Soils that are best suited to producing sustained high yields of crops are identified as prime farmland (U.S. Department of Agriculture 1989). Prime farmland soils do not have to currently be used for cropland. Areas with these soils can be forest land, pastureland, cropland, or other land (Natural Resources Conservation Service 2012). Prime farmland soils on Tinian are shown in Figure 3.12-4. Within the Military Lease Area, prime farmland soils include Saipan-Dandan clays (0 to 5 percent slope) and Saipan clays (0 to 5 percent slope) and comprise approximately 71 percent (1,054 acres) of prime farmland soils on Tinian.

3.13 Groundwater and Hydrology

This section describes Tinian groundwater and hydrology conditions, which is the occurrence, movement, and quality of water beneath the surface.

3.13.1 Groundwater Availability

Rainfall is the primary source of fresh groundwater on Tinian. This rainwater percolates downward into porous limestone rock (Doan et al. 1960) and recharges Tinian's freshwater aquifer. Fresh groundwater on Tinian is primarily classified as basal (a body of fresh groundwater that floats on saline groundwater). The portion of the basal freshwater lens that is usable for potable water (groundwater with chloride concentrations less than 250 parts per million) is thickest south and southwest of Mount Lasso and thins approaching the coastline (Figure 3.13-1). Tinian relies on groundwater for all of its water supply. The basal freshwater lens underlying Tinian meets the definition of an aquifer found in CNMI Title 65, Chapter 65-90-010 and is the principal source of drinking water for the island's residents.

The groundwater table on Tinian (the underground area where water fills the spaces between sediment layers), ranges from sea level around the perimeter of the island to over 3 feet above mean sea level in the central portions of the island. The U.S. Geological Survey estimates the average annual groundwater recharge for Tinian to be approximately 30 inches per year (Gingerich 2002). This translates into approximately 20 billion gallons per year of recharge. Groundwater flows outward from the North Central Highland and the Southeastern Ridge and generally seaward around the island (Appendix M). Figure 3.13-1 depicts groundwater table elevation contours and the general direction of groundwater flow. Most of the fresh groundwater slowly discharges naturally from springs around the perimeter of the island and submarine coastal springs.

Numerous wells have been installed on Tinian, beginning with potentially more than 100 wells installed by the Japanese from 1914 to 1944. Most of these wells were reportedly filled. Between 1944 and 1945, the U.S. installed approximately 40 wells, including Maui Well Number 1. The majority of these wells have been inactive since shortly after World War II, except Maui Well Number 1. Between 1993 and 1997, the U.S. Geological Survey installed 17 wells and rehabilitated 16 World War II-era wells for groundwater monitoring; all of which remain open.

Figure 3.12-4 Tinian Prime Farmland Soils

The Commonwealth Utilities Corporation operates the Tinian public potable water system. Until it was disconnected and abandoned, Maui Well Number 1 supplied potable water to Tinian. This Maui-style well, featuring a horizontal infiltration system, was constructed at Makpo Marsh by the U.S. military during World War II. It served as Tinian's primary potable water source until it was replaced by Maui Well Number 2 (Commonwealth Utilities Corporation 2022). Maui Well Number 2 is also located in the Makpo Marsh within the Makpo sub-watershed. Ranchers and farmers pump fresh water from agricultural wells M-21 and M-26 (Figure 3.13-1), which are not regulated for potable water use. Currently, the U.S. Air Force Divert Activities project is using well M-21 to supply construction water (DON 2023).

3.13.2 Groundwater Quality

The Commonwealth Utilities Corporation routinely tests Maui Well Number 2 for chemical constituents regulated under the Safe Drinking Water Act. All analyzed water samples were reported to be within primary and secondary drinking water standards (Appendix M).

Tinian's groundwater quality is potentially vulnerable to increased nitrates and microbial contaminants, which can be associated with on-site wastewater systems and agricultural practices. Most residences, commercial buildings, and government facilities rely on septic systems. Annual monitoring reports for Maui Well Number 2 indicate water quality complies with total nitrogen limits, which includes nitrate and nitrite concentrations. Tinian has the potential for high chloride levels in groundwater due to saltwater intrusion into the freshwater lens. Chloride concentration is an important secondary standard for Maui Well Number 2 because it has the potential to indicate the quantity of freshwater available at that location. Annual monitoring reports for Maui Well Number 2 indicate water quality complies with total chloride limits. The Commonwealth Utilities Corporation conducts monthly water tests for signs of microbial contamination. The latest published results reported no microbial detection (Commonwealth Utilities Corporation 2024a). As an agricultural well, M-26 is not legally mandated to be monitored. However, it was sampled in 2015 as part of the *CNMI Aquifer Study*. The results showed that the water met primary and secondary drinking water standards (Appendix M).

Figure 3.13-1 Tinian Groundwater Wells, Elevation, and Flow Direction