater is disposed of in a leach field without a septic tank.



Figure 1 Existing Individual Wastewater Disposal System at USAGM

Camp Tinian

A U.S. military Individual Wastewater Disposal System was constructed on Tinian in 1999 to support military training (Figure 2). The septic tank and leach field system are sized for 6,640 gallons per day (Department of Environmental Quality 1999).



Figure 2 Existing Individual Wastewater Disposal System near Camp Tinian

Commonwealth Utilities Corporation Tinian Power Plant

The Commonwealth Utilities Corporation power plant on Tinian has an Individual Wastewater Disposal System with a small aeration tank similar to the USAGM facility. No information was made available regarding this system (Bureau of Environmental and Coastal Quality, Personal Communication, September 12, 2024).

1.3.2 Existing Other Wastewater Treatment System Infrastructure

Tinian Dynasty Hotel and Casino

The Tinian Dynasty Hotel and Casino operated 500 rooms, a casino, several restaurants, and dwelling units for staff accommodation until it closed in 2016. The hotel had its own Other Wastewater Treatment System, a tertiary treatment plant that was permitted to treat 240,000 gallons per day. The condition of this facility is not known. Figure 3 shows the condition of the entrance to the facility in September 2024; the Other Wastewater Treatment System is not visible through the vegetation.



Figure 3 Entrance to the Tinian Dynasty Hotel and Casino

Note: The Other Wastewater Treatment System is located within the vegetation to the right and was not visible at the time this photo was taken.

Tinian Diamond Hotel and Casino

The Tinian Diamond Hotel and Casino operated a hotel, a casino, and a restaurant until it closed in December 2024. The facility had its own Other Wastewater Treatment System, a tertiary treatment plant that consists of membrane bioreactors with denitrification (Figure 4). The Bureau of Environmental and Coastal Quality stated that the Other Wastewater Treatment System had not operated due to a lack of minimum wastewater flow (Bureau of Environmental and Coastal Quality, Personal Communication, September 12, 2024).



Figure 4 Other Wastewater Treatment System at Tinian Diamond Hotel and Casino

1.4 PROPOSED WASTEWATER DEMAND AND WASTEWATER INFRASTRUCTURE

1.4.1 Design Population

The maximum number of personnel on island at any one time from the Proposed Action would be 1,070 (estimates for this study used 1,100 to be conservative) and consists of the following types:

- Up to a maximum of 1,000 military personnel participating in training.
- Between 30 and 50 permanent support personnel, who would maintain and operate the facility. It is assumed that 20 individuals would relocate to Tinian and that the on-island local workforce could fill 30 positions.
- Up to 50 construction workers, who are assumed to relocate to Tinian from off-island. Construction would occur in phases over approximately 10 to 15 years.

Dependents are not included in the estimates above based on the experience of other U.S. Department of Defense (DoD) construction projects on Tinian.

1.4.2 Portable Vehicle Wash Facility

A portable wash rack would be stored at the Base Camp and made available for use at either TNI or North Field in the event cargo/material arrives that does not meet cleanliness standards and for cargo/equipment departing from TNI or North Field. A water truck would supply water to the water bladder attached to the portable wash rack. Washing would be conducted using only water and no soaps or solvents. Wash water would be contained during the washing cycle. Wash water from the portable wash rack would be run through an oil water separator and discarded in accordance with all applicable laws, regulations and permits. The oil/water separator would be periodically pumped out and disposed of in conformance with CNMI regulations for oily waste.

1.4.3 Proposed Wastewater Demand

Wastewater demand is determined using the requirements of Unified Facilities Criteria 3-240-01 based on population. Wastewater demand for both Alternatives 1 and 2 is the same. Table 1 summarizes the estimated wastewater demands for the Proposed Action.

Table 1. Peak Proposed Wastewater Demand

<i>Personnel Type</i>	<i>Use Category ^a</i>	<i>Unit Flow (gpcd)</i>	<i>Population</i>	<i>Wastewater Flow (gpd)</i>
Military Personnel	Military Training Camps	50	1,000	50,000
Construction Workers (8-hour shift)	Nonresident Personnel and Civilian Employees (per 8-hour shift)	30	50	1,500
Permanent Support Personnel (8-hour shift)	Nonresident Personnel and Civilian Employees (per 8-hour shift)	30	50	1,500
			Total	53,000

Legend: gpcd = gallon(s) per capita per day; gpd = gallon(s) per day.

Notes: ^a Data per Table 3.1 of Unified Facilities Criteria 3-240-01.

Wastewater infrastructure is designed to accommodate the peak flow. Actual flow will vary significantly between training events and non-training periods. During non-training periods, wastewater flow could be 1,500 gallons per day or less.

1.4.4 Proposed Wastewater Infrastructure

The Proposed Action includes construction of new wastewater infrastructure at the Base Camp, which would be operated and maintained by the U.S. Marine Corps (USMC). The new wastewater infrastructure could include a sanitary sewer collection system, a sewer lift station, and one or more Individual Wastewater Disposal Systems. Individual Wastewater Disposal Systems are proposed because the USAGM site does not appear to be within either a Class I or II Aquifer Recharge Area/Groundwater Protection Zone on Tinian (Captain B. Bearden, U.S. Public Health Service, Personal Communication, March 3, 2025). USMC will continue to coordinate with the CNMI Bureau of Environmental and Coastal Quality on the consideration of additional treatment technologies. At Base Camp, a grease trap with a capacity of at least 1,000 gallons is proposed to be located at the mess tent sewer connection. Grease will be periodically removed and disposed in conformance with CNMI regulations.

Wastewater service outside of the Base Camp would be provided using portable toilets. These portable toilets would be periodically emptied and disposed of at a septage disposal site approved by the CNMI Bureau of Environmental and Coastal Quality per section 65-120-1405 (CNMI Code of Regulations).

Sludge from the CNMI Joint Military Training septic tanks would also be emptied and disposed of at a septage disposal site approved by the Bureau of Environmental and Coastal Quality per Northern Mariana Islands Administrative Code section 65-120-1405.

Septic Tank Size

The following is an estimate of the total volume needed for all the septic tanks in order to estimate sludge removal. Per Northern Mariana Islands Administrative Code section 65-120-605, septic tanks shall be sized using the following equation when the average daily sewer flow is greater than 1,500 gallons per day:

$$\text{Liquid volume} = 1,125 \text{ gallons} + (75\% \times \text{Average daily sewage flow in gallons per day})$$

$$\text{Liquid volume} = 1,125 \text{ gallons} + (75\% \times 53,000 \text{ gallons per day}) = 40,875 \text{ gallons}$$

Per Northern Mariana Islands Administrative Code section 65-120-625, the minimum septic tank dimensions are 6 feet in length, 4 feet wide, and 6 feet deep. Tanks are also required to include scum storage for 15 percent of the liquid depth and 1 inch of air space at the top of the tank. Conceptual tank dimensions that would meet these requirements are:

- *Width:* 20 feet
- *Length:* 42 feet
- *Depth:* 8 feet
- *Tank Volume:* 50,272 gallons

The calculation above assumed a single septic system for the Proposed Action. Multiple smaller systems or parallel tanks that provide the same capacity could also be used instead.

Leach Field Size

Leach fields for septic systems are sized based on the percolation rate of the soil per Northern Mariana Islands Administrative Code section 65-120-820, Table 800-1. Below are calculations for

the total leach field size using the smallest allowable percolation rate (largest required area) for all septic systems.

Assuming percolation at 0.67 inches per hour:

$$53,000 \text{ gallons per day} / 0.5 \text{ gallons per square foot per day} = 106,000 \text{ square feet of leach field} = 2.4 \text{ acres}$$

Percolation tests would be done per Northern Mariana Islands Administrative Code section 65-120-700 prior to starting engineering design of the leach fields.

1.5 VEHICLE MAINTENANCE

Under the Proposed Action, vehicle maintenance activities would not be conducted at the Base Camp. The training unit would bring on-island all vehicles used during training and remove the vehicles following the completion of training. No drainage or drywells would be constructed or used.

1.6 SUMMARY

Wastewater generated on the Military Lease Area as a result of the Proposed Action can be collected and treated in accordance with Northern Mariana Islands Administrative Code. Below is a summary of the anticipated wastewater system to be constructed at the Base Camp:

- Wastewater Demand: 53,000 gallons per day
- Total Septic Volume: 50,272 gallons
- Leach Field Size: 2.4 acres

Operation and maintenance of the wastewater system in accordance with Unified Facilities Criteria 3-240-03 is anticipated to include the following:

- Maintain vegetation over the leach field by cutting grass and removing trees, shrubs, and larger plants.
- Monitor sludge depth within septic tanks and remove sludge when the system is no longer working efficiently in accordance with the equipment manufacturer's recommendations.
- The quantity and frequency of sludge removal is based on the amount the system is used. Generally, it is expected that a septic tank is pumped every 3 to 5 years. If the tanks are half full of sludge, then removal could consist of 25,000 gallons or approximately 100 tons.

The wastewater generated by new populations residing outside the Military Lease Area in existing housing, including wastewater generated by construction workers and permanent support personnel outside shift hours, would not exceed the capacity of the Individual Wastewater Disposal Systems. Each private property owner is responsible for maintenance and compliance with the CNMI regulations for their Individual Wastewater Disposal System. Thus, no indirect impact is anticipated from the construction workers or permanent support personnel living outside of the Military Lease Area in support of the Proposed Action.

2 REFERENCES

Department of Environmental Quality. 1999. *Individual Wastewater Disposal System Certification for Use of Septic System*. CNMI Department of Environmental Quality. March 10.

Department of Defense, United States (DoD). 2019. *Unified Facilities Criteria (UFC), Operation and Maintenance (O&M): Wastewater Treatment*. UFC 3-240-03. April 1.

Department of Defense, United States (DoD). 2024. *Unified Facilities Criteria (UFC), Wastewater Collection and Treatment*. UFC 3-240-01. October 1. Northern Mariana Islands Administrative Code. 2017a. *Wastewater Treatment and Disposal Rules and Regulations*. Chapter 65-120.

Northern Mariana Islands Administrative Code. 2017b. *Water Quality Standards*. Chapter 65-130.

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